DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 248

SURFACE WATER SUPPLY OF THE UNITED STATES

1907–8

PART VIII. WESTERN GULF OF MEXICO

PREPARED UNDER THE DIRECTION OF M. O. LEIGHTON

BY

W. B. FREEMAN, W. A. LAMB, AND
R. H. BOLSTER

WASHINGTON
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SURFACE WATER SUPPLY OF WESTERN GULF OF MEXICO, 1907-8.

By W. B. FREEMAN, W. A. LAMB, and R. H. BOLSTER.

INTRODUCTION.

AUTHORITY FOR INVESTIGATIONS.

This volume contains results of flow measurements made on certain streams in the United States. The work was performed by the water-resources branch of the United States Geological Survey, either independently or in cooperation with organizations mentioned herein. These investigations are authorized by the organic law of the Geological Survey (Stat. L., vol. 20, p. 394), which provides, among other things, as follows:

> 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.

Inasmuch as water is the most abundant and most valuable mineral in nature, the investigation of water resources is included under the above provision for investigating mineral resources. The work has been supported since the fiscal year ending June 30, 1895, by appropriations in successive sundry civil bills passed by Congress under 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.

The various appropriations that have been made for this purpose are as follows:

Annual appropriations for the fiscal year ending June 30—

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000

SCOPE OF INVESTIGATIONS.

These investigations are not complete nor do they include all the river systems or parts thereof that might purposefully be studied. The scope of the work is limited to that which can be provided with the appropriations available. The field covered and the character of the work are believed to be the best that could be accomplished under the controlling conditions. It would undoubtedly be of more scientific importance and ultimately of more practical value if the money now applied to wide areas were concentrated on a few small basins. Such a course is impossible because general appropriations made by Congress are applicable to all parts of the country. Each part demands its proportionate share of the benefits.

It is essential that records of stream flow shall be maintained during a period of years sufficient to cover all stages, in order that within reasonable limits the entire range of flow from the absolute maximum to the absolute minimum may be determined. The length of such a period manifestly varies for different streams and can not be absolutely determined. Experience has shown that the records should cover from five to ten years, or for some streams twenty years or more, the limit being determined by the relative importance of the stream and the interdependence of the results and other long-time records on adjacent streams.

In the performance of this work the Geological Survey endeavors to approach as nearly as possible the highest degree of precision which a rational expenditure of time and a judicious expenditure of a small amount of money will allow. In all engineering work there is a point of refinement beyond which it is needless and wasteful to proceed, and this principle applies with especial force to stream-flow measurements. It is confidently believed that with some unavoidable exceptions the stream-flow data presented in the publications of the Survey are sufficiently accurate for all practical purposes. Many of the records are, however, of insufficient length, owing to the unforeseen reduction of appropriations and consequent abandonment of many stations. All persons are cautioned to exercise the greatest care in the utilization of such incomplete records.

Records of varying lengths have been obtained at about 1,400 different points in the United States, and in addition the surface water supply of small areas in Seward Peninsula and the Yukon-Tanana region, Alaska, has been investigated. During 1907 and 1908 regular gaging stations were maintained by the Survey and cooperating organizations at about 740 points in the United States, and in addition numerous miscellaneous measurements were made. Data were also obtained in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country.

These data will be made available in the regular surface water-supply papers and in special papers from time to time.

PURPOSES OF THE WORK.

Among the purposes for which the results contained in this volume are requisite are navigation, irrigation, domestic water supply, water power, swamp and overflow land drainage, and flood prevention. The demands of all these interests are immediate.

Navigation.—The Federal Government has expended more than $250,000,000 for the improvement of inland navigation and prospective expenditures will approximate several times this amount. It is obvious that the determination of stream flow is necessary to the intelligent solution of the many problems involved.

Irrigation.—The United States is now expending $42,000,000 on federal irrigation systems, and this amount is far exceeded by the private expenditures of this nature in the arid West. The integrity of any irrigation system is based absolutely on the amount of water available. Therefore investigations of stream flow in that portion of the country are of first importance in the redemption of the lands, as well as constituting an insurance of federal and private investments.

Domestic water supply.—The highest use of water is that of domestic supply, and while the federal interest in this aspect of the matter is less direct than in the aspects already named this use of water nevertheless has so broad a significance with respect to the general welfare that the Federal Government is ultimately and intimately concerned.

Water power.—The time is rapidly approaching when the development of the water power of the country will be an economic necessity. Our stock of coal is being rapidly depleted and the cost of steam power is increasing accordingly. Industry will cease its growth if cheap power is not available, and in that event the United States as a nation will cease to progress. Water power is the only avenue now open. When the electric transmission of power was accomplished, the relation of our water powers to national economy changed entirely. Previous to the day of electric transmission the importance of a water power was largely confined to the locality at which it was generated, but it has now become a pubilc utility in which the individual citizen is vitally interested. Inasmuch as the amount of water power that may be made available is dependent on the flow of rivers, the investigation of flow becomes a prerequisite in the judicious management of this source of energy.

Drainage of swamp and overflowed lands.—More than 70,000,000 acres of the richest land in this country are now practically worthless, or of precarious value, by reason of overflow and swamp conditions. When this land is drained it becomes exceedingly produc-

tive and its value increases many fold. Such reclamation would add to the national assets at least $700,000,000. The study of run-off is the first consideration in connection with drainage projects. If, by the drainage of a large area into any particular channel, that channel becomes so gorged with water, which it had not hitherto been called upon to convey, that overflow conditions are created in places where previously the land was not subject to inundation, then drainage results merely in an exchange of land values. This is not the purpose of drainage improvement.

Flood prevention.—The damage from floods in the United States exceeds $100,000,000 annually, and in the year 1908 the aggregate damage, based on reliable data, approximated $250,000,000. Such an annual tax on the property of great regions should be reduced in the orderly progress of government. It goes without saying that any consideration of flood prevention must be based on a thorough knowledge of stream flow, both in the contributing areas which furnish the water and along the great lowland rivers.

PUBLICATIONS.

The data on stream flow collected by the United States Geological Survey since its inception have appeared in the annual reports, bulletins, and water-supply papers. Owing to natural processes of evolution and to changes in governmental requirements, the character of the work and the territory covered by these different publications has varied greatly. For the purpose of uniformity in the presentation of reports a general plan has been agreed upon by the United States Reclamation Service, the United States Forest Service, the United States Weather Bureau, and the United States Geological Survey, according to which the area of the United States has been divided into twelve parts, whose boundaries coincide with certain natural drainage lines. The areas so described are indicated by the following list of papers on surface water supply for 1907 and 1908. The dividing line between the North Atlantic and South Atlantic drainage areas lies between York and James rivers.

Papers on surface water supply of the United States, 1907–8.

Part.	No.	Title.	Part.	No.	Title.
I	241	North Atlantic coast.	VI	246	Missouri River basin.
II	242	South Atlantic coast and eastern Gulf of Mexico.	VII	247	Lower Mississippi River basin.
III	243	Ohio River basin.	VIII	248	Western Gulf of Mexico.
IV	244	St. Lawrence River basin.	IX	249	Colorado River basin.
V	245	Upper Mississippi River and Hudson Bay basins.	X	250	Great Basin.
			XI	251	California.
			XII	252	North Pacific coast.

The following table gives the character of data regarding stream flow at regular stations to be found in the various publications of the United States Geological Survey exclusive of all special papers. Numbers of reports are inclusive and dates also are inclusive so far as the data are available.

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

[Ann.=Annual Report; B.=Bulletin; W. S.=Water-Supply Paper.]

Report.	Character of data.	Year.
10th Ann., pt. 2	Descriptive information only	
11th Ann., pt. 2	Monthly discharge	1884 to Sept., 1890.
12th Ann., pt. 2	....do	1884 to June 30, 1891.
13th Ann., pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th Ann., 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 Ann., pt. 2	Descriptive information only	
B. 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
W. S. 11	Gage heights (also gage heights for earlier years)	1896.
18 Ann., pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for earlier years).	1895 and 1896.
W. S. 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
W. S. 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th Ann., pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
W. S. 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
W. S. 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th Ann., pt. 4	Monthly discharge (also for many earlier years)	1898.
W. S. 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st Ann., pt. 4	Monthly discharge	1899.
W. S. 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d Ann., pt. 4	Monthly discharge	1900.
W. S. 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W. S. 75	Monthly discharge	1901.
W. S. 82 to 85	Complete data	1902.
W. S. 97 to 100	....do	1903.
W. S. 124 to 135	....do	1904.
W. S. 165 to 178	....do	1905.
W. S. 201 to 214	Complete data, except descriptions	1906.
W. S. 241 to 252	Complete data	1907–8.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The records at most of the stations discussed in these reports extend over a series of years. An index of the reports containing records prior to 1904 has been published in Water-Supply Paper 119. The first table which follows gives, by years and drainage basins, the numbers of the papers on surface water supply published from 1899 to 1908. Wherever the data for a drainage basin appear in two papers the number of one is placed in parentheses and the portion of the basin covered by that paper is indicated in the second table. For example, in 1904 the data for Missouri River were published in Water-Supply Papers 130 and 131, and the portion of the records contained in Water-Supply Paper 131, as indicated by the second table, is that relating to Platte and Kansas rivers.

Numbers of water-supply papers containing results of stream measurements, 1899–1908.

	1899.[a]	1900.[b]	1901.	1902.	1903.	1904.	1905.	1906.	1907–8.
Atlantic coast and eastern Gulf of Mexico:									
New England rivers	35	47	65,75	82	97	124	165	201	241
Hudson River to Delaware River, inclusive	35	47, (48)	65,75	82	97	125	166	202	241
Susquehanna River to York River, inclusive	35	48	65,75	82	97	126	167	203	241
James River to Yadkin River, inclusive	(35), 36	48	65,75	(82), 83	(97), 98	126	167	203	242
Santee River to Pearl River, inclusive	36	48	65,75	83	98	127	168	204	242
St. Lawrence River	36	49	65,75	(82), 83	97	129	170	206	244
Hudson Bay	.....	.....	66,75	85	100	130	171	207	245
Mississippi River:									
Ohio River	36	48, (49)	65,75	83	98	128	169	205	243
Upper Mississippi River	36	49	65,75	83	98, (99)	128, (130)	171	207	245
Missouri River	(36), 37	49, (50)	66,75	84	99	130, (131)	172	208	246
Lower Mississippi River	37	50	(65), 66,75	(83), 84	(98), 99	(128), 131	(169), 173	(205), 209	247
Western Gulf of Mexico	37	50	66,75	84	99	132	174	210	248
Pacific coast and Great Basin:									
Colorado River	(37), 38	50	66,75	85	100	133, (134)	175, (177)	211, (213)	249, (251)
Great Basin	38, (39)	51	66,75	85	100	133, (134)	176, (177)	212, (213)	250, (251)
South Pacific coast to Klamath River, inclusive	(38), 39	51	66,75	85	100	134	177	213	251
North Pacific coast	38	51	66,75	85	100	135	(177), 178	214	252

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39.
[b] 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.

Numbers of water-supply papers containing data covering portions of drainage basins.

No.	River basin.	Tributaries included.
35.	James	
36.	Missouri	Gallatin.
37.	Colorado	Green, Gunnison, Grand above junction with Gunnison.
38.	Sacramento	Except Kings and Kern.
39.	Great Basin	Mohave.
48.	Delaware	Wissahickon and Schuylkill.
49.	Ohio	Scioto.
50.	Missouri	Loup and Platte near Columbus, Nebr. All tributaries below junction with Platte.
65.	Lower Mississippi	Yazoo.
82.	James	
	St. Lawrence	Lake Ontario, tributaries to St. Lawrence River proper.
83.	Lower Mississippi	Yazoo.
97.	James	
98.	Lower Mississippi	Do.
99.	Upper Mississippi	Tributaries from the west.
128.	Lower Mississippi	Yazoo.
130.	Upper Mississippi	Tributaries from the west.
131.	Missouri	Platte, Kansas.
134.	Colorado	Data near Yuma, Ariz., repeated.
	Great Basin	Susan, Owens, Mohave.
169.	Lower Mississippi	Yazoo.
177.	Colorado	Below junction with Gila.
	Great Basin	Susan repeated, Owens, Mohave.
	North Pacific coast	Rogue, Umpqua, Siletz.
205.	Lower Mississippi	Yazoo, Homochitto.
213.	Colorado	Data at Hardyville repeated; at Yuma, Salton Sea.
	Great Basin	Owens, Mohave.
251.	Colorado	All stations in Colorado and Great Basin drainages lying in California repeated.
	Great Basin	

The order of treatment of stations in any basin in these papers is downstream. The main stem of any river is determined on the

basis of drainage area, local changes in name and lake surface being disregarded. After all stations from the source to the mouth of the main stem of the river have been given, the tributaries are taken up in regular order from source to mouth. The tributaries are treated the same as the main stream, all stations in each tributary basin being given before taking up the next one below.

The exceptions to this rule occur in the records for Mississippi River, which are given in four parts, as indicated above, and in the records for large lakes, where it is often clearer to take up the streams in regular order around the rim of the lake than to cross back and forth over the lake surface.

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 which represent a rate of flow, as second-feet, gallons per minute, miner's inches, and run-off in second-feet per square mile, and (2) those which represent the actual quantity of water, as run-off in depth in inches and acre-feet. They may be defined as follows:

"Second-foot" is an abbreviation for cubic foot per second and is the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at a rate of 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the following table of equivalents.

"Gallons per minute" is generally used in connection with pumping and city water supply.

The "miner's inch" is the rate of discharge of water that passes through an orifice 1 inch square under a head which varies locally. It is commonly used by miners and irrigators throughout the West and is defined by statute in each State in which it is used.

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

"Acre-foot" is equivalent to 43,560 cubic feet, and is the quantity required to cover an acre to a depth of 1 foot. It is commonly used in connection with storage for irrigation work.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:

1 second-foot equals 40 California miner's inches (law of March 23, 1901).
1 second-foot equals 38.4 Colorado miner's inches.
1 second-foot equals 40 Arizona miner's inches.
1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,272 gallons for one day.
1 second-foot equals 6.23 British imperial gallons per second.
1 second-foot for one year covers 1 square mile 1.131 feet or 13.572 inches deep.
1 second-foot for one year equals 31,536,000 cubic feet.
1 second-foot equals about 1 acre-inch per hour.
1 second-foot for one day covers 1 square mile 0.03719 inch deep.
1 second-foot for one 28-day month covers 1 square mile 1.041 inches deep.
1 second-foot for one 29-day month covers 1 square mile 1.079 inches deep.
1 second-foot for one 30-day month covers 1 square mile 1.116 inches deep.
1 second-foot for one 31-day month covers 1 square mile 1.153 inches deep.
1 second-foot for one day equals 1.983 acre-feet.
1 second-foot for one 28-day month equals 55.54 acre-feet.
1 second-foot for one 29-day month equals 57.52 acre-feet.
1 second-foot for one 30-day month equals 59.50 acre-feet.
1 second-foot for one 31-day month equals 61.49 acre-feet.
100 California miner's inches equal 18.7 United States gallons per second.
100 California miner's icnhes equal 96.0 Colorado miner's inches.
100 California miner's inches for one day equal 4.96 acre-feet.
100 Colorado miner's inches equal 2.60 second-feet.
100 Colorado miner's inches equal 19.5 United States gallons per second.
100 Colorado miner's inches equal 104 California miner's inches.
100 Colorado miner's inches for one day equal 5.17 acre-feet.
100 United States gallons per minute equal 0.223 second-foot.
100 United States gallons per minute for one day equal 0.442 acre-foot.
1,000,000 United States gallons per day equal 1.55 second-feet.
1,000,000 United States gallons equal 3.07 acre-feet.
1,000,000 cubic feet equal 22.95 acre-feet.
1 acre-foot equals 325,850 gallons.
1 inch deep on one square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals 5,280 feet.
1 acre equals 0.4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot equals 7.48 gallons.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.
1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76.0 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.

1½ horsepower equal about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Sec.-ft.} \times \text{fall in feet}}{11}$ = net horsepower on water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF TABLES.

For each drainage basin there is given a brief description of general conditions covering such features as area, source, tributaries, topography, geology, conditions of forestation, rainfall, ice conditions, irrigation, storage, power possibilities, and other special features of importance or interest.

For each regular current-meter gaging station are given in general, and so far as available, the following data: Description of station, list of discharge measurements, table of daily gage heights, rating table, table of monthly and yearly discharges and run-off. For stations located at weirs or dams the gage-height and rating tables are omitted and a table of daily discharge is substituted. For stations where the flow is computed by shifting-channel methods, a table of daily discharge is given in place of rating tables, which are not used in these methods of computation.

In addition to statements regarding the location and installation of current-meter stations the descriptions give information in regard to any conditions which may affect the constancy of the relation of gage height to discharge, covering such points as ice, logging, shifting conditions of flow, and backwater; also full information regarding diversions which decrease the total flow at the measuring section. Statements are also made regarding the accuracy and reliability of the data.

The discharge-measurement table gives the results of the discharge measurements made during the year, including the date, name of hydrographer, width and area of cross section, gage height, and discharge in second-feet.

The table of daily gage heights gives the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day. At most stations the gage is read in the morning and in the evening. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. All gage heights during ice conditions, backwater from obstructions, etc., are published as recorded, with suitable footnotes. The rating is not applicable for such periods unless the proper correction to the gage heights is known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum and has no relation to zero flow or the bottom of the river. In general, the zero is located somewhat below the lowest known flow, so that negative readings shall not occur.

The discharge measurements and gage heights are the base data from which the rating tables and monthly-discharge tables are computed.

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is published to enable engineers to determine the daily discharge by its application to the table of gage heights or to check results in the table of monthly discharge.

In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, 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 period when the water surface was at crest height and the corresponding discharge consequently larger than given in this column. Likewise, in the column of "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 for each second during the month. On this the computations for the remaining columns, which are defined on page 11, are based.

FIELD METHODS OF MEASURING STREAM FLOW.

There are three distinct methods of determining the flow of open-channel streams: (1) By measurements of slope and cross section and the use of Chezy's and Kutter's formulas; (2) by means of a weir or dam; (3) by measurements of the velocity of the current and of the area of the cross section. The method chosen depends on the local physical conditions, the degree of accuracy desired, the funds available, and the length of time that the record is to be continued.

Slope method.—Much information has been collected relative to the coefficients to be used in the Chezy formula, $v=c\sqrt{rs}$. This has been utilized by Kutter, both in developing his formula for c and in determining the values of the coefficient n which appears therein. The results obtained by the slope method are in general only roughly approximate, owing to the difficulty in obtaining accurate data and the uncertainty of the value for n to be used in Kutter's formula. The most common use of this method is in estimating the flood discharge of a stream when the only data available are the cross section, the slope as shown by marks along the bank, and a knowledge of the general conditions. It is seldom used by the United States Geological Survey. For full information regarding this method the reader is referred to the various text-books on hydraulics.

Weir method.—Relatively few stations are maintained at weirs or dams by the United States Geological Survey. Standard types of sharp-crested and broad-crested weirs within the limits for which

accurate coefficients have been experimentally obtained give very accurate records of discharge if properly maintained. At practically all broad-crested weirs, however, there is a diversion of water either through or around the dam, usually for the purpose of development of water power. The flow is often complicated and the records are subject to errors from such sources as leakage through the dam, backwater at high stages, uncertainty regarding coefficient, crest which is not level, obstructions from logs or ice, use of flashboards, old turbines with imperfect ratings, and many others depending on the type of development and the uses of the diverted water.

In general, records of discharge at dams are usually accurate enough for practical use if no others are available. It has been the general experience of the United States Geological Survey, however, that records at current-meter gaging stations under unobstructed channel conditions are more accurate than those collected at dams, and where the conditions are reasonably favorable are practically as good as those obtained at sharp-crested weirs.

The determination of discharge over the different types of weirs and dams is treated fully in "Weir experiments, coefficients, and formulas" (Water-Supply Paper 200[a]) and in the various text-books on hydraulics. "Turbine water-wheel tests and power tables" (Water-Supply Paper 180) treats of the discharge through turbines when used as meters. The editions of both of these water-supply papers are practically exhausted. They can, however, be consulted at most of the larger libraries of the country or they can be obtained from the Superintendent of Documents, Washington, D. C., at a cost of 20 cents for No. 180 and 35 cents for No. 200. Remittances must be made by postal money order, express order, or New York draft.

Velocity method.—Streams in general present throughout their courses to a greater or less extent all conditions of permanent, semi-permanent, and varying conditions of flow. In accordance with the location of the measuring section with respect to these physical conditions, current-meter gaging stations may in general be divided into four classes—(1) those with permanent conditions of flow; (2) those with beds which change only during extreme high water; (3) those with beds which change frequently but which do not cause a variation of more than about 5 per cent in the discharge curves from year to year; and (4) those with constantly shifting beds. In determining the daily flow different office methods are necessary for each class. The field data on which the determinations are based and the methods of collecting them are, however, in general the same.

Great care is taken in the selection and equipment of gaging stations for determining discharge by velocity measurements, in

[a] Water-Supply Paper 200 is a revision of No. 150, the edition of which is exhausted.

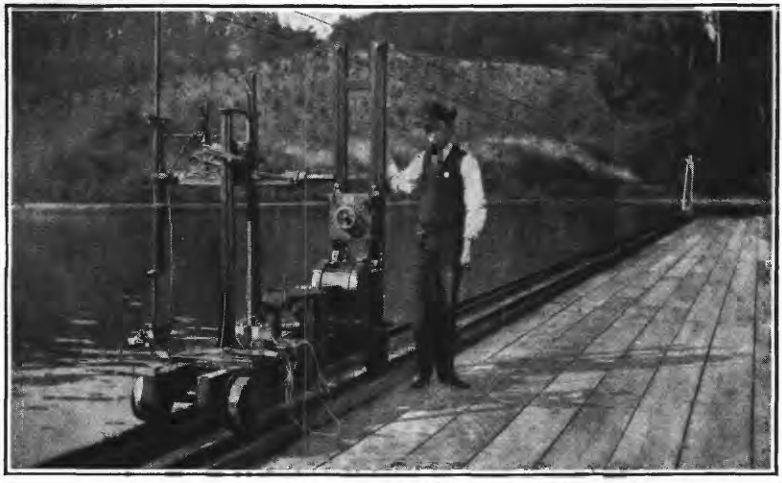
order that the data may have the required degree of accuracy. They are located, as far as possible, at such points that the relation between gage height and discharge will always remain constant for any given stage. The experience of engineers of the Geological Survey has been that permanency of conditions of flow is the prime requisite of any current-meter gaging station when maintained for several years unless funds are available to cover all changes in conditions of flow. A straight, smooth section without cross currents, backwater, boils, etc., at any stage is highly desirable, but on most streams is not attainable except at the cost of a cable equipment. Rough, permanent sections, if measurements are properly made by experienced engineers, taking measuring points at a distance apart of 2 to 5 per cent or less of the total width, will within reasonable limits yield better results for a given outlay of money than semi-permanent or shifting sections with smooth, uniform current. So far as possible stations are located where the banks are high and not subject to overflow at high stages and out of the influence of tributary streams, dams, or other artificial obstructions which might affect the relation between gage height and discharge.

A gaging station consists essentially of a gage for determining the daily fluctuations of stage of the river and some structure or apparatus from which discharge measurements are made, usually a bridge or cable.

The two factors required to determine the discharge of a stream past a section perpendicular to the mean direction of the current are the area of the cross section and the mean velocity of flow normal to that section.

In making a measurement with a current meter a number of points, called measuring points, are measured off above and in the plane of the measuring section at which observations of depth and velocity are taken. (See Pl. I, *B*.) These points are spaced equally for those parts of the section where the flow is uniform and smooth and are spaced unequally for other parts according to the discretion and judgment of the engineer. In general the points should not be spaced farther apart than 5 per cent of the distance between piers, nor farther apart than the approximate mean depth at the time of measurement.

The measuring points divide the total cross section into elementary strips at each end of which observations of depth and velocity are made. The discharge of any elementary strip is the product of the average of the depths at the two ends times the width of the strip times the average of the mean velocities at the two ends of the strip. The sum of the discharges of the elementary strips is the total discharge of the stream. (For a discussion of methods of computing the discharge of a stream see Engineering News, June 25, 1908.)



A. CURRENT-METER RATING STATION AT LOS ANGELES, CAL.

B. BRIDGE STATION AND CROSS SECTION OF STREAM.

Illustrating 0.2 and 0.8 depth method.

Depths for the determination of the area are usually obtained by sounding with the current meter and cable. In rough sections or swift current an ordinary weight and cable are used, particular care being taken that all observations shall be in the plane of the cross section.

Two methods of determining the velocity of flow of a stream are in general use—the float method and the current-meter method.

The float method with its various modifications of surface, subsurface, and tube or rod floats is now considered obsolete in the ordinary practice of the United States Geological Survey. The use of this method is limited to special conditions where it is impracticable to use the current meter, such as in places where large quantities of ice or débris which may damage the meter are flowing with the current, and for miscellaneous measurements or other work where a high degree of accuracy is not necessary. Tube floats are very satisfactory for use in canals with regular bottoms and even flow of current. Measurements by the float method are made as follows: The velocity of flow of the stream is obtained by observing the time which it takes floats set free at different points across the stream to pass between two range lines about 200 feet apart. The area used is the mean value obtained from several cross sections measured between the two range lines. The chief disadvantages of this method are difficulty in obtaining the correct value of mean area for the course used and uncertainty regarding the proper coefficient to apply to the observed velocity. For further information regarding this method the reader is referred to Water-Supply Paper 95 and to the various text-books covering the general subject of stream flow.

The Price current meter is now used almost to the exclusion of other types of meters by the United States Geological Survey in the determination of the velocity of flow of water in open channels, a use for which it is adapted under practically all conditions. Plate II shows in the center the new type of penta-recording current meter equipped for measurements at bridge and cable stations. On the sides of the same type of meter is shown equipped for wading measurements to record by the acoustic method on the left and by the electric method on the right. Briefly, the meter consists of six cups attached to a vertical shaft which revolves on a conical hardened steel point when immersed in moving water. The number of revolutions is indicated electrically. The rating, or relation between the velocity of the moving water and the revolutions of the wheel, is determined for each meter by drawing it through still water for a given distance at different speeds and noting the number of revolutions for each run. (See Pl. I, *A*.) From these data a rating table is prepared which gives the velocity per second of moving water for any number

of revolutions in a given time interval. The ratio of revolutions per second to velocity of flow in feet per second is very nearly a constant for all speeds and is approximately 0.45.

Three classes of methods of measuring velocity with current meters are in general use—multiple-point, single-point, and integration.

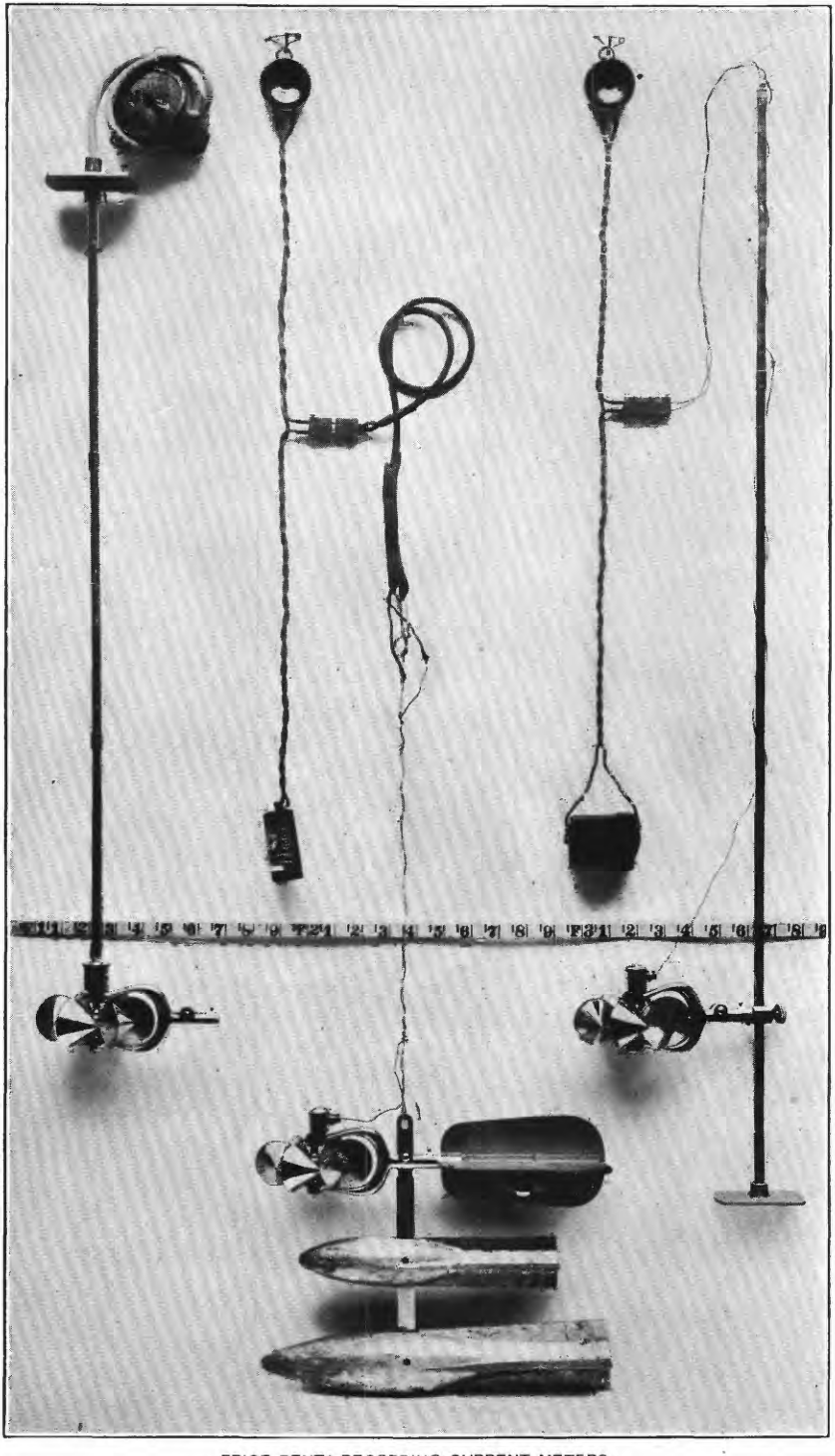
The two principal multiple-point methods in general use are the vertical velocity curve and 0.2 and 0.8 depth.

In the vertical velocity curve method a series of velocity determinations are made in each vertical at regular intervals, usually about 10 to 20 per cent of the depth apart. By plotting these velocities as abscissas and their depths as ordinates and drawing a smooth curve among the resulting points, the vertical velocity curve is developed. This curve shows graphically the magnitude and changes in velocity from the surface to the bottom of the stream. The mean velocity in the vertical is then obtained by dividing the area bounded by this velocity curve and its axis by the depth. This method of obtaining the mean velocity in the vertical is probably the best known, but on account of the length of time required to make a complete measurement its use is largely limited to the determination of coefficients for purposes of comparison and to measurements under ice.

In the second multiple-point method the meter is held successively at 0.2 and 0.8 depth, and the mean of the velocities at these two points is taken as the mean velocity for that vertical. (See Pl. I, *B*.) On the assumption that the vertical velocity curve is a common parabola with horizontal axis, the mean of the velocities at 0.22 and 0.79 depth will give (closely) the mean velocity in the vertical. Actual observations under a wide range of conditions show that this multiple-point method gives the mean velocity very closely for open-water conditions and that in a completed measurement it seldom varies as much as 1 per cent from the value given by the vertical velocity curve method. Moreover, the indications are that it holds nearly as well for ice-covered rivers. It is very extensively used in the regular practice of the United States Geological Survey.

The single-point method consists in holding the meter either at the depth of the thread of mean velocity or at an arbitrary depth for which the coefficient for reducing to mean velocity has been determined or must be assumed.

Extensive experiments by means of vertical velocity curves show that the thread of mean velocity generally occurs between 0.5 and 0.7 total depth. In general practice the thread of mean velocity is considered to be at 0.6 depth, and at this point the meter is held in most of the measurements made by the single-point method. A large number of vertical velocity curve measurements, taken on many streams and under varying conditions, show that the average coefficient for reducing the velocity obtained at 0.6 depth to mean



PRICE PENTA-RECORDING CURRENT METERS.

velocity is practically unity. The variation of the coefficient from unity in individual cases is, however, greater that in the 0.2 and 0.8 method and the general results are not as satisfactory.

In the other principal single-point method the meter is held near the surface, usually 1 foot below, or low enough to be out of the effect of the wind or other disturbing influences. This is known as the subsurface method. The coefficient for reducing the velocity taken at the subsurface to the mean has been found to be in general from about 0.85 to 0.95, depending on the stage, velocity, and channel conditions. The higher the stage the larger the coefficient. This method is especially adapted for flood measurements, or when the velocity is so great that the meter can not be kept in the correct position for the other methods.

The vertical-integration method consists in moving the meter at a slow, uniform speed from the surface to the bottom and back again to the surface and noting the number of revolutions and the time taken in the operation. This method has the advantage that the velocity at each point of the vertical is measured twice. It is useful as a check on the point methods. In using the Price meter great care should be taken that the vertical movement of the meter is not rapid enough to vitiate the accuracy of the resulting velocity.

The determination of the flow of an ice-covered stream is difficult, owing to diversity and instability of conditions during the winter period and also to lack of definite information in regard to the laws of flow of water under ice. The method now employed is to make frequent discharge measurements during the frozen periods by the 0.2 and 0.8 and the vertical velocity curve methods, and to keep an accurate record of the conditions, such as the gage height to the surface of the water as it rises in a hole cut in the ice, and the thickness and character of the ice. From these data an approximate estimate of the daily flow can be made by constructing a rating curve (really a series of curves) similar to that used for open channels, but considering, in addition to gage heights and discharge, the varying thickness of ice. For information in regard to flow under ice cover, see Water-Supply Paper 187.

OFFICE METHODS OF COMPUTING AND STUDYING DISCHARGE AND RUN-OFF.

At the end of each year the field or base data for current-meter gaging stations, consisting of daily gage heights, discharge measurements, and full notes, are assembled. The measurements are plotted on cross-section paper and rating curves are drawn wherever feasible. The rating tables prepared from these curves are then applied to the tables of daily gage heights to obtain the daily discharges, and

from these applications the tables of monthly discharge and run-off are computed.

Rating curves are drawn and studied with special reference to the class of channel conditions which they represent. (See p. 17.) The discharge measurements for all classes of stations when plotted with gage heights in feet as ordinates and discharges in second-feet as abscissas define rating curves which are more or less generally parabolic in form. In many cases curves of area in square feet and mean velocity in feet per second are also constructed to the same scale of ordinates as the discharge curve. These are used mainly to extend the discharge curves beyond the limits of the plotted discharge measurements, and for checking purposes to avoid errors in the form of the discharge curve and to determine and eliminate erroneous measurements.

For every published rating table the following assumptions are made for the period of application of the table: (*a*) That the discharge is a function of and increases gradually with the stage; (*b*) that the discharge is the same whenever the stream is at a given stage, and hence such changes in conditions of flow as may have occurred during the period of application are either compensating or negligible, except that the rating as stated in the footnote of each table is not applicable for known conditions of ice, log jams, or other similar obstructions; (*c*) that the increased and decreased discharge due to change of slope on rising and falling stages is either negligible or compensating.

As already stated the gaging stations may be divided into several classes, as indicated in the following paragraphs:

The stations of class 1 represent the most favorable conditions for an accurate rating and are also the most economical to maintain. The bed of the stream is usually composed of rock and is not subject to the deposit of sediment and loose material. This class includes also many stations located in a pool below which is a permanent rocky riffle that controls the flow like a weir. Provided the control is sufficiently high and close to the gage to prevent cut and fill at the gaging point from materially affecting the slope of the water surface, the gage height will for all practical purposes be a true index of the discharge. Discharge measurements made at such stations usually plot within 2 or 3 per cent of the mean-discharge curve and the rating developed from that curve represents a very high degree of accuracy. For illustrative example of a station of this type see fig. 1 and Water-Supply Paper 241.

Class 2 is confined mainly to stations on rough mountainous streams with steep slopes. The beds of such streams are as a rule comparatively permanent during low and medium stages and when the flow is sufficiently well defined by an adequate number of discharge

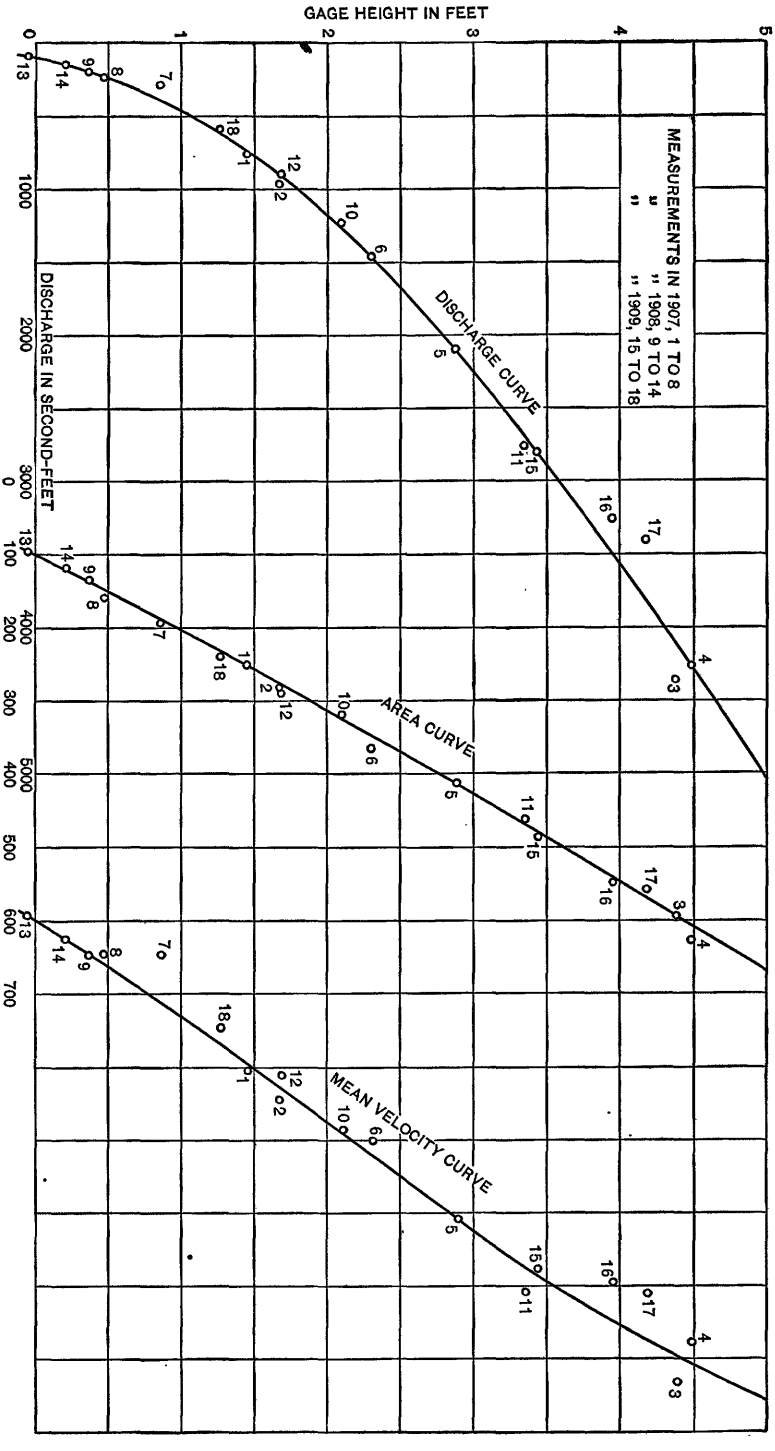


FIGURE 1.—Discharge, area, and mean velocity curves of Rio Grande near Creede, Colo.

measurements before and after each flood the stations of this class give nearly as good results as those of class 1. As it is seldom possible to make measurements covering the time of change at flood stage, the assumption is often made that the curves before and after the flood converged to a common point at the highest gage height recorded during the flood. Hence the only uncertain period occurs during the few days of highest gage heights covering the period of actual change in conditions of flow. For illustrative examples of stations of this type see Water-Supply Paper 246.

Class 3 includes most of the current-meter gaging stations maintained by the United States Geological Survey. If sufficient measurements could be made at stations of this class results would be obtained nearly equaling those of class 1, but owing to the limited funds at the disposal of the Survey this is manifestly impossible, nor is it necessary for the uses to which discharge data are applied. The critical points are as a rule at relatively high or low stages. The percentage of error, however, is greater at low stages. No absolute rule can be laid down for stations of this class. Each rating curve must be constructed mainly on the basis of the measurements of the current year, the engineer being guided largely by the past history of the station and the following general law: If all measurements ever made at a station of this class are plotted on cross-section paper, they will define a mean curve which may be called a standard curve. It has been found in practice that if after a change caused by high stage, a relatively constant condition of flow occurs at medium and low stages, all measurements made after the change will plot on a smooth curve which is practically parallel to the standard curve with respect to their ordinates, or gage heights. This law of the parallelism of ratings is the fundamental basis of all ratings and estimates at stations with semipermanent and shifting channels. It is not absolutely correct but, with few exceptions, answers all the practical requirements of estimates made at low and medium stages after a change at a high stage. This law appears to hold equally true whether the change occurs at the measuring section or at some controlling point below. The change is of course fundamentally due to change in the channel caused by cut, or fill, or both, at and near the measuring section. For all except small streams the changes in section usually occur at the bottom. The following simple but typical examples illustrate this law:

(*a*) If 0.5 foot of planking were to be nailed on the bottom of a well-rated wooden flume of rectangular section there would result, other conditions of flow being equal, new curves of discharge, area, and velocity, each plotting 0.5 foot above the original curves when referred to the original gage. In other words, this condition would be analogous to a uniform fill or cut in a river channel which either

reduces or increases all three values of discharge, area, and velocity for any gage height. In practice, however, such ideal conditions rarely exist.

(*b*) In the case of a cut or fill at the measuring section there is a marked tendency toward decrease or increase, respectively, of the velocity. In other words, the velocity has a compensating effect and if the compensation is exact at all stages the discharge at a given stage will be the same under both the new and the old conditions.

(*c*) In the case of uniform change along the crest of a weir or rocky controlling point, the area curve will remain the same as before the change, and it can be shown that here again the change in velocity curve is such that it will produce a new discharge curve essentially parallel to the original discharge curve with respect to their ordinates.

Of course in actual practice such simple changes of section do not occur. The changes are complicated and lack uniformity, a cut at one place being largely offset by a fill at another and vice versa. If these changes are very radical and involve large percentages of the total area—as, for example, on small streams—there may result a wide departure from the law of parallelism of ratings. In complicated changes of section the corresponding changes in velocity which tend to produce a new parallel discharge curve may interfere with each other materially, causing eddies, boils, backwater, and radical changes in slope. In such extreme conditions, however, the measuring section would more properly fall under class 4 and would require very frequent measurements of discharge. Special stress is laid on the fact that in the lack of other data to the contrary the utilization of this law will yield the most probable results.

Slight changes at low or medium stages of an oscillating character are usually averaged by a mean curve drawn among them parallel to the standard curve, and if the individual measurements do not vary more than 5 per cent from the rating curve the results are considered good for stations of this class. For illustrative example of a station of this type see Water-Supply Paper 242.

Class 4 comprises stations that have soft, muddy, or sandy beds. Good results can be obtained from such sections only by frequent discharge measurements, the frequency varying from a measurement every two or three weeks to a measurement every day, according to the rate of diurnal change in conditions of flow. These measurements are plotted and a mean or standard curve drawn among them. It is assumed that there is a different rating curve for every day of the year and that this rating is parallel to the standard curve with respect to their ordinates. On the day of a measurement the rating curve for that day passes through that measurement. For days between successive measurements it is

assumed that the rate of change is uniform, and hence the ratings for the intervening days are equally spaced between the ratings passing through the two measurements. This method must be modified or abandoned altogether under special conditions. Personal judgment and a knowledge of the conditions involved can alone dictate the course to pursue in such cases. For illustrative examples of stations of this type, showing the Bolster method of determining the daily discharge graphically, see Water-Supply Papers 247 and 249.

The computations have, as a rule, been carried to three significant figures. Computation machines, Crelle's tables, and the 20-inch slide rule have been generally used. All computations are carefully checked.

After the computations have been completed they are entered in tables and carefully studied and intercompared to eliminate or account for all gross errors so far as possible. Missing periods are filled in, so far as is feasible, by means of comparison with adjacent streams. The attempt is made to complete years or periods of discharge, thus eliminating fragmentary and disjointed records. Full notes accompanying such estimates follow the monthly discharge tables.

For most of the northern stations estimates have been made of the monthly discharge during frozen periods. These are based on measurements under ice conditions wherever available, daily records of temperature and precipitation obtained from the United States Weather Bureau climate and crop reports, observers' notes of conditions, and a careful and thorough intercomparison of results with adjacent streams. Although every care possible is used in making these estimates they are often very rough, the data for some of them being so poor that the estimates are liable to as much as 25 to 50 per cent error. It is believed, however, that estimates of this character are better than none at all, and serve the purpose of indicating in a relative way the proportionate amount of flow during the frozen period. These estimates are, as a rule, included in the annual discharge. The large error of the individual months has a relatively small effect on the annual total, and it is for many purposes desirable to have the yearly discharge computed even though some error is involved in doing so.

ACCURACY AND RELIABILITY OF FIELD DATA AND COMPARATIVE RESULTS.

Practically all discharge measurements made under fair conditions are well within 5 per cent of the true discharge at the time of observation. Inasmuch as the errors of meter measurements are largely compensating, the mean rating curve, when well defined, is much more accurate than the individual measurements. Numerous

tests and experiments have been made to test the accuracy of current-meter work. These show that it compares very favorably with the results from standard weirs, and, owing to simplicity of methods, usually gives results that are much more reliable than those from stations at dams, where uncertainty regarding the coefficient and complicated conditions of flow prevail.

The work is, of course, dependent on the reliability of the observers. With relatively few exceptions, the observers perform their work honestly. Care is taken, however, to watch them closely and to inquire into any discrepancies. It is, of course, obvious that one gage reading a day does not always give the mean height for that day. As an almost invariable rule, however, errors from this source are compensating and virtually negligible in a period of one month, although a single day's reading may, when taken by itself, be considerably in error.

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the rating tables and an accuracy column is inserted in the monthly discharge table. In 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" or "approximate," 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 accuracy column in the monthly-discharge table does not apply to the maximum or minimum nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating, the probable reliability of the observer, and knowledge of local conditions. In this column, A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

USE OF THE DATA.

In general the policy is followed of making available for the public the base data which are collected in the field each year by the Survey engineers. This is done to comply with the law, but also for the express purpose of giving to any engineer the opportunity of examining the computed results and of changing and adjusting them as may seem best to him. Although it is believed that the rating tables and computed monthly discharges are as good as the base data up to and including the current year will warrant, it should always be borne in mind that the additional data collected at each station from year to year nearly always throw new light on data already collected and published, and hence allow more or less improvement in the computed

results of earlier years. It is therefore expected that the engineer who makes serious use of the data given in these papers will verify all ratings and make such adjustments in earlier years as may seem necessary. The work of compiling, studying, revising, and republishing data for different drainage basins for five or ten year periods or more is carried on by the United States Geological Survey so far as the funds for such work are available.

The values in the table of monthly discharge are so arranged as to give only a general idea of the conditions of flow at the station, and it is not expected that they will be used for other than preliminary estimates. This is particularly true of the maximum and minimum figures, which in the very nature of the method of collecting these data are liable to large errors. The maximum value should be increased considerably for many stations in considering designs for spillways, and the minimum value should be considered for a group of, say, seven days and not for one day.

The rating table, provided the engineer accepts it, is published primarily to allow him to apply it directly to the daily gage heights and rearrange the daily discharges in order of magnitude or by some other method.

COOPERATION AND ACKNOWLEDGMENTS.

Special acknowledgments are due to the following parties for assistance rendered and records furnished: The International Boundary Commission, Gen. Anson Mills, commissioner on the part of the United States; Señor Don Jacobo Blanco, commissioner on the part of Mexico; W. W. Follett, consulting engineer on the part of the United States; the territorial engineer of New Mexico, who has paid more than half of the expense of maintaining records in the Rio Grande drainage in New Mexico, except those on Pecos River; the state engineer of Colorado, who has paid the gage observers at most of the Rio Grande stations in Colorado, and has materially assisted in the work financially and otherwise, and Mr. Antoine Jacob.

The United States Reclamation Service has paid practically all the expense of maintaining gaging stations in the Pecos River drainage.

Thanks are due Mr. A. L. Fellows for valuable suggestions; the Denver and Rio Grande Railroad for transportation furnished in 1907; the United States Weather Bureau and United States Forest Service for the data which they have furnished, and the various engineers and power and irrigation companies which have given us data.

DIVISION OF WORK.

The field data in the Rio Grande drainage basin, except for those stations maintained by the United States International Boundary Commission, were collected under the direction of W. B. Free-

man, district engineer, R. I. Meeker and W. A. Lamb, district hydrographers, assisted by J. B. Stewart, Robert L. Cooper, C. L. Chatfield, and various engineers of the United States Reclamation Service. The New Mexico work since July 1, 1907, has been under the more immediate supervision of Vernon L. Sullivan, territorial engineer, assisted by C. D. Miller.

The data furnished by the United States International Boundary Commission were computed under the direction of W. W. Follett from the discharge measurements.

The data, ratings, and special studies of the completed data of the stations maintained by the United States Geological Survey were prepared by W. B. Freeman and R. H. Bolster. The computations and the preparation of the completed data for publication were made under the direction of R. H. Bolster, assistant engineer, assisted by R. C. Rice, J. G. Mathers, H. D. Padgett, and M. I. Walters.

The entire report was edited by Mrs. B. D. Wood.

RIO GRANDE DRAINAGE BASIN.

GENERAL FEATURES.

The Rio Grande Basin is a long, narrow strip of country extending from the southern part of Colorado southeastward to the Gulf of Mexico. The perennial supply of water for the upper third of this basin comes principally from a comparatively small area of about 2,000 square miles of lofty mountains in Colorado and the extreme northern part of New Mexico.

The Conchos enters the river from the Mexican side some 200 miles below El Paso and brings a good perennial flow as well as enormous floods in the summer and fall. Pecos and Devils rivers and a number of springs also contribute substantial reinforcement to the perennial supply, and other tributaries furnish frequent flood discharges, so that the "lower river" is a considerable stream and is not dependent on the mountain area for its perennial flow. The flood season above the Conchos is in May and June; below that stream it is in August and September. Frequently the river is dry at El Paso when the lower river country is inundated. In addition to the areas contributing a perennial supply of water and a spasmodic supply, there is a vast area of lost river basins from which no water comes at any time, but which from topographic features may be included within this great catchment basin.

The Rio Grande rises in the mountainous area to the south and east of the Continental Divide in southwestern Colorado, flows eastward for a time as a mountain stream, enters the San Luis Valley about 80 miles below its source. In this valley it receives from the north the waters of Saguache and San Luis rivers by seepage, if at all; from

the west, near the lower end of the valley, Alamos, La Jara, and Conejos rivers; and from the east the Trinchera, Culebra, and Rio Costilla. About 4 miles north of the Colorado state line it enters a long canyon locally known as the Rio Grande canyon. From the east there enter this canyon two good tributaries, Red River and Rio Hondo.

The general slope of the valley is still toward the south, the river descending, however, more rapidly than does the surface of the country. This canyon is 300 or 400 feet deep in places, appearing from above as a gash in an otherwise level mesa. Its southern end is 3 miles above Embudo, N. Mex., where the walls open and the river enters the Espanola Valley. While in the valley above Embudo the river receives from the east Taos River, Embudo Creek, and other small streams, and in the Espanola Valley it is increased by the Chama, flowing in from the west, and by a number of streams from the east.

At the lower end of Espanola Valley the river passes through White Rock canyon, a gorge in a range of hills stretching from the Jemez to the Santa Fe Mountains. From Pena Blanca, near the lower end of this canyon, nearly to Socorro the river flows in a valley from 1 to 3 miles wide, bounded on each side by mesas from 300 to 600 feet above the river. About 20 miles below Pena Blanca the Jemez enters from the west, and 60 miles or more below Albuquerque the Puerco comes in from the same side. The Puerco is a torrential stream with no perennial flow. Below these streams the Rio Grande has no tributaries of note until the Pecos comes in about 400 miles by river below El Paso.

At and below Socorro the valley contracts until it becomes too narrow for agriculture, but from San Antonio to San Marcial it is from 1 to 2 miles wide. Below San Marcial the river swings to the west around the Cristobal and Caballos mountains, which lie along the west edge of the Jornada del Muerto, the valley from San Marcial to Rincon being narrow, low, and marshy. At Rincon the river enters a canyon, which extends to Fort Selden, a distance of 15 miles. The Mesilla Valley, the most fertile valley in New Mexico, begins below Fort Selden and extends to the pass above El Paso, a distance of over 50 miles. Above El Paso the banks of the river again assume the canyon-like character for 3 miles, and the river passing this enters the Ysleta Valley, now commonly called the El Paso Valley.

The canyons above these valleys are not cut into hard, indurated rocks, but are bordered in many places by steep walls of comparatively soft, friable sandstones, alternating with conglomerates or beds of clay, the whole series in the northern part of New Mexico, at least, being capped by a vesicular lava. The fall through these can-

yons being great, the down-cutting is rapid, and thus the waters are supplied constantly with fresh detritus, part of which is deposited in turn in the valley below.

From El Paso to the Gulf the river forms the boundary between Mexico and the United States.

From source to mouth the Rio Grande is nearly 2,000 miles long, and its total drainage area comprises about 248,000 square miles.

Many national forests have been established on the headwaters of the Rio Grande and its tributaries, both in Colorado and New Mexico. The drainage basin of the Rio Grande, exclusive of the Pecos, includes between 5,000 and 6,000 square miles of merchantable timber land, 6,000 square miles of woodland and sparsely timbered land, and 2,000 square miles of burned and cut-over land, the remainder being sage brush and open land.

The five largest tributaries are the Conchos, which enters from the Mexican side 200 miles below El Paso; the Conejos, which joins the Rio Grande just above the Colorado-New Mexico line; the Chama, which enters it in the Espanola Valley; the Pecos, which joins it in the southwestern part of Texas; and Devils River, about 50 miles below the Pecos. Most of the remaining tributaries are intermittent in character.

The mountains at the headwaters reach altitudes up to 14,000 feet above sea level. At Albuquerque, N. Mex., the elevation of the river is 5,000 feet, and it leaves the territory at an elevation of about 4,000 feet.

The rainfall varies greatly from year to year and from source to mouth, its irregularity making it very difficult to give averages. The annual precipitation in the mountainous district of Colorado—that is, along the upper Rio Grande—ranges from 15 to 25 inches. In the northern part of New Mexico it ranges from 10 to 15 inches and in the southern part from 5 to 12 inches.

In the mountains of Colorado the river is covered with a foot or more of ice from early in the winter until late in the spring. During severe winters the river is frozen over at times in northern New Mexico, and the snowfall is often very heavy. From the melting of the snows in Colorado and New Mexico come the spring floods.

Irrigation is now practiced extensively in the following valleys along the Rio Grande and its smaller tributaries:

1. *San Luis Valley,* beginning a short distance above Del Norte and extending to the mouth of Conejos River. This district contains probably the largest cultivated area along the Rio Grande, aggregating nearly one-half million acres.

2. *Valleys of the Taos district,* lying on the east side of the river below the Colorado line and including the following valleys: Cuesta,

Rio Colorado, San Cristobal, Arroyo Hondo, and Taos. The Taos Valley far surpasses the others both in water facilities and in area cultivated.

3. *Espanola Valley,* located south of the Taos district and Tres Piedras Mesa. It lies along the river, and, as in the Taos country, agriculture has been engaged in for years.

4. *Albuquerque district,* including the valley from Pena Blanca to San Marcial. The system of irrigation is practically the same as the old Pueblo Indian system. In the last few years, however, new settlers have adopted progressive methods and have greatly increased the duty of water.

5. *Mesilla Valley,* next to the San Luis, is the most important agricultural area along the Rio Grande. The valley broadens just below Selden and continues generally broad and fertile for a distance of 35 miles or beyond the Texas line. A view of the Leasburg diversion dam of the Rio Grande project of the United States Reclamation Service is presented in Plate III, *A*.

Along the Rio Grande and its tributaries in Colorado and New Mexico are available reservoir sites equal to storing of all flood waters. The largest reservoir in the country is about to be built near Engle, N. Mex. It will impound 2,500,000 acre-feet of water for the irrigation of 200,000 acres of land in New Mexico, Texas, and Mexico.

The estimated power possibilities of the Rio Grande and its tributaries from its source to El Paso, Tex., are theoretically as follows:

Minimum horsepower	123,500
Minimum horsepower, 6 high months	241,000
Horsepower from storage 6 months period	405,000

Developments will, however, be made chiefly on the upper tributaries in Colorado and a few of the mountain streams in New Mexico, and will not amount to more than 100,000 horsepower. At present, very few water-power plants of any importance are operated in the drainage basin. The waters of the Rio Grande have been used only for irrigation and domestic purposes, but some of the tributaries have also been used in mining.

The wettest years on the upper Rio Grande appear to be 1906 and 1907; 1902 and 1908 are low-water years.

The determination of the amount of water in the Rio Grande is of importance, both on account of its use in irrigation and from its bearing upon interstate and international distribution of water. Most of the New Mexico and all the Texas stations down to Eagle Pass are maintained by the United States section of the International Boundary Commission. The data for the following stations have been collected by W. W. Follett, consulting engineer for the commis-

A. LEASBURG DIVERSION DAM AND INTAKE GATES OF MAIN RIO GRANDE CANAL, RIO GRANDE PROJECT, NEW MEXICO.

B. WEIR AND SCOUR GATE IN MAIN INLET CANAL AT INLET OF HONDO RESERVOIR, HONDO PROJECT, NEW MEXICO.

sion, and have been furnished through the courtesy of Gen. Anson Mills, commissioner.

Rio Grande near San Marcial, N. Mex.
Rio Grande near El Paso, Tex.
Rio Grande above Presidio, Tex.
Rio Grande below Presidio, Tex.
Rio Grande near Langtry, Tex.
Rio Grande near Devils River (below mouth), Texas.
Rio Grande at Eagle Pass, Tex.
Pecos River near Moorhead, Tex.
Devils River near Devils River Station, Tex.

On account of the shifting character of the river beds at the International Boundary stations, no rating tables have been prepared. The estimated monthly discharges are from daily discharges computed by Mr. Follett directly from the discharge measurements.

The five stations from Laredo down (Laredo, Roma, Brownsville, Salado near Guerrero, and San Juan at Santa Rosalia ranch) are maintained by the Mexican section of the commission.

The following is a list of the gaging stations maintained in the Rio Grande drainage basin, with the exception of the Pecos River stations, together with the length of records:

Rio Grande near Creede (Wason), Colo., 1907–8.
Rio Grande near Del Norte, Colo., 1889–1908 except 1907.
Rio Grande near Lobatos (Cenicero), Colo., 1899–1908.
Rio Grande near Alamosa, Colo., 1894, 1895, 1903.
Rio Grande near Embudo, N. Mex., 1889–1903.
Rio Grande near Buckman, N. Mex., (Rio Grande near San Ildefonso) 1895–1905.
Rio Grande near San Marcial, N. Mex., 1895–1908.
Rio Grande near El Paso, Tex., 1889–1893, 1897–1908.
Rio Grande near Fort Hancock, Tex., 1900–1903.
Rio Grande above and below Presidio, Tex., 1900–1908.
Rio Grande near Langtry, Tex., 1900–1908.
Rio Grande near Devils River (below mouth), Tex., 1900–1908.
Rio Grande near Eagle Pass, Tex., 1900–1908.
Rio Grande near Nuevo Laredo, Tamaulipas, Mexico, 1900–1903.
Rio Grande near Laredo, Tex., 1903–1908.
Rio Grande near Roma, Tex., 1900–1908.
Rio Grande near Brownsville, Tex., 1900–1908.
Conejos River near Mogote, Colo., 1899, 1900, 1903–1908.
Chama River near Abiquiu, N. Mex., 1895–1897.
Santa Fe Creek at Santa Fe, N. Mex., 1907–8.
Mimbres River near Faywood, N. Mex., 1908.
Cameron Creek at Fort Bayard, N. Mex., 1907–8.
Stephens Creek at Fort Bayard, N. Mex., 1907–8.
Devils River near Devils River, Tex., 1900–1908.
Rio Salado at Guerrero, Tamaulipas, Mexico, 1900–1908.
Rio San Juan at La Quemada, Tamaulipas, Mexico, 1900–1902.
Rio San Juan at Santa Rosalia ranch, Tamaulipas, Mexico, 1902–1908.

RIO GRANDE PROPER.

RIO GRANDE NEAR CREEDE, COLO.

This station, which was established April 24, 1907, to obtain information concerning the quantity of run-off of the upper Rio Grande available for storage, is located at the three-span highway bridge one-quarter mile south of Wason siding, on the Creede branch of the Denver and Rio Grande Railroad, about 3 miles from Creede, the terminus of the line, and is a few miles above the site of the proposed dam and reservoir.

Willow Creek (or Goblin Creek) enters the river a short distance upstream from Wason, and Goose Creek comes in at Wagon-wheel Gap about 5 miles below. The drainage at the station is about 700 square miles.

Except for a little meadow irrigation, no water is diverted above this station. Two or three reservoirs are about to be constructed on the upper waters of the Rio Grande and its tributaries above Wason. Among others may be mentioned the Farmers' Union Irrigation Company's reservoir on the main stream, about 35 miles above. The proposed reservoir near Wason will have a capacity almost equal to the normal annual flow of the river.

The winters are long and very severe in this locality, and the stream has a heavy ice cover for several months. The bridge piers cause eddies which materially affect the accuracy of measurements. The river channel is rough, and the velocity high at flood stages, so that results obtained at this station at high stages are only fair. The low and medium water portions of the rating are excellent. For illustration of rating curve for this station see figure 1, page 21.

The datum of the gage has not been changed since the station was established.

Discharge measurements of Rio Grande near Creede, Colo., in 1907 and 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
1907.		*Feet.*	*Sq. ft.*	*Feet.*	*Sec.-ft.*
April 24	R. I. Meeker	116	249	1.45	759
May 15	W. B. Freeman	116	280	1.67	962
June 14	do	116	594	4.38	4,350
June 26	do	116	627	4.49	4,260
July 22	do	116	411	2.88	2,090
August 30	C. L. Chatfield	116	364	2.30	1,460
October 9	J. B. Stewart	101	192	.86	281
November 9	W. B. Freeman	95	158	.47	230
1908.					
March 29	J. B. Stewart	69	134	.37	196
May 17	W. B. Freeman	114	317	2.10	1,220
June 12	J. B. Stewart	115	461	3.35	2,750
July 14	do	116	289	1.69	897
November 16	W. B. Freeman	60.5	95	−.05	86
Do	do	68.5	118	.21	150

Daily gage height, in feet, of Rio Grande near Creede, Colo., for 1907 and 1908.

[Henry H. Wason, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.										
1			1.58	2.70	5.40	2.22	1.98	0.90	0.65	0.48
2			1.55	2.70	5.32	2.20	1.95	.85	.62	.45
3			1.58	2.80	5.25	2.15	1.85		.60	.45
4			1.60	3.15	5.22	2.08	1.75		.58	.42
5			1.55	3.70	5.10	2.12	1.40		.60	.48
6			1.50	3.85	5.08	1.98	1.42		.55	.50
7			1.45	4.10	5.02	2.02	1.35	.80	.58	.45
8			1.40		4.85	1.90	1.32	.82	.55	.48
9			1.40		4.78	1.82	1.32	.82	.58	.45
10			1.50		4.55	1.75	1.35	.85	.52	.48
11			1.85		4.60	1.70	1.28	.85	.50	.52
12			2.15			2.05	1.28	.82	.45	.50
13			2.05	4.20		2.38	1.25	.75	.50	.58
14			1.75	4.50		2.15	1.22	.75	.45	.00
15			1.75			1.95	1.22	.75	.45	
16			1.90			1.88	1.20	.70	.42	
17			2.45	4.90		1.72	1.22	.68	.42	
18			2.50	4.78		1.58	1.22	.70	.42	
19			2.88	4.55		1.60	1.20	.65	.40	
20			3.45	4.15		1.58	1.18	.65	.45	
21			3.90	3.90	3.00	1.48	1.15	.62	.40	
22			3.95		3.02	1.48	1.10	.62	.42	
23			4.20		2.80	1.42	1.00	.68		
24		1.45	3.90		2.68	1.40	1.05	.72		
25		1.58	3.25	4.05	2.72	1.42	.95	.72	.45	
26		1.55	3.00	4.40	3.00	1.48	.92	.68	.45	
27		1.62	2.98	4.85	2.88	1.38	1.00	.62	.40	
28		1.60	2.85	4.88	2.65	1.38	.98	.62	.40	
29		1.58	2.70	5.05	2.58	1.50	.92	.62	.42	
30		1.52	2.68	5.08	2.40	2.28	.92	.62	.42	
31					2.30	2.15		.62		
1908.										
1	0.3	.4	1.6	2.8	2.3	1.9	1.1	.5	.35	
2	.3	.5	1.9	2.85	2.3	2.4	1.1	.5	.4	
3	.3	.5	1.9	2.95	2.2	1.9	.9	.55	.35	
4	.25	.5	1.9	2.85	2.2	1.8	.8	.55	.35	
5		.5	1.75	2.8	2.05	1.6	.85	.45	.35	
6		.55	1.75	3.0	2.0	1.55	.8	.5	.35	
7		.6	1.7	2.75	2.0	1.5	.75	.45	.35	
8		.5	1.8	2.4	1.8	1.45	.7	.45	.3	
9		.6	1.9	3.0	1.7	1.65	.65	.45	.4	
10		.65	1.75	3.8	1.75	1.55	.7	.45	.35	
11	.3	.8	1.6	3.9	1.9	1.45	.7	.45	.3	
12	.3	.85	1.5	3.6	1.8	1.35	.7	.5	.35	
13	.3	.9	1.5	3.6	1.75	1.25	.7	.5	.3	
14	.3	1.1	1.4	3.6	1.7	1.35	.65	.55	.25	
15	.3	1.2	1.4	3.55	1.7	1.35	.65	.5	.25	
16	.3	1.3	1.8	3.6	1.7	1.3	.6	.45	.08	
17	.3	1.6	2.0	3.6	1.6	1.45	.6	.55	.25	
18	.3	1.65	2.5	3.2	1.55	2.05	.65	.55	.2	
19	.3	1.7	2.85	2.65	1.45	1.85	.55	.55	.2	
20	.3	1.65	3.0	2.7	1.4	1.75	.55	.55	.2	
21	.35	1.45	2.5	2.9	1.3	1.6	.55	.5	.2	
22	.3	1.35	2.5	2.9	1.3	1.55	.5	.4	.15	
23	.3	1.35	2.1	2.9	1.3	1.45	.55	.35	.2	
24	.35	1.25	1.9	2.95	1.3	1.4	.55	.4	.2	
25	.4	1.2	1.8	3.0	1.4	1.25	.55	.35	.2	
26	.4	1.0	2.2	2.85	1.35	1.25	.5	.35	.15	
27	.4	.95	2.0	2.8	1.4	1.2	.65	.35	.15	
28	.3	1.0	1.95	2.7	1.2	1.2	.55	.35	.25	
29	.35	1.0	1.95	2.55	1.2	1.3	.5	.35	.15	
30	.4	1.0	2.7	2.5	1.2	1.2	.55	.4	.05	
31	.4		2.6		1.6	1.1		.35		

NOTE.—Ice March 1 to 10, 1908; readings approximate.

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Rating table for Rio Grande near Creede, Colo., for 1907 and 1908.[a]

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
−0.10	75	1.00	465	2.20	1,350	3.80	3,285
− .05	86	1.10	520	2.30	1,450	4.00	3,560
.00	97	1.20	575	2.40	1,555	4.20	3,840
.10	121	1.30	635	2.50	1,660	4.40	4,130
.20	147	1.40	700	2.60	1,770	4.60	4,430
.30	175	1.50	770	2.70	1,880	4.80	4,740
.40	205	1.60	840	2.80	1,995	5.00	5,050
.50	240	1.70	915	2.90	2,115	5.20	5,370
.60	280	1.80	995	3.00	2,235	5.40	5,690
.70	320	1.90	1,080	3.20	2,485		
.80	365	2.00	1,165	3.40	2,745		
.90	415	2.10	1,255	3.60	3,015		

[a] For illustration of this rating curve see figure 1, p. 21.

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on 17 discharge measurements made during 1907-1909 and is well defined.

Monthly discharge of Rio Grande near Creede, Colo., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1907.					
April 24-30	855	735	810	11,200	
May	3,840	700	1,660	102,000	A.
June	5,180	1,880	3,800	226,000	A.
July	5,690	1,450	3,460	213,000	A.
August	1,530	687	1,020	62,700	A.
September	1,150	425	629	37,400	A.
October	415	288	337	20,700	A.
November	300	205	236	14,000	A.
December 1-15	280	212	239	7,110	A.
The period				694,000	
1908.					
March	205	161	179	11,000	B.
April	915	205	483	28,700	A.
May	2,240	700	1,190	73,200	A.
June	3,420	1,560	2,310	137,000	A.
July	1,450	575	904	55,600	A.
August	1,560	520	795	48,900	A.
September	520	240	313	18,600	A.
October	260	190	226	13,900	A.
November	205	109	163	9,700	B.
The period				397,000	

NOTE.—Discharge for missing days 1907 and 1908 interpolated which may give results slightly too low for June, 1908. No correction made for ice conditions March 1–10, 1908.

RIO GRANDE NEAR DEL NORTE, COLO.

This station, which was established in the fall of 1889, was originally located about 2 miles above Del Norte, and records were taken more or less continuously until May 16, 1908, when a new station was established at the new state highway bridge about 6 miles above Del Norte, near the upper edge of the San Luis Valley. Some inflow

takes place between the two points at certain seasons of the year, so that the mean annual flow at the state bridge is somewhat less than that at the old station.

As the station is above all the important diversions, the records show the amount of water available for irrigation, and also the run-off from a drainage area of 1,400 square miles.

The new station is about 4 miles above the mouth of Los Pinos Creek, below the mouth of Wolf Creek, and about 10 miles below the mouth of the South Fork of the Rio Grande. The old station is just above the mouth of Los Pinos Creek.

The diversions from the Rio Grande and its tributaries above this point are all small and are used chiefly for meadow irrigation. They represent a very small percentage of the total flow of the stream. The largest ditch takes water out at Del Norte, about 2 miles below the original station. From this canal and many others diverted at various points nearly 300,000 acres of land in Colorado are now being irrigated from the Rio Grande.

Numerous small storage reservoirs under construction or in contemplation on the tributaries of the Rio Grande will store a large proportion of flood waters, but all the waters of the upper Rio Grande have been filed upon.

The flow of the stream is effected by ice for three or four months during the winter.

Practically no change was made in the datum of the gage at the old station during its maintenance, and this old gage is still being used by the water commissioner in that irrigation district of the State. The present chain gage is located on the highway bridge, and the readings have no determined relation to those taken at the old gage.

Very good results can be obtained at the present station except when ice conditions prevail.

Discharge measurements of Rio Grande near Del Norte, Colo., in 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
May 16 [a]	W. B. Freeman	144	355	2.27	1,370
June 11 [a]	J. B. Stewart	156	720	4.70	4,710
May 16 [b]	W. B. Freeman	174	463	2.32	1,450
June 11 [b]	J. B. Stewart	188	722	3.75	3,910
July 13 [b]	do	176	471	1.95	1,320
Nov. 17 [b]	W. B. Freeman	145	213	[c] .60	163

[a] Measurements made at old cable station.
[b] Measurements made at new state bridge, 3 miles above cable station.
[c] Gage at old cable station read 0.70 foot.

Daily gage height, in feet, of Rio Grande near Del Norte, Colo., for 1908.

[James G. Duncan, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	3.1	2.5	1.9	1.2	0.9	0.8	.....
2	.....	2.6	3.1	2.4	2.15	1.15	.9	.8	.....
3	.....	.....	3.2	2.25	2.2	1.15	.9	.8	.....
4	.....	.....	3.25	2.2	2.0	1.1	.9	.75	.....
5	.....	2.0	3.1	2.2	1.85	1.1	.9	.75	.....
6	.....	.....	3.1	2.15	1.85	1.05	.9	.75	.....
7	.....	2.1	3.0	2.05	1.75	1.0	.85	.75	.....
8	.....	.....	2.8	2.05	1.85	1.0	.85	.8	.....
9	.....	.....	3.0	1.95	1.7	.95	.85	.8	.....
10	.....	.....	3.5	1.9	1.6	.95	.85	.75	.....
11	.....	.....	3.85	1.9	1.6	.95	.8	.7	.....
12	.....	.....	3.75	1.95	1.55	.95	.8	.65	.....
13	.....	2.1	3.7	1.9	1.45	.9	.8	.7	.....
14	.....	.....	3.65	1.85	1.5	.95	.8	.7	.....
15	.....	.....	3.65	1.9	1.55	.95	.75	.6	.....
16	2.1	2.3	3.7	1.95	1.5	.95	.75	.65	.....
17	.....	2.6	3.65	1.9	1.65	.9	.8	.65	.....
18	2.3	2.85	3.3	1.8	2.1	.85	.85	.65	.....
19	.....	3.3	2.95	1.75	2.05	.85	.9	.65	.....
20	.....	3.5	2.9	1.65	1.95	.8	.85	.65	.....
21	2.1	2.9	2.9	1.6	1.9	.8	.85	.65	.....
22	.....	2.95	3.0	1.6	1.75	.85	.85	.7	.....
23	.....	2.8	2.95	1.6	1.8	.85	.75	.65	.....
24	.....	2.5	2.9	1.6	1.65	.85	.75	.65	.....
25	2.0	2.4	2.95	1.6	1.55	.85	.85	.65	.....
26	.....	2.5	3.5	1.6	1.55	1.05	.8	.65	.....
27	.....	2.5	3.3	1.55	1.55	.95	.75	.6	.....
28	1.8	2.4	3.25	1.5	1.45	.95	.8	.6	.....
29	.....	2.35	2.85	1.4	1.4	.9	.8	.7	.....
30	1.9	2.7	2.7	1.4	1.3	.9	.8	.7	.....
31	.....	3.2	.....	1.65	1.3	.....	.8	.....	.....

NOTE.—Gage heights April 16 to May 13 refer to old gage at cable station; from May 16 to November 30 they refer to new gage at state bridge.

Rating tables for Rio Grande near Del Norte, Colo.

JANUARY 1, 1906, TO MAY 15, 1908.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1.80	840	2.10	1,120	2.40	1,435
1.90	930	2.20	1,220	2.50	1,550
2.00	1,025	2.30	1,325	2.60	1,670

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on seven discharge measurements made during 1906 and 1908, and is well defined. This table applies only to the old cable station gage.

MAY 16, 1908, TO NOVEMBER 30, 1908.

0.60	160	1.80	1,005	3.00	2,520
.70	205	1.90	1,100	3.10	2,690
.80	255	2.00	1,200	3.20	2,870
.90	310	2.10	1,305	3.30	3,060
1.00	370	2.20	1,415	3.40	3,250
1.10	435	2.30	1,530	3.50	3,440
1.20	505	2.40	1,650	3.60	3,630
1.30	580	2.50	1,770	3.70	3,830
1.40	660	2.60	1,900	3.80	4,030
1.50	740	2.70	2,040	3.90	4,230
1.60	825	2.80	2,190		
1.70	915	2.90	2,350		

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on seven discharge measurements made during 1908-9 and is well defined. This table applies only to the new gage at the state bridge.

Monthly discharge of Rio Grande near Del Norte, Colo., for 1908.

[Drainage area, 1,400 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
April 16–30	1,320	840	1,060	0.757	0.42	31,600	B.
May	3,440	1,020	1,690	1.21	1.40	104,000	A.
June	4,130	2,040	2,930	2.09	2.33	174,000	A.
July	1,770	660	1,070	.764	.88	65,800	A.
August	1,420	580	931	.665	.77	57,200	A.
September	505	255	345	.246	.27	20,500	A.
October	310	230	271	.194	.22	16,700	A.
November	255	160	205	.146	.16	12,200	A.
The period						482,000	

RIO GRANDE NEAR LOBATOS, COLO.

This station was established June 28, 1899, at the state bridge about 15 miles east of Antonito, in T. 33 N., R. 11 E.

The station is particularly important because it is located only a few miles above the Colorado-New Mexico line, and the records show the amount of water passing from Colorado into New Mexico. The data are valuable also in connection with the proposed Engle reservoir of the United States Reclamation Service, and they will be used in the adjudication of all water rights along the Rio Grande which must eventually be made.

Conejos River enters about 7 miles above the station. A large part of the normal flow of the river is diverted above this station during the irrigation period. About 450,000 acres of land are irrigated, and more will be put under water in connection with some of the proposed reservoir systems above.

Ice usually forms on the river at this point for about three months during the winter, but occasionally open-water conditions prevail through part of this period.

The datum of the gage has not been changed since the station was established. Very good results have been obtained at this station. The river channel is quite permanent, being a gash cut in the lava rock. Occasionally during low water, some sediment is deposited, but it is scoured out in times of flood.

Discharge measurements of Rio Grande near Lobatos, Colo., in 1907 and 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
1907.		*Feet.*	*Sq. ft.*	*Feet.*	*Sec.-ft.*
April 23	R. I. Meeker	242	823	3.70	2,570
May 14	W. B. Freeman	242	764	3.42	2,180
June 12	Freeman and Chatfield	255	1,510	6.35	6,640
July 31	W. B. Freeman	246	831	3.76	2,720
October 8	J. B. Stewart	238	424	2.12	635
1908.					
March 28	J. B. Stewart	233	449	2.20	711
May 19	W. B. Freeman	236	473	2.35	803
June 10	J. B. Stewart	233	474	2.26	765
July 12	do	216	304	1.45	240
October 8[a]	Thomas Grieve, jr	.....	126	1.50	236
December 2[b]	J. B. Stewart	132	111	2.20	243

[a] Made by wading above gage.
[b] Made by wading below bridge; ice conditions.

Daily gage height, in feet, of Rio Grande near Lobatos, Colo., for 1907 and 1908.

[Román Mondragón, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.[a]												
1	2.3	2.2	2.1	2.5	3.2	4.7	6.7	3.55	3.75	2.1	2.0	1.8
2	2.3	2.2	2.1	2.5	3.3	4.5	6.85	3.4	3.8	2.1	2.0	1.8
3	2.3	2.2	2.1	2.45	3.3	4.4	7.0	3.5	3.55	2.1	2.0	1.8
4	2.3	2.2	2.1	2.3	3.15	4.75	6.95	3.6	3.25	2.1	2.0	1.8
5	2.3	2.2	2.05	2.45	3.0	5.1	6.85	3.65	3.15	2.1	2.0	1.8
6	2.3	2.2	2.05	2.6	3.15	5.45	6.65	3.45	3.0	2.1	2.0	1.7
7	2.3	2.2	2.1	2.6	3.05	5.65	6.5	3.3	2.95	2.2	2.0	1.7
8	2.3	2.2	2.1	2.4	2.95	5.95	6.4	3.2	2.9	2.15	1.9	1.7
9	2.3	2.2	2.1	2.55	2.9	6.2	6.35	3.15	2.8	2.15	1.9	1.7
10	2.3	2.2	2.0	2.8	2.9	6.3	6.15	3.05	2.7	2.15	1.9	1.7
11	2.3	2.2	2.0	2.95	2.9	6.3	5.95	3.0	2.7	2.1	1.9	1.7
12	2.3	2.2	2.1	3.2	3.0	6.32	5.75	2.9	2.6	2.1	1.9	1.7
13	2.3	2.2	2.1	3.6	3.1	6.15	5.50	2.8	2.55	2.1	1.9	1.8
14	2.3	2.2	2.1	4.05	3.3	6.15	5.30	2.8	2.5	2.1	1.9	2.45
15	2.3	2.2	2.1	4.3	3.3	6.35	5.55	3.15	2.4	2.0	1.9	2.4
16	2.3	2.2	2.0	4.5	3.15	6.7	5.65	3.25	2.4	2.0	1.9	2.4
17	2.3	2.2	2.0	4.4	3.15	6.8	5.6	3.1	2.4	2.0	1.9	2.4
18	2.3	2.2	2.1	4.3	3.45	6.8	5.35	3.0	2.4	2.0	1.95	2.4
19	2.3	2.2	2.1	4.2	3.85	6.8	5.0	2.9	2.4	2.0	1.9	2.4
20	2.3	2.2	2.25	4.05	4.1	6.94	4.55	2.9	2.4	2.0	1.9	2.4
21	2.3	2.2	2.7	3.8	4.8	6.89	4.3	2.9	2.5	2.0	1.9	2.4
22	2.3	2.2	2.95	3.8	5.25	6.69	4.2	3.0	2.4	2.0	1.9	2.4
23	2.3	2.2	3.0	3.65	5.75	6.44	4.2	3.0	2.4	2.0	2.0	2.4
24	2.3	2.2	3.0	3.5	6.15	6.19	3.95	2.9	2.35	2.0	1.95	2.4
25	2.3	2.2	2.9	3.35	6.4	6.04	3.6	2.8	2.3	2.0	1.9	2.4
26	2.3	2.2	2.85	3.1	6.35	6.04	3.6	2.7	2.3	2.0	1.9	2.4
27	2.3	2.1	2.75	3.0	6.05	6.24	3.85	2.8	2.3	2.0	1.8	2.4
28	2.3	2.1	2.7	2.95	5.45	6.33	4.05	2.9	2.3	2.0	1.8	2.4
29	2.3	.....	2.65	2.9	5.05	6.48	4.05	2.95	2.3	2.0	1.8	2.4
30	2.3	.....	2.6	3.0	4.8	6.58	3.9	3.1	2.15	2.0	1.8	2.4
31	2.3	.....	2.55	.....	4.75	.....	3.75	3.3	.....	2.0	.....	2.4
1908.[b]												
1	.....	.....	1.95	2.1	1.95	2.1	2.55	1.0	2.1	1.5	1.8	.....
2	.....	.....	2.0	2.1	2.1	2.1	2.35	1.5	2.0	1.55	1.75	.....
3	.....	.....	2.05	2.1	2.2	2.25	2.2	2.1	1.9	1.5	1.7	.....
4	.....	.....	2.1	2.0	2.3	2.4	2.2	2.55	1.85	1.5	1.7	.....
5	.....	.....	2.15	2.0	2.45	2.4	2.05	2.1	1.8	1.5	1.7	.....
6	.....	.....	2.2	1.95	2.3	2.3	2.0	1.95	1.8	1.5	1.7	.....
7	.....	.....	2.2	1.95	2.25	2.35	1.85	1.9	1.7	1.5	1.65	.....
8	.....	.....	2.15	1.9	2.1	2.25	1.8	1.8	1.7	1.5	1.55	.....
9	.....	.....	2.1	1.9	2.1	2.2	1.7	1.8	1.7	1.5	1.45	.....
10	.....	.....	2.0	1.9	2.2	2.3	1.55	1.8	1.6	1.55	1.4	.....

[a] Ice conditions probably prevailed December 14 to 31, 1907. It is not known to what extent they may have prevailed during the early part of the year.
[b] Probable ice conditions November 18–30, 1908.

Daily gage height, in feet, of Rio Grande near Lobatos, Colo., for 1907 and 1908—Cont'd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
11	.....	.....	2.0	1.9	2.15	2.45	1.5	1.75	1.6	1.55	1.4	.....
12	.....	.....	2.0	1.9	2.1	2.85	1.4	1.6	1.6	1.55	1.3	.....
13	.....	.....	2.0	1.9	2.0	3.25	1.25	1.65	1.6	1.55	1.3	.....
14	.....	.....	2.05	1.95	2.0	3.4	1.25	1.6	1.55	1.5	1.2	.....
15	.....	.....	2.05	2.0	2.0	3.4	1.4	1.65	1.5	1.5	1.25	.....
16	.....	.....	2.1	2.1	1.95	3.35	1.65	1.75	1.5	1.5	1.3	.....
17	.....	.....	2.1	2.2	2.0	3.25	1.85	1.9	1.5	1.5	1.45	.....
18	.....	.....	2.2	2.25	2.15	2.95	1.8	1.9	1.5	1.55	1.7	.....
19	.....	.....	2.25	2.4	2.45	2.85	1.6	2.05	1.5	1.6	1.7	.....
20	.....	.....	2.4	2.4	2.65	2.75	1.4	2.35	1.5	1.6	1.7	.....
21	.....	.....	2.4	2.4	2.85	2.55	1.5	2.55	1.5	1.6	1.7	.....
22	.....	.....	2.3	2.35	2.7	2.35	1.4	2.7	1.5	1.6	1.6	.....
23	.....	.....	2.3	2.3	2.6	2.2	1.3	2.7	1.45	1.6	1.6	.....
24	.....	.....	2.3	2.4	2.5	2.2	1.3	2.6	1.4	1.6	1.6	.....
25	.....	.....	2.3	2.4	2.5	2.2	1.2	2.5	1.4	1.6	1.65	.....
26	.....	.....	2.3	2.3	2.5	2.2	1.1	2.45	1.5	1.7	1.6	.....
27	.....	.....	2.3	2.1	2.4	2.25	1.05	2.4	1.5	1.7	1.7	.....
28	.....	.....	2.3	2.1	2.25	2.85	1.0	2.3	1.45	1.75	1.7	.....
29	.....	.....	2.2	2.0	2.0	3.0	1.0	2.2	1.5	1.75	1.9	.....
30	.....	.....	2.2	1.8	2.0	2.8	1.0	2.15	1.5	1.8	1.9	.....
31	.....	.....	2.2	.....	2.0	.....	1.0	2.1	.....	1.85	.....	.....

NOTE.—Probable ice conditions November 18–30, 1908.

Rating tables for Rio Grande near Lobatos, Colo.

JANUARY 1, 1905, TO APRIL 16, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
2.00	475	2.60	1,000	3.20	1,710	3.80	2,580
2.10	550	2.70	1,110	3.30	1,840	3.90	2,740
2.20	630	2.80	1,230	3.40	1,980	4.00	2,900
2.30	715	2.90	1,350	3.50	2,120	4.20	3,240
2.40	805	3.00	1,470	3.60	2,270	4.40	3,590
2.50	900	3.10	1,590	3.70	2,420	4.60	3,950

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on discharge measurements made during 1905–6 and is well defined.

APRIL 17, 1907, TO DECEMBER 31, 1908.

1.00	63	2.20	705	3.40	2,150	5.00	4,700
1.10	91	2.30	800	3.50	2,300	5.20	5,080
1.20	125	2.40	900	3.60	2,450	5.40	5,470
1.30	163	2.50	1,000	3.70	2,600	5.60	5,870
1.40	205	2.60	1,110	3.80	2,750	5.80	6,280
1.50	250	2.70	1,230	3.90	2,900	6.00	6,700
1.60	295	2.80	1,350	4.00	3,060	6.20	7,120
1.70	345	2.90	1,470	4.20	3,380	6.40	7,540
1.80	400	3.00	1,600	4.40	3,700	6.60	7,960
1.90	460	3.10	1,730	4.60	4,020	6.80	8,380
2.00	530	3.20	1,870	4.80	4,360	7.00	8,800
2.10	615	3.30	2,010				

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on discharge measurements made during 1907–8, and is well defined above gage height 1.4 feet.

Monthly discharge of Rio Grande near Lobatos, Colo., for 1907 and 1908.

[Drainage area, 7,700 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1907.							
January	715	715	715	0.093	0.11	44,000	B.
February	630	550	624	.081	.08	34,700	B.
March	1,470	475	779	.101	.12	47,900	B.
April	3,770	715	1,960	.255	.28	117,000	A.
May	7,540	1,470	3,270	.425	.49	201,000	A.
June	8,670	3,700	6,900	.896	1.00	411,000	B
July	8,800	2,450	5,440	.706	.81	334,000	B.
August	2,520	1,230	1,740	.226	.26	107,000	A.
September	2,750	660	1,230	.160	.18	73,200	A.
October	705	530	576	.075	.09	35,400	A.
November	530	390	473	.061	.07	27,900	A.
December	390	335	358	.047	.05	21,800	C.
The year	8,800	335	2,000	.260	3.54	1,450,000	
1908.							
March	900	495	678	.088	.10	41,700	A.
April	900	400	629	.082	.09	37,400	A.
May	1,410	495	765	.099	.11	47,000	A.
June	2,150	615	1,150	.149	.17	68,400	A.
July	1,060	63	316	.041	.05	19,400	A.
August	1,230	63	624	.081	.09	38,400	A.
September	615	205	306	.040	.05	18,200	A.
October	430	250	289	.038	.04	17,800	A.
November	400	125	250	.032	.04	14,900	C.
The period						303,000	

NOTE.—Open-channel flow assumed January to March, 1907. Discharge December 14 to 31, 1907, estimated 350 second-feet; November 18 to 30, 1908, estimated 240 second-feet.

RIO GRANDE NEAR SAN MARCIAL, N. MEX.

A station was established near San Marcial, N. Mex., August 8, 1889, and a measurement was made which gave a discharge of 19 second-feet; but soon after this date the river gage was destroyed and the locality was abandoned until January 29, 1895, when the station was reestablished at the bridge of the Atchison, Topeka and Santa Fe Railway 1 mile south of San Marcial, N. Mex.

The channel is sandy and shifting. A number of bridge piers interfere with the current to a certain extent and sometimes affect the discharge measurements, but they do not affect the observed gage heights. Measurements are made frequently in order to determine closely the daily flow. There is no overflow channel beyond the bridge. The section gives gravity flow. The range between high and low water is about 8 feet.

The inclined gage established January 29, 1895, was carried away in 1896 and a wire gage was put in its place. This gage has since been abandoned and the gage heights are now measured with a graduated rod from the deck of the bridge, but using the old gage datum.

The observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande near San Marcial, N. Mex., in 1907.

[By Geo. W. King and D. H. Armstrong.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	248	8.4	1,033	July 6	1,347	10.3	7,529
January 6	183	8.0	683	July 9	1,309	10.0	7,732
January 9	321	8.4	901	July 12	1,196	9.7	6,027
January 12	251	8.4	1,139	July 15	1,073	9.4	5,462
January 15	237	8.3	970	July 18	1,027	9.5	5,106
January 18	338	8.7	1,423	July 21	888	9.2	4,111
January 21	278	8.3	1,130	July 24	677	8.7	3,273
January 24	249	8.3	772	July 27	754	8.9	3,138
January 27	212	8.3	860	July 29	755	9.1	3,244
January 30	331	8.6	970	July 31	597	8.6	2,555
February 2	298	8.7	1,110	August 3	600	8.9	2,595
February 5	313	8.7	1,350	August 6	600	8.8	2,780
February 8	346	8.6	1,187	August 9	524	8.6	2,152
February 11	350	8.7	1,227	August 12	410	8.3	1,698
February 14	353	8.6	1,062	August 15	306	8.2	1,139
February 17	292	8.5	1,106	August 18	246	8.0	950
February 20	362	8.7	1,190	August 21	564	9.1	2,410
February 23	391	8.8	1,305	August 23	815	9.5	4,066
February 26	376	8.8	1,456	August 26	514	9.0	2,171
February 28	290	8.7	1,400	August 27	1,064	10.4	5,540
March 3	275	8.6	1,239	August 30	1,120	10.6	5,701
March 6	245	8.6	952	September 1	2,033	12.0	11,458
March 9	194	8.6	903	September 4	856	9.8	3,962
March 12	273	8.7	1,190	September 7	591	9.7	2,591
March 15	312	8.8	1,147	September 10	362	9.3	1,921
March 18	178	8.4	713	September 13	328	9.4	1,476
March 21	262	8.6	1,135	September 16	416	9.4	1,442
March 23	507	9.35	2,425	September 19	457	9.6	2,064
March 26	658	9.5	2,981	September 21	1,174	10.7	5,276
March 29	429	8.9	2,480	September 22	1,463	11.7	6,871
March 31	501	9.0	2,181	September 25	497	9.1	1,649
April 3	495	9.0	1,856	September 28	280	9.0	1,082
April 6	483	9.0	1,918	September 30	309	9.2	1,000
April 9	435	9.0	2,160	October 3	297	9.1	760
April 12	500	9.0	1,878	October 6	280	9.2	794
April 14	756	9.8	3,754	October 9	303	9.3	829
April 16	1,257	10.7	5,810	October 12	188	9.2	814
April 19	1,122	10.4	5,708	October 15	237	9.4	894
April 24	983	9.7	4,954	October 18	241	9.5	988
April 27	872	9.4	4,041	October 21	255	9.6	893
April 30	1,018	9.7	3,871	October 24	419	9.9	1,591
May 3	1,028	9.7	4,743	October 27	305	9.3	1,450
May 6	947	9.7	4,339	October 30	283	9.2	1,416
May 9	923	9.55	3,904	November 2	264	9.2	1,189
May 12	827	9.4	3,854	November 5	210	9.3	984
May 15	900	9.7	4,269	November 8	214	9.3	868
May 18	779	9.7	4,093	November 11	200	9.3	859
May 21	1,073	10.0	5,164	November 14	230	9.3	913
May 22	1,269	10.7	6,318	November 17	260	9.5	1,009
May 25	1,837	11.4	9,358	November 20	217	9.4	905
May 28	1,716	11.3	11,067	November 23	222	9.6	998
May 31	1,710	11.1	9,697	November 26	249	9.5	948
June 3	1,554	10.3	7,406	November 29	225	9.5	700
June 7	1,620	10.3	8,804	December 2	227	9.6	817
June 9	1,694	10.9	9,660	December 5	223	9.6	828
June 12	1,698	10.7	9,344	December 8	212	9.5	824
June 15	1,824	10.5	9,508	December 12	203	9.6	831
June 18	1,598	10.9	9,342	December 15	177	9.5	678
June 20	1,765	11.3	10,218	December 18	142	9.3	602
June 21	2,051	11.6	11,679	December 21	164	9.4	586
June 24	1,698	10.5	9,207	December 24	200	9.5	617
June 27	1,419	10.2	7,652	December 27	216	9.6	738
June 30	1,296	9.7	7,148	December 30	210	9.5	599
July 3	1,322	10.0	7,318				

Discharge measurements of Rio Grande near San Marcial, N. Mex., in 1908.

[By G. W. King.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	235	9.7	854	June 21	464	10.4	1,942
January 5	249	9.8	922	June 24	263	10.0	1,284
January 8	274	9.8	723	June 27	217	9.8	794
January 11	195	9.7	648	June 30	149	9.5	537
January 14	200	9.7	654	July 3	218	9.9	891
January 17	184	9.8	687	July 6	170	9.7	648
January 20	181	9.8	736	July 9	185	9.9	905
January 23	157	9.7	663	July 12	71	9.1	229
January 26	200	9.7	581	July 15	155	9.65	536
January 30	245	9.7	686	July 17	266	10.2	1,366
February 2	180	9.6	710	July 20	351	10.2	1,503
February 5	170	9.6	631	July 23	151	9.0	522
February 8	217	10.0	810	July 26	216	9.5	803
February 11	172	9.5	620	July 29	320	9.8	983
February 14	194	9.7	759	July 31	212	9.5	565
February 17	160	9.7	566	August 3	167	9.5	569
February 20	167	9.7	606	Do	780	11.4	3,462
February 23	223	9.9	731	August 5	379	10.6	2,330
February 26	395	10.4	1,598	August 8	133	9.2	474
February 29	271	9.7	1,029	August 9	839	12.3	4,987
March 3	291	10.2	1,291	August 12	230	9.8	961
March 6	211	9.6	1,009	August 15	526	11.4	2,942
March 10	329	10.0	1,321	August 18	427	10.5	1,540
March 13	241	9.7	945	August 21	228	10.1	870
March 16	253	9.5	1,097	August 24	439	10.6	1,508
March 19	405	10.2	1,803	August 28	377	11.0	1,662
Marrh 22	397	10.4	1,737	August 31	184	10.2	968
March 25	376	10.0	1,504	September 3	157	10.1	586
March 28	276	9.9	1,192	September 6	143	9.9	374
March 31	307	9.9	1,231	September 9	123	9.8	218
April 3	332	9.7	795	September 12	63	9.4	103
April 6	354	9.7	865	September 15	32	9.1	35
April 9	329	9.9	1,093	October 22	7	9.2	7
April 12	387	10.1	1,648	October 25	37	9.4	71
April 15	377	10.2	1,978	October 28	107	9.9	203
April 19	881	11.5	4,695	October 31	127	10.0	283
April 22	615	10.5	3,567	November 3	206	10.2	431
April 25	817	10.8	3,254	November 6	199	10.3	513
April 28	579	10.5	2,832	November 9	192	10.3	494
April 30	472	10.2	2,154	November 12	176	10.3	515
May 3	426	10.1	1,578	November 15	183	10.3	560
May 6	611	10.9	3,862	November 18	144	10.2	459
May 9	393	10.1	2,104	November 21	121	10.1	373
May 12	397	10.4	2,113	November 24	128	10.0	419
May 15	477	10.6	2,409	November 27	189	10.5	672
May 18	636	10.6	2,413	November 30	212	10.5	757
May 22	719	11.1	3,625	December 3	204	10.5	694
May 25	854	11.1	4.045	December 6	230	10.6	818
May 28	677	10.8	3,263	December 9	210	10.5	786
May 31	483	10.3	2,189	December 12	179	10.4	576
June 3	436	10.3	1,918	December 15	264	10.5	546
June 6	531	10.4	1,813	December 18	163	10.5	569
June 9	542	10.5	1,679	December 21	172	10.5	551
June 12	283	10.2	1,281	December 24	193	10.4	594
June 15	301	10.2	1,201	December 27	279	10.6	712
June 18	470	10.5	2,094	December 30	130	10.3	498

Daily gage height, in feet, of Rio Grande near San Marcial, N. Mex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	8.3	8.7	8.7	8.9	9.75	10.8	9.9	8.85	11.75	9.15	9.4	9.6
2	8.3	8.65	8.6	9.0	9.7	10.65	9.95	8.7	10.3	9.15	9.25	9.6
3	8.4	8.8	8.6	8.9	9.65	10.25	10.0	8.9	9.9	9.1	9.1	9.6
4	8.4	8.8	8.5	8.85	9.6	10.05	10.05	9.2	9.7	9.1	9.2	9.6
5	8.3	8.7	8.5	8.85	9.7	10.0	10.05	9.0	9.6	9.1	9.3	9.6
6	8.0	8.55	8.6	9.0	9.7	9.9	10.3	8.8	9.8	9.15	9.4	9.6
7	8.15	8.5	8.5	9.2	9.7	10.15	10.2	8.6	9.7	9.1	9.3	9.6
8	8.2	8.6	8.5	9.15	9.65	10.6	10.2	8.85	9.65	9.1	9.3	9.5
9	8.4	8.7	8.6	8.9	9.6	10.9	9.9	8.5	9.45	9.3	9.3	9.5
10	8.4	8.7	8.6	8.8	9.5	10.7	9.85	8.45	9.3	9.1	9.2	9.5
11	8.4	8.7	8.7	9.05	9.4	10.65	9.85	8.3	9.3	9.1	9.3	9.5
12	8.4	8.6	8.7	8.95	9.4	10.6	9.7	8.3	9.5	9.2	9.35	9.6
13	8.3	8.55	8.6	9.2	9.4	10.65	9.7	8.3	9.4	9.35	9.4	9.6
14	8.3	8.6	8.75	9.6	9.6	10.6	9.45	8.3	9.35	9.4	9.3	9.6
15	8.3	8.5	8.8	10.0	9.7	10.5	9.4	8.2	9.5	9.4	9.3	9.55
16	8.3	8.55	8.7	10.6	9.65	10.5	9.5	8.15	9.35	9.45	9.4	9.5
17	8.3	8.5	8.55	10.6	9.7	10.55	9.5	8.05	9.5	9.5	9.45	9.5
18	8.55	8.6	8.4	10.65	9.65	10.8	9.5	8.0	9.5	9.5	9.5	9.3
19	8.65	8.6	8.35	10.4	9.7	11.0	9.4	8.3	9.7	9.5	9.5	9.3
20	8.5	8.7	8.5	10.4	10.0	11.25	9.35	8.55	10.2	9.7	9.4	9.25
21	8.3	8.8	8.6	10.5	10.1	11.6	9.2	9.0	10.4	9.6	9.45	9.4
22	8.3	8.85	8.6	10.6	10.7	11.3	9.2	9.6	11.05	9.45	9.6	9.5
23	8.4	8.8	9.3	10.0	11.0	10.9	9.1	9.3	9.65	9.4	9.6	9.5
24	8.3	8.7	9.45	9.7	11.3	10.6	8.65	8.9	9.2	10.3	9.6	9.5
25	8.4	8.8	9.45	9.75	11.3	10.45	8.6	9.05	9.15	9.9	9.6	9.5
26	8.55	8.8	9.45	9.6	11.6	10.35	8.9	9.0	9.0	10.05	9.5	9.5
27	8.3	8.7	9.3	9.3	11.3	10.1	8.85	10.2	9.0	9.5	9.5	9.6
28	8.3	8.7	9.1	9.1	11.4	9.85	9.1	9.65	9.0	9.4	9.5	9.7
29	8.55	.....	9.05	9.25	11.35	9.85	9.2	9.4	9.05	9.2	9.5	9.7
30	8.6	.....	9.25	9.65	11.4	9.75	8.7	10.05	9.2	9.25	9.5	9.55
31	8.65	.....	9.05	.....	11.1	.....	8.55	12.05	.....	9.0	.....	9.5
1908.												
1	9.5	9.8	9.7	9.9	10.2	10.3	9.65	9.65	10.2	.....	10.1	10.4
2	9.65	9.65	10.15	9.65	10.2	10.45	9.5	9.6	10.1	.....	10.1	10.5
3	9.7	9.6	10.2	9.7	10.1	10.3	9.95	10.8	10.1	.....	10.2	10.5
4	9.7	9.7	9.9	9.7	10.3	10.3	9.75	10.4	10.0	.....	10.2	10.6
5	9.8	9.6	9.8	9.7	10.8	10.4	9.8	10.8	10.1	.....	10.3	10.5
6	9.9	9.75	9.6	9.65	10.95	10.4	9.7	10.25	9.9	.....	10.3	10.6
7	9.8	9.8	9.6	9.5	10.55	10.4	9.7	9.6	9.8	.....	10.3	10.5
8	9.8	9.95	9.6	9.6	10.3	10.4	9.7	9.25	9.7	.....	10.3	10.4
9	9.7	9.75	9.6	9.8	10.1	10.5	9.8	10.7	9.8	.....	10.3	10.5
10	9.7	9.55	9.9	10.0	10.2	10.4	9.55	10.7	9.7	.....	10.3	10.5
11	9.7	9.5	9.7	10.15	10.2	10.3	9.45	10.1	9.5	.....	10.3	10.4
12	9.7	9.5	9.7	10.1	10.35	10.2	9.15	9.8	9.4	.....	10.3	10.4
13	9.6	9.55	9.7	10.0	10.4	10.2	9.1	9.95	9.3	.....	10.3	10.4
14	9.7	9.65	9.55	10.1	10.45	10.2	9.1	9.85	9.3	.....	10.3	10.5
15	9.8	9.7	9.5	10.2	10.6	10.2	9.35	10.75	9.15	.....	10.3	10.5
16	9.7	9.85	9.5	10.1	10.45	10.25	9.45	11.35	8.95	.....	10.3	10.45
17	9.8	9.75	9.5	10.2	10.4	10.45	10.6	10.95	8.75	.....	10.2	10.55
18	9.8	9.6	9.7	10.4	10.5	10.45	10.85	10.6	.....	.....	10.2	10.5
19	9.8	9.6	10.1	11.2	10.6	10.6	10.0	10.6	.....	.....	10.2	10.45
20	9.8	9.7	10.2	10.85	10.6	10.45	10.5	10.4	.....	.....	10.1	10.4
21	9.8	9.9	10.55	10.7	10.65	10.4	9.7	10.15	.....	.....	10.1	10.45
22	9.75	9.9	10.3	10.5	11.1	10.4	9.4	10.25	.....	9.2	10.2	10.55
23	9.7	9.9	10.2	10.4	11.1	10.15	9.1	10.35	.....	9.25	10.15	10.5
24	9.7	10.2	10.2	10.5	10.9	10.0	9.0	10.55	.....	9.3	10.05	10.4
25	9.7	10.35	10.0	10.8	11.0	9.9	9.05	10.75	.....	9.4	10.05	10.4
26	9.7	10.4	9.9	10.75	11.0	9.8	9.3	10.7	.....	9.55	10.1	10.4
27	9.7	10.25	9.8	10.8	10.85	9.8	9.45	10.7	.....	9.75	10.35	10.55
28	9.8	10.35	9.9	10.55	10.8	9.7	9.65	10.9	.....	9.9	10.5	10.45
29	9.8	9.85	9.9	10.35	10.8	9.6	9.9	10.65	.....	9.9	10.6	10.35
30	9.7	.....	9.9	10.2	10.7	9.5	9.6	10.5	.....	10.0	10.5	10.3
31	9.8	.....	9.9	.....	10.35	.....	9.5	10.25	.....	10.0	.....	10.4

NOTE.—No flow September 18–October 21, 1908.

Daily discharge, in second-feet, of Rio Grande near San Marcial, N. Mex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1,010	1,080	1,390	1,950	4,260	8,840	7,260	2,810	a10,610	905	1,440	815
2	980	a1,060	1,250	1,960	4,450	8,410	7,290	2,420	5,660	855	1,230	a815
3	a1,035	1,290	a1,240	a1,740	a4,640	a7,330	a7,320	a2,590	4,300	a760	1,010	820
4	1,035	1,370	1,040	1,700	4,410	7,010	7,350	3,200	a3,760	760	1,000	825
5	945	a1,350	950	1,720	4,470	6,930	7,350	2,990	3,170	760	a985	a830
6	a685	1,180	a950	a1,920	a4,340	6,770	a7,530	a2,780	3,180	a775	1,020	840
7	765	1,110	840	2,320	4,340	a8,040	7,600	2,360	a2,590	760	905	850
8	795	a1,190	820	2,320	4,190	9,240	7,860	2,650	2,510	760	a870	a825
9	a900	1,230	a900	a2,000	a4,050	a9,660	a7,530	a2,000	2,170	a830	865	815
10	980	1,230	960	1,790	3,890	9,340	7,060	1,920	a1,920	800	780	810
11	1,060	a1,230	1,130	2,040	3,770	9,260	6,700	1,700	1,710	800	a860	800
12	a1,140	1,100	a1,190	a1,810	a3,850	a9,140	a6,030	a1,700	1,890	a815	915	a830
13	1,030	1,030	1,030	2,350	3,850	9,430	6,630	1,560	a1,480	875	975	805
14	1,000	a1,060	1,140	a3,280	4,130	9,520	5,560	1,430	1,360	895	a915	785
15	a970	1,020	a1,150	4,210	a4,270	a9,510	a5,460	a1,140	1,650	a895	915	a720
16	970	1,100	1,040	a5,580	4,110	9,190	5,460	1,090	a1,340	940	960	680
17	970	a1,110	870	5,780	4,150	8,960	5,280	990	1,720	a990	a985	680
18	a1,255	1,150	a710	6,200	a3,920	a9,120	a5,110	a950	1,790	990	1,010	a600
19	1,385	1,150	740	a5,710	4,090	9,560	4,770	1,350	a2,360	990	1,010	585
20	1,275	a1,190	960	6,450	5,160	a10,110	4,610	1,680	3,820	1,190	a905	545
21	a1,130	1,300	a1,130	7,500	a5,340	a11,680	a4,110	a2,280	a4,400	a895	930	a585
22	1,010	1,360	1,250	7,500	a6,320	11,000	4,110	3,840	a5,840	820	1,000	615
23	970	a1,300	a2,350	5,800	7,620	10,100	3,940	a3,670	2,750	a795	a1,000	615
24	a770	1,270	2,710	a4,950	8,920	a9,430	a3,190	2,570	1,850	2,230	1,000	a615
25	860	1,410	2,790	5,110	a8,920	8,950	2,960	2,570	a1,750	1,590	1,000	630
26	995	a1,460	a2,880	4,650	10,860	8,430	3,290	a2,170	1,330	1,740	a950	645
27	a860	1,400	2,810	a3,840	10,360	a7,550	a3,160	a5,050	1,190	a1,520	865	a740
28	860	1,400	2,650	3,180	a11,470	7,290	3,240	3,960	a1,080	1,490	780	800
29	950	.....	a2,720	3,230	11,080	7,290	a3,400	3,380	940	1,420	a700	780
30	a970	.....	2,810	a3,770	11,090	a7,190	2,690	a4,600	a1,000	a1,430	700	a640
31	1,010	.....	a2,260	.....	a9,700	.....	a2,490	10,050	.....	1,220	.....	600
1908.												
1	650	815	1,030	1,150	2,030	2,100	670	750	875	.....	355	685
2	a815	a750	1,260	825	1,900	2,220	535	690	675	.....	355	715
3	855	685	a1,290	a795	a1,580	a1,920	a950	a2,540	a585	.....	a430	a695
4	855	740	1,150	820	2,150	1,840	710	2,050	480	.....	430	770
5	a920	a630	1,100	840	3,570	1,890	770	a2,620	585	.....	515	745
6	935	705	a1,010	a815	a4,000	a1,810	a650	1,860	a375	.....	a515	a820
7	790	695	1,010	635	3,090	1,720	650	1,000	270	.....	505	785
8	a725	a770	1,010	750	2,540	1,630	650	a540	165	.....	500	755
9	650	690	1,010	a980	a2,100	a1,680	a820	a2,660	a220	.....	a495	a785
10	650	600	a1,240	1,340	2,110	1,550	610	2,410	190	.....	500	735
11	a650	a620	1,040	1,700	1,960	1,420	525	1,440	130	.....	510	630
12	650	620	990	a1,650	a2,040	a1,280	a270	a960	a105	.....	a515	a575
13	580	655	a945	1,490	2,110	1,250	230	1,150	80	.....	530	550
14	a655	a725	935	1,730	2,190	1,230	230	1,020	80	.....	545	570
15	710	695	1,000	a1,980	a2,410	a1,200	a370	a2,140	a45	.....	a560	a545
16	630	735	a1,100	1,770	2,180	1,420	415	2,860	25	.....	560	530
17	a685	a600	1,170	1,980	2,110	1,870	a1,970	2,240	10	.....	460	585
18	705	510	1,380	2,400	a2,260	a2,020	2,390	a1,690	.....	.....	a460	a570
19	720	520	a1,730	a4,070	2,410	2,250	1,160	1,710	.....	.....	460	540
20	a735	a605	1,800	3,960	2,410	2,020	a1,750	1,370	.....	.....	375	505
21	735	730	2,010	3,790	2,530	a1,940	1,090	a950	.....	.....	a375	a525
22	700	730	a1,680	a3,570	a3,620	1,940	845	1,060	.....	a5	455	590
23	a665	a730	1,620	3,160	3,760	1,530	a600	1,190	.....	25	460	580
24	635	1,230	1,620	3,060	3,420	a1,280	520	a1,440	.....	40	a445	a545
25	610	1,490	a1,500	a3,250	a3,800	1,080	550	1,570	.....	a70	445	565
26	a580	a1,600	1,350	3,180	3,780	890	a690	1,550	.....	110	470	590
27	605	1,490	1,190	3,250	3,390	a790	775	1,550	.....	160	a600	a690
28	715	1,640	a1,190	a2,900	a3,260	710	895	a1,620	.....	a205	700	605
29	740	a1,180	1,200	2,490	3,260	620	a1,120	1,360	.....	205	810	535
30	a685	.....	1,220	a2,150	3,050	a535	705	1,230	.....	285	a755	a500
31	765	.....	1,230	.....	2,300	.....	565	a1,010	.....	a285	.....	550

a Dates of measurement.

NOTE.—No flow September 18–October 21, 1908.

Monthly discharge of Rio Grande near San Marcial, N. Mex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907.				
January	1,385	685	986	60,635
February	1,460	1,020	1,219	67,696
March	2,880	710	1,505	92,549
April	7,500	1,700	3,745	222,863
May	11,470	3,770	6,001	368,965
June	11,680	6,770	8,809	524,192
July	7,860	2,490	5,346	328,740
August	10,050	950	2,692	165,521
September	10,610	940	2,704	160,899
October	2,230	760	1,048	64,453
November	1,440	700	949	56,489
December	850	545	727	44,707
The year	11,680	545	2,961	2,157,709
1908.				
January	935	580	710	43,636
February	1,640	510	834	47,970
March	2,010	935	1,258	77,375
April	4,070	635	2,083	123,927
May	4,000	1,580	2,688	165,263
June	2,250	535	1,521	90,516
July	2,390	230	796	48,952
August	2,860	540	1,556	95,663
September	875	0	163	9,709
October	285	0	45	2,757
November	810	355	503	29,931
December	820	500	625	38,410
The year	4,070	0	1,065	774,109

RIO GRANDE NEAR EL PASO, TEX.

This station was located at the pumping house of the smelter company, 3 miles north of El Paso, Tex. The bed of the stream at that point is composed of mud, and is constantly shifting and changing. May 1, 1897, the station was placed under the charge of W. W. Follett, consulting engineer, International Boundary Commission, and by him removed 1 mile farther up the river to Courchesne's lime-kiln. Although the section is unstable and subject to overflow, it is still the best site for a station in the vicinity of El Paso, as the entire bed is constantly shifting for many miles above and below. On this account frequent discharge measurements are made in order to closely estimate the daily discharge.

River heights were measured at the masonry pump-foundation pier. As the pier was torn down in October, 1902, an inclined wooden gage was established some 60 feet upstream and later the gage was removed 300 feet downstream.

The observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande near El Paso, Tex., in 1907.

[By W. L. Follett and E. E. Winter.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	358	7.9	941	July 8	1,122	11.3	7,651
January 6	277	7.7	837	July 12	1,082	11.0	6,665
January 9	267	7.5	718	July 15	977	10.8	6,235
January 12	302	7.75	948	July 18	839	10.3	5,134
January 15	413	8.0	1,253	July 22	822	10.25	4,917
January 19	323	8.4	1,399	July 25	755	9.85	4,274
January 22	295	8.1	1,208	July 28	779	9.6	3,966
January 25	241	7.8	961	July 31	832	10.2	4,349
January 29	195	7.6	632	August 3	707	9.15	3,611
January 31	214	7.7	658	August 6	552	9.0	2,476
February 3	384	7.9	916	August 9	524	9.0	2,244
February 6	449	7.95	1,000	August 12	510	8.65	2,163
February 9	394	8.1	918	August 15	373	8.3	1,133
February 12	378	8.05	905	August 18	341	7.8	723
February 15	290	7.9	801	August 21	225	7.95	622
February 18	267	7.85	799	August 24	461	9.4	2,117
February 21	252	7.7	784	August 27	477	9.35	2,284
February 24	275	7.8	751	August 29	696	10.35	3,508
February 28	272	7.85	819	August 31	834	10.95	4,622
March 3	259	8.0	951	September 2	1,324	12.85	8,036
March 6	229	7.85	824	September 3	1,562	13.5	10,562
March 9	177	7.7	585	September 5	821	10.55	4,111
March 12	177	7.6	597	September 8	543	9.55	2,605
March 15	234	7.9	827	September 11	420	9.0	1,835
March 18	246	7.85	882	September 14	414	8.65	1,396
March 21	195	7.4	499	September 17	400	8.5	1,123
March 24	190	7.4	509	September 20	393	8.6	1,360
March 27	512	8.95	2,058	September 23	712	10.1	3,565
March 29	498	9.15	2,377	September 25	475	9.35	2,398
March 31	398	8.9	1,875	September 27	329	8.4	1,303
April 3	363	8.65	1,742	September 30	257	7.8	781
April 6	337	8.45	1,437	October 3	227	7.6	560
April 9	339	8.4	1,414	October 6	243	7.65	531
April 12	332	8.4	1,333	October 9	211	7.55	488
April 15	358	8.3	1,311	October 12	202	7.35	421
April 17	639	9.8	3,351	October 15	220	7.45	489
April 19	1,067	11.15	5,281	October 18	248	7.75	529
April 21	1,084	11.2	6,064	October 21	296	7.85	837
April 24	872	10.85	5,481	October 24	263	7.95	852
April 27	706	9.95	3,747	October 27	362	8.55	1,467
April 30	576	9.45	2,915	October 30	375	8.65	1,488
May 3	835	10.55	4,140	November 3	296	8.1	1,039
May 6	714	10.0	3,723	November 6	270	8.0	927
May 9	645	10.0	3,746	November 9	254	7.85	769
May 12	545	9.4	2,800	November 13	264	7.95	902
May 15	500	9.2	2,468	November 15	240	7.8	752
May 18	615	9.7	3,089	November 18	252	7.95	864
May 21	670	9.65	3,183	November 21	290	8.2	1,106
May 25	938	11.05	5,275	November 24	298	8.1	1,009
May 28	1,143	12.1	7,423	November 27	281	8.1	944
May 30	1,401	12.6	8,993	November 30	266	8.0	759
June 2	1,473	12.55	9,781	December 3	226	7.8	592
June 5	1,098	11.4	7,136	December 6	253	8.0	803
June 8	956	11.2	5,776	December 9	246	7.9	673
June 11	1,113	11.8	6,928	December 12	239	7.9	674
June 14	1,148	11.95	7,515	December 15	259	7.9	658
June 17	1,095	11.95	6,957	December 18	249	7.85	645
June 20	1,269	12.3	8,283	December 21	241	7.95	631
June 22	1,398	12.45	9,024	December 24	224	7.7	563
June 24	1,597	13.05	10,753	December 27	213	7.65	464
June 27	1,207	11.95	7,866	December 30	204	7.6	437
June 30	839	11.1	5,503	December 31	223	7.7	515
July 3	923	10.9	5,262				

Discharge measurements of Rio Grande near El Paso, Tex., in 1908.

[By W. L. Follett, J. D. Dillard, and T. A. Stiles.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 7	209	8.3	814	June 6	220	8.35	898
January 10	214	8.1	666	June 9	204	8.3	808
January 13	204	8.0	528	June 12	189	8.1	663
January 16	172	7.6	385	June 15	126	7.6	363
January 19	176	7.75	432	June 18	108	7.5	218
January 22	191	7.9	519	June 22	232	8.6	932
January 25	198	7.9	504	June 25	184	8.2	557
January 28	166	7.85	484	June 30	95	7.1	129
January 31	188	7.85	456	July 3	35	6.3	37
February 3	178	7.8	436	July 10	6	6.2	3
February 6	200	7.95	494	July 21	325	9.0	1,358
February 9	167	7.9	481	July 24	202	8.3	621
February 12	233	8.2	808	July 27	169	8.2	591
February 15	226	7.9	532	July 30	166	8.0	470
February 18	234	8.0	521	August 2	165	8.05	417
February 21	228	7.95	566	August 5	171	8.15	529
February 24	212	7.85	562	August 7	224	8.7	924
February 27	211	7.9	560	August 8	333	9.4	1,395
February 29	227	8.0	593	August 11	137	7.7	273
March 3	241	8.3	770	August 13	318	9.5	1,504
March 6	249	8.2	784	August 16	229	8.7	872
March 9	251	8.2	523	August 18	414	10.2	1,977
March 12	253	8.2	797	August 21	312	9.1	1,280
March 15	264	8.1	735	August 24	226	8.65	822
March 18	143	7.6	287	August 27	422	10.3	2,038
March 21	129	7.4	281	August 29	192	8.7	627
March 23	391	9.1	1,638	August 31	303	9.3	1,246
March 26	269	8.65	1,120	September 3	163	8.1	389
March 29	214	8.25	778	September 4	631	11.4	3,209
March 31	192	8.0	612	September 7	115	7.7	229
April 3	182	8.1	603	September 10	62	7.2	79
April 6	186	7.9	507	September 13	28	6.7	23
April 9	132	7.5	264	September 16	27	6.5	22
April 12	159	7.7	384	November 14	39	7.2	56
April 15	245	8.5	937	November 17	79	7.2	117
April 18	349	9.0	1,577	November 21	104	7.3	180
April 21	571	10.5	3,323	November 24	112	7.3	157
April 24	485	9.9	2,715	November 29	102	7.35	169
April 27	456	9.8	2,464	December 3	226	8.1	524
April 30	385	9.6	1,876	December 6	176	7.85	331
May 3	303	8.9	1,341	December 10	137	7.5	209
May 6	272	8.7	1,134	December 13	220	8.1	516
May 17	328	9.1	1,616	December 16	149	7.7	256
May 21	250	8.6	1,092	December 19	138	7.5	202
May 24	416	9.7	2,385	December 22	141	7.6	224
May 28	517	10.2	3,090	December 24	138	7.5	205
May 31	429	9.4	2,084	December 27	208	8.0	498
June 3	256	8.65	1,137	December 31	236	8.2	557

NOTE.—No measurements during October, 1908, as there was no flow.

Daily gage height, in feet, of Rio Grande near El Paso, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	7.85	7.7	7.95	8.9	9.45	12.65	10.95	9.3	10.85	7.65	8.35	7.9
2	7.95	7.8	7.9	8.8	9.7	12.3	10.9	9.1	13.0	7.6	8.25	7.9
3	7.9	7.85	8.0	8.65	10.4	12.0	10.8	9.1	13.45	7.6	8.1	7.8
4	8.0	7.9	8.05	8.5	10.4	11.6	10.9	8.95	11.55	7.6	8.3	7.8
5	7.8	7.9	7.85	8.5	10.3	11.35	11.1	8.9	10.3	7.6	8.05	7.85
6	7.7	7.95	7.85	8.45	10.0	10.75	11.2	9.15	10.3	7.65	8.0	7.95
7	7.55	8.25	7.7	8.3	9.9	10.9	11.2	9.65	9.95	7.6	7.95	7.9
8	7.5	8.2	7.7	8.25	9.95	11.2	11.3	9.2	9.6	7.6	7.9	7.9
9	7.5	8.1	7.7	8.35	9.9	11.5	11.3	8.95	9.8	7.5	7.9	7.9
10	7.45	7.9	7.55	8.5	9.85	11.6	11.3	8.9	9.3	7.35	7.85	7.9
11	7.45	7.9	7.5	8.45	9.6	11.75	11.05	8.8	9.0	7.35	7.9	7.9
12	7.7	8.05	7.6	8.4	9.5	11.7	10.95	8.55	8.75	7.35	7.95	7.9
13	7.85	7.95	7.55	8.25	9.45	11.9	11.0	8.4	8.6	7.35	7.9	7.9
14	7.95	8.0	7.65	8.2	9.15	11.85	10.75	8.3	8.6	7.35	7.85	7.8
15	8.05	7.9	7.9	8.25	9.2	11.8	10.8	8.3	8.5	7.4	7.8	7.8
16	8.05	7.75	7.9	8.55	9.3	11.7	10.6	8.1	8.35	7.5	7.9	7.95
17	8.05	7.9	7.9	9.6	9.4	11.95	10.45	7.9	8 3	7.65	8.0	7.9
18	8.9	7.85	7.95	10.4	9.7	11.9	10.3	7.8	8.5	7.7	7.9	7.9
19	8.4	7.8	7.7	11.0	9.8	11.9	10.25	7.8	8.35	7.65	7.95	7.85
20	8.15	7.7	7.45	11.3	9.8	12.25	10.3	8.15	8.75	7.7	8.1	7.95
21	8.15	7.7	7.45	11.2	9.7	12.3	10.4	7.95	8.8	7.8	8.2	7.95
22	8.1	7.65	7.35	11.05	9.9	12.5	10.25	8.3	10.15	8.05	8.25	7.9
23	8.0	7.6	7.3	11.4	10.2	12.5	10.1	8.7	10.5	7.95	8.1	7.7
24	7.9	7.8	7.4	11.05	10.55	13.05	10.05	8.85	10.9	7.95	8.1	7.7
25	7.8	7.75	7.6	10.55	11.15	12.55	9.85	9.8	9.5	8.5	8.0	7.65
26	7.75	7.9	8.75	10.0	11.8	12.1	9.5	9.25	8.8	9.1	8.1	7.65
27	7.65	7.9	8.95	9.95	12.15	11.85	9.4	9.35	8.45	8.55	8.1	7.65
28	7.5	7.85	9.2	9.9	12.2	11.6	9.6	8.9	8.1	9.25	7.95	7.6
29	7.6	.....	9.15	9.75	12.55	11.3	9.4	10.5	7.85	9.0	7.95	7.6
30	7.6	.....	8.95	9.5	12.7	11.0	9.4	11.15	7.8	8.6	8.0	7.65
31	7.7	.....	8.95	.....	12.7	.....	10.2	10.85	.....	8.35	.....	7.85
1908.												
1	8.0	7.7	8.2	8.0	9.3	9.15	6.6	8.4	9.35	.....	.....	8.05
2	7.75	7.8	8.4	8.0	8.95	8.8	6.35	8.0	8.6	.....	.....	8.1
3	7.7	7.8	8.3	8.2	8.9	8.6	6.25	7.65	8.05	.....	.....	8.1
4	7.8	7.85	8.0	8.25	8.9	8.5	.....	8.0	9.7	.....	.....	8.0
5	7.95	8.0	8.0	8.0	8.8	8.5	.....	8.0	9.65	.....	.....	7.9
6	8.2	8.0	8.2	7.95	8.7	8.35	.....	8.7	8.1	.....	.....	7.85
7	8.2	8.1	8.3	7.85	9.2	8.3	.....	9.25	7.65	.....	.....	7.65
8	8.05	8.0	8.3	7.75	10.05	8.4	6.7	9.25	7.6	.....	.....	7.8
9	8.15	7.9	8.3	7.6	9.75	8.35	6.4	8.55	7.35	.....	.....	7.7
10	8.1	7.9	8.2	7.5	9.35	8.35	6.25	8.05	7.15	.....	.....	7.45
11	7.9	7.9	8.2	7.7	9.25	8.2	6.65	7.6	7.0	.....	.....	7.45
12	8.05	8.15	8.2	7.75	9.15	8.1	6.3	9.0	6.85	.....	.....	7.85
13	8.1	8.0	8.25	8.1	8.75	8.05	6.3	9.3	6.65	.....	.....	8.1
14	7.95	7.9	8.4	8.25	9.0	7.75	6.3	8.65	6.4	.....	7.15	8.1
15	7.9	7.9	8.05	8.55	9.1	7.5	6.2	8.75	6.2	.....	7.2	8.05
16	7.65	7.9	8.05	8.5	9.1	7.45	.....	8.7	6.5	.....	7.2	7.75
17	7.7	7.9	7.9	8.7	9.15	7.45	.....	8.9	6.4	.....	7.2	7.6
18	7.7	8.0	7.7	8.9	9.2	7.4	.....	10.1	6.3	.....	7.25	7.5
19	7.8	8.0	7.55	9.1	9.1	7.45	.....	9.95	6.15	.....	7.3	7.5
20	7.7	8.1	7.45	9.1	8.85	8.5	8.15	9.45	.....	.....	7.3	7.5
21	7.75	7.95	7.3	10.0	8.7	8.45	8.9	9.1	.....	.....	7.3	7.5
22	7.8	7.85	8.35	10.6	9.0	8.6	8.55	8.85	.....	.....	7.3	7.6
23	7.8	7.9	9.0	10.3	9.3	8.4	9.15	8.5	.....	.....	7.3	7.55
24	7.95	7.85	9.0	10.0	9.7	8.3	8.25	8.6	.....	.....	7.3	7.55
25	8.0	8.0	8.8	9.7	10.3	8.1	7.85	8.15	.....	.....	7.3	8.4
26	7.85	8.1	8.65	9.6	10.25	7.9	7.4	8.55	.....	.....	7.3	8.2
27	7.9	7.95	8.6	9.7	10.15	7.75	7.9	9.95	.....	.....	7.25	8.05
28	7.75	7.9	8.4	9.7	10.1	7.6	7.65	9.55	.....	.....	7.2	7.8
29	7.8	8.0	8.3	9.5	9.75	7.35	7.95	8.95	.....	.....	7.35	7.95
30	7.9	.....	8.15	9.5	9.5	7.15	7.9	8.7	.....	.....	7.75	8.55
31	7.85	.....	8.0	.....	9.4	.....	7.75	9.35	.....	.....	.....	8.05

NOTE.—No flow July 4–7, July 16–19, and September 20–November 13, 1908.

Daily discharge, in second-feet, of Rio Grande near El Paso, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	870	690	910	1,870	2,920	9,780	5,190	3,720	4,440	660	1,190	675
2	965	805	860	1,820	3,200	a9,210	5,160	3,580	a 8,620	595	1,130	675
3	a 940	a 875	a 950	a1,740	a 3,980	8,520	a4,980	a3,560	a10,370	a 560	a1,040	a 590
4	1,020	930	995	1,570	4,030	7,600	5,520	3,090	6,660	540	1,260	590
5	900	945	825	1,530	3,950	a7,020	6,330	2,710	a 3,730	520	985	645
6	a 835	a1,000	a 825	a1,440	a 3,720	5,580	6,860	a2,600	3,730	a 530	a 925	a 750
7	750	1,240	665	1,320	3,630	5,640	7,120	3,000	3,200	510	875	695
8	720	1,130	625	1,290	3,690	a5,780	a7,650	2,480	a 2,680	510	820	685
9	a 720	a 920	a 585	a1,370	a 3,650	6,350	7,650	a2,230	2,950	a 470	a 820	a 675
10	675	770	505	1,470	3,510	6,540	7,650	2,220	2,250	420	770	675
11	675	780	500	1,400	3,110	a6,830	6,830	2,200	a 1,830	420	835	675
12	a 905	a 905	a 595	a1,330	a 2,960	6,540	a6,560	a2,080	1,520	a 420	900	a 675
13	1,070	835	560	1,240	2,880	7,320	6,660	1,710	1,330	420	a 835	670
14	1,190	870	635	1,220	2,390	a7,220	6,130	1,380	a 1,330	420	800	585
15	a1,295	a 800	a 825	a1,280	a 2,470	7,070	a6,230	a1,130	1,180	a 455	a 750	a 580
16	1,295	705	860	1,650	2,590	6,770	5,800	970	970	495	825	710
17	1,295	825	890	a3,080	2,720	a6,960	5,470	805	a 880	515	900	675
18	1,970	a 800	a 960	4,210	a 3,090	6,770	a5,130	a 725	1,160	a 520	a 825	a 685
19	a1,400	795	755	a5,070	3,300	6,770	5,000	650	1,020	500	865	615
20	1,240	755	540	5,920	3,350	a8,040	5,070	855	a 1,540	615	1,010	665
21	1,240	a 785	a 540	a6,060	a 3,260	8,280	5,240	a 620	1,650	a 785	a1,110	a 630
22	a1,210	715	470	5,810	3,560	a9,170	a4,920	980	3,640	1,010	1,150	635
23	1,125	645	445	6,460	4,010	9,170	4,680	1,400	a 4,150	880	1,010	520
24	1,045	a 750	a 510	a5,810	4,530	a10,750	4,590	a1,550	4,820	a 850	a1,010	a 565
25	a 960	720	710	4,900	a 5,480	9,440	a4,270	2,590	a 2,630	1,410	885	505
26	880	845	1,860	3,840	6,800	8,260	3,840	2,110	1,760	2,020	965	485
27	760	850	a2,060	a3,750	7,520	a7,590	3,720	a2,280	a 1,360	a1,470	a 945	a 465
28	595	a 820	2,460	3,660	a 7,740	6,890	a3,970	1,740	1,040	2,170	765	435
29	a 630	.....	a2,380	3,410	8,840	6,060	3,770	a3,790	870	1,890	740	435
30	635	.....	1,980	a3,000	a 9,290	a5,230	3,770	5,000	a 780	a1,440	a 760	a 475
31	a 660	.....	a1,980	.....	9,630	.....	a4,350	a4,440	.....	1,190	.....	a 635
1908.												
1	665	395	710	590	1,650	1,770	75	650	1,280	.....	.....	490
2	540	435	830	570	1,380	1,320	45	a 400	745	.....	.....	525
3	515	a 435	a 770	a 650	a1,340	a1,100	a 30	295	a 355	.....	.....	a 525
4	565	455	670	675	1,340	1,020	.....	460	a 1,760	.....	.....	445
5	640	510	685	555	1,240	1,020	.....	a 460	1,720	.....	.....	370
6	765	a 505	a 785	a 530	a 1,130	a 900	.....	925	535	.....	.....	a 330
7	a 765	555	745	475	1,740	845	.....	a1,290	a 215	.....	.....	260
8	690	520	660	415	2,770	910	85	a1,290	200	.....	.....	315
9	710	a 480	a 575	a 325	2,400	a 845	35	835	125	.....	.....	280
10	a 665	480	615	265	1,920	845	a 5	505	a 75	.....	.....	a 185
11	555	480	705	385	1,800	735	80	a 240	55	.....	.....	185
12	580	a 755	a 795	a 420	1,680	a 665	35	1,160	40	.....	.....	385
13	a 565	675	830	660	1,190	635	35	a1,360	a 20	.....	.....	a 515
14	510	585	920	765	1,500	455	35	830	10	.....	a 50	515
15	490	a 530	a 690	a1,000	1,620	a 305	25	910	5	.....	75	485
16	a 400	515	690	940	1,620	245	.....	a 870	a 20	.....	95	a 290
17	415	500	555	1,190	a 1,670	220	.....	1,020	15	.....	a 115	230
18	415	a 520	a 375	a1,450	1,720	a 155	.....	a1,910	10	.....	150	200
19	a 450	545	290	1,690	1,620	185	.....	1,820	5	.....	180	a 200
20	420	605	275	1,690	1,350	870	510	1,500	.....	.....	180	200
21	450	a 565	a 240	a2,740	a 1,210	840	a1,260	a1,280	.....	.....	a 180	200
22	a 480	540	1,040	3,420	1,560	a 930	885	1,020	.....	.....	170	a 225
23	475	570	a1,560	3,120	1,910	745	1,515	680	.....	.....	160	215
24	530	a 560	1,520	a2,820	a 2,380	650	a 605	a 770	.....	.....	a 155	a 235
25	a 545	615	1,290	2,460	3,230	a 515	485	450	.....	.....	155	745
26	485	650	a1,120	2,310	3,160	440	350	750	.....	.....	155	625
27	505	a 580	1,080	a2,360	3,020	380	a 470	a1,730	.....	.....	145	a 530
28	a 445	560	910	2,230	a 2,960	325	370	1,380	.....	.....	135	365
29	455	a 595	a 825	1,900	2,520	230	455	a 850	.....	.....	a 170	440
30	485	.....	710	a1,800	2,210	a 150	a 440	625	.....	.....	290	785
31	a 455	.....	a 610	.....	a 2,080	.....	395	a1,300	.....	.....	.....	a 495

a Dates of measurement.

NOTE.—No flow July 4–7, July 16–19, and September 20–November 13, 1908.

24440—IRR 248—10——4

Monthly discharge of Rio Grande near El Paso, Tex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907.				
January	1,970	595	983	60,436
February	1,240	645	839	46,621
March	2,460	445	976	60,020
April	6,460	1,220	2,951	175,577
May	9,630	2,390	4,381	269,355
June	10,750	5,230	7,438	442,612
July	7,650	3,720	5,487	337,408
August	5,000	620	2,200	135,263
September	10,370	780	2,801	166,671
October	2,170	420	813	50,003
November	1,260	740	923	54,942
December	750	435	612	37,636
The year	10,750	420	2,534	1,836,544
1908.				
January	765	400	536	32,985
February	755	395	542	31,170
March	1,560	240	777	47,752
April	3,420	265	1,347	80,132
May	3,230	1,130	1,901	116,866
June	1,770	150	675	40,165
July	1,515	0	265	16,314
August	1,910	240	954	58,641
September	1,760	0	240	14,261
October	0	0	0	0
November	290	0	85	5,078
December	785	185	380	23,385
The year	3,420	0	642	466,749

RIO GRANDE ABOVE PRESIDIO, TEX.

The station was established April 4, 1900, by the International Boundary Commission. It was originally located 9 miles above Presidio and 8 miles above the mouth of Rio Conchos, one of the principal tributaries of the Rio Grande, and about 200 miles below El Paso. The station was in a straight stretch of the river, but in the bight of a long bend. In 1905 the river began to erode a cut-off across this bend, and the spring flood of 1905 deepened this channel to such an extent that more water passed through it than through the station, and it became necessary to abandon the location. In September, 1905, the station was moved 8 miles farther upstream and rebuilt. Its location is far enough above the mouth of Rio Conchos to be free from the effects of backwater from that stream.

The river is nearly straight for one-fourth mile above and below the new location. Both banks overflow slightly in extreme flood, but no large amount of water passes outside the measured section. The bed is shifting sand. The banks are fairly solid, but would erode if a heavy current should strike them. Frequent discharge measurements are necessary to determine closely the daily discharge.

The observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande above Presidio, Tex., in 1907.

[By F. X. Dougherty.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 1	231	4.3	559	July 4	1,200	7.4	5,174
January 4	256	4.5	639	July 7	1,103	7.2	4,423
January 7	266	4.5	669	July 10	1,179	7.3	4,731
January 10	297	4.6	819	July 13	1,333	7.7	6,368
January 13	250	4.4	643	July 16	1,124	7.4	4,944
January 16	244	4.3	592	July 19	1,006	7.25	4,860
January 19	295	4.8	913	July 22	712	6.3	3,399
January 22	390	5.3	1,384	July 25	705	6.3	3,348
January 25	335	5.0	1,150	July 28	665	6.05	3,086
January 28	299	4.8	855	July 31	702	6.15	3,269
January 31	256	4.5	682	August 3	585	5.7	2,682
February 3	232	4.3	661	August 6	529	5.4	2,393
February 6	242	4.3	653	August 9	528	5.3	2,103
February 9	261	4.3	718	August 12	428	5.1	1,525
February 12	293	4.7	1,030	August 15	358	5.0	1,348
February 15	259	4.4	786	August 18	262	4.7	876
February 18	290	4.7	966	August 21	257	4.7	842
February 21	253	4.3	694	August 24	232	4.4	682
February 24	258	4.3	695	August 27	257	4.8	1,018
February 27	249	4.3	666	August 30	248	4.7	904
March 3	220	4.25	591	September 2	1,074	7.3	5,361
March 5	226	4.3	648	September 5	965	6.9	3,758
March 8	252	4.6	829	September 8	1,445	7.7	6,826
March 11	229	4.3	649	September 11	704	6.2	2,540
March 14	219	4.2	565	September 14	512	5.5	1,689
March 17	179	4.1	452	September 17	405	5.0	1,477
March 20	204	4.2	554	September 20	471	5.35	1,621
March 23	204	4.2	556	September 23	519	5.4	1,734
March 27	174	4.0	359	September 26	738	6.4	3,341
March 30	200	4.2	547	September 29	543	5.8	2,312
April 2	376	5.45	1,586	October 2	330	5.0	1,135
April 5	336	5.3	1,369	October 5	292	4.8	992
April 8	293	5.0	1,076	October 8	251	4.3	610
April 11	273	4.7	894	October 11	246	4.3	586
April 14	271	4.7	889	October 14	215	4.1	451
April 17	268	4.6	816	October 17	221	4.25	501
April 20	314	5.0	1,181	October 20	400	5.5	1,856
April 23	653	6.3	2,815	October 23	312	4.9	1,132
April 26	797	6.9	4,073	October 26	295	4.8	1,070
April 29	857	7.1	4,353	October 30	508	5.9	2,459
May 2	607	6.2	2,740	November 2	453	5.4	1,613
May 5	572	6.0	2,499	November 4	347	5.0	1,170
May 8	630	6.3	2,787	November 7	327	4.8	1,053
May 11	549	6.0	2,430	November 10	309	4.7	965
May 14	596	6.1	2,644	November 13	288	4.6	819
May 17	496	5.7	1,981	November 16	320	4.6	866
May 20	512	5.9	2,117	November 19	293	4.5	728
May 23	571	6.1	2,656	November 22	261	4.4	689
May 26	587	6.1	2,720	November 25	296	4.7	976
May 29	686	6.4	3,257	November 29	314	4.6	849
June 1	889	7.1	4,535	December 2	246	4.5	722
June 4	1,078	7.6	5,667	December 5	238	4.5	722
June 7	1,596	8.0	8,261	December 8	215	4.4	652
June 10	1,115	7.5	5,552	December 11	228	4.5	719
June 13	1,057	7.5	5,421	December 14	204	4.2	540
June 16	1,104	7.65	5,993	December 17	196	4.2	540
June 19	1,191	7.85	6,789	December 20	188	4.1	445
June 22	1,193	7.8	6,719	December 23	203	4.2	519
June 25	1,600	8.0	8,222	December 26	189	4.1	481
June 28	1,717	8.2	9,124	December 30	181	4.1	457
July 1	1,621	8.0	8,374				

Discharge measurements of Rio Grande above Presidio, Tex., in 1908.

[By F. X. Dougherty and W. T. Millington.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	186	4.05	415	June 3	468	5.15	1,739
January 5	188	4.1	444	June 6	357	4.55	1,303
January 8	187	4.1	422	June 9	292	4.2	931
January 11	231	4.4	647	June 12	263	4.0	593
January 14	216	4.2	529	June 15	193	3.9	340
January 17	226	4.35	604	June 18	165	3.8	282
January 20	206	4.2	500	June 21	127	3.55	160
January 23	168	4.1	469	June 24	95	3.2	67
January 27	156	4.1	466	June 27	74	2.9	52
January 30	177	4.2	496	June 30	54	3.0	30
February 4	171	4.0	404	July 4	212	4.0	249
February 7	165	4.0	402	July 7	122	3.0	103
February 10	166	4.0	401	July 10	37	2.85	8
February 13	206	4.2	521	July 13	24	2.8	5
February 16	181	4.15	480	July 22	213	4.0	243
February 19	199	4.2	535	July 26	365	4.6	642
February 22	196	4.2	504	July 28	387	4.6	393
February 25	165	4.0	393	July 31	252	4.0	186
February 28	187	4.0	397	August 3	127	3.6	99
March 2	159	3.9	344	August 6	319	4.6	844
March 5	160	3.9	349	August 9	165	4.0	362
March 8	210	4.2	489	August 12	259	4.4	615
March 11	195	4.1	477	August 15	189	4.1	379
March 14	183	4.1	456	August 18	254	4.4	623
March 17	172	4.1	436	August 21	247	4.4	602
March 20	179	4.2	466	August 24	265	4.7	730
April 9	200	4.1	393	August 27	228	4.3	544
April 13	130	4.1	345	August 30	231	4.4	556
April 15	112	3.9	242	September 1	499	5.1	1,781
April 18	110	3.9	235	September 4	400	4.7	1,162
April 21	223	4.3	596	September 7	247	4.05	571
April 24	292	4.7	853	September 11	227	3.95	511
April 27	585	5.7	2,515	September 14	137	3.6	224
April 29	467	5.3	1,964	September 16	176	3.4	175
May 3	429	5.0	1,538	September 19	55	3.1	74
May 7	381	4.5	1,472	September 22	52	3.0	68
May 11	471	4.9	1,665	September 25	37	2.7	43
May 13	462	5.15	1,525	December 13	39	3.2	33
May 16	407	4.6	1,386	December 16	43	3.2	38
May 19	418	4.8	1,454	December 19	51	3.05	23
May 22	351	4.85	1,098	December 23	96	3.5	92
May 25	337	4.4	1,129	December 26	61	3.3	75
May 28	482	5.4	1,960	December 30	62	3.3	80
May 31	670	5.95	2,486				

NOTE.—No measurements were made in October and November, 1908, as there was no flow.

Daily gage height, in feet, of Rio Grande above Presidio, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	4.3	4.45	4.25	5.25	6.55	7.0	8.05	5.8	6.9	5.1	5.5	4.6
2	4.45	4.35	4.3	5.35	6.25	7.35	8.2	5.55	7.2	4.95	5.5	4.55
3	4.45	4.3	4.3	5.3	6.1	7.55	7.75	5.8	6.8	4.85	5.1	4.5
4	4.45	4.3	4.3	5.25	6.0	7.65	7.4	5.65	6.85	4.8	4.95	4.45
5	4.45	4.3	4.35	5.3	5.95	7.8	7.3	5.45	7.05	4.75	4.95	4.45
6	4.45	4.3	4.45	5.15	6.15	7.9	7.2	5.35	7.15	4.55	4.85	4.35
7	4.5	4.3	4.45	5.0	6.3	8.0	7.25	5.3	7.4	4.45	4.75	4.4
8	4.6	4.3	4.6	5.0	6.3	8.0	7.35	5.3	7.7	4.35	4.8	4.4
9	4.65	4.3	4.45	4.9	6.2	7.75	7.35	5.3	6.9	4.35	4.8	4.35
10	4.6	4.5	4.4	4.8	6.15	7.5	7.4	5.6	6.55	4.25	4.7	4.35
11	4.6	4.75	4.35	4.7	6.05	7.4	7.45	5.45	6.25	4.3	4.7	4.45
12	4.5	4.65	4.25	4.65	6.1	7.45	7.4	5.15	6.15	4.3	4.7	4.25
13	4.45	4.6	4.2	4.65	6.1	7.5	7.7	5.05	5.85	4.25	4.55	4.25
14	4.4	4.5	4.15	4.7	6.0	7.55	7.5	5.05	5.55	4.15	4.45	4.2
15	4.35	4.45	4.1	4.7	5.8	7.55	7.45	4.95	5.25	4.35	4.45	4.25
16	4.35	4.4	4.15	4.65	5.85	7.65	7.5	4.8	5.1	4.35	4.5	4.3
17	4.65	4.5	4.1	4.6	5.7	7.9	7.25	4.75	5.0	4.25	4.55	4.25
18	4.7	4.65	4.1	4.55	5.6	7.85	6.95	4.7	4.95	4.2	4.45	4.1
19	4.8	4.6	4.1	4.6	5.6	7.9	7.25	4.6	4.8	4.25	4.5	4.1
20	4.9	4.5	4.2	4.95	5.85	7.9	6.55	4.65	5.3	5.4	4.45	4.1
21	5.05	4.4	4.3	5.6	5.9	7.95	6.45	4.6	5.45	5.1	4.6	4.05
22	5.35	4.3	4.3	6.0	6.0	7.8	6.3	4.5	5.25	5.05	4.45	4.2
23	5.2	4.3	4.2	6.35	6.05	7.85	6.4	4.4	5.35	4.8	4.4	4.2
24	5.1	4.35	4.15	6.55	6.0	7.95	6.4	4.4	5.2	4.7	4.5	4.15
25	5.0	4.3	4.1	6.75	5.9	8.0	6.3	4.35	6.0	4.65	4.65	4.1
26	5.0	4.3	4.0	6.95	6.1	8.0	6.25	4.3	6.45	4.75	4.7	4.1
27	4.9	4.3	3.95	7.05	6.15	8.05	6.15	4.75	6.7	4.85	4.95	4.2
28	4.8	4.25	4.0	7.2	6.4	8.15	6.0	5.0	6.2	4.65	4.75	4.2
29	4.7	.....	4.0	7.05	6.45	8.1	5.8	5.35	5.7	5.6	4.65	4.2
30	4.7	.....	4.2	6.95	6.6	8.05	6.0	4.8	5.45	5.9	4.6	4.15
31	4.55	.....	4.85	.....	6.8	.....	6.1	7.75	.....	5.45	.....	4.1
1908.												
1	4.1	4.0	4.05	4.45	5.3	5.7	3.75	3.9	4.95	.....	.....	.....
2	4.0	3.95	3.9	4.35	5.3	5.35	3.5	3.65	4.65	.....	.....	.....
3	4.0	4.0	4.0	4.3	5.0	5.15	4.4	3.6	5.05	.....	.....	.....
4	4.0	4.05	4.0	4.25	4.9	4.9	4.0	5.3	4.7	.....	.....	.....
5	4.05	4.0	3.95	4.2	4.7	4.75	3.45	6.15	4.55	.....	.....	.....
6	4.25	4.05	4.25	4.2	4.7	4.55	3.1	4.45	4.3	.....	.....	.....
7	4.15	4.05	4.35	4.1	4.5	4.35	3.0	5.1	4.05	.....	.....	.....
8	4.15	4.05	4.15	4.1	4.5	4.25	3.0	4.5	4.4	.....	.....	.....
9	4.2	4.0	4.1	4.1	4.5	4.2	2.9	3.9	4.3	.....	.....	.....
10	4.2	4.05	4.05	4.1	4.4	4.15	2.85	3.65	4.15	.....	.....	.....
11	4.4	4.0	4.1	4.1	4.95	4.05	2.9	3.65	3.95	.....	.....	3.0
12	4.45	4.05	4.05	4.15	5.3	4.0	2.9	4.45	3.85	.....	.....	3.1
13	4.35	4.2	4.1	4.1	5.15	4.0	2.75	4.35	3.75	.....	.....	3.2
14	4.2	4.2	4.15	4.05	4.9	3.9	.....	4.25	3.6	.....	.....	3.2
15	4.35	4.15	4.1	3.85	4.75	3.9	.....	4.05	3.45	.....	.....	3.1
16	4.35	4.15	4.1	3.8	4.6	3.9	.....	3.85	3.4	.....	.....	3.2
17	4.35	4.15	4.1	3.95	4.65	3.85	.....	4.55	3.3	.....	.....	3.2
18	4.3	4.2	4.1	3.9	4.75	3.8	.....	4.35	3.2	.....	.....	3.1
19	4.2	4.2	4.2	4.15	4.8	3.8	3.0	4.35	3.1	.....	.....	3.0
20	4.2	4.2	4.2	4.3	4.8	3.65	.....	4.6	3.0	.....	.....	3.5
21	4.15	4.2	4.2	4.3	4.8	3.55	3.65	4.45	2.95	.....	.....	3.6
22	4.0	4.15	4.1	4.65	4.85	3.45	4.35	5.0	2.95	.....	.....	3.55
23	4.1	4.1	4.05	4.7	4.7	3.35	4.2	4.95	2.8	.....	.....	3.5
24	4.1	4.15	3.95	4.7	4.5	3.2	4.2	4.9	2.75	.....	.....	3.4
25	4.1	4.05	3.85	5.6	4.4	3.2	4.0	4.75	2.7	.....	.....	3.3
26	4.05	4.15	3.75	5.7	4.75	2.95	4.75	4.5	2.55	.....	.....	3.3
27	4.05	4.1	3.75	5.65	4.95	2.9	4.35	4.2	.....	.....	.....	3.3
28	4.1	4.05	4.75	5.45	5.4	2.9	4.55	4.25	.....	.....	.....	3.3
29	4.1	4.05	4.7	5.3	5.8	3.0	4.7	4.8	.....	.....	.....	3.3
30	4.15	.....	4.6	5.35	5.8	3.0	4.2	4.4	.....	.....	.....	3.3
31	4.15	.....	4.5	.....	5.95	.....	3.95	4.3	.....	.....	.....	3.3

NOTE.—No flow July 14-18, July 20, and September 27–December 10, 1908.

Daily discharge, in second-feet, of Rio Grande above Presidio, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	a560	680	620	1,460	3,350	a4,380	a8,640	2,810	4,270	1,260	1,860	825
2	620	670	635	a1,520	a2,830	5,100	9,410	2,490	a5,090	a1,100	a1,730	a765
3	620	a666	a620	1,410	2,620	5,550	7,040	a2,780	3,360	1,030	1,280	720
4	a620	660	635	1,340	2,500	a5,990	a5,170	2,630	3,560	990	a1,140	685
5	630	655	a680	a1,370	a2,450	6,970	4,800	2,440	a4,330	a950	1,140	a685
6	640	a655	740	1,220	2,640	7,620	4,420	a2,340	4,710	800	1,080	615
7	a670	675	740	1,080	2,790	a8,260	a4,580	2,200	5,670	730	a1,010	650
8	760	695	a830	a1,080	a2,790	8,260	4,880	2,150	a6,830	a650	1,050	a650
9	820	a720	740	1,010	2,670	6,910	4,880	a2,100	4,540	630	1,050	620
10	a820	875	710	950	2,610	a5,550	a5,140	2,400	3,540	565	a965	620
11	800	1,070	a680	a890	a2,490	5,210	5,340	2,140	a2,680	a585	940	a685
12	720	a990	605	855	2,590	5,310	5,140	a1,610	2,480	585	915	570
13	a670	950	565	855	2,620	a5,420	a6,370	1,440	2,120	550	a790	570
14	645	865	a510	a890	a2,480	5,610	5,420	1,440	a1,750	a485	745	a540
15	620	a825	450	890	2,150	5,610	5,180	a1,270	1,580	600	760	570
16	a620	785	510	855	2,230	a5,990	a5,420	1,040	1,520	600	a805	600
17	815	855	a450	a815	a1,980	6,990	4,640	960	a1,480	a500	805	a570
18	850	a960	450	780	1,830	6,790	4,040	a880	1,460	445	710	445
19	a915	920	450	815	1,790	a6,990	a4,860	760	1,400	500	a730	445
20	1,005	845	a555	a1,130	a2,060	6,990	3,780	800	a1,600	a1,740	705	a445
21	1,150	a770	655	1,940	2,200	7,190	3,630	a740	1,770	1,370	835	410
22	a1,420	695	655	2,440	2,430	a6,720	a3,400	740	1,510	1,310	a730	520
23	1,310	695	a555	a2,920	2,590	7,150	3,530	680	a1,660	a1,070	690	a520
24	1,230	a730	505	3,340	2,540	7,790	3,510	a680	1,410	1,010	785	500
25	a1,150	685	460	3,760	2,420	a8,220	a3,350	640	2,700	975	a930	480
26	1,100	675	360	a4,170	a2,720	8,220	3,300	600	a3,430	a1,040	975	a480
27	980	a665	a310	4,370	2,810	8,440	3,190	a980	3,850	1,130	1,230	535
28	a855	635	360	4,670	3,260	a8,900	a2,990	1,250	3,000	880	1,010	530
29	795	.....	360	a4,250	a3,360	8,750	2,630	1,640	a2,140	2,080	a805	520
30	740	.....	a545	4,050	3,660	8,560	2,990	a1,020	1,720	a2,460	850	a485
31	a710	.....	1,200	.....	4,060	.....	a3,180	6,570	.....	1,920	.....	455
1908.												
1	455	405	425	735	1,890	2,250	195	165	a1,550	.....	.....	.....
2	a385	380	a345	660	1,800	1,930	140	110	1,080	.....	.....	.....
3	385	405	385	610	a1,360	a1,740	530	a100	1,700	.....	.....	.....
4	385	a430	390	565	1,400	1,560	a250	1,490	a1,160	.....	.....	.....
5	a415	405	a370	520	1,380	1,450	165	2,510	1,030	.....	.....	.....
6	525	435	515	505	1,490	a1,300	120	a725	800	.....	.....	.....
7	460	a430	560	430	a1,470	1,090	a105	1,290	a570	.....	.....	.....
8	a450	430	a485	410	1,470	985	85	765	885	.....	.....	.....
9	495	400	475	a395	1,470	a930	40	a300	800	.....	.....	.....
10	510	a430	470	380	1,430	830	a10	140	675	.....	.....	.....
11	a645	400	a475	370	a1,670	695	20	140	a510	.....	.....	25
12	675	430	460	385	1,820	a595	20	a650	430	.....	.....	30
13	620	a520	465	a345	a1,530	530	a5	575	345	.....	.....	a35
14	a530	515	a465	320	1,470	405	.....	495	a225	.....	.....	35
15	605	485	450	a240	1,430	a340	.....	a340	185	.....	.....	30
16	605	a480	440	200	a1,390	340	.....	175	a175	.....	.....	a40
17	a605	490	a435	260	1,400	310	.....	740	140	.....	.....	40
18	570	525	435	a235	1,440	a280	.....	a585	105	.....	.....	30
19	500	a535	465	425	a1,450	280	40	575	a75	.....	.....	a20
20	a500	525	a465	555	1,330	210	.....	770	70	.....	.....	90
21	480	515	465	a595	1,200	a160	175	a640	65	.....	.....	105
22	410	a475	420	820	a1,100	135	a480	1,140	a65	.....	.....	100
23	a470	450	395	850	1,110	105	380	1,070	50	.....	.....	a90
24	470	475	350	a855	1,100	a65	380	a1,000	45	.....	.....	80
25	465	a420	305	2,350	a1,130	65	245	755	a45	.....	.....	75
26	445	475	260	2,510	1,420	55	a745	640	15	.....	.....	a75
27	a450	450	260	a2,450	1,590	a50	445	a500	.....	.....	.....	75
28	465	a425	1,010	2,170	1,960	40	a375	525	.....	.....	.....	75
29	465	425	965	a1,960	2,340	40	425	945	.....	.....	.....	80
30	a480	.....	870	2,030	2,340	30	250	a555	.....	.....	.....	a80
31	480	.....	780	.....	2,490	.....	a175	510	.....	.....	.....	80

a Dates of measurement.

NOTE.—No flow July 14–18, July 20, and September 27–December 11, 1908.

Monthly discharge of Rio Grande above Presidio, Tex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet.)
	Maximum.	Minimum.	Mean.	
1907.				
January	1,420	560	834	51,293
February	1,070	635	770	42,764
March	1,200	310	585	35,980
April	4,670	780	1,904	113,306
May	4,060	1,790	2,630	161,693
June	8,900	4,380	6,848	407,484
July	9,440	2,630	4,674	287,365
August	6,570	600	1,685	103,577
September	6,830	1,400	2,905	172,879
October	2,460	445	985	60,575
November	1,860	690	972	57,818
December	825	410	571	35,127
The year	9,440	310	2,114	1,529,861
1908.				
January	675	385	497	30,545
February	535	380	454	26,112
March	1,010	260	486	29,861
April	2,510	200	838	49,855
May	2,490	1,100	1,544	94,949
June	2,250	30	626	37,279
July	745	0	187	11,504
August	2,510	100	675	41,494
September	1,700	0	426	25,379
October	0	0	0	0
November	0	0	0	0
December	105	0	42	2,559
The year	2,510	0	481	349,537

RIO GRANDE BELOW PRESIDIO, TEX.

The station was established April 8, 1900, by the International Boundary Commission. It is 6 miles below Presidio, 7 miles below the mouth of Rio Conchos, and about 215 miles below El Paso. It is at the west end of the canyon section of the Rio Grande. The discharge at this station minus the discharge at the station above Presidio, Tex., is the discharge of Rio Conchos, except at rare intervals, when some rain water enters the Rio Grande from the north.

The river is fairly straight at the station and for one-fourth mile above and below. The right bank is a rocky bluff. The left bank is an alluvial deposit and overflows for 750 feet back from the river, where gravel hills are found. The bed is shifting sand and is affected by a drainage line called Alamos Creek, which reaches the river one-fourth mile below the station. This is subject to torrential floods, which bring large quantities of bowlders and gravel into the Rio Grande, forming a temporary dam, which remains, throwing backwater onto the gage, until a flood in the river scours it out. The extreme floods come from Rio Conchos, the highest recorded gage height being 26.35 feet on September 11, 1904. Frequent discharge measurements are made to determine closely the daily flow.

The observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande below Presidio, Tex., in 1907.

[By F. X. Dougherty.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	813	7.5	1,152	July 6	987	9.3	5,726
January 5	798	7.5	1,097	July 9	935	9.2	5,210
January 8	787	7.5	1,066	July 11	1,036	9.4	6,200
January 11	839	7.6	1,359	July 14	1,016	9.4	6,085
January 15	746	7.4	1,004	July 17	956	9.3	5,762
January 17	764	7.5	1,129	July 20	774	9.1	4,283
January 20	799	7.5	1,293	July 24	824	9.1	4,444
January 23	831	7.75	1,587	July 26	832	9.1	4,382
January 26	939	8.1	2,336	July 29	951	9.25	5,399
January 29	910	7.8	1,900	August 1	996	9.3	5,685
February 1	808	7.7	1,368	August 4	953	9.25	5,284
February 4	758	7.6	1,218	August 8	781	8.75	3,598
February 7	752	7.6	1,185	August 10	869	9.05	4,475
February 10	718	7.5	1,086	August 13	765	8.75	3,623
February 13	719	7.6	1,197	August 17	605	8.3	1,676
February 16	706	7.6	1,161	August 19	729	8.5	2,158
February 19	695	7.6	1,109	August 22	681	8.35	1,920
February 22	695	7.5	1,082	August 25	1,028	9.45	6,049
February 25	637	7.4	971	August 28	977	9.3	5,434
February 28	636	7.4	969	August 31	1,397	10.45	8,597
March 4	552	7.4	900	September 3	1,869	11.5	11,706
March 6	534	7.4	837	September 6	1,765	11.3	10,953
March 9	582	7.5	1,007	September 9	2,045	11.7	13,285
March 12	539	7.4	900	September 12	1,842	11.2	10,485
March 16	533	7.4	890	September 15	1,384	10.1	7,662
March 18	480	7.2	586	September 18	2,242	11.95	14,157
March 21	501	7.3	660	September 21	2,075	11.75	12,380
March 24	485	7.3	663	September 24	1,634	10.4	9,517
March 28	441	7.0	441	September 27	1,463	10.2	8,400
March 31	544	7.5	881	September 30	1,109	9.2	5,506
April 3	784	7.9	1,559	October 3	1,064	8.4	2,656
April 6	711	7.9	1,451	October 6	910	8.1	2,329
April 9	594	7.7	1,130	October 9	799	7.9	1,694
April 12	558	7.6	998	October 12	803	7.8	1,310
April 15	513	7.5	916	October 16	859	8.0	1,787
April 18	483	7.4	822	October 18	779	7.8	1,366
April 22	618	8.1	1,934	October 21	1,099	9.3	5,700
April 24	831	8.6	3,640	October 24	847	8.4	2,461
April 27	1,004	8.8	4,079	October 27	808	8.3	2,191
April 30	1,072	8.7	4,402	October 31	860	8.5	2,666
May 3	796	8.6	3,590	November 3	886	8.35	2,391
May 6	731	8.5	2,813	November 5	1,043	9.35	5,760
May 9	749	8.5	3,074	November 8	2,188	11.85	13,849
May 12	696	8.4	2,598	November 11	1,265	9.45	6,429
May 15	687	8.3	2,321	November 14	1,165	8.6	3,818
May 19	637	8.2	1,945	November 17	1,161	8.5	2,965
May 21	619	8.2	1,987	November 20	1,099	8.2	2,516
May 24	642	8.3	2,352	November 23	1,083	8.1	2,187
May 27	771	8.6	3,280	November 27	1,198	8.2	2,656
May 31	828	8.9	4,077	November 30	2,467	12.2	14,848
June 2	949	9.1	4,936	December 3	1,723	10.3	8,840
June 5	999	9.2	5,271	December 6	1,442	9.65	6,875
June 8	1,189	9.7	7,134	December 9	1,309	9.5	5,523
June 11	1,156	9.4	6,209	December 12	1,244	8.9	4,640
June 14	1,071	9.3	5,662	December 15	1,178	8.6	3,300
June 17	1,155	9.5	6,421	December 18	1,170	8.4	2,739
June 20	1,336	10.3	8,229	December 21	987	8.2	2,202
June 23	1,232	10.0	7,281	December 24	1,009	8.1	2,052
June 26	1,208	9.7	6,756	December 27	952	8.0	1,883
June 29	1,286	10.1	7,690	December 31	896	7.8	1,527
July 2	1,252	10.05	7,502				

Discharge measurements of Rio Grande below Presidio, Tex., in 1908.

[By F. X. Dougherty and W. T. Millington.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	829	7.7	1,343	July 9	161	6.1	126
January 7	861	7.7	1,433	July 12	135	6.1	89
January 9	762	7.6	1,185	July 15	123	5.95	78
January 12	795	7.7	1,306	July 17	309	7.1	184
January 15	782	7.65	1,239	July 18	131	6.15	35
January 19	760	7.5	1,085	July 21	275	7.2	207
January 22	747	7.4	998	July 23	2,489	13.1	12,791
January 24	745	7.4	979	July 24	1,206	9.6	2,138
January 28	682	7.3	903	July 27	1,785	11.2	5,989
January 31	661	7.3	861	July 30	1,094	9.5	2,928
February 3	663	7.2	798	August 4	1,803	11.3	5,140
February 6	656	7.2	765	August 7	1,713	10.9	3,910
February 9	661	7.2	773	August 14	2,006	11.5	4,826
February 12	658	7.2	761	August 16	1,542	10.1	3,045
February 14	678	7.5	1,060	August 19	1,341	9.7	2,436
February 17	666	7.4	950	August 22	1,413	9.9	3,408
February 20	695	7.5	1,026	August 25	1,450	10.1	3,182
February 23	655	7.3	880	August 28	1,350	10.2	2,597
February 27	659	7.3	870	August 31	2,517	12.8	10,676
February 29	647	7.2	817	September 2	3,547	15.15	18,655
March 3	592	7.05	654	September 5	3,725	15.35	20,553
March 7	610	7.2	823	September 8	1,662	10.05	4,942
March 9	572	7.0	620	September 10	2,163	11.7	9,192
March 12	572	7.0	614	September 13	1,820	10.6	6,453
March 15	586	7.0	621	September 17	1,349	8.8	3,894
March 18	554	6.9	567	September 20	1,257	8.5	3,435
March 21	580	7.0	593	September 23	1,164	8.1	1,522
March 25	553	6.9	535	September 26	1,017	7.8	1,175
March 28	535	6.9	572	September 30	808	7.5	917
March 31	587	7.2	788	October 3	739	7.4	730
April 3	586	7.0	608	October 6	715	7.3	633
April 6	514	6.8	508	October 9	694	7.1	629
April 10	583	6.8	450	October 12	674	7.0	554
April 14	728	7.5	646	October 15	645	6.9	501
April 16	652	7.1	420	October 19	623	6.9	601
April 19	631	7.0	394	October 22	617	6.8	419
April 22	708	7.4	592	October 25	581	6.8	454
April 26	1,030	8.7	2,548	October 28	557	6.8	458
April 30	927	8.4	1,737	October 31	575	6.8	405
May 4	817	8.15	1,589	November 2	595	6.8	458
May 8	699	7.7	1,274	November 5	612	6.8	395
May 12	857	8.3	1,635	November 8	622	6.8	383
May 14 [a]	775	8.15	1,147	November 11	614	6.8	381
May 17	722	7.7	1,103	November 15	615	6.8	389
May 20	707	7.9	1,092	November 18	628	6.8	418
May 23	660	7.85	1,038	November 21	625	6.8	423
May 26	744	7.65	1,187	November 24	614	6.8	497
May 30	1,022	8.75	2,407	November 27	612	6.7	454
June 2	820	8.45	1,629	November 30	567	6.7	374
June 5	666	8.05	1,132	December 3	564	6.7	387
June 8	539	7.55	933	December 6	558	6.7	402
June 11	511	7.5	882	December 9	566	6.7	407
June 14	479	7.15	806	December 12	565	6.7	430
June 17	453	7.1	352	December 15	586	6.9	494
June 20	301	6.85	285	December 18	621	6.8	614
June 23	284	6.55	270	December 21	607	6.75	628
June 26	241	6.3	165	December 24	618	6.85	650
June 29	191	6.1	43	December 27	615	6.75	705
July 3	845	8.15	1,822	December 31	611	6.75	625
July 6	251	6.35	221				

[a] Measurement too small; rejected.

Daily gage height, in feet, of Rio Grande below Presidio, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	7.5	7.75	7.4	7.9	8.55	8.95	10.05	9.25	10.75	8.7	8.35	13.25
2	7.5	7.7	7.4	7.95	8.55	9.1	10.1	9.2	10.95	8.5	8.6	12.15
3	7.5	7.7	7.4	7.9	8.55	9.05	10.25	9.25	11.5	8.35	8.45	10.6
4	7.55	7.65	7.4	7.95	8.35	9.05	10.4	9.3	11.55	8.2	8.45	9.8
5	7.5	7.6	7.4	7.95	8.3	9.3	9.4	9.2	11.65	8.1	9.55	9.65
6	7.5	7.6	7.45	7.9	8.4	9.4	9.35	9.1	11.4	8.15	13.4	9.6
7	7.5	7.6	7.45	7.8	8.55	9.5	9.35	9.0	11.35	8.1	13.9	9.5
8	7.5	7.6	7.6	7.75	8.55	9.7	9.4	8.8	12.4	8.05	11.55	9.5
9	7.6	7.55	7.55	7.65	8.45	9.75	9.25	8.9	11.85	7.95	9.9	9.5
10	7.6	7.5	7.5	7.6	8.4	9.5	9.3	9.0	11.05	7.9	9.45	9.15
11	7.6	7.75	7.45	7.55	8.4	9.35	9.4	8.95	11.05	7.8	9.35	9.1
12	7.55	7.75	7.4	7.5	8.4	9.2	9.45	8.95	11.2	7.8	8.95	8.85
13	7.5	7.65	7.4	7.4	8.35	9.2	9.4	8.65	10.35	7.75	8.8	8.8
14	7.5	7.6	7.4	7.5	8.4	9.25	9.4	8.65	10.2	7.65	8.7	8.7
15	7.4	7.6	7.4	7.5	8.35	9.3	9.6	8.55	10.1	7.6	8.6	8.6
16	7.5	7.55	7.35	7.5	8.25	9.45	9.7	8.35	10.35	8.05	8.4	8.55
17	7.55	7.6	7.25	7.5	8.3	9.6	9.55	8.3	10.6	7.85	8.45	8.5
18	7.7	7.6	7.2	7.45	8.3	10.05	9.3	8.3	12.0	7.75	8.35	8.4
19	7.7	7.6	7.2	7.4	8.2	10.15	9.25	8.4	11.75	7.6	8.3	8.35
20	7.55	7.6	7.25	7.45	8.2	10.2	9.1	8.25	11.3	8.0	8.2	8.25
21	7.6	7.5	7.3	7.85	8.25	10.1	9.05	8.3	11.8	9.25	8.2	8.15
22	7.85	7.5	7.3	8.15	8.3	10.05	9.0	8.3	10.95	8.85	8.2	8.15
23	7.75	7.5	7.3	8.4	8.4	10.05	9.05	8.2	10.56	8.7	8.15	8.1
24	7.7	7.5	7.3	8.55	8.35	9.9	9.05	10.5	10.4	8.5	8.1	8.1
25	7.75	7.45	7.2	8.7	8.35	9.8	9.05	9.65	10.15	8.3	8.1	8.05
26	8.05	7.4	7.1	8.8	8.4	9.8	9.05	9.4	10.05	8.25	8.0	8.0
27	8.15	7.4	7.05	8.8	8.55	9.9	9.0	9.25	10.15	8.3	8.1	8.0
28	8.1	7.4	7.0	8.9	8.65	9.9	9.25	9.25	9.55	8.4	8.35	7.95
29	7.85	.....	7.0	8.85	8.75	9.9	9.2	9.3	9.25	8.55	8.4	7.9
30	7.9	.....	7.05	8.7	8.8	10.1	9.45	9.5	9.0	8.95	12.45	7.8
31	7.9	.....	7.7	.....	8.95	.....	9.3	10.45	.....	8.55	.....	7.8
1908.												
1	7.7	7.2	7.1	7.25	8.55	8.85	6.9	9.65	15.8	7.4	6.8	6.7
2	7.7	7.2	7.1	7.1	8.4	8.45	6.55	9.9	15.15	7.4	6.8	6.7
3	7.7	7.2	7.05	7.0	8.3	8.3	8.15	11.3	15.15	7.35	6.8	6.7
4	7.7	7.2	7.1	7.0	8.15	8.2	7.3	11.35	15.45	7.3	6.8	6.7
5	7.7	7.2	7.05	6.9	8.0	8.05	6.8	11.25	15.35	7.3	6.8	6.7
6	7.7	7.2	7.1	6.85	7.9	7.85	6.35	10.85	13.15	7.25	6.8	6.7
7	7.7	7.15	7.15	6.8	7.75	7.75	6.25	10.9	10.7	7.2	6.8	6.7
8	7.65	7.15	7.15	6.8	7.7	7.55	6.1	11.15	10.05	7.1	6.8	6.7
9	7.6	7.2	7.0	6.8	7.7	7.5	6.1	11.6	10.75	7.1	6.8	6.7
10	7.6	7.2	7.0	6.8	7.6	7.55	6.1	13.9	11.7	7.1	6.8	6.7
11	7.6	7.2	7.05	6.9	7.7	7.5	6.1	17.6	11.55	7.0	6.8	6.7
12	7.65	7.2	7.05	7.55	8.3	7.3	6.1	16.4	10.85	7.0	6.8	6.7
13	7.7	7.2	7.0	7.4	8.3	7.25	6.1	14.05	10.6	7.0	6.8	6.7
14	7.65	7.4	7.05	7.4	8.15	7.15	6.05	11.25	10.3	7.0	6.8	6.75
15	7.6	7.4	7.05	7.25	7.95	7.1	5.95	10.15	9.6	6.9	6.8	6.9
16	7.65	7.4	7.0	7.1	7.75	7.1	5.95	10.05	9.25	6.9	6.8	6.8
17	7.65	7.4	7.0	7.1	7.7	7.1	7.1	9.95	8.8	6.9	6.8	6.8
18	7.55	7.5	6.95	7.05	7.65	7.05	6.15	9.8	8.7	6.9	6.8	6.8
19	7.5	7.5	6.9	7.0	7.9	7.0	6.1	9.7	8.6	6.9	6.8	6.75
20	7.5	7.5	6.95	7.35	7.9	6.85	6.4	9.7	8.45	6.9	6.8	6.7
21	7.5	7.4	6.95	7.4	7.9	6.8	7.25	9.7	8.3	6.85	6.8	6.8
22	7.4	7.3	7.0	7.45	8.0	6.75	7.25	9.9	8.15	6.8	6.8	6.8
23	7.4	7.3	7.05	7.7	7.85	6.55	11.85	9.9	8.1	6.8	6.8	6.85
24	7.4	7.3	6.95	7.7	7.7	6.5	9.4	9.95	8.0	6.8	6.8	6.9
25	7.3	7.3	6.85	8.15	7.6	6.45	8.45	10.3	7.85	6.8	6.75	6.8
26	7.3	7.3	6.8	8.7	7.65	6.3	9.95	10.45	7.75	6.8	6.7	6.8
27	7.3	7.3	6.8	8.8	7.75	6.25	11.2	10.5	7.6	6.8	6.7	6.8
28	7.3	7.25	7.0	8.55	8.3	6.15	10.45	10.2	7.55	6.8	6.7	6.75
29	7.3	7.2	7.35	8.35	8.6	6.1	9.85	10.3	7.5	6.8	6.7	6.75
30	7.3	.....	7.3	8.35	8.75	6.4	9.5	10.3	7.5	6.8	6.7	6.75
31	7.3	.....	7.2	.....	8.75	.....	9.55	13.1	.....	6.8	.....	6.7

Daily discharge, in second-feet, of Rio Grande below Presidio, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1,160	a1,540	950	1,560	3,780	4,290	7,500	a5,530	9,480	3,790	2,390	18,210
2	a1,150	1,350	935	1,640	3,610	a4,940	a7,650	5,300	10,080	3,030	2,850	14,710
3	1,130	1,330	920	a1,560	a3,440	4,770	8,100	5,370	a11,710	a2,600	a2,570	a9,780
4	1,190	a1,270	a900	1,600	2,680	4,770	8,550	a5,430	11,890	2,440	2,730	7,330
5	a1,100	1,210	870	1,570	2,370	a5,640	5,980	5,120	12,270	2,330	a6,410	6,880
6	1,090	1,200	a875	a1,450	a2,510	6,020	a5,850	4,780	a11,330	a2,380	18,880	a6,720
7	1,080	a1,190	905	1,290	3,050	6,390	5,800	4,440	11,400	2,330	20,500	6,120
8	a1,070	1,190	1,060	1,210	3,140	a7,130	5,880	a3,760	15,840	2,170	a12,920	5,820
9	1,260	1,140	a1,050	a1,060	a2,920	7,290	a5,360	4,040	a13,880	a1,850	7,820	a5,520
10	1,310	a1,090	1,000	1,000	2,710	6,520	5,700	a4,330	10,420	1,690	6,430	5,010
11	a1,360	1,360	950	940	2,650	a6,060	a6,200	4,190	10,150	1,310	a6,120	4,930
12	1,270	1,360	a900	a915	a2,600	5,530	6,310	4,190	a10,480	a1,310	4,890	a4,640
13	1,180	a1,250	900	835	2,460	5,450	6,120	a3,360	8,300	1,190	4,430	4,190
14	1,160	1,190	895	915	2,600	a5,510	a6,090	3,170	7,920	950	a4,130	3,750
15	a1,000	1,170	890	a915	a2,460	5,660	6,730	2,720	a7,660	830	3,630	a3,300
16	1,130	a1,130	a855	915	2,160	6,230	7,050	2,010	8,540	a1,900	2,850	3,160
17	a1,210	1,140	705	915	2,260	a6,650	a6,570	a1,680	9,420	1,470	a2,820	3,020
18	1,450	1,130	a585	a870	2,230	7,660	5,470	1,680	a14,360	a1,270	2,740	a2,740
19	1,450	a1,110	585	820	a1,950	7,890	5,030	a2,000	13,030	970	2,660	2,610
20	a1,330	1,120	625	900	1,970	a8,000	a4,280	1,760	10,900	2,080	a2,520	2,340
21	1,410	1,070	a660	1,540	a2,140	7,600	4,170	1,840	a12,580	a5,560	2,520	a2,130
22	1,710	a1,080	660	a2,040	2,310	7,440	4,060	a1,840	10,680	4,080	2,520	2,130
23	a1,590	1,070	660	2,900	2,630	a7,440	4,250	1,680	9,840	3,540	a2,350	2,050
24	1,540	1,050	a665	a3,530	a2,500	7,110	a4,290	8,750	a9,520	a2,820	2,230	a2,050
25	1,640	a1,000	590	3,860	2,510	6,930	4,260	a6,570	8,600	2,190	2,270	1,970
26	a2,240	970	515	4,080	2,660	a6,990	a4,230	5,840	8,120	2,060	2,010	1,880
27	2,440	970	480	a4,080	a3,130	7,220	4,180	5,340	a8,250	a2,190	a2,360	a1,880
28	2,360	970	a440	4,480	3,410	7,220	5,390	a5,280	6,520	2,430	3,110	1,790
29	a1,980	.....	440	4,550	3,680	a7,220	a5,250	5,430	5,650	2,790	3,270	1,700
30	2,060	.....	485	a4,400	3,810	7,690	6,000	5,980	a4,930	3,740	a15,650	1,530
31	2,060	.....	a1,060	.....	a4,210	.....	5,550	a8,600	.....	a2,790	.....	a1,530
1908.												
1	1,360	800	705	830	1,810	2,670	680	3,200	21,900	790	430	380
2	1,360	800	705	700	1,730	a1,630	360	3,500	a18,650	760	a460	380
3	1,350	a800	a655	a610	1,670	1,440	a1,820	5,140	18,950	a680	440	a385
4	a1,340	785	710	610	a1,590	1,320	1,060	a5,240	20,750	635	420	390
5	1,370	775	655	560	1,490	a1,130	620	4,990	a20,550	635	a395	395
6	1,400	a765	710	a535	1,420	1,050	a220	3,760	14,050	a590	395	a400
7	a1,430	730	a770	495	1,310	1,020	185	a3,910	6,850	605	390	405
8	1,310	735	770	480	a1,270	a935	125	4,800	a4,940	575	a385	405
9	a1,180	a775	a620	465	1,270	895	a125	6,400	6,740	a630	385	a405
10	1,180	770	620	a450	1,210	920	115	15,100	a9,190	630	380	415
11	1,170	765	645	480	1,270	a880	100	34,000	8,820	555	a380	425
12	a1,240	a760	a645	660	a1,630	820	a90	25,600	7,080	a555	380	a430
13	1,310	760	615	620	1,630	820	90	15,640	a6,450	555	385	430
14	1,240	960	650	a620	a1,500	a805	85	a4,760	6,030	555	385	445
15	a1,170	950	a650	505	1,320	640	a80	3,110	5,030	a500	a390	a495
16	1,240	950	620	a420	1,140	490	80	a2,970	4,530	525	395	515
17	1,240	a950	620	420	a1,100	a350	a185	2,810	a3,890	550	405	565
18	1,140	1,030	a595	410	1,030	340	a35	2,590	3,740	575	a420	a615
19	a1,090	1,030	565	a395	1,140	325	30	a2,440	3,590	a600	420	610
20	1,090	a1,030	580	570	a1,090	a285	75	2,640	a3,330	560	420	605
21	1,090	955	a580	595	1,090	280	a230	2,840	2,660	490	a425	a630
22	a1,000	880	595	a620	1,200	280	230	a3,400	1,990	a420	450	640
23	990	a880	620	770	a1,040	a270	a8,980	3,210	a1,520	430	475	650
24	a980	880	565	770	1,040	250	a1,980	3,110	1,410	445	a495	a660
25	905	875	a510	1,440	1,070	230	1,220	a3,540	1,230	a455	475	665
26	905	875	495	a2,550	a1,190	a165	3,820	3,560	a1,130	455	455	690
27	905	a870	510	2,690	1,300	135	a5,990	3,390	1,000	455	a455	a720
28	a905	845	a645	2,140	1,910	75	4,640	a2,600	960	a460	425	685
29	890	a815	895	1,680	2,240	a45	3,560	2,980	915	440	400	665
30	875	.....	860	a1,630	2,410	225	a2,930	3,180	a915	420	a375	645
31	a860	.....	a790	.....	2,410	.....	3,200	a11,880	.....	a405	.....	a610

a Dates of measurement.

Monthly discharge of Rio Grande below Presidio, Tex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907.				
January	2,440	1,000	1,455	[illegible],474
February	1,540	970	1,166	[illegible],760
March	1,060	440	775	[illegible],623
April	4,550	820	1,945	115,716
May	4,210	1,950	2,792	171,650
June	8,000	4,290	6,509	387,292
July	8,550	4,060	5,737	352,760
August	8,750	1,680	4,258	261,838
September	15,840	4,930	10,125	602,479
October	5,560	830	2,325	142,969
November	20,500	2,010	5,286	314,539
December	18,210	1,530	4,562	280,502
The year	20,500	440	3,911	2,831,602
1908.				
January	1,430	860	1,146	70,443
February	1,030	730	855	49,180
March	895	495	651	40,007
April	2,690	395	857	51,015
May	2,410	1,030	1,436	88,304
June	2,670	45	691	41,098
July	8,980	30	1,385	85,170
August	34,000	2,440	6,332	389,335
September	21,900	915	6,960	414,129
October	790	405	546	33,590
November	495	375	416	24,774
December	720	380	528	32,440
The year	34,000	30	1,817	1,319,485

RIO GRANDE NEAR LANGTRY, TEX.

This station was established in April, 1900, by the International Boundary Commission. It is located one-half mile south of Langtry station, on the Southern Pacific Railroad, and is about 440 miles below El Paso, Tex., at the east end of the canyon section of the Rio Grande, and a short distance to the west of the mouth of Pecos River, one of the principal tributaries of the Rio Grande.

The right (Mexican) bank is a rock bluff; the left bank is alluvial deposit for 200 feet back to a rock bluff. As the river is constantly shifting, because of alluvial deposits, frequent discharge measurements are made in order to determine closely the daily flow.

Observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande near Langtry, Tex., in 1907.

[By E. E. Winter, D. J. Smith, I. P. Whitis, and W. H. Dodd.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	771	1.65	1,913	July 2	1,400	4.4	6,690
January 7	781	1.55	1,834	July 8	1,264	3.7	5,610
January 11	794	1.55	1,891	July 14	1,222	3.7	5,554
January 15	786	1.55	1,931	July 18	1,216	3.7	5,845
January 19	795	1.45	1,880	July 25	1,171	3.4	5,571
January 24	816	1.5	1,954	July 30	1,226	3.6	5,750
January 28	817	1.6	2,015	August 2	1,211	3.6	5,454
February 3	726	1.9	1,839	August 8	1,098	3.2	4,612
February 7	697	1.6	1,600	August 12	1,048	3.0	4,287
February 11	676	1.6	1,573	August 16	1,045	3.0	4,255
February 14	665	1.6	1,582	August 21	768	1.9	2,108
February 17	678	1.55	1,548	August 24	776	1.9	2,153
February 21	695	1.55	1,489	August 28 [a]	1,238	3.6	6,359
February 25	703	1.55	1,577	September 5	1,708	5.2	9,053
March 2	608	1.4	1,390	September 8	1,819	5.8	10,475
March 7	647	1.3	1,438	September 13	1,559	5.25	8,323
March 11	581	1.3	1,317	September 20	2,386	7.5	15,307
March 15	631	1.3	1,390	September 23	1,887	5.75	12,176
March 19	646	1.4	1,476	September 27	1,579	4.8	9,221
March 23	599	1.2	1,178	October 2	1,263	3.6	5,665
March 28	596	1.1	1,096	October 7	997	3.2	4,243
April 2	604	0.9	1,024	October 11	730	2.1	2,425
April 6	700	1.7	1,537	October 16	654	1.8	1,971
April 11	706	1.7	1,595	October 21	637	1.7	1,872
April 15	671	1.5	1,429	October 25	964	2.9	3,823
April 18	656	1.3	1,293	October 29	757	2.0	2,597
April 23	671	1.3	1,241	November 2	1,003	3.0	4,091
April 28	1,086	2.8	2,760	November 7	834	2.4	2,825
May 2	1,137	3.0	3,396	November 10	1,952	6.1	12,235
May 7	1,045	2.6	2,944	November 14	1,120	3.8	5,681
May 11	1,055	2.65	2,929	November 18	925	3.05	4,083
May 16	1,051	2.6	2,949	November 22	813	2.7	3,359
May 20	1,018	2.4	2,838	November 28	725	2.3	2,799
May 24	980	2.3	2,577	December 2	752	2.5	2,923
May 28	1,018	2.35	2,731	December 9	1,305	4.3	6,556
June 8	1,227	3.7	5,703	December 13	1,164	3.8	5,585
June 11	1,357	4.3	6,301	December 17	1,012	3.2	4,162
June 15	1,210	3.7	5,662	December 21	858	2.7	3,287
June 18	1,402	4.8	6,606	December 24	790	2.5	2,849
June 22	1,920	5.65	7,264	December 29	724	2.3	2,461
June 27	1,337	4.2	5,809				

[a] Measurement too large. Rejected.

Discharge measurements of Rio Grande near Langtry, Tex., in 1908.

[By W. H. Dodd and E. E. Winter.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	680	2.1	2,233	July 2	363	.5	621
January 7	622	1.9	1,936	July 7	1,788	5.25	10,010
January 11	609	1.8	1,838	July 12	417	.8	911
January 15	624	1.8	1,810	July 16	348	.5	603
January 19	590	1.7	1,684	July 20	392	.4	682
January 23	587	1.65	1,623	July 25	1,306	4.0	6,070
January 28	526	1.5	1,416	July 29	1,468	4.4	8,683
February 1	523	1.4	1,327	August 3	1,200	3.0	4,800
February 5	526	1.4	1,302	August 7	2,172	6.95	15,986
February 10	523	1.4	1,339	August 12	2,458	8.5	19,318
February 14	499	1.25	1,214	August 15	2,888	9.25	23,100
February 20	557	1.5	1,454	August 20	1,229	3.95	6,253
February 27	513	1.3	1,277	August 25	1,225	3.95	6,424
March 1	501	1.25	1,207	August 28	1,302	4.25	7,617
March 5	473	1.1	1,059	September 3	2,783	9.0	21,867
March 10	451	1.0	953	September 7	2,709	8.85	19,492
March 14	468	1.1	996	September 11	1,517	5.0	9,280
March 20	440	1.0	915	September 15	1,557	5.0	9,449
March 24	443	.95	938	September 19	1,093	3.4	4,796
March 29	428	.9	897	September 23	834	2.55	2,879
April 3	511	1.25	1,276	September 27	743	2.0	2,224
April 8	472	1.1	1,128	October 2	674	1.6	1,563
April 12	469	1.0	1,033	October 7	686	1.65	1,589
April 16	620	1.7	1,675	October 12	511	1.0	1,143
April 20	491	1.2	1,014	October 16	498	.9	1,071
April 24	413	.8	796	October 20	464	.8	990
April 27	454	.9	928	October 24	444	.7	826
May 2	710	2.0	2,329	October 28	431	.6	806
May 7	598	1.8	1,668	November 2	417	.5	760
May 11	553	1.7	1,530	November 6	420	.5	766
May 16	562	1.7	1,623	November 10	414	.5	753
May 19	580	1.5	1,626	November 14	412	.45	748
May 23	558	1.4	1,503	November 19	404	.45	748
May 28	528	1.3	1,361	November 23	404	.45	711
June 2	681	2.0	2,213	November 27	405	.45	717
June 6	611	1.9	1,728	December 2	393	.4	675
June 11	593	1.2	1,451	December 7	392	.4	669
June 15	512	1.0	1,181	December 12	397	.4	702
June 19	419	.8	756	December 17	392	.4	667
June 23	380	.5	676	December 22	387	.35	668
June 27	494	.9	1,120	December 28	378	.4	716

Daily gage height, in feet, of Rio Grande near Langtry, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.7	2.0	1.4	1.05	3.2	2.85	4.4	3.7	3.35	3.9	2.55	2.55
2	1.6	1.9	1.4	.9	2.95	3.1	4.45	3.65	3.85	3.55	3.0	4.55
3	1.6	1.9	1.4	.9	2.8	3.0	4.45	3.45	4.8	3.3	2.8	8.15
4	1.6	1.9	1.4	1.1	2.8	3.15	4.2	3.3	4.9	3.05	2.85	5.75
5	1.55	1.8	1.35	1.55	2.75	3.	3.95	3.4	5.4	3.2	2.75	5.1
6	1.55	1.8	1.3	1.7	2.7	3.3	3.9	3.5	6.15	2.85	2.5	4.7
7	1.55	1.6	1.3	1.8	2.6	3.6	3.75	3.4	5.85	3.0	2.4	4.5
8	1.55	1.55	1.3	1.8	2.5	3.75	3.7	3.25	5.8	2.85	7.3	4.35
9	1.55	1.55	1.3	1.75	2.45	3.95	3.6	2.95	6.1	2.45	9.95	4.3
10	1.55	1.6	1.3	1.7	2.45	4.35	3.6	2.9	7.05	2.15	6.25	4.3
11	1.55	1.6	1.3	1.7	2.7	4.3	3.6	2.85	7.6	2.05	5.35	4.15
12	1.6	1.6	1.3	1.7	2.75	3.95	3.8	2.85	6.7	2.0	4.5	3.95
13	1.6	1.6	1.3	1.7	2.6	3.7	3.7	2.8	5.25	1.9	4.05	3.85
14	1.6	1.6	1.3	1.6	2.55	3.7	3.7	2.8	4.75	1.85	3.85	3.65
15	1.55	1.55	1.3	1.5	2.6	3.7	3.7	2.8	4.6	1.9	3.55	3.45
16	1.55	1.55	1.3	1.45	2.55	3.7	3.7	3.0	4.5	1.85	3.35	3.3
17	1.55	1.55	1.3	1.3	2.3	3.85	3.7	2.6	4.8	1.7	3.15	3.2
18	1.5	1.55	1.35	1.3	2.2	5.0	3.6	2.45	4.65	2.05	3.05	3.1
19	1.45	1.55	1.35	1.3	2.2	4.7	3.6	2.3	5.0	2.1	3.0	2.95
20	1.45	1.55	1.3	1.3	2.6	4.6	3.5	2.2	7.75	1.95	2.9	2.9
21	1.4	1.55	1.15	1.35	2.6	4.55	3.45	1.95	6.55	1.75	2.85	2.7
22	1.4	1.55	1.2	1.3	2.4	5.5	3.35	1.95	6.6	1.85	2.75	2.7
23	1.4	1.55	1.15	1.3	2.35	4.65	3.2	1.9	5.5	1.7	2.6	2.5
24	1.5	1.55	1.15	1.4	2.3	4.25	3.4	1.9	4.9	3.0	2.55	2.5
25	1.65	1.55	1.1	1.8	2.4	4.0	3.4	1.9	4.95	2.85	2.5	2.5
26	1.7	1.55	1.2	2.25	2.5	4.05	3.5	3.9	4.75	2.7	2.45	2.4
27	1.6	1.5	1.45	2.55	2.4	4.25	3.2	3.5	4.7	2.5	2.4	2.4
28	1.6	1.45	1.15	2.85	2.35	4.25	4.15	3.4	4.75	2.35	2.3	2.3
29	1.65	.....	1.1	3.1	2.4	4.2	3.4	3.3	4.6	2.1	2.55	2.3
30	2.2	.....	1.1	3.2	2.5	4.2	3.6	3.3	4.25	2.05	2.65	2.2
31	2.15	.....	1.1	.....	2.55	.....	3.65	3.3	.....	2.05	.....	2.1
1908.												
1	2.1	1.4	1.25	.9	2.0	1.75	.5	3.75	5.0	1.65	.5	.45
2	2.0	1.4	1.25	.95	2.0	1.95	.5	3.25	7.7	1.6	.5	.45
3	2.0	1.4	1.2	1.25	2.05	2.2	.5	2.95	9.0	1.55	.5	.45
4	2.0	1.4	1.2	1.25	2.05	2.15	.5	2.6	8.85	1.45	.5	.45
5	1.9	1.4	1.1	1.2	1.95	2.05	.45	2.5	8.1	1.35	.5	.45
6	1.9	1.4	1.1	1.2	1.9	1.9	.35	5.15	9.05	1.3	.5	.4
7	1.9	1.35	1.1	1.05	1.8	1.8	4.95	6.55	8.5	1.5	.5	.4
8	1.9	1.35	1.1	1.05	1.65	1.75	1.8	4.9	7.45	1.6	.5	.4
9	1.85	1.4	1.1	1.05	1.6	1.6	1.45	4.3	5.7	1.25	.5	.4
10	1.8	1.4	1.05	.95	1.55	1.4	1.35	4.15	5.15	1.15	.5	.4
11	1.8	1.55	1.0	.95	1.65	1.2	1.25	4.15	5.15	1.05	.45	.4
12	1.8	1.5	1.15	1.0	1.45	1.05	.85	7.8	6.45	1.0	.45	.4
13	1.8	1.4	1.2	.95	1.3	1.0	.75	11.25	6.15	1.0	.45	.35
14	1.8	1.25	1.1	1.25	1.2	1.0	.65	12.3	5.85	.95	.45	.35
15	1.8	1.25	1.1	1.1	1.1	1.0	.55	8.9	4.95	.95	.45	.35
16	1.8	1.25	1.05	1.45	1.75	.95	.5	6.1	4.35	.9	.45	.35
17	1.7	1.25	1.1	1.6	1.9	.9	.4	5.3	3.95	.9	.45	.35
18	1.7	1.3	1.05	2.1	1.8	.8	.4	4.9	3.6	.9	.45	.35
19	1.7	1.5	1.0	1.8	1.5	.8	.4	4.45	3.3	.85	.45	.35
20	1.7	1.5	1.0	1.45	1.4	.75	.4	4.0	3.05	.8	.45	.35
21	1.7	1.4	1.05	1.1	1.4	.7	3.1	3.95	2.85	.8	.45	.35
22	1.7	1.4	1.0	.95	1.4	.6	1.75	3.95	2.65	.75	.45	.35
23	1.65	1.5	1.0	.95	1.4	.5	.9	3.95	2.55	.7	.45	.35
24	1.6	1.5	.95	.85	1.4	2.65	3.4	3.95	2.4	.7	.45	.35
25	1.6	1.5	.95	.8	1.4	2.05	4.55	4.4	2.25	.7	.45	.35
26	1.6	1.4	.95	.8	1.4	1.65	3.5	4.85	2.05	.7	.45	.35
27	1.55	1.3	.9	.85	1.3	.95	2.45	4.35	2.05	.65	.45	.35
28	1.5	1.3	.9	.9	1.3	1.0	2.65	4.35	1.9	.6	.45	.4
29	1.5	1.3	.9	1.1	1.3	.75	4.45	4.55	1.8	.6	.45	.4
30	1.5	.....	.9	2.0	1.3	.55	4.0	4.65	1.7	.6	.45	.35
31	1.4	.....	.9	.....	1.35	.....	3.85	4.9	.....	.5	.....	.35

Daily discharge, in second-feet, of Rio Grande near Langtry, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	2,010	2,370	1,430	1,080	3,480	3,740	6,450	5,790	4,930	6,800	3,410	3,040
2	1,880	2,040	a1,390	a1,020	a3,340	4,320	a6,760	a 5,550	6,050	a5,660	a 4,090	a 8,150
3	a1,860	a1,840	1,420	1,020	3,170	4,090	6,760	5,140	8,160	4,940	3,670	17,360
4	1,870	1,840	1,440	1,150	?,170	4,430	6,400	4,820	8,390	4,320	3,770	10,610
5	1,840	1,760	1,430	1,440	110	5,010	6,030	5,030	a 9,530	4,490	3,560	8,790
6	1,830	1,760	1,420	a1,540	3,060	5,240	5,960	5,240	11,300	3,670	3,040	7,670
7	a1,830	a1,600	a1,440	1,620	a2,940	5,470	5,740	5,030	10,590	a3,840	a 2,830	7,110
8	1,850	1,550	1,410	1,630	2,800	a5,750	a5,670	a 4,720	a10,480	3,670	15,280	6,690
9	1,860	1,550	1,380	1,610	2,720	5,950	5,560	4,200	11,330	3,010	22,010	a 6,560
10	1,880	1,580	1,350	1,580	2,700	6,350	5,540	4,120	14,020	2,510	a12,620	6,560
11	a1,890	a1,570	a1,320	a1,590	a3,000	a6,300	5,520	4,040	15,610	a2,350	10,100	6,260
12	1,940	1,580	1,330	1,600	3,070	5,930	5,680	a 4,040	12,830	2,270	7,680	5,880
13	1,950	1,580	1,350	1,600	2,950	5,660	5,570	3,970	a 8,320	2,120	6,390	a 5,680
14	1,960	a1,580	1,370	1,510	2,910	5,660	a5,550	3,970	7,320	2,050	a 5,820	5,230
15	a1,930	1,550	a1,390	a1,430	2,950	a5,660	5,630	3,970	a 7,020	2,120	5,150	4,760
16	1,930	1,550	1,390	1,390	a2,900	5,660	5,700	a 4,260	6,820	a2,050	4,720	4,400
17	1,930	a1,550	1,390	1,290	2,650	5,790	5,770	3,470	7,670	1,820	4,300	a 4,160
18	1,900	1,530	1,430	a1,290	2,550	a6,760	a5,750	3,180	7,240	2,350	a 4,080	3,990
19	a1,880	1,520	a1,430	1,280	2,550	6,530	5,750	2,890	8,240	2,420	3,980	3,720
20	1,890	1,500	1,360	1,270	a3,080	6,450	5,660	2,700	a16,060	2,210	3,770	3,640
21	1,850	a1,490	1,210	1,290	3,080	6,410	5,620	a 2,210	13,610	a1,940	3,670	a 3,290
22	1,860	1,510	1,210	1,250	2,740	a7,150	5,530	2,220	13,700	2,120	a 3,460	3,290
23	1,870	1,530	a1,140	a1,240	2,660	6,260	5,390	2,140	a11,400	1,870	3,220	2,850
24	a1,950	1,550	1,140	1,340	a2,580	5,860	5,570	a 2,150	9,540	3,990	3,150	2,850
25	2,050	a1,570	1,100	1,750	2,740	5,610	a5,570	2,150	9,690	a3,760	3,080	a 2,850
26	2,080	1,570	1,180	2,200	2,900	5,660	5,660	6,080	9,060	3,550	3,010	2,660
27	2,010	1,540	1,380	2,500	2,780	a5,860	5,390	5,240	a 8,910	3,280	2,940	2,660
28	a2,010	1,510	a1,140	a2,810	a2,730	5,860	6,250	5,030	9,120	3,070	a 2,800	2,460
29	2,080	.....	1,100	3,180	2,810	5,810	5,570	4,820	8,820	a2,730	3,150	a 2,460
30	2,850	.....	1,100	3,330	2,970	5,810	a5,750	4,820	8,120	2,660	3,290	2,280
31	2,780	.....	1,100	.....	3,050	.....	5,790	4,820	.....	2,660	.....	2,100
1908.												
1	2,170	a1,330	a1,210	895	2,210	1,900	650	7,010	9,740	1,710	710	695
2	a2,110	1,320	1,210	950	a2,330	a2,150	a 620	5,530	17,920	a1,560	a 760	a 675
3	2,100	1,320	1,166	a1,280	2,380	2,540	620	a 4,700	a21,870	1,540	760	675
4	2,090	1,310	1,160	1,280	2,330	2,370	620	4,000	20,940	1,490	760	675
5	1,960	a1,300	a1,060	1,230	2,080	2,100	570	3,800	18,200	1,430	765	675
6	1,950	1,310	1,050	1,230	1,920	a1,730	470	11,060	20,570	1,410	a 765	670
7	a1,940	1,280	1,050	1,080	a1,670	1,690	a9,290	a14,870	a18,560	a1,490	765	a 670
8	1,940	1,280	1,040	a1,080	1,460	1,670	2,000	10,250	15,780	1,550	760	670
9	1,890	1,330	1,040	1,080	1,390	1,610	1,620	8,570	11,140	1,310	760	670
10	1,830	a1,340	a 990	985	1,320	1,530	1,510	8,150	9,680	1,240	a 755	670
11	a1,840	1,460	940	985	a1,460	a1,450	1,400	8,150	a 9,730	1,170	750	670
12	1,830	1,420	1,050	a1,030	1,220	1,250	a 970	a17,520	13,630	a1,140	750	a 670
13	1,820	1,340	1,090	985	1,040	1,180	860	27,570	12,770	1,140	750	660
14	1,820	a1,210	a1,000	1,260	930	1,180	755	30,700	11,900	1,110	a 750	666
15	a1,810	1,210	1,000	1,120	820	1,180	655	a21,990	a 9,300	1,110	750	660
16	1,810	1,210	960	1,450	a1,700	1,080	a 605	13,080	7,560	a1,070	750	665
17	1,680	1,210	1,000	1,540	1,940	970	565	10,540	6,390	1,070	745	a 665
18	1,680	1,260	960	2,200	1,860	800	600	9,270	5,389	1,070	745	665
19	a1,680	1,450	920	1,810	a1,630	a 755	640	7,840	a 4,570	1,070	a 745	670
20	1,680	a1,450	a 910	a1,340	1,530	745	a 680	a6,410	4,010	a1,030	740	670
21	1,680	1,370	970	960	1,520	730	4,130	6,290	3,566	970	730	670
22	1,680	1,370	945	875	1,510	700	1,970	6,320	3,110	950	720	a 670
23	a1,620	1,450	965	875	a1,500	a 675	1,120	6,350	a 2,880	885	a 710	670
24	1,560	1,450	a 940	a 820	1,490	3,060	4,870	6,390	2,700	a 825	710	670
25	1,550	1,450	940	780	1,480	2,400	a7,450	a 7,770	2,520	825	710	670
26	1,550	1,370	940	760	1,470	1,950	5,070	9,120	2,280	825	715	670
27	1,480	a1,280	895	a 790	1,360	a1,170	4,020	a 7,860	a 2,220	815	a 715	670
28	a1,420	1,280	895	930	a1,360	1,230	4,320	7,860	2,100	a 805	715	a 715
29	1,420	1,280	a 895	1,140	1,360	955	a8,800	8,460	1,980	785	720	715
30	1,420	.....	895	2,100	1,360	735	7,680	8,740	1,860	765	720	670
31	1,320	.....	895	.....	1,410	.....	7,310	9,440	.....	a 675	.....	670

a Dates of measurement.

Monthly discharge of Rio Grande near Langtry, Tex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907.				
January	2,850	1,830	1,977	121,587
February	2,370	1,490	1,631	90,585
March	1,440	1,100	1,312	80,668
April	3,330	1,020	1,628	96,853
May	3,480	2,550	2,908	178,790
June	7,150	3,740	5,701	339,253
July	6,760	5,390	5,792	356,112
August	6,080	2,140	4,123	253,507
September	16,060	4,930	9,796	582,902
October	6,800	1,820	3,106	191,008
November	22,010	2,800	5,401	321,401
December	17,360	2,100	5,162	317,375
The year	22,010	1,020	4,045	2,930,041
1908.				
January	2,170	1,320	1,753	107,762
February	1,460	1,210	1,332	76,641
March	1,210	895	999	61,438
April	2,200	760	1,161	69,104
May	2,380	820	1,582	97,269
June	3,060	675	1,449	86,251
July	9,290	470	2,659	163,517
August	30,700	3,800	10,181	626,003
September	21,870	1,860	9,162	545,157
October	1,710	675	1,124	69,094
November	765	710	740	44,033
December	715	660	673	41,375
The year	30,700	470	2,735	1,987,644

RIO GRANDE BELOW MOUTH OF DEVILS RIVER, TEX.

The station was established in April, 1900, by the International Boundary Commission. It is alongside the Southern Pacific Railroad track, about a mile below the mouth of Devils River and about 480 miles below El Paso.

The bed of the river is rock for a short distance from the left bank; the right bank is alluvial deposit, overflowing in extreme high water for a distance of some 500 feet back from the river. The left bank is a loose rock fill, along which runs the Southern Pacific Railroad.

Frequent discharge measurements are made to determine closely the daily flow. The observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

24440—IRR 248—10——5

Discharge measurements of Rio Grande below mouth of Devils River, Tex., in 1907.

[By E. E. Winter, D. J. Smith, I. P. Whitis, and W. H. Dodd.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 5	1,419	4.0	3,416	June 30	1,694	5.9	7,356
January 10	1,368	3.9	3,043	July 4	1,936	5.9	8,800
January 14	1,371	3.9	3,066	July 10	1,733	5.4	7,844
January 18	1,414	4.0	3,354	July 15	1,863	5.7	8,418
January 23	1,411	4.0	3,359	July 19	1,714	5.4	7,709
January 26	1,401	4.0	3,363	July 24	1,635	5.1	6,030
January 31	1,416	4.05	3,460	July 28	1,866	5.8	8,337
February 9	1,300	3.9	2,898	August 5	1,593	5.2	6,335
February 13	1,301	3.8	2,742	August 10	1,556	5.0	6,119
February 16	1,286	3.7	2,718	August 14	1,290	4.4	4,256
February 19	1,323	3.8	2,778	August 19	1,251	4.3	4,028
February 23	1,262	3.8	2,660	August 22	1,212	4.4	3,349
February 28	1,266	3.7	2,626	August 25	1,208	4.4	3,309
March 5	1,284	3.6	2,620	August 31 [a]	1,539	5.0	4,473
March 10	1,262	3.7	2,511	September 7	2,393	6.8	13,300
March 14	1,226	3.7	2,506	September 11	3,000	7.6	18,679
March 18	1,204	3.5	2,441	September 21	2,777	7.6	17,482
March 21	1,206	3.4	2,481	September 30	1,875	6.0	9,190
March 27	1,142	3.4	2,149	October 5	1,603	5.4	6,715
March 31	1,135	3.4	2,179	October 10	1,271	4.7	4,203
April 5	1,178	3.1	2,072	October 14	1,154	4.5	3,326
April 10	1,323	3.7	2,502	October 18	1,044	4.4	3,201
April 14	1,212	3.5	2,284	October 23	1,226	4.5	3,334
April 17	1,219	3.55	2,332	October 27	1,450	5.0	4,969
April 21	1,217	3.4	2,428	October 31	1,390	4.9	4,475
April 26	1,180	3.2	2,108	November 5	1,609	5.5	7,053
April 30	1,584	4.75	4,018	November 9	3,630	8.8	21,852
May 4	1,489	4.5	3,506	November 13	1,843	6.1	9,160
May 10	1,435	4.2	3,375	November 17	1,602	5.4	6,683
May 15	1,418	4.2	3,340	November 21	1,438	5.1	5,241
May 18	1,374	4.2	3,142	November 26	1,328	4.9	4,656
May 23	1,411	4.1	3,313	November 30	1,431	5.0	5,047
May 27	1,375	4.3	3,366	December 4	2,943	7.4	15,963
May 31	1,425	4.35	3,614	December 11	1,706	6.0	8,312
June 9	1,773	5.4	6,657	December 15	1,587	5.5	6,818
June 13	1,858	5.8	8,308	December 19	1,451	5.2	5,457
June 16	1,785	5.4	7,278	December 23	1,319	4.9	4,679
June 21	1,965	6.1	9,022	December 26	1,338	4.8	4,372
June 25	1,758	6.0	7,430	December 31	1,277	4.7	4,002

[a] Too small, rejected.

Discharge measurements of Rio Grande below mouth of Devils River, Tex., in 1908.

[By W. H. Dodd and E. E. Winter.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	1,262	4.6	3,751	July 6	986	3.6	2,091
January 8	1,230	4.6	3,539	July 10	1,655	5.0	5,158
January 13	1,290	4.5	3,432	July 15	1,040	3.9	2,459
January 16	1,266	4.4	3,366	July 19	996	3.7	2,006
January 20	1,266	4.4	3,244	July 24	1,142	3.95	2,842
January 24	1,275	4.35	3,105	July 27	1,459	5.0	5,357
January 30	1,245	4.3	3,002	July 31	1,735	5.9	8,737
February 3	1,224	4.2	2,689	August 6	2,171	7.0	11,812
February 7	1,229	4.2	2,678	August 10	1,776	6.1	9,747
February 12	1,240	4.2	2,861	August 14	3,168	9.4	22,498
February 16	1,220	4.05	2,553	August 19	1,935	5.95	9,465
February 23	1,268	4.1	2,755	August 23	1,817	5.75	8,043
February 29	1,225	4.0	2,485	August 27	1,917	6.0	10,588
March 4	1,210	4.0	2,325	August 31	2,012	6.25	10,872
March 8	1,185	3.9	2,214	September 5	2,652	8.6	19,667
March 12	1,181	3.9	2,266	September 10	2,176	7.0	12,931
March 17	1,154	3.85	2,044	September 14	2,200	7.0	12,658
March 21	1,135	3.8	2,054	September 18	1,733	5.7	7,874
March 25	1,128	3.75	1,998	September 22	1,453	5.0	5,138
March 31	1,107	3.75	1,909	September 26	1,275	4.7	3,659
April 7	1,147	3.85	2,167	September 30	1,242	4.4	3,392
April 10	1,167	3.95	2,374	October 6	1,026	4.1	2,791
April 15	1,170	3.95	2,263	October 11	999	4.1	2,464
April 18	2,380	7.1	15,018	October 15	966	3.95	2,285
April 23	1,069	4.0	2,362	October 19	949	3.8	2,179
April 26	1,011	3.8	2,131	October 23	931	3.8	2,029
April 30	1,082	4.2	2,518	October 27	918	3.8	1,992
May 6	1,243	4.3	3,129	October 31	909	3.8	1,963
May 9	1,164	4.2	2,678	November 5	912	3.75	1,896
May 14	1,112	4.0	2,274	November 9	901	3.75	1,866
May 18	1,195	4.3	3,138	November 13	923	3.7	1,898
May 22	1,227	3.9	2,967	November 18	896	3.7	1,849
May 27	1,231	4.1	3,212	November 22	889	3.7	1,804
May 31	1,197	3.9	2,736	November 26	893	3.7	1,810
June 5	1,425	4.5	3,903	November 30	928	3.75	1,940
June 9	1,354	4.1	3,318	December 5	905	3.7	1,813
June 14	1,096	3.9	2,306	December 10	927	3.7	1,847
June 18	965	3.7	1,872	December 16	939	3.7	1,854
June 22	982	3.6	1,709	December 21	912	3.7	1,795
June 26	1,200	4.4	3,096	December 27	917	3.7	1,816
June 30	1,077	3.7	2,186	December 31	916	3.7	1,799

Daily gage height, in feet, of Rio Grande below mouth of Devils River, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	4.0	4.2	3.65	3.3	4.7	4.65	5.9	5.35	5.1	5.75	4.9	5.0
2	4.0	4.3	3.6	3.2	4.7	4.95	5.9	5.5	5.45	5.3	5.2	5.0
3	4.0	4.2	3.6	3.2	4.7	5.0	5.9	5.45	6.6	5.25	5.3	8.3
4	4.0	4.2	3.6	3.2	4.5	5.05	5.9	5.2	6.15	5.1	4.9	7.35
5	3.95	4.2	3.6	3.1	4.5	5.1	6.05	5.15	6.45	5.45	5.55	6.45
6	3.85	4.15	3.6	3.1	4.45	5.15	5.25	5.1	6.75	5.25	5.55	6.2
7	3.9	4.0	3.6	3.7	4.25	5.25	5.2	5.2	6.75	5.1	5.5	6.05
8	3.9	4.0	3.6	3.7	4.25	5.3	5.55	5.25	6.7	5.1	6.65	6.1
9	3.85	3.9	3.65	3.7	4.25	5.45	5.6	5.0	6.7	4.95	8.65	6.0
10	3.85	3.9	3.7	3.7	4.2	5.65	5.4	5.0	6.9	4.7	7.65	5.95
11	3.85	3.9	3.7	3.7	4.2	5.7	5.4	4.8	7.6	4.7	6.95	5.95
12	3.9	3.8	3.7	3.7	4.3	5.8	5.45	4.8	6.95	4.55	6.5	5.9
13	3.9	3.8	3.7	3.5	4.2	5.8	5.65	4.9	6.35	4.5	6.05	5.7
14	3.9	3.8	3.7	3.55	4.2	5.55	5.7	4.4	6.2	4.5	5.85	5.5
15	3.9	3.8	3.7	3.6	4.2	5.4	5.75	4.3	5.4	4.4	5.8	5.5
16	3.95	3.7	3.6	3.5	4.1	5.5	5.6	4.35	5.25	4.5	5.0	5.4
17	3.95	3.9	3.5	3.55	4.15	5.85	5.65	4.25	6.2	4.4	5.35	5.3
18	4.0	3.9	3.5	3.55	4.2	6.85	5.5	4.15	6.05	4.4	5.3	5.2
19	4.0	3.8	3.5	3.4	4.2	6.25	5.4	4.3	5.95	4.4	5.3	5.15
20	4.0	3.9	3.4	3.4	4.1	6.4	5.4	4.35	7.5	4.4	5.2	5.1
21	4.0	3.85	3.4	3.4	4.4	6.05	5.4	4.4	7.55	4.4	5.1	5.1
22	4.0	3.8	3.4	3.4	4.45	6.55	5.3	4.4	7.2	4.4	5.05	5.0
23	4.0	3.8	3.4	3.4	4.1	6.0	5.35	4.4	6.75	4.45	5.0	4.9
24	4.0	3.8	3.4	3.35	3.95	6.0	5.15	4.4	6.35	4.4	5.0	4.9
25	4.0	3.75	3.4	3.2	3.9	5.95	5.1	4.4	6.2	5.05	5.0	4.8
26	3.95	3.7	3.4	3.5	4.1	5.8	5.25	4.4	6.15	5.0	4.9	4.8
27	4.0	3.7	3.4	4.1	4.3	5.85	5.1	5.4	6.1	5.0	4.95	4.8
28	4.0	3.7	3.4	4.3	4.15	5.9	5.8	5.4	6.15	5.0	4.95	4.7
29	4.0	.....	3.4	4.55	4.1	5.9	5.2	5.15	6.05	6.9	4.9	4.7
30	4.0	.....	3.4	4.75	4.1	5.9	5.15	5.1	6.0	4.95	5.0	4.7
31	4.1	.....	3.4	.....	4.5	.....	5.75	5.0	.....	4.9	.....	4.7
1908.												
1	4.7	4.3	4.0	3.7	4.5	3.95	3.7	5.4	6.45	4.25	3.75	3.75
2	4.6	4.2	4.0	3.7	4.5	4.15	3.6	5.2	6.85	4.2	3.75	3.7
3	4.6	4.2	4.0	3.8	4.45	4.35	3.75	4.9	8.2	4.2	3.75	3.7
4	4.6	4.2	4.0	3.9	4.3	4.5	3.65	5.0	8.7	4.15	3.75	3.7
5	4.6	4.2	4.0	3.9	4.3	4.55	3.6	5.25	8.8	4.1	3.75	3.7
6	4.6	4.2	3.9	3.85	4.3	4.55	3.55	6.85	8.25	4.1	3.75	3.7
7	4.6	4.2	3.9	3.85	4.2	4.35	7.8	7.25	8.45	4.5	3.75	3.7
8	4.6	4.1	3.9	3.8	4.2	4.2	5.95	6.45	8.1	4.4	3.75	3.7
9	4.5	4.2	3.9	3.7	4.2	4.1	5.0	5.6	7.4	4.35	3.75	3.7
10	4.5	4.2	3.9	3.95	4.1	4.1	5.0	6.05	6.9	4.15	3.75	3.7
11	4.5	4.2	3.85	3.8	4.1	4.05	4.65	5.95	6.45	4.1	3.7	3.7
12	4.5	4.2	3.9	3.85	4.05	3.9	4.3	6.55	7.0	4.0	3.7	3.7
13	4.5	4.1	3.9	3.9	4.0	4.0	4.1	8.45	7.25	4.0	3.7	3.7
14	4.5	4.1	3.9	4.05	4.0	3.9	4.0	9.45	6.95	4.0	3.7	3.7
15	4.5	4.05	3.9	3.95	3.95	3.9	3.9	9.8	6.65	3.95	3.7	3.7
16	4.4	4.05	3.85	4.1	3.9	3.8	3.8	7.6	6.2	3.9	3.7	3.7
17	4.4	4.05	3.85	4.15	3.9	3.8	3.8	6.6	6.0	3.85	3.7	3.7
18	4.4	4.05	3.8	5.4	4.3	3.7	3.7	6.15	5.65	3.85	3.7	3.7
19	4.4	4.05	3.8	5.4	4.3	3.7	3.7	5.9	5.45	3.8	3.7	3.7
20	4.4	4.1	3.8	4.75	4.05	3.7	3.7	5.75	5.3	3.8	3.7	3.7
21	4.4	4.1	3.8	4.5	3.95	3.7	3.75	5.7	5.2	3.8	3.7	3.7
22	4.4	4.1	3.8	4.15	3.9	3.6	3.85	5.7	5.0	3.8	3.7	3.7
23	4.4	4.1	3.8	4.0	3.95	3.6	4.15	5.75	5.0	3.8	3.7	3.7
24	4.4	4.05	3.8	3.95	5.25	4.35	3.95	5.75	4.85	3.8	3.7	3.7
25	4.35	4.15	3.75	3.95	4.55	4.6	5.0	6.15	4.7	3.8	3.7	3.75
26	4.3	4.1	3.8	3.8	4.15	4.35	6.0	6.4	4.7	3.8	3.7	3.7
27	4.3	4.1	3.8	3.9	4.1	4.2	5.0	5.95	4.7	3.8	3.7	3.7
28	4.3	4.05	3.8	3.9	4.05	4.05	4.35	5.8	4.65	3.8	3.7	3.7
29	4.3	4.0	3.8	4.05	3.95	3.85	4.95	5.75	4.45	3.8	3.75	3.7
30	4.3	.....	3.75	4.25	3.9	3.7	5.9	6.1	4.4	3.8	3.75	3.7
31	4.3	.....	3.75	.....	3.9	.....	5.95	6.4	.....	3.8	.....	3.7

Daily discharge, in second-feet, of Rio Grande below mouth of Devils River, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	3,560	3,700	2,620	2,050	3,920	4,480	7,720	6,840	6,150	8,160	4,480	5,050
2	3,520	3,860	2,620	2,020	3,920	5,350	8,080	7,350	7,620	6,310	5,770	5,050
3	3,490	3,650	2,620	2,060	3,920	5,500	8,440	7,180	12,470	6,100	6,190	19,740
4	3,450	3,610	2,620	2,100	a3,510	5,640	a8,800	6,340	10,570	5,480	4,480	a15,760
5	a3,320	3,560	a2,620	a2,070	3,570	5,790	9,090	a6,280	11,830	a6,920	a7,280	11,870
6	3,080	3,440	2,590	2,070	3,550	5,930	7,560	6,220	13,100	6,180	7,280	10,570
7	3,150	3,150	2,560	2,500	3,260	6,220	7,460	6,330	a13,100	5,640	7,050	9,680
8	3,110	3,100	2,530	2,500	3,330	6,370	8,130	6,390	12,630	5,640	12,200	9,590
9	2,980	a2,900	2,520	2,500	3,400	a6,860	8,230	6,120	12,630	5,100	a21,150	8,890
10	a2,940	2,900	a2,510	a2,500	a3,370	7,690	a7,840	a6,120	13,970	a4,200	16,450	8,400
11	2,950	2,900	2,510	2,500	3,370	7,900	7,840	5,480	a18,680	4,200	13,160	a8,160
12	3,050	2,740	2,510	2,500	3,520	8,310	7,940	5,480	15,360	3,550	11,040	8,010
13	3,060	a2,740	2,510	2,280	3,350	a8,310	8,320	5,860	12,300	3,330	a8,890	7,420
14	a3,070	2,740	a2,510	a2,330	3,350	7,670	8,420	a4,260	11,540	a3,330	8,280	6,820
15	3,090	2,740	2,500	2,380	a3,340	7,280	a8,510	4,030	7,460	3,200	8,100	a6,820
16	3,210	a2,720	2,470	2,280	3,130	7,530	8,180	4,140	6,700	3,330	5,270	6,360
17	3,230	3,040	2,440	2,330	3,140	8,400	8,300	3,910	11,060	3,200	a6,440	5,910
18	a3,350	2,990	a2,440	2,390	a3,140	12,000	7,950	3,690	10,370	a3,200	6,200	5,460
19	3,350	a2,780	2,460	2,320	3,140	9,620	a7,710	a4,030	9,910	3,200	6,200	a5,330
20	3,350	2,890	2,460	2,370	3,000	10,220	7,550	3,830	17,030	3,200	5,720	5,200
21	3,350	2,790	a2,480	a2,430	3,600	a8,820	7,400	3,640	a17,260	3,200	a5,240	5,200
22	3,360	2,690	2,430	2,400	3,700	10,520	6,940	a3,350	15,380	3,200	5,100	4,940
23	a3,360	a2,660	2,370	2,360	a3,310	8,030	6,940	3,340	13,020	a3,270	4,950	a4,680
24	3,360	2,680	2,320	2,290	3,100	7,730	a6,180	3,320	10,920	3,200	4,950	4,680
25	3,360	2,630	2,260	2,140	3,030	a7,280	6,030	3,310	10,140	5,130	4,950	4,370
26	a3,260	2,580	2,210	a2,480	3,200	6,870	6,520	3,310	9,880	4,970	a4,660	a4,370
27	3,360	2,600	a2,150	3,210	a3,370	7,070	6,030	6,940	9,620	a4,970	4,850	4,370
28	3,360	a2,630	2,130	3,460	3,170	7,260	a8,340	6,940	9,880	4,970	4,850	4,000
29	3,360	.....	2,110	3,770	3,130	7,310	6,540	6,180	9,350	14,350	4,660	4,000
30	3,360	.....	2,100	a4,020	3,170	a7,360	6,390	6,030	9,190	4,720	a5,050	4,000
31	a3,570	.....	a2,080	.....	a3,910	.....	8,190	5,730	.....	a4,480	.....	a4,000
1908.												
1	4,000	2,960	2,440	1,870	3,190	2,830	2,190	6,940	11,620	3,090	1,900	1,920
2	3,750	2,730	2,400	1,890	3,250	3,220	2,090	6,220	13,120	2,990	1,900	1,860
3	3,750	a2,690	2,360	2,030	3,220	3,610	2,230	5,120	18,170	2,990	1,900	1,840
4	a3,750	2,690	a2,320	2,170	2,990	3,900	2,140	5,440	20,040	2,890	1,900	1,830
5	3,700	2,680	2,320	2,190	3,060	a3,980	2,090	6,240	a20,420	2,790	a1,900	a1,810
6	3,650	2,680	2,210	2,150	a3,130	3,980	a2,040	a11,340	18,190	a2,790	1,890	1,820
7	3,590	a2,680	2,210	a2,170	2,850	3,680	17,200	12,700	19,040	3,590	1,880	1,830
8	a3,540	2,520	a2,210	2,140	2,760	3,470	9,240	10,550	17,560	3,310	1,870	1,830
9	3,360	2,750	2,220	2,040	a2,680	a3,320	5,160	8,590	14,620	3,170	a1,870	1,840
10	3,380	2,790	2,220	a2,370	2,480	3,200	a5,160	a9,550	a12,630	2,610	1,890	a1,850
11	3,400	2,830	2,170	2,140	2,480	2,970	4,300	9,160	11,280	a2,460	1,860	1,850
12	3,420	a2,860	a2,230	2,190	2,380	2,550	3,440	11,470	12,660	2,340	1,880	1,850
13	a3,430	2,660	2,200	2,240	2,280	2,630	2,950	18,830	13,410	2,340	a1,900	1,850
14	3,470	2,660	2,180	2,430	a2,270	a2,310	2,700	a22,750	a12,470	2,340	1,890	1,850
15	3,520	2,550	2,150	a2,260	2,130	2,310	a2,460	24,500	11,370	a2,280	1,880	1,850
16	a3,370	a2,550	2,070	2,470	1,990	2,090	2,230	15,900	9,710	2,250	1,870	a1,850
17	3,340	2,570	a2,040	2,540	1,990	2,090	2,230	12,000	8,980	2,210	1,860	1,840
18	3,300	2,580	2,010	a6,520	a3,140	a1,870	2,010	10,250	a7,680	2,210	a1,850	1,830
19	3,270	2,600	2,020	6,520	3,290	1,870	a2,010	a9,270	6,900	a2,180	1,840	1,820
20	a3,240	2,710	2,040	4,440	2,950	1,870	2,060	8,540	6,310	2,140	1,830	1,810
21	3,230	2,730	a2,050	3,640	2,910	1,870	2,230	8,180	5,920	2,110	1,820	a1,790
22	3,220	2,740	2,050	2,570	a2,970	a1,710	2,510	8,020	a5,140	2,070	a1,810	1,800
23	3,210	a2,760	2,050	a2,360	3,090	1,710	3,220	a8,040	4,990	a2,030	1,810	1,800
24	a3,200	2,640	2,050	2,300	6,310	3,010	a2,840	8,350	4,400	2,020	1,810	1,800
25	3,100	2,830	a2,000	2,300	4,420	3,440	5,360	10,170	3,800	2,010	1,810	1,860
26	3,000	2,720	2,040	a2,130	3,350	a3,030	8,960	11,420	a3,660	2,000	a1,810	1,810
27	3,000	2,710	2,020	2,230	a3,210	2,840	a5,360	a10,020	3,740	a1,990	1,820	a1,820
28	3,000	2,600	2,010	2,230	3,090	2,640	3,540	9,450	3,720	1,980	1,840	1,810
29	3,000	2,480	1,990	2,370	2,850	2,380	5,550	9,260	3,410	1,980	1,940	1,810
30	a3,000	.....	1,920	2,570	2,740	2,190	8,740	10,380	3,390	1,970	a1,940	1,800
31	.....	.....	a1,910	.....	a2,740	.....	a8,900	a11,470	.....	a1,960	.....	a1,800

a Dates of measurement.

Monthly discharge of Rio Grande below mouth of Devils River, Tex., for 1907 and 1908

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907.				
January	3,570	2,940	3,270	201,064
February	3,860	2,580	2,979	165,441
March	2,620	2,080	2,428	149,276
April	4,020	2,020	2,487	147,987
May	3,920	3,030	3,385	208,106
June	12,000	4,480	7,511	446,916
July	9,090	6,030	7,664	471,212
August	7,350	3,310	5,225	321,263
September	18,680	6,150	11,637	692,409
October	14,350	3,200	4,836	297,382
November	21,150	4,480	7,363	438,129
December	19,740	4,000	7,055	433,785
The year	21,150	2,020	5,487	3,973,030
1908.				
January	4,000	3,000	3,361	206,658
February	2,960	2,480	2,688	154,611
March	2,440	1,910	2,133	131,127
April	6,520	1,870	2,649	157,626
May	6,310	1,990	2,974	182,856
June	3,980	1,710	2,752	163,775
July	17,200	2,010	4,295	264,079
August	24,500	5,120	10,649	654,783
September	20,420	3,390	10,278	611,603
October	3,590	1,960	2,422	148,939
November	1,940	1,810	1,866	111,015
December	1,920	1,800	1,830	112,522
The year	24,500	1,710	3,991	2,899,594

RIO GRANDE AT EAGLE PASS, TEX.

The station was established in April, 1900, by the International Boundary Commission. It is one-half mile above the highway bridge between Eagle Pass, Tex., and Ciudad Porfirio Diaz, Mexico, and about 540 miles below El Paso.

The right bank is alluvial deposit, with a bottom back of it about 1,500 feet wide, which begins to overflow at gage height 22 feet. The left bank is shale rock rising abruptly from the river. The bed of the stream is constantly shifting, and frequent discharge measurements are necessary to determine closely the daily discharge. The section is subject to overflow at high stages. At low water, the depth is considerable and the velocity slow.

The observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

Discharge measurements of Rio Grande at Eagle Pass, Tex., in 1907.

[By J. K. Wilson and E. T. Rucker, jr.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec. ft.*		*Sq. ft.*	*Feet.*	*Sec. ft.*
January 3	2,082	2.8	4,977	July 6	2,372	4.3	9,629
January 6	2,015	2.7	4,375	July 10	2,032	3.8	7,354
January 10	2,007	2.7	4,194	July 13	2,064	3.9	7,683
January 13	2,121	2.7	4,306	July 16	1,954	4.0	7,416
January 16	2,116	2.7	4,284	July 19	2,010	3.9	8,170
January 19	2,115	3.0	4,789	July 22	1,996	3.6	7,404
January 22	2,129	2.9	4,569	July 25	1,814	3.4	6,375
January 25	2,080	2.9	4,443	July 28	1,788	3.3	5,643
January 28	2,083	2.9	4,422	July 31	1,856	3.5	6,873
January 31	2,153	3.2	5,021	August 3	1,803	3.7	7,248
February 3	2,112	3.0	4,556	August 6	1,699	3.3	5,657
February 6	2,121	3.1	4,619	August 9	1,629	3.45	5,523
February 9	1,994	2.8	4,119	August 12	1,464	3.0	4,882
February 12	1,923	2.7	3,787	August 15	1,478	3.0	4,922
February 15	1,877	2.6	3,760	August 18	1,450	3.0	4,853
February 18	1,843	2.6	3,763	August 21	1,368	2.6	4,394
February 21	1,853	2.7	3,907	August 24	1,320	2.5	4,183
February 25	1,832	2.6	3,616	August 27	1,282	2.4	3,880
February 28	1,777	2.5	3,563	August 31	1,469	3.3	5,527
March 3	1,722	2.5	3,128	September 3	1,826	3.7	7,668
March 7	1,690	2.4	3,054	September 6	2,260	4.7	11,869
March 10	1,751	2.5	3,446	September 9	2,370	4.9	12,639
March 13	1,774	2.5	3,435	September 12	2,703	5.55	15,802
March 16	1,710	2.4	3,215	September 15	2,213	4.5	11,296
March 19	1,696	2.3	2,968	September 18	2,357	4.2	9,189
March 22	1,618	2.2	2,838	September 21	3,119	6.05	16,792
March 25	1,632	2.1	2,873	September 24	2,363	5.05	13,001
March 28	1,561	2.1	2,642	September 27	2,260	4.4	9,621
March 31	1,593	2.1	2,640	September 30	2,247	4.3	9,206
April 3	1,551	2.0	2,565	October 3	2,087	3.9	7,906
April 6	1,537	2.0	2,526	October 6	2,410	4.55	10,695
April 9	1,710	2.4	3,231	October 10	1,739	3.2	4,882
April 12	1,667	2.3	3,097	October 13	1,665	2.9	4,704
April 15	1,631	2.2	2,920	October 16	1,613	2.7	4,078
April 18	1,591	2.2	2,661	October 19	1,578	2.7	3,961
April 21	1,570	2.2	2,579	October 22	1,592	2.7	3,847
April 24	1,539	2.2	2,721	October 25	1,495	2.6	3,188
April 27	1,711	2.45	3,475	October 28	1,814	3.35	5,724
April 30	2,050	3.3	5,552	October 31	1,756	3.5	5,842
May 3	1,977	3.4	5,512	November 3	1,905	3.8	6,770
May 6	1,935	3.1	4,799	November 7	2,124	4.0	8,066
May 10	1,906	2.9	4,708	November 9	3,021	6.45	22,559
May 13	1,757	3.0	4,369	November 12	3,131	5.55	12,440
May 16	1,777	2.9	4,617	November 15	2,875	4.3	9,400
May 19	1,751	2.8	4,314	November 18	2,614	3.9	9,957
May 22	1,711	2.8	4,228	November 21	2,086	3.6	6,619
May 25	1,669	2.7	3,838	November 24	1,981	3.4	6,311
May 28	1,838	2.9	5,048	November 27	1,919	3.2	5,956
May 31	1,843	2.9	5,081	November 30	1,975	3.4	6,564
June 3	1,902	3.1	5,406	December 3	1,864	3.5	5,783
June 6	1,853	3.3	5,701	December 5	3,132	5.5	13,656
June 9	1,999	3.6	6,893	December 8	2,756	4.8	12,564
June 12	2,049	3.9	8,066	December 12	2,476	4.4	8,400
June 15	1,984	3.7	6,942	December 15	2,217	4.1	8,433
June 18	2,085	3.85	7,728	December 18	2,037	3.6	7,618
June 21	2,256	4.2	8,511	December 21	1,902	3.5	5,895
June 24	2,385	4.4	10,190	December 24	1,951	3.3	5,967
June 27	2,188	4.1	8,289	December 27	1,847	3.2	5,453
June 30	2,145	4.1	8,045	December 31	1,691	3.1	4,751
July 3	2,326	4.4	9,721				

Discharge measurements of Rio Grande at Eagle Pass, Tex., in 1908.

[By J. K. Wilson.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	1,688	3.0	4,753	July 6	1,818	1.4	2,538
January 6	1,615	2.9	4,366	July 9	1,778	3.3	4,774
January 9	1,604	2.8	4,267	July 12	1,566	2.1	2,351
January 12	1,607	2.7	4,320	July 16	1,499	1.7	2,081
January 15	1,529	2.6	4,024	July 19	1,515	1.7	2,052
January 18	1,477	2.6	3,838	July 22	1,438	1.6	1,854
January 22	1,416	2.5	3,616	July 25	1,577	1.65	2,024
January 25	1,469	2.5	3,757	July 28	1,830	3.0	4,663
January 28	1,500	2.5	3,663	July 31	2,496	4.1	9,067
January 31	1,467	2.5	3,275	August 3	1,668	3.0	4,446
February 3	1,407	2.3	3,066	August 6	3,436	6.7	17,104
February 6	1,348	2.3	2,694	August 10	2,637	4.5	8,633
February 9	1,536	2.5	3,728	August 13	3,158	5.25	12,951
February 12	1,608	2.4	3,510	August 16	4,193	7.4	25,893
February 15	1,535	2.3	3,153	August 19	2,585	4.6	11,921
February 18	1,490	2.2	2,799	August 22	2,485	4.0	8,071
February 21	1,487	2.2	2,836	August 25	2,502	3.9	7,564
February 24	1,500	2.2	3,025	August 28	2,647	4.2	8,500
February 27	1,492	2.1	2,792	August 31	2,746	4.3	8,375
February 29	1,468	2.1	2,710	September 3	3,328	6.15	17,510
March 3	1,456	2.1	2,751	September 6	3,814	6.7	21,680
March 6	1,420	2.1	2,618	September 9	3,683	6.35	18,968
March 10	1,428	1.9	2,568	September 12	2,318	4.8	10,783
March 13	1,350	1.8	2,406	September 15	2,803	5.3	13,389
March 21	1,306	1.7	2,261	September 18	2,197	4.0	8,260
March 24	1,315	1.7	2,232	September 21	2,086	3.3	5,345
March 27	1,298	1.7	2,172	September 24	1,860	2.85	4,584
March 31	1,266	1.7	2,120	September 27	1,773	2.5	4,069
April 3	1,256	1.7	2,121	September 30	1,712	2.3	3,379
April 7	1,291	1.8	2,195	October 3	1,680	2.2	3,252
April 10	1,335	1.8	2,292	October 6	1,639	2.1	3,090
April 13	1,599	2.3	3,340	October 9	1,781	2.3	3,567
April 16	1,441	2.0	2,843	October 13	1,613	1.9	3,314
April 19	2,189	4.4	9,511	October 16	1,427	1.7	2,828
April 22	1,459	2.75	3,691	October 19	1,421	1.6	2,652
April 25	1,396	2.1	3,273	October 22	1,455	1.6	2,738
April 28	1,363	2.0	3,107	October 25	1,371	1.6	2,412
April 30	1,311	2.0	2,874	October 28	1,377	1.6	2,418
May 3	1,460	2.7	3,435	October 31	1,329	1.6	2,311
May 6	1,422	2.5	3,284	November 3	1,325	1.5	2,239
May 9	1,456	2.3	3,424	November 6	1,315	1.5	2,228
May 13	1,480	2.2	3,675	November 9	1,324	1.5	2,234
May 16	1,435	2.0	3,430	November 12	1,360	1.5	2,381
May 19	1,448	2.3	2,941	November 15	1,335	1.5	2,269
May 22	1,352	3.1	2,778	November 18	1,347	1.5	2,355
May 24	5,610	9.8	57,214	November 21	1,355	1.5	2,316
May 25 [a]	3,156	4.5	8,999	November 24	1,363	1.5	2,313
May 28	1,529	2.65	3,522	November 27	1,318	1.5	2,291
May 31	2,388	2.3	4,374	November 30	1,315	1.5	2,276
June 3	1,987	2.3	3,989	December 3	1,302	1.5	2,229
June 6	1,865	2.5	3,809	December 6	1,285	1.5	2,199
June 9	2,006	2.5	4,119	December 9	1,281	1.5	2,156
June 12	1,678	2.2	2,974	December 12	1,265	1.5	2,153
June 15	1,516	2.2	2,718	December 15	1,284	1.4	2,205
June 18	2,012	1.8	2,486	December 18	1,270	1.4	2,251
June 21	1,997	1.7	2,517	December 21	1,264	1.4	2,175
June 24	1,901	1.5	2,112	December 24	1,272	1.4	2,212
June 27	2,183	2.15	3,508	December 27	1,267	1.4	2,212
June 30	2,019	1.7	2,641	December 31	1,264	1.4	2,169
July 3	1,847	1.5	2,736				

[a] Velocity obtained from floats.

Daily gage height, in feet, of Rio Grande at Eagle Pass, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	2.8	3.0	2.7	2.1	3.35	2.9	4.2	3.6	3.3	4.3	3.5	3.4
2	2.8	3.0	2.6	2.1	3.4	3.0	4.2	3.65	3.35	3.9	3.4	3.4
3	2.8	3.0	2.5	2.0	3.4	3.15	4.4	3.7	4.05	3.9	3.85	4.55
4	2.7	3.0	2.4	2.0	3.3	3.2	4.3	3.35	4.7	3.9	3.85	6.45
5	2.7	3.0	2.4	2.0	3.2	3.3	4.3	3.3	4.3	4.7	3.85	5.4
6	2.7	3.1	2.4	2.0	3.1	3.3	4.3	3.3	4.75	4.4	4.0	5.05
7	2.7	3.0	2.4	2.4	3.0	3.1	4.05	3.35	4.9	3.65	4.0	4.85
8	2.7	2.9	2.4	2.4	3.1	3.5	3.95	3.45	4.8	3.55	4.0	4.75
9	2.7	2.8	2.5	2.4	2.95	3.65	3.8	3.45	5.0	3.45	6.4	4.6
10	2.7	2.9	2.5	2.4	2.9	3.8	3.75	3.25	5.25	3.15	7.4	4.4
11	2.7	2.85	2.4	2.35	2.95	3.9	3.7	3.2	5.6	2.9	6.15	4.3
12	2.7	2.7	2.45	2.25	3.0	3.95	3.8	3.0	5.65	2.9	5.55	4.35
13	2.7	2.7	2.5	2.25	3.0	4.1	4.0	3.0	5.1	2.9	5.0	4.3
14	2.7	2.7	2.5	2.25	2.9	3.9	4.4	3.05	4.6	2.85	4.6	4.2
15	2.7	2.6	2.45	2.2	2.9	3.7	4.2	3.0	4.5	2.8	4.3	4.1
16	2.7	2.6	2.4	2.3	2.9	3.6	3.95	3.0	4.45	2.7	4.3	3.9
17	2.7	2.7	2.4	2.3	2.9	3.7	3.9	3.05	4.25	2.7	4.05	3.8
18	3.0	2.6	2.3	2.2	2.9	3.9	3.95	2.95	4.35	2.7	3.9	3.6
19	3.0	2.65	2.3	2.15	2.8	4.65	3.95	2.9	4.15	2.7	3.7	3.5
20	2.9	2.7	2.25	2.2	3.0	4.25	3.9	2.6	4.1	2.7	3.6	3.5
21	2.9	2.7	2.2	2.2	3.0	4.25	3.7	2.55	6.1	2.7	3.6	3.45
22	2.9	2.7	2.2	2.2	2.8	4.5	3.6	2.5	5.85	2.65	3.6	3.4
23	2.9	2.7	2.15	2.2	2.7	4.65	3.55	2.5	5.65	2.6	3.5	3.3
24	2.9	2.65	2.1	2.2	2.7	4.35	3.6	2.5	5.05	2.6	3.4	3.3
25	2.9	2.6	2.1	2.15	2.7	4.2	3.4	2.5	5.0	2.6	3.3	3.25
26	2.9	2.6	2.1	2.1	2.8	4.1	3.55	2.4	4.6	3.35	3.2	3.2
27	2.9	2.6	2.1	2.5	2.85	4.1	3.65	2.4	4.4	3.2	3.25	3.2
28	2.85	2.5	2.1	2.8	2.9	4.1	3.3	3.65	4.4	3.35	3.5	3.1
29	2.8	.....	2.25	3.15	2.9	4.1	3.5	3.45	4.4	3.6	3.4	3.1
30	2.8	.....	2.1	3.3	2.9	4.1	3.55	3.3	4.3	3.85	3.4	3.1
31	3.2	.....	2.1	.....	2.9	.....	3.5	3.25	.....	3.5	.....	3.1
1908.												
1	3.1	2.4	2.1	1.7	2.5	2.2	1.6	3.7	4.65	2.3	1.5	1.5
2	3.1	2.35	2.1	1.7	2.65	2.2	1.55	3.5	4.6	2.3	1.5	1.5
3	3.0	2.3	2.1	1.75	2.7	2.35	1.5	3.05	6.05	2.25	1.5	1.5
4	3.0	2.3	2.1	1.85	2.6	2.3	1.5	3.05	6.55	2.1	1.5	1.5
5	3.0	2.3	2.1	1.9	2.55	2.3	1.5	5.6	6.9	2.1	1.5	1.5
6	2.95	2.3	2.1	1.85	2.45	2.7	1.35	6.7	6.7	2.05	1.5	1.5
7	2.9	2.3	2.0	1.8	2.4	2.6	1.2	5.45	6.85	2.2	1.5	1.5
8	2.85	2.3	2.0	1.8	2.4	2.5	4.9	5.8	6.9	2.55	1.5	1.5
9	2.8	2.45	1.9	1.8	2.3	2.5	3.25	4.95	6.2	2.45	1.5	1.5
10	2.8	2.4	1.9	1.85	2.3	2.45	3.35	4.55	5.4	2.4	1.5	1.5
11	2.8	2.4	1.9	1.85	2.3	2.25	3.2	4.1	4.9	2.15	1.5	1.5
12	2.75	2.4	1.9	2.6	2.3	2.2	2.1	3.4	4.8	1.95	1.5	1.5
13	2.7	2.35	1.85	2.4	2.2	2.2	2.25	5.7	5.7	1.85	1.5	1.5
14	2.7	2.3	1.8	2.1	2.15	2.2	2.0	7.2	5.5	1.8	1.5	1.4
15	2.65	2.3	1.8	2.05	2.0	2.2	1.8	7.85	5.25	1.8	1.5	1.4
16	2.6	2.3	1.8	2.0	2.0	2.1	1.7	7.45	4.8	1.7	1.5	1.4
17	2.6	2.25	1.8	2.0	2.15	1.95	1.8	7.15	4.35	1.65	1.5	1.4
18	2.6	2.2	1.7	2.2	2.3	1.75	1.75	5.3	4.0	1.6	1.5	1.4
19	2.55	2.2	1.7	4.45	2.25	1.7	1.65	4.5	3.75	1.6	1.5	1.4
20	2.5	2.2	1.7	4.4	2.2	1.7	1.6	4.25	3.5	1.6	1.5	1.4
21	2.5	2.2	1.7	3.45	2.2	1.7	1.6	4.3	3.35	1.6	1.5	1.4
22	2.5	2.2	1.7	2.7	2.1	1.65	1.6	4.2	3.2	1.6	1.5	1.4
23	2.5	2.25	1.7	2.15	4.45	1.55	3.2	4.2	3.0	1.6	1.5	1.4
24	2.5	2.15	1.7	2.1	8.9	1.5	2.05	4.1	2.85	1.6	1.5	1.4
25	2.5	2.1	1.7	2.1	4.9	3.8	1.65	3.9	2.6	1.6	1.5	1.4
26	2.5	2.1	1.7	2.1	3.55	2.5	4.1	4.2	2.55	1.6	1.5	1.4
27	2.5	2.1	1.7	2.05	2.85	2.15	3.75	4.65	2.5	1.6	1.5	1.4
28	2.5	2.1	1.7	2.0	2.6	1.85	2.95	4.2	2.4	1.6	1.5	1.4
29	2.5	2.1	1.8	2.0	2.35	1.75	2.65	4.1	2.3	1.6	1.5	1.4
30	2.5	.....	1.7	2.0	2.3	1.65	3.5	4.7	2.3	1.6	1.5	1.4
31	2.5	.....	1.7	.....	2.25	.....	3.95	4.25	.....	1.55	.....	1.4

Daily discharge, in second-feet, of Rio Grande at Eagle Pass, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	4,980	4,600	3,760	2,640	5,580	5,080	8,600	7,060	5,530	9,210	5,840	6,640
2	4,980	4,580	3,440	2,640	5,600	5,240	8,760	7,150	5,790	7,910	5,530	5,910
3	a4,980	a4,560	a3, 30	a2,560	a 5,510	a 5,490	a9,720	a 7,250	a 9,140	a 7,910	a 6,970	a 11,760
4	4,640	4,560	3,050	2,550	5,270	5,550	9,430	6,280	11,870	7,910	7,090	22,560
5	4,510	4,560	3,050	2,540	5,040	5,700	9,530	5,920	10,190	11,350	7,220	a 13,500
6	a4,370	a4,620	3,050	a2,530	a 4,800	a 5,700	a9,630	a 5,660	a12,060	a10,050	7,940	12,950
7	4,330	4,450	a3,050	3,110	4,660	5,400	8,490	5,610	12,640	6,820	a 8,070	12,640
8	4,280	4,280	3,140	3,170	5,000	6,600	8,040	5,670	12,250	6,380	8,070	a 12,390
9	4,240	a4,120	3,350	3,230	4,730	a 7,090	7,350	a 5,520	a13,130	5,950	a22,270	11,180
10	a4,190	4,250	a3,450	3,230	a 4,710	7,670	a7,190	5,240	14,340	a 4,730	28,260	9,800
11	4,230	4,110	3,320	3,230	4,640	8,070	7,030	5,170	16,050	4,220	17,570	8,760
12	4,270	a3,790	3,380	a3,160	4,570	a 8,270	7,360	a 4,880	a16,250	4,460	a12,440	a 8,250
13	a4,310	3,840	a3,430	3,040	a 4,370	8,760	a8,080	4,900	13,870	a 4,700	11,100	8,410
14	4,300	3,890	3,400	3,040	4,290	7,850	9,680	5,010	11,730	4,550	10,130	8,420
15	4,290	a3,760	3,310	a2,920	4,450	a 6,940	8,550	a 4,920	a11,300	4,390	a 9,400	a 8,430
16	a4,280	3,760	a3,220	2,950	a 4,620	6,660	a7,220	4,900	10,940	a 4,080	9,900	8,110
17	4,280	3,920	3,170	2,870	4,620	7,110	7,400	4,980	9,540	4,040	9,810	7,940
18	4,790	a3,760	3,010	a2,660	4,620	a 7,840	7,990	a 4,800	a10,240	4,000	a 9,950	a 7,620
19	a4,790	3,830	a2,970	2,570	a 4,310	10,310	a8,370	4,740	8,980	3,960	8,600	6,910
20	4,570	3,910	2,900	2,610	4,750	8,710	8,170	4,390	8,780	3,920	7,490	6,400
21	4,570	a3,910	2,840	a2,580	4,750	a 8,710	7,660	a 4,290	a16,980	3,880	a 6,620	a 5,690
22	a4,570	3,870	a2,840	2,630	a 4,230	10,000	a7,400	4,180	16,030	3,700	6,620	5,850
23	4,530	3,830	2,830	2,670	3,960	10,900	7,120	4,180	15,280	3,430	6,460	5,810
24	4,480	3,720	2,820	a2,720	3,900	a 9,990	7,180	a 4,180	a13,000	3,310	a 6,310	a 5,970
25	a4,440	a3,620	a2,870	2,660	a 3,840	9,160	a6,370	4,150	12,740	3,190	6,130	5,760
26	4,440	3,640	2,800	2,600	4,320	8,510	6,770	3,910	10,660	5,720	5,960	5,570
27	4,430	3,670	2,720	a3,600	4,680	a 8,290	7,000	a 3,880	a 9,620	5,220	a 6,110	a 5,450
28	a4,320	a3,560	a2,640	4,330	a 5,050	8,210	a5,640	6,630	9,620	5,720	6,870	5,130
29	4,220	.....	2,820	5,180	5,060	8,130	6,520	6,000	9,620	6,470	6,560	5,000
30	4,220	.....	2,640	5,550	5,070	a 8,040	6,870	5,530	a 9,210	7,220	a 6,560	4,880
31	a5,020	.....	a2,640	.....	5,080	.....	a6,870	a 5,430	.....	5,840	.....	a 4,750
1908.												
1	4,820	3,140	2,730	2,120	3,590	4,130	2,650	7,390	10,100	3,380	2,240	2,260
2	4,880	3,100	2,740	2,120	3,610	4,000	2,700	6,550	9,860	3,380	2,240	2,240
3	a4,750	a3,070	a2,750	a2,160	a 3,440	a 4,050	a2,740	a 4,620	a17,020	a 3,330	a 2,240	a 2,230
4	4,690	2,940	2,710	2,230	3,320	3,850	2,740	4,620	20,540	3,090	2,240	2,220
5	4,630	2,820	2,660	2,270	3,300	3,710	2,740	13,340	23,200	3,090	2,230	2,210
6	a4,470	a2,690	a2,620	2,230	a 3,180	a 4,210	a2,510	a17,100	a21,680	a 2,970	a 2,230	a 2,200
7	4,370	2,890	2,590	a2,190	3,260	4,110	2,420	12,290	22,840	3,330	2,230	2,180
8	4,320	3,090	2,590	2,230	3,440	4,010	10,800	13,640	23,230	4,160	2,230	2,170
9	a4,270	a3,620	2,570	2,260	a 3,420	a 4,120	a4,670	10,370	a18,180	a 3,930	a 2,230	a 2,160
10	4,350	3,510	a2,570	a2,400	3,530	3,930	4,870	a 8,830	13,950	3,870	2,250	2,160
11	4,430	3,510	2,550	2,400	3,650	3,170	4,570	7,750	11,310	3,590	2,270	2,160
12	a4,420	a3,510	2,530	3,970	3,760	a 2,970	a2,350	6,200	a10,780	3,370	a 2,280	a 2,150
13	4,290	3,360	a2,460	a3,550	a 3,670	2,890	2,650	a15,660	15,470	a 3,250	2,280	2,200
14	4,260	3,210	2,400	3,010	3,610	2,800	2,390	24,690	14,430	3,110	2,270	2,150
15	a4,120	a3,150	2,390	2,920	3,430	a 2,720	2,180	28,600	a13,190	3,030	a 2,270	2,200
16	3,960	3,100	2,390	a2,840	a 3,430	2,660	a2,080	a26,200	11,410	a 2,830	2,260	2,220
17	3,900	2,950	2,380	2,840	3,330	2,570	2,150	24,640	9,640	2,750	2,260	2,230
18	a3,840	a2,800	2,280	3,240	3,220	a 2,460	2,100	15,400	a 8,260	2,680	a 2,260	a 2,250
19	3,730	2,810	2,270	9,700	a 2,880	2,460	a1,950	a11,280	7,220	a 2,650	2,280	2,220
20	3,620	2,820	2,270	9,510	2,850	2,490	1,850	9,670	6,170	2,680	2,300	2,200
21	3,620	a2,840	a2,260	6,060	2,870	a 2,520	1,850	10,000	a 5,550	2,710	a 2,320	a 2,180
22	a3,620	2,900	2,250	a3,660	a2,780	2,420	a1,850	a 9,100	5,180	a 2,740	2,320	2,190
23	3,660	3,060	2,240	3,310	12,180	2,210	5,060	9,100	4,840	2,630	2,310	2,200
24	3,710	a2,910	a2,230	3,270	a49,560	a 2,110	2,810	8,580	a 4,580	2,520	a 2,310	a 2,210
25	a3,760	2,790	2,210	a3,270	a12,630	7,060	a2,020	a 7,560	4,220	a 2,410	2,310	2,210
26	3,730	2,790	2,190	3,270	6,190	4,260	7,840	9,060	4,140	2,410	2,300	2,210
27	3,700	a2,790	a2,170	3,190	4,120	a 3,510	6,830	11,310	a 4,070	2,420	a 2,290	a 2,210
28	a3,660	2,750	2,160	a3,110	a 3,420	2,930	a4,560	a 8,500	3,770	a 2,420	2,290	2,200
29	3,530	a2,710	2,250	2,990	3,440	2,740	3,960	8,000	3,470	2,380	2,280	2,190
30	3,410	.....	2,130	a2,870	3,850	a 2,540	6,950	11,000	a 3,380	2,350	a 2,280	2,180
31	a3,280	.....	a2,120	.....	a 4,270	.....	a8,540	a 8,020	.....	a 2,260	.....	a 2,170

a Dates of measurement.

Monthly discharge of Rio Grande at Eagle Pass, Tex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907.				
January	5,020	4,190	4,479	275,405
February	4,620	3,560	4,035	224,073
March	3,760	2,640	3,066	188,509
April	5,550	2,530	3,053	181,646
May	5,600	3,840	4,712	289,745
June	10,900	5,080	7,666	456,158
July	9,720	5,640	7,806	479,980
August	7,250	3,880	5,239	322,135
September	16,980	5,530	11,579	688,978
October	11,350	3,190	5,621	345,600
November	28,260	5,530	9,262	551,107
December	22,560	4,750	8,337	512,608
The year	28,260	2,530	6,238	4,515,944
1908.				
January	4,880	3,280	4,058	249,521
February	3,620	2,690	3,022	173,811
March	2,750	2,120	2,408	148,086
April	9,700	2,120	3,373	200,707
May	49,560	2,780	5,588	343,596
June	4,210	2,110	3,320	197,573
July	10,800	1,850	3,722	228,853
August	28,600	4,620	11,905	732,040
September	23,230	3,380	11,056	657,877
October	4,160	2,260	2,959	181,924
November	2,320	2,230	2,270	135,074
December	2,260	2,150	2,199	135,193
The year	49,560	1,850	4,657	3,384,255

RIO GRANDE NEAR NUEVO LAREDO, TAMAULIPAS, MEXICO, AND LAREDO, TEX.

The station was established near Nuevo Laredo, Mexico, in April, 1900, by the International Boundary Commission. It was intended to measure the river from the highway bridge connecting Laredo with Nuevo Laredo, Tamaulipas, and the gage was established on the right bank just above the bridge. Measurements were kept up by the Mexican section of the commission until September 24, 1900, and gage heights were read until February 28, 1903, but the results were so conflicting that the station was abandoned. In July, 1903, a cable station was established by the commission about 2 miles above Nuevo Laredo, and on August 1, 1903, regular meter measurements and gage heights were started. The new gage heights are not comparable with the old. This station is about 670 miles below El Paso.

The river bed at the new station is constantly shifting, and frequent discharge measurements are made to determine closely the daily discharge. The banks at the new station are not subject to overflow.

The observations at these stations have been made under the direction of the Mexican section of the International Boundary Commission.

Discharge measurements and gage heights for the years 1900 to 1904, which have not hitherto been published by the United States Geological Survey, are given herewith, together with those for 1907–8.

Discharge measurements of Rio Grande near Nuevo Laredo, Tamaulipas, Mexico, in 1900.

[By E. Zayas and Luis Varela.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
May 7	2,352	0.8	5,253	July 24	2,653	1.5	6,178
May 8	2,223	.7	4,951	July 26	3,025	2.2	9,256
May 9	2,388	1.2	6,437	July 28	2,713	1.6	7,129
May 15	11,652	12.0	75,141	July 30	3,216	2.5	9,728
May 23	2,901	3.0	13,377	August 3	3,670	3.0	133,283
May 28	2,452	2.2	9,710	August 7	4,083	3.7	16,279
May 31	2,581	1.5	6,483	August 10	7,170	6.85	46,528
June 1	6,137	8.0	31,544	August 13	4,727	4.0	17,533
June 7	2,793	1.7	9,161	August 16	3,463	3.1	11,688
June 9	2,470	1.6	7,311	August 20	3,327	2.35	9,236
June 11	2,379	1.5	5,852	August 22	3,984	3.3	15,059
June 15	2,564	1.3	6,333	August 25	3,580	2.5	12,069
June 20	2,621	1.6	7,134	August 31	3,099	2.05	8,858
June 22	2,459	1.3	6,445	September 3	3,486	2.1	10,669
June 25	2,436	1.2	5,576	September 6	3,157	2.0	10,254
July 2	2,707	2.1	8,142	September 7	4,047	3.8	[a] 17,872
July 6	2,407	1.4	6,672	September 12	2,451	1.25	6,079
July 9	2,576	1.5	6,950	September 15	3,115	1.9	9,174
July 14	2,334	0.8	4,719	September 18	2,974	2.0	8,626
July 16	3,640	3.5	18,607	September 21	2,801	1.6	7,248
July 20	3,152	2.6	10,039	September 24	7,283	8.55	48,715

[a] Observation made on September 7 and 8, 1900.

Discharge measurements of Rio Grande near Laredo, Tex., in 1903.

[By Luis Varela.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
August 1	2,173	3.55	6,303	October 22	2,059	2.5	4,292
August 5	1,659	2.60	3,680	October 26	1,805	2.45	3,322
August 11	1,654	2.30	3,270	October 30	1,753	2.4	3,084
August 15	1,647	2.30	2,965	November 4	1,653	2.1	2,721
August 20	1,588	2.20	2,625	November 7	1,629	2.0	2,556
August 25	1,885	3.10	4,755	November 10	1,421	2.0	2,441
August 30	1,791	2.90	4,446	November 17	1,454	2.0	2,594
September 4	1,854	3.0	4,665	November 21	1,426	1.9	2,360
September 8	2,216	3.8	7,476	November 24	1,421	1.9	2,365
September 10	7,485	12.55	[a] 34,291	November 28	1,452	1.9	2,461
September 12	5,875	9.45	50,702	December 1	1,408	1.9	2,303
September 18	2,310	3.7	7,817	December 5	1,363	1.8	2,193
September 22	2,085	2.8	5,631	December 10	1,452	1.8	2,357
September 29	2,171	3.9	7,529	December 19	1,320	1.7	1,844
October 3	2,518	4.2	9,966	December 23	1,327	1.7	1,885
October 9	2,256	3.8	8,053	December 26	1,323	1.7	2,092
October 14	2,249	2.9	5,355	December 29	1,351	1.7	2,067
October 19	2,209	2.6	5,096				

[a] Extreme high water September 10, 1903, due to backwater from floods in streams below Laredo.

Discharge measurements of Rio Grande near Laredo, Tex., in 1904.

[By Luis Varela.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 5	1,323	1.7	2,208	June 23	1,433	2.00	2,507
January 10	1,353	1.7	2,317	June 28	1,513	2.10	2,663
January 14	1,301	1.6	2,213	June 30	3,786	8.10	21,047
January 18	1,330	1.6	2,170	July 5	2,124	2.5	4,067
January 23	1,357	1.6	2,332	July 9	1,840	1.9	2,746
January 27	1,370	1.5	2,316	July 12	1,837	1.8	2,611
January 31	1,355	1.5	2,260	July 18	1,707	1.3	2,389
February 3	1,351	1.5	2,216	July 23	1,600	1.2	1,981
February 8	1,369	1.5	2,277	July 26	2,550	3.9	7,944
February 13	1,372	1.55	2,305	July 31	1,374	1.6	2,448
February 17	1,364	1.45	2,281	August 5	1,158	1.4	1,840
February 21	1,390	1.5	2,309	August 9	1,297	1.4	2,216
February 25	1,403	1.5	2,345	August 13	1,196	1.5	1,948
February 29	1,406	1.5	2,360	August 20	1,077	1.2	1,500
March 1	1,385	1.5	2,374	August 24	1,130	1.1	1,592
March 5	1,378	1.5	2,340	August 27	1,056	1.2	1,448
March 8	1,365	1.5	2,325	August 31	1,196	1.4	1,857
March 14	1,299	1.3	2,166	September 3	1,429	1.9	2,718
March 19	1,291	1.3	2,147	September 9	3,135	6.5	19,098
March 23	1,271	1.3	2,077	September 13	8,040	17.7	48,235
March 28	1,277	1.3	2,069	September 27	4,277	6.5	18,548
April 3	2,748	4.0	9,780	September 30	3,750	5.8	15,598
April 5	2,206	2.55	5,146	October 4	2,979	4.8	11,860
April 12	1,336	1.3	2,304	October 8	2,991	4.0	8,454
April 16	1,321	1.3	2,269	October 12	2,992	4.2	8,779
April 21	1,310	1.3	2,230	October 19	4,709	8.5	28,841
April 23	1,318	1.3	2,242	October 27	4,470	7.0	21,438
April 26	1,444	1.6	2,674	October 31	3,422	5.2	14,236
May 1	1,291	1.6	2,203	November 3	3,512	5.8	12,750
May 5	1,270	1.55	2,145	November 7	2,957	4.6	8,384
May 10	1,258	1.5	2,116	November 11	2,884	4.3	7,368
May 19	1,262	1.4	1,859	November 19	2,427	3.2	6,460
May 22	1,051	1.0	1,225	November 25	2,455	2.7	5,437
May 24	1,046	1.0	1,274	November 29	2,275	2.6	5,051
May 28	1,359	1.9	2,444	December 6	2,197	2.4	4,838
May 31	2,346	4.2	8,298	December 9	2,386	3.4	6,715
June 4	1,490	2.30	3,033	December 14	2,675	3.1	6,093
June 8	1,559	2.40	3,329	December 20	2,332	3.1	6,144
June 14	1,733	3.50	6,106	December 23	2,271	2.9	5,162
June 20	1,449	1.90	2,456	December 30	2,189	2.4	4,216

Discharge measurements of Rio Grande near Laredo, Tex., in 1907.

[By Luis Varela.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq.-ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	1,839	3.9	4,388	July 8	2,526	5.85	11,952
January 10	2,046	3.9	4,929	July 15	2,357	5.05	8,791
January 14	2,016	3.8	4,862	July 20	2,058	4.7	7,270
January 18	2,033	3.8	4,835	July 25	2,013	4.4	6,481
January 23	2,038	3.8	5,102	July 30	1,973	4.2	5,698
January 28	1,891	3.8	4,647	August 5	1,998	4.4	6,305
February 1	1,887	3.8	4,814	August 10	1,975	4.4	6,165
February 8	2,063	4.0	4,638	August 18	1,864	4.0	4,890
February 11	1,855	3.7	4,325	August 22	1,798	3.7	3,815
February 16	1,628	3.6	3,770	August 28	1,475	3.4	3,159
February 21	1,641	3.6	3,808	August 30	1,967	4.5	6,554
February 26	1,577	3.6	3,816	September 5	2,677	5.8	11,506
March 4	1,633	3.4	3,246	September 8	2,575	6.1	12,239
March 9	1,608	3.3	3,238	September 11	2,827	6.55	15,528
March 13	1,613	3.3	3,410	September 13	3,353	7.25	17,317
March 19	1,562	3.3	3,226	September 19	2,435	5.5	10,545
March 23	1,463	3.1	2,877	September 22	3,392	7.65	18,577
March 28	1,371	3.0	2,672	September 30	2,347	5.4	9,452
April 3	1,366	3.0	2,674	October 5	1,994	4.65	6,808
April 9	1,479	3.2	3,202	October 8	1,993	4.8	7,010
April 13	1,547	3.3	3,274	October 14	1,966	4.0	4,496
April 22	1,449	3.1	2,870	October 19	1,783	4.0	4,216
April 25	1,467	3.0	2,848	October 25	1,871	4.0	4,177
April 29	1,615	3.45	3,570	October 30	2,121	4.7	7,648
May 1	2,040	4.25	5,642	October 31	2,375	5.1	8,269
May 7	2,416	4.3	5,557	November 6	2,570	5.0	7,823
May 11	2,495	4.1	5,051	November 10	3,527	7.85	14,267
May 17	2,484	3.9	4,801	November 11	4,193	9.7	20,511
May 22	2,458	4.1	5,426	November 18	2,263	5.0	8,730
May 27	2,458	4.4	5,739	November 25	2,032	4.4	6,636
June 8	2,068	4.3	6,114	November 29	2,213	4.4	6,889
June 12	2,218	4.8	8,001	December 5	3,604	8.0	18,181
June 15	2,180	4.8	8,189	December 10	2,635	5.6	10,675
June 19	2,193	4.95	8,518	December 15	2,553	5.2	9,194
June 20	2,476	5.45	11,795	December 21	2,447	4.5	7,044
June 25	2,442	5.3	10,320	December 27	2,239	4.3	6,086
June 29	2,301	5.0	8,950	December 31	2,277	4.2	5,557
July 4	2,480	5.6	10,814				

Discharge measurements of Rio Grande near Laredo, Tex., in 1908.

[By Luis Varela.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 5	2,332	4.0	5,123	July 9	3,381	8.5	27,439
January 13	2,018	3.9	4,056	July 14	1,638	3.5	3,902
January 18	1,985	3.8	4,309	July 19	1,316	2.6	2,354
January 21	1,964	3.7	4,180	July 24	1,274	2.4	2,219
January 25	1,893	3.8	5,092	July 28	2,404	5.4	9,127
January 31	1,734	3.2	3,431	July 31	2,219	4.5	6,110
February 5	1,713	3.3	3,478	August 1	2,639	6.3	11,556
February 10	1,628	3.2	3,282	August 6	3,169	7.55	14,561
February 15	1,606	3.1	2,980	August 6	4,687	10.7	37,745
February 20	1,592	3.1	3,030	August 11	2,723	5.8	10,971
February 25	1,566	3.0	2,819	August 15	3,643	8.7	26,127
February 29	1,606	3.0	2,872	August 16	4,658	10.4	32,261
March 5	1,627	3.1	2,960	August 23	2,177	5.0	8,052
March 10	1,666	3.1	3,087	August 30	2,451	5.5	8,789
March 15	1,505	2.9	2,665	September 4	3,493	8.2	22,491
March 20	1,502	2.9	2,578	September 10	3,393	7.7	20,511
March 25	1,369	2.7	2,215	September 15	2,869	6.2	14,007
March 31	1,311	2.6	2,065	September 21	1,905	4.4	6,853
April 5	1,275	2.6	2,060	September 26	2,085	4.0	4,711
April 11	1,390	2.8	2,254	September 30	1,830	3.8	3,986
April 13	2,271	5.5	9,119	October 5	1,878	3.6	3,330
April 16	2,848	7.3	17,356	October 11	1,958	3.9	4,310
April 19	1,674	3.5	3,611	October 15	1,607	3.2	3,023
April 21	4,620	11.0	34,536	October 20	1,570	3.3	3,112
April 25	2,092	3.5	4,402	October 25	1,523	2.9	2,769
April 30	1,881	3.0	3,082	October 31	1,447	2.7	2,440
May 6	1,693	3.5	3,478	November 5	1,440	2.5	2,336
May 11	1,567	3.3	3,161	November 11	1,425	2.3	2,196
May 15	2,025	5.0	6,762	November 15	1,451	2.5	2,384
May 20	1,359	3.3	2,872	November 20	1,390	2.1	2,040
May 26	2,702	6.25	12,206	November 25	1,397	2.3	2,170
May 30	1,847	3.9	4,302	November 30	1,424	2.6	2,311
June 5	1,712	3.5	3,817	December 5	1,418	2.5	2,330
June 11	1,560	3.2	3,222	December 11	1,363	2.5	2,342
June 16	1,470	2.9	2,639	December 15	1,492	2.7	2,636
June 20	1,334	2.7	2,334	December 21	1,592	2.9	3,010
June 25	1,334	2.5	2,263	December 26	1,487	2.6	2,466
June 29	1,452	3.0	2,952	December 31	1,411	2.4	2,272
July 4	1,275	2.3	2,130				

Daily gage height, in feet, of Rio Grande near Nuevo Laredo, Tamaulipas, Mexico, for 1900, 1901, and 1902.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900. [a]												
1	.....	.....	.....	.....	3.35	6.75	3.4	2.9	1.85	3.2	1.5	.....
2	.....	.....	.....	.....	1.9	3.3	1.8	2.75	2.7	2.75	1.5	.....
3	.....	.....	.....	.....	1.4	2.0	1.25	3.0	2.1	2.35	1.6	.....
4	.....	.....	.....	.....	1.1	2.05	1.25	2.85	1.8	2.6	1.55	.....
5	.....	.....	.....	.....	1.05	2.4	1.3	3.3	1.85	2.5	1.35	.....
6	.....	.....	.....	.....	1.0	1.85	1.45	3.25	2.0	2.3	1.3	.....
7	.....	.....	.....	.....	.85	1.65	1.85	3.7	3.8	2.2	2.2	.....
8	.....	.....	.....	.....	.7	1.7	2.1	3.45	3.1	2.2	1.25	.....
9	.....	.....	.....	.....	1.15	1.65	1.5	3.9	2.2	2.3	1.3	.....
10	.....	.....	.....	.....	.85	1.5	1.5	6.85	1.65	2.05	1.2	.....
11	.....	.....	.....	.....	.8	1.5	1.25	4.85	1.45	2.0	1.2	.....
12	.....	.....	.....	.....	1.1	1.4	.95	4.55	1.25	1.9	1.1	.....
13	.....	.....	.....	.....	1.0	1.3	.8	4.0	1.4	1.8	1.1	.....
14	.....	.....	.....	.....	1.05	1.3	1.2	3.65	1.55	1.75	1.0	.....
15	.....	.....	.....	.....	8.7	1.35	2.6	3.4	1.9	1.7	1.0	.....
16	.....	.....	.....	.....	9.15	1.6	3.5	3.1	2.1	1.6	1.1	.....
17	.....	.....	.....	.....	3.9	1.45	3.3	2.85	2.1	1.5	1.1	.....
18	.....	.....	.....	.....	2.55	1.65	2.9	2.6	2.0	1.8	1.1	.....
19	.....	.....	.....	.....	2.0	1.95	3.35	2.5	1.9	1.8	1.1	.....
20	.....	.....	.....	.....	2.75	1.6	2.6	2.35	1.75	2.05	1.1	.....
21	.....	.....	.....	.....	2.4	1.4	2.0	2.35	1.6	2.0	1.15	.....
22	.....	.....	.....	.....	2.1	1.3	1.75	3.3	1.7	2.1	1.0	.....
23	.....	.....	.....	.....	2.75	1.3	1.55	2.65	8.1	2.05	1.0	.....
24	.....	.....	.....	.....	3.75	1.1	1.5	2.7	8.55	2.05	1.0	.....
25	.....	.....	.....	.....	2.85	1.2	1.8	2.5	9.95	2.15	1.0	.....

[a] Gage heights for 1900 complete so far as Mexican records exist.

Daily gage height, in feet, of Rio Grande near Nuevo Laredo, Tamaulipas, Mexico, for 1900, 1901, and 1902—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.												
26	.....	.....	.....	.....	2.35	1.3	2.15	2.05	5.35	2.2	1.0	.....
27	.....	.....	.....	.....	2.25	1.15	1.65	1.8	3.5	2.1	.9	.....
28	.....	.....	.....	.....	2.0	1.05	1.95	1.8	3.0	2.15	.9	.....
29	.....	.....	.....	.....	1.9	.95	2.6	2.25	2.7	2.7	.9	.....
30	.....	.....	.....	.....	1.5	2.85	2.5	2.1	2.3	1.9	.9	.....
31	.....	.....	.....	.....	1.5	.....	2.7	2.05	.....	1.95	.....	.....
1901.												
1	.....	0.4	0.3	0.25	5.6	2.4	.4	.4	.9	2.5	2.4	3.2
2	.....	.4	.3	.25	3.5	2.4	.4	.4	.9	2.5	2.4	3.2
3	.....	.4	.3	.25	3.0	1.9	.4	.4	.9	2.6	2.4	3.2
4	.....	.4	.3	.25	3.0	1.8	.4	.4	.9	2.7	2.4	3.2
5	.....	.4	.3	.25	2.5	1.6	.4	.4	2.0	2.8	2.4	3.2
6	.....	.4	.3	.25	2.5	1.5	.4	.5	2.0	2.2	2.4	3.2
7	.....	.4	.3	.25	2.5	1.5	.4	.6	3.0	2.2	2.4	3.2
8	.....	.4	.3	.25	2.5	1.4	.4	.7	4.0	2.2	2.4	3.2
9	.....	.4	.3	.25	4.5	1.4	.4	.7	4.5	2.1	2.3	3.2
10	.....	.4	.3	.25	3.0	1.4	.4	.9	5.5	2.1	2.3	3.2
11	.....	.4	.3	.25	3.0	1.3	.4	.9	3.5	2.1	2.2	3.2
12	.....	.4	.3	.25	2.5	1.3	.4	.7	3.0	2.0	2.2	3.2
13	.....	.4	.3	.25	2.5	1.2	.4	.5	3.0	2.0	2.2	3.2
14	.....	.4	.3	.25	2.5	1.2	.4	.4	2.0	2.0	2.2	3.2
15	.....	.4	.3	.25	2.5	1.2	.4	.4	2.8	2.0	2.2	2.3
16	.....	.3	.3	.25	2.5	1.2	.4	.5	2.8	2.6	2.2	2.3
17	.....	.3	.3	.25	2.5	1.0	.4	.6	2.3	2.6	2.2	2.3
18	.....	.3	.3	.25	3.5	1.0	.4	.7	2.6	2.6	2.2	2.3
19	.....	.3	.3	.25	3.0	1.0	.4	.8	2.6	2.5	4.0	2.3
20	.....	.3	.3	.25	2.5	1.0	.4	.8	2.5	2.5	4.0	2.2
21	.....	.3	.3	.25	2.5	1.0	.4	.8	2.3	2.4	4.0	2.2
22	.....	.3	.3	.25	2.5	1.0	.4	.8	2.2	2.4	4.0	2.2
23	.....	.3	.3	.25	2.5	.9	.4	.8	2.2	2.4	4.0	2.2
24	.....	.3	.3	.25	3.2	.9	.4	.8	2.1	2.4	4.0	2.2
25	.....	.3	.3	.25	2.9	.9	.4	.9	2.1	2.4	4.0	2.2
26	.....	.3	.3	.25	2.5	.8	.4	.9	2.0	2.4	4.0	2.2
27	.....	.3	.3	.25	2.5	.8	.4	.9	2.15	2.4	3.6	2.2
28	.....	.3	.3	.25	2.5	.7	.4	.9	2.4	2.4	3.6	2.2
29	.....	.....	.3	.25	2.5	.7	.4	.9	2.4	2.4	3.5	2.2
30	.....	.....	.2	.25	2.5	.5	.4	.9	2.4	2.4	3.4	2.2
31	.....	.....	.....	.....	2.8	.....	.4	.9	.....	2.4	.....	2.3
1902.												
1	2.3	2.3	1.2	.4	.4	.6	.6	3.3	1.95	1.7	.25	.5
2	2.3	2.3	1.2	.4	.4	.9	.5	3.05	2.85	1.2	.35	3.95
3	2.2	2.3	1.2	.4	.4	1.0	1.45	2.65	4.05	1.3	1.0	2.8
4	2.2	2.2	1.1	.4	.4	.9	1.8	2.25	3.9	1.05	1.1	1.0
5	2.2	2.2	1.1	.4	1.8	.8	.95	2.1	3.3	1.8	.8	.5
6	2.2	2.2	1.1	.4	3.65	.7	.75	2.0	3.75	1.45	.6	.3
7	2.2	2.1	1.0	.4	2.6	.65	.6	1.7	3.65	1.0	.5	.3
8	2.2	2.1	1.0	.4	1.85	.6	.55	1.2	3.45	1.1	.65	.35
9	2.2	2.1	1.0	.4	1.7	.6	.5	1.1	3.85	.95	.75	.4
10	2.2	2.0	.9	.4	1.3	.6	.5	1.3	4.95	.7	.6	.4
11	2.2	2.0	.9	.4	.95	.5	.6	1.05	6.3	.6	.5	.35
12	2.2	2.0	.8	.4	.85	.5	.7	.9	6.25	.5	.5	.4
13	2.2	1.9	.8	.4	.8	.5	1.0	.8	5.4	.5	.5	.4
14	2.2	1.9	.7	.4	.75	.5	1.4	.7	4.95	.65	.5	.4
15	2.2	1.9	.7	.4	.7	.6	1.65	.6	4.35	1.05	.5	.4
16	2.2	1.7	.6	.4	.6	.7	2.95	2.8	3.65	1.6	.4	.3
17	2.2	1.7	.6	1.35	.6	.8	2.45	2.1	3.15	.95	.7	.3
18	2.2	1.7	.5	1.15	.6	.7	1.95	1.7	2.65	1.2	1.0	.3
19	2.2	1.7	.5	.85	2.35	.65	1.85	1.7	3.05	.4	.8	.3
20	2.2	1.6	.5	.75	4.6	.7	1.85	1.65	3.25	.4	.6	.2
21	2.2	1.6	.5	.7	2.8	.65	1.85	1.5	2.15	.4	.4	.2
22	2.3	1.6	.5	.65	1.65	.6	1.7	1.5	1.8	.4	1.0	.2
23	2.3	1.4	.5	.6	1.25	.85	1.7	1.45	2.25	.4	.8	.3
24	2.3	1.4	.5	.5	1.05	1.0	1.85	1.4	2.3	.4	.5	.3
25	2.3	1.4	.5	.45	1.0	.9	2.2	1.4	1.6	.4	.35	.3
26	2.3	1.3	.5	.4	.9	.75	3.0	1.3	1.3	.4	.2	.3
27	2.3	1.3	.5	.4	.85	.65	5.5	1.6	1.25	.4	.3	.3
28	2.3	1.3	.45	.4	.8	.6	4.7	2.45	1.0	.4	.3	.3
29	2.3	.....	.4	.4	.8	.7	3.7	2.45	.95	.4	.3	.3
30	2.3	.....	.4	.4	.7	.7	3.6	2.0	1.8	.3	.3	.3
31	2.3	.....	.4	.....	.7	.....	3.95	1.7	.....	.3	.....	.3

Daily gage height, in feet, of Rio Grande near Laredo, Tex., for 1903–4 and 1907–8.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	0.3	0.4	.....	.....	.....	.....	.....	3.75	2.9	2.85	2.4	1.9
2	.2	.4	.....	.....	.....	.....	.....	3.95	2.9	3.7	2.4	1.9
3	.2	.3	.....	.....	.....	.....	.....	3.05	3.2	3.05	2.1	1.8
4	.2	.3	.....	.....	.....	.....	.....	2.65	3.45	3.9	2.1	1.8
5	.2	.4	.....	.....	.....	.....	.....	2.45	3.85	4.15	2.05	1.8
6	.2	.4	.....	.....	.....	.....	.....	2.2	3.8	4.1	2.0	1.8
7	.2	.4	.....	.....	.....	.....	.....	2.4	3.75	3.7	2.0	1.8
8	.2	.4	.....	.....	.....	.....	.....	2.8	3.8	3.55	2.0	1.8
9	.2	.4	.....	.....	.....	.....	.....	2.75	3.5	3.4	2.0	1.8
10	.2	.5	.....	.....	.....	.....	.....	2.35	9.5	2.8	2.0	1.8
11	.2	.45	.....	.....	.....	.....	.....	2.15	6.6	2.85	2.0	1.8
12	.25	.4	.....	.....	.....	.....	.....	2.1	6.95	2.9	2.0	1.8
13	.3	.4	.....	.....	.....	.....	.....	2.3	3.7	2.8	2.0	1.8
14	.4	.5	.....	.....	.....	.....	.....	2.25	2.3	2.8	2.0	1.8
15	.4	.4	.....	.....	.....	.....	.....	2.4	2.3	2.8	2.0	1.8
16	.4	.9	.....	.....	.....	.....	.....	2.5	2.6	2.8	2.0	1.8
17	.1	.9	.....	.....	.....	.....	.....	2.45	2.7	2.8	2.0	1.8
18	.75	.9	.....	.....	.....	.....	.....	2.4	3.6	2.6	1.9	1.8
19	.45	.8	.....	.....	.....	.....	.....	2.45	2.85	2.6	1.9	1.7
20	.45	.8	.....	.....	.....	.....	.....	2.4	2.7	2.55	1.9	1.7
21	.45	.6	.....	.....	.....	.....	.....	2.3	2.6	2.5	1.9	1.7
22	.4	.6	.....	.....	.....	.....	.....	2.2	2.6	2.5	2.0	1.7
23	.4	.6	.....	.....	.....	.....	.....	2.4	2.65	2.5	1.95	1.7
24	.4	.6	.....	.....	.....	.....	.....	2.3	2.75	2.45	1.9	1.7
25	.4	.7	.....	.....	.....	.....	.....	3.15	2.75	2.4	1.9	1.7
26	.4	1.6	.....	.....	.....	.....	.....	3.35	2.6	2.45	1.9	1.7
27	.4	1.75	.....	.....	.....	.....	.....	3.05	3.0	2.5	1.9	1.7
28	.4	.85	.....	.....	.....	.....	.....	2.8	3.1	2.95	1.9	1.7
29	.4	.....	.....	.....	.....	.....	.....	2.55	4.45	2.6	1.9	1.7
30	.4	.....	.....	.....	.....	.....	.....	2.6	3.6	2.4	1.9	1.7
31	.4	.....	.....	.....	.....	.....	.....	3.5	.....	2.4	.....	1.7
1904.												
1	1.7	1.5	1.45	1.3	1.5	3.25	5.3	1.6	1.75	5.1	5.75	2.5
2	1.7	1.5	1.4	4.0	1.5	2.8	4.1	1.55	1.95	5.2	5.95	2.4
3	1.7	1.5	1.4	4.2	1.3	2.35	3.65	1.5	1.9	5.35	5.8	2.4
4	1.7	1.5	1.4	3.3	1.3	2.2	2.85	1.45	1.85	4.9	5.45	2.4
5	1.7	1.5	1.45	2.45	1.35	1.9	2.4	1.4	2.4	4.7	5.05	2.35
6	1.7	1.5	1.5	1.95	1.2	1.9	2.3	1.35	2.35	4.7	4.8	2.4
7	1.7	1.5	1.5	1.55	1.2	2.05	2.15	1.3	2.45	4.3	4.55	2.45
8	1.7	1.5	1.45	1.5	1.2	2.5	2.05	1.3	7.5	4.0	4.55	2.75
9	1.7	1.5	1.3	1.4	1.25	3.55	1.9	1.45	7.15	4.0	4.65	3.5
10	1.7	1.5	1.3	1.35	1.35	3.4	1.8	1.5	8.45	3.9	4.55	3.55
11	1.7	1.85	1.3	1.3	1.2	2.9	1.65	1.55	7.0	4.05	4.25	3.3
12	1.6	1.65	1.3	1.3	1.2	2.35	1.7	1.6	9.8	4.2	4.1	3.1
13	1.6	1.55	1.3	1.3	1.2	3.55	1.65	1.5	15.8	4.4	3.9	3.2
14	1.6	1.5	1.3	1.3	3.95	3.4	1.65	1.6	15.65	5.4	3.65	3.15
15	1.6	1.5	1.3	1.3	2.65	3.0	1.5	1.55	20.75	6.9	3.6	2.95
16	1.6	1.5	1.3	1.3	2.1	2.7	1.35	1.5	24.25	8.95	3.45	2.8
17	1.6	1.45	1.3	1.3	2.4	2.65	1.3	1.4	25.0	8.35	3.05	2.9
18	1.6	1.4	1.3	1.3	1.65	2.35	1.3	1.4	18.25	8.4	2.95	2.9
19	1.6	1.4	1.3	1.3	1.35	2.05	1.3	1.35	8.1	8.35	3.2	2.9
20	1.6	1.45	1.3	1.3	1.2	1.95	1.3	1.2	7.0	8.7	3.15	2.9
21	1.6	1.5	1.3	1.3	1.1	2.45	1.25	1.2	8.5	9.05	3.0	2.95
22	1.6	1.5	1.3	1.3	1.0	2.15	1.2	1.0	9.95	8.35	2.95	2.9
23	1.6	1.5	1.3	1.3	1.0	1.9	1.25	1.0	14.0	8.05	2.8	2.9
24	1.6	1.5	1.3	1.3	.95	2.25	1.4	1.1	12.1	8.05	2.7	2.85
25	1.6	1.5	1.3	1.55	.9	2.65	1.85	1.2	10.5	7.7	2.7	2.75
26	1.6	1.5	1.3	1.5	.9	2.4	3.5	1.3	7.9	7.45	2.75	2.65
27	1.5	1.5	1.3	1.3	2.0	2.2	2.5	1.2	8.0	6.9	2.65	2.5
28	1.5	1.5	1.3	1.35	1.85	2.0	1.9	1.15	7.1	6.4	2.6	2.4
29	1.5	1.5	1.3	1.5	2.25	6.7	1.75	1.2	6.8	6.05	2.6	2.4
30	1.5	.....	1.3	1.75	2.75	8.8	1.55	1.3	5.8	5.55	2.5	2.35
31	1.5	.....	1.3	.....	4.7	.....	1.55	1.4	.....	5.25	.....	2.3

Daily gage height, in feet, of Rio Grande near Laredo, Tex., for 1903–4 and 1907–8—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	3.9	3.85	3.5	3.0	4.4	4.0	5.0	4.45	4.2	5.3	4.5	4.4
2	3.9	3.9	3.4	3.0	4.4	4.0	5.05	4.4	4.15	5.15	4.5	4.4
3	3.85	3.9	3.4	3.1	4.4	4.0	5.75	4.4	4.2	4.85	4.25	4.3
4	3.8	3.8	3.45	3.05	4.45	4.25	5.4	4.35	4.8	4.6	4.65	5.65
5	3.8	3.8	3.4	3.0	4.4	4.2	5.25	4.35	5.75	4.55	4.8	7.75
6	3.8	3.9	3.4	3.05	4.35	4.3	5.2	4.2	5.3	5.5	5.0	6.85
7	3.8	4.0	3.45	3.1	4.4	4.0	5.3	4.25	5.85	6.15	5.05	6.35
8	3.8	4.0	3.4	3.2	4.35	4.1	6.0	4.3	6.1	4.7	4.95	6.0
9	3.8	3.95	3.4	3.25	4.25	4.35	5.25	4.35	6.05	4.6	4.9	5.75
10	3.85	3.95	3.3	3.3	4.1	4.45	5.0	4.35	6.75	4.45	8.1	5.6
11	3.85	3.75	3.3	3.3	4.05	4.6	4.95	4.0	6.5	4.25	9.55	5.55
12	3.9	3.7	3.3	3.3	4.2	4.7	5.0	4.0	6.85	4.0	7.2	5.5
13	3.8	3.8	3.3	3.3	4.1	5.0	5.05	4.0	7.2	4.0	6.65	5.5
14	3.8	3.7	3.3	3.2	4.1	5.0	5.1	4.0	6.0	4.0	6.15	5.35
15	3.8	3.6	3.2	3.25	4.0	4.7	5.45	4.05	5.35	4.0	5.6	5.2
16	3.8	3.6	3.3	3.3	4.0	4.65	5.25	4.05	5.3	4.0	5.4	5.05
17	3.8	3.6	3.2	3.25	4.05	5.2	5.2	4.05	5.05	4.0	5.0	4.9
18	3.8	3.6	3.3	3.5	4.0	5.3	5.35	4.0	5.1	4.0	5.0	4.65
19	3.85	3.65	3.2	3.35	4.0	5.05	4.85	4.0	5.5	4.0	5.0	4.6
20	3.85	3.6	3.2	3.25	4.1	5.7	4.8	3.9	5.2	4.0	4.85	4.5
21	3.8	3.65	3.2	3.2	4.1	5.15	4.6	3.8	6.55	4.0	4.45	4.5
22	3.8	3.7	3.1	3.15	4.0	5.25	4.5	3.7	7.6	4.0	4.35	4.5
23	3.8	3.7	3.05	3.1	4.0	5.3	4.4	3.65	7.2	3.95	4.4	4.4
24	3.8	3.7	3.0	3.05	4.0	5.35	4.5	3.6	6.85	3.8	4.4	4.35
25	3.8	3.7	3.0	3.0	3.8	5.35	4.5	3.55	6.15	3.85	4.4	4.3
26	3.75	3.6	3.05	3.0	4.0	5.35	4.55	3.4	5.6	3.9	4.35	4.3
27	3.8	3.6	3.0	3.1	4.2	5.0	4.5	3.35	5.55	4.2	4.35	4.3
28	3.8	3.5	2.95	3.15	4.25	5.0	4.5	3.4	5.35	4.45	4.4	4.3
29	3.8	.....	2.95	3.85	4.05	4.95	4.4	3.9	5.35	4.8	4.4	4.2
30	3.8	.....	3.05	4.7	3.9	5.0	4.5	4.45	5.35	4.75	4.4	4.2
31	3.8	.....	3.1	.....	4.05	.....	4.45	4.3	.....	5.55	.....	4.2
1908.												
1	4.15	3.2	3.05	2.6	3.0	3.7	2.4	6.3	5.5	3.8	2.8	2.6
2	4.1	3.2	3.1	2.6	2.9	3.5	2.4	6.05	5.8	3.9	2.8	2.5
3	4.05	3.2	3.1	2.6	3.2	3.45	2.55	4.95	6.5	3.7	2.75	2.5
4	4.0	3.2	3.1	2.6	3.35	3.35	2.5	3.7	7.65	3.65	2.65	2.5
5	4.0	3.3	3.1	2.6	3.5	3.5	2.2	2.95	8.8	3.6	2.55	2.5
6	4.05	3.2	3.05	2.6	3.5	3.55	2.35	8.75	8.5	3.5	2.5	2.4
7	4.1	3.2	3.05	2.6	3.45	3.6	2.25	8.15	8.45	3.5	2.5	2.35
8	4.1	3.2	3.0	2.6	3.4	3.65	2.4	5.35	8.25	4.0	2.4	2.3
9	4.1	3.2	3.1	2.6	3.35	3.6	7.9	5.5	8.6	3.5	2.4	2.4
10	4.1	3.2	3.1	2.6	3.3	3.4	4.45	5.8	7.5	3.75	2.35	2.5
11	3.95	3.2	3.1	2.9	3.3	3.25	3.75	5.7	5.5	3.8	2.25	2.5
12	3.9	3.2	3.05	5.3	3.3	3.3	3.45	5.15	4.55	3.55	2.25	2.5
13	3.9	3.2	3.0	4.8	3.3	3.2	3.4	4.85	4.35	3.55	2.65	2.5
14	3.8	3.15	2.9	3.95	5.65	3.3	3.5	5.85	5.3	3.4	2.65	2.45
15	3.8	3.1	2.9	3.55	4.85	3.1	3.3	9.3	5.65	3.2	2.5	2.7
16	3.8	3.1	2.9	6.2	3.6	2.9	3.05	10.6	6.25	3.1	2.5	2.7
17	3.8	3.1	2.9	4.6	3.2	2.95	2.95	8.2	5.65	3.0	2.4	2.65
18	3.8	3.1	2.9	3.9	3.2	2.8	2.7	5.45	5.35	3.1	2.35	2.6
19	3.7	3.1	2.9	3.4	3.1	2.7	2.55	5.0	5.0	3.15	2.2	2.6
20	3.7	3.1	2.9	5.25	3.3	2.7	2.45	4.6	4.8	3.3	2.1	2.65
21	3.7	3.1	2.8	10.5	3.2	2.6	2.4	4.6	4.35	3.3	2.15	2.9
22	3.7	3.1	2.8	7.3	3.25	2.55	2.35	4.95	4.3	3.25	2.2	2.8
23	3.7	3.1	2.7	6.75	3.3	2.35	2.35	5.0	4.1	3.55	2.3	2.6
24	3.7	3.0	2.7	4.95	4.05	2.35	2.7	4.9	4.1	3.2	2.3	2.6
25	3.8	3.0	2.7	3.5	10.3	2.5	2.5	5.2	4.0	2.9	2.3	2.5
26	3.7	3.0	2.7	3.15	5.85	2.5	2.35	5.3	4.0	2.85	2.2	2.6
27	3.6	3.0	2.7	3.0	4.65	2.55	3.6	5.4	3.95	2.8	2.35	2.45
28	3.5	3.0	2.65	3.0	4.1	2.75	5.2	5.6	3.8	2.8	2.45	2.45
29	3.4	3.0	2.6	3.0	3.9	2.9	3.7	4.9	3.75	2.75	2.5	2.5
30	3.2	.....	2.6	3.0	3.9	2.6	3.15	5.4	3.8	2.7	2.6	2.45
31	3.2	.....	2.6	.....	3.85	.....	4.25	6.05	.....	2.7	.....	2.4

RIO GRANDE NEAR ROMA, TEX.

The station was established in 1900 by the International Boundary Commission. It is near Roma, Tex., 775 miles by river below El Paso.

The right bank is alluvial deposit and overflows in high water for a width of 250 feet. The overflow section is thickly covered with mesquite brush. The left bank is of hard material and does not overflow.

The river bed is constantly shifting and frequent discharge measurements are necessary to determine closely the daily discharge. The section is subject to overflow at high water.

The highest recorded flood, September 16, 1904, marked 26 feet on the gage.

The observations at this station have been made under the direction of the Mexican section of the International Boundary Commission.

Discharge measurements and gage heights for the years 1900 to 1904, which have not hitherto been published by the United States Geological Survey, are given herewith, together with those for 1907–8.

Discharge measurements of Rio Grande near Roma, Tex., in 1900.

[By S. P. Vale.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
September 9	3,359	6.45	16,489	November 11	1,813	4.5	5,262
September 13	2,059	4.6	6,661	November 14	1,811	4.4	5,097
September 17	2,645	5.6	8,914	November 17	1,815	4.4	5,101
September 22	2,330	4.95	7,209	November 21	1,829	4.4	5,100
September 26	6,624	12.9	43,626	November 24	1,812	4.4	5,128
September 29	3,055	5.85	12,443	November 28	1,714	4.2	4,532
October 4	2,650	6.2	10,026	December 1	1,680	4.1	3,951
October 8	2,576	5.8	9,168	December 5	1,609	4.1	4,015
October 16	2,493	5.1	7,515	December 8	1,603	4.1	4,032
October 19	2,377	5.0	7,177	December 13	1,699	4.1	3,992
October 24	2,524	5.7	9,744	December 17	1,727	4.1	4,174
October 26	2,484	5.4	8,011	December 21	1,592	4.0	3,895
October 30	2,816	6.3	12,021	December 25	1,531	3.9	3,588
November 3	1,994	4.9	6,554	December 29	1,495	3.9	3,420
November 7	1,936	4.7	6,040				

NOTE.—Discharge measurements for 1900 complete so far as Mexican records exist.

Discharge measurements of Rio Grande near Roma, Tex., in 1901.

[By S. P. Vale.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	1,568	4.0	3,211	July 10	981	2.9	1,828
January 7	1,563	3.9	3,218	July 14	968	2.9	1,556
January 11	1,525	3.9	3,344	July 18	854	2.7	1,435
January 15	1,471	3.8	3,280	July 21	846	2.8	1,521
January 19	1,453	3.7	3.011	July 26	1,122	3.3	2,049
January 23	1,460	3.8	3.062	July 30	1,447	4.0	2,779
January 26	1,561	4.0	3,298	August 3	1,579	4.2	3,095
January 30	1,518	3.9	3,131	August 7	1,873	4.6	3,707
February 3	1,503	3.9	2,901	August 11	1,925	4.7	4,048
February 7	1,552	3.9	2,989	August 15	1,766	4.6	3,916
February 11	1,539	3.8	2,886	August 20	1,408	3.9	2,898
February 15	1,480	3.7	2,859	August 25	1,360	4.4	3,691
February 19	1,556	3.7	2,722	August 29	1,552	4.3	3,513
February 23	1,482	3.6	2,600	September 1	1,264	3.5	2,532
February 27	1,380	3.5	2,572	September 7	1,394	3.7	3,576
March 3	1,510	3.8	3,080	September 10	1,128	3.35	2,734
March 8	1,349	3.6	2,620	September 11	2,884	7.6	14,332
March 12	1,314	3.5	2,573	September 16	1,268	4.1	3,225
March 16	1,184	3.4	2,413	September 20	1,546	4.15	4,186
March 20	1,152	3.2	2,150	September 24	1,995	5.25	8,075
March 24	1,052	3.1	2,098	September 28	1,810	4.55	5,575
March 28	1,014	3.0	1,908	October 2	1,412	3.8	3,520
April 10	1,016	2.8	1,974	October 7	1,152	3.6	2,816
April 14	1,127	2.9	2,062	October 11	1,236	3.6	2,919
April 17	1,087	2.8	2,123	October 13	1,946	5.25	7,834
April 20	1,159	2.7	2,011	October 15	1,402	3.8	3,568
April 23	1,078	2.6	1,786	October 20	1,270	3.5	2,441
April 27	1,048	2.6	1,729	October 24	1,326	3.5	2,977
April 29	1,059	2.5	1,761	October 29	1,443	4.0	3,866
May 3	2,599	5.8	11,080	November 4	1,779	4.45	5,392
May 9	1,962	5.35	8,778	November 8	1,490	4.05	4,481
May 14	1,332	3.8	3,348	November 12	1,560	3.9	4,243
May 18	1,191	3.6	2,807	November 17	1,658	4.2	4,602
May 22	1,270	3.6	3,027	November 21	1,602	4.2	4,616
May 26	2,382	6.6	10,206	November 25	1,372	3.7	3,570
May 30	1,422	3.8	3,479	November 29	1,946	5.0	6,564
June 4	1,513	4.2	4,040	December 4	1,441	3.8	3,143
June 8	1,532	4.0	3,734	December 9	1,448	3.7	3,044
June 12	1,554	4.15	3,861	December 13	1,326	3.55	2,732
June 16	1,479	4.0	3,177	December 18	1,242	3.4	2,524
June 20	1,638	4.0	3,010	December 22	1,164	3.35	2,432
June 25	1,204	3.3	2,290	December 26	1,153	3.25	2,427
June 30	2,518	5.9	10,044	December 31	1,149	3.2	2,058
July 4	1,220	3.2	2,275				

Discharge measurements of Rio Grande near Roma, Tex., in 1902.

[By S. P. Vale and A. Argándar.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	1,178	3.1	2,190	July 9	794	2.4	1,408
January 8	1,165	3.1	2,156	July 12	707	2.1	1,231
January 13	1,269	3.4	2,401	July 17	1,817	5.4	[a] 7,113
January 17	1,340	3.5	2,540	July 21	1,344	3.45	3,681
January 22	1,294	3.2	2,218	July 26	1,444	3.85	3,831
January 26	1,292	3.0	2,095	July 29	4,111	10.1	[b] 29,847
January 30	1,260	2.9	1,922	August 4	2,196	5.8	9,511
February 5	1,259	2.9	2,100	August 8	1,811	4.9	6,667
February 9	1,274	3.0	2,139	August 13	1,507	4.0	3,823
February 13	1,292	2.95	2,071	August 16	1,506	4.0	3,198
February 17	1,029	2.9	1,951	Do. [c]	1,504	4.0	3,301
February 21	1,061	2.8	1,820	August 22	2,205	4.7	6,034
February 26	978	2.7	1,888	August 26	2,042	4.8	5,745
March 3	1,098	2.6	1,743	September 3 [c]	2,651	6.2	10,788
March 8	941	2.3	1,565	September 7	2,256	5.4	9,108
March 12	912	2.2	1,509	September 11	3,624	8.75	21,363
March 17	879	2.2	1,460	September 13	4,381	10.1	28,188
March 19	832	2.1	1,370	September 17	2,912	7.0	14,155
March 23	707	2.0	1,304	September 21	3,178	7.5	15,435
March 27	716	2.1	1,385	September 25	2,443	5.8	7,390
March 31	701	1.9	1,324	September 29	1,452	4.2	3,995
April 4	687	1.8	1,308	October 3	2,916	7.75	15,055
April 9	694	1.9	1,339	October 7	1,568	4.4	4,746
April 13	659	1.8	1,243	October 11	1,338	3.6	2,512
April 15	1,758	4.3	[a] 4,932	October 15	2,671	7.0	13,161
April 22	1,265	2.8	1,941	October 16	3,497	9.1	21,161
April 27	913	2.0	1,380	October 21	1,495	4.2	4,394
May 4	733	1.8	1,162	October 26	1,146	3.3	2,666
May 6	3,592	8.4	[a] 19,833	October 30	993	3.1	2,280
May 10	1,350	3.95	4,378	November 4	1,408	3.8	3,943
May 19	801	2.5	1,573	November 12	1,335	3.3	3,679
May 21	3,325	8.5	[a] 21,184	November 16	1,271	2.9	3,379
May 26	854	3.2	2,283	November 20	1,131	2.6	2,700
May 31	785	2.9	1,764	November 24	1,432	3.8	4,125
June 3	675	2.5	1,411	November 28	1,253	3.1	3,379
June 6	890	3.0	1,982	December 4	2,324	5.8	7,135
June 11	671	2.3	1,339	December 9	1,486	4.3	4,431
Do	671	2.3	1,453	December 13	1,208	2.9	2,338
June 16	608	2.0	1,118	December 17	1,212	2.9	2,394
June 20	723	2.5	1,459	December 21	1,129	2.8	2,084
June 25	837	2.8	1,776	December 25	1,107	2.8	1,908
June 29	760	2.4	1,429	December 31	1,019	2.8	1,642
July 5	1,257	4.0	3,717				

[a] Measurements April 15, May 6 and 21, July 17, 1902, made by floats.
[b] Measurement July 29, 1902, made by floats. Maximum gage height 11.5 feet.
[c] Extra measurement on August 16 and measurement on September 3, 1902, made by E. Zayas.

Discharge measurements of Rio Grande near Roma, Tex., in 1903.

[By A. Argándar and H. P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 5	992	2.7	1,535	August 4	2,309	5.3	10,104
January 9	982	2.7	1,410	August 8	1,335	3.3	4,124
January 17	1,008	3.0	1,619	August 11	1,235	3.4	4,164
January 21	989	2.9	1,499	August 15	1,256	3.2	3,668
January 25	967	2.9	1,476	August 18	1,685	4.3	5,432
January 29	977	2.7	1,426	August 20	1,656	4.0	5,077
January 31	957	2.7	1,446	August 22	1,623	3.5	3,766
February 4	944	2.7	1,450	September 3	2,170	4.2	4,964
February 8	975	2.8	1,519	September 7	2,645	5.6	8,077
February 12	939	2.6	1,370	September 12	3,520	7.55	15,731
February 17	927	2.4	1,231	September 15	1,757	3.8	5,606
February 18	1,424	2.7	3,938	September 21	1,684	3.7	5,304
February 20	1,316	3.2	3,658	September 25	1,763	3.5	4,665
February 24	1,296	3.0	3,508	September 29	2,358	3.9	4,881
February 28	1,282	3.1	3,481	October 7	3,550	5.9	11,151
May 5	1,554	3.2	3,631	October 13	2,667	3.8	6,704
May 8	1,279	2.7	2,569	October 17	2,435	3.6	5,942
May 12	1,363	2.9	3,473	October 20	1,947	2.7	4,189
May 15	2,598	5.5	13,121	October 24	1,778	2.5	3,901
May 20	2,442	5.4	10,750	October 27	1,683	2.4	3,808
May 23	1,481	3.4	3,915	October 31	1,661	2.3	3,601
May 26	1,666	3.7	4,723	November 3	1,468	2.0	3,108
June 2	1,667	3.85	4,109	November 6	1,429	1.9	3,006
June 5	1,834	4.1	6,293	November 10	1,313	1.7	2,650
June 9	1,415	3.2	3,198	November 13	1,299	1.7	2,691
June 18	5,849	11.6	33,972	November 17	1,311	1.7	2,648
June 20	4,195	8.4	19,099	November 21	1,284	1.6	2,605
June 23	3,516	7.1	12,600	November 26	1,252	1.5	2,568
June 26	3,658	6.8	13,329	December 1	1,250	1.5	2,593
July 3	3,517	5.8	10,263	December 4	1,242	1.5	2,586
July 7	4,776	8.6	27,358	December 8	1,143	1.4	2,398
July 10	3,078	5.3	10,966	December 11	1,135	1.4	2,384
July 14	3,657	5.9	12,415	December 15	1,131	1.4	2,488
July 18	2,824	5.1	9,799	December 18	1,172	1.4	2,352
July 22	2,435	4.1	6,915	December 26	1,182	1.4	2,291

NOTE.—No discharge measurements made in March and April, 1903.

Discharge measurements of Rio Grande near Roma, Tex., in 1904.

[By H. P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	1,173	1.4	2,263	July 1	4,231	9.7	24,299
January 5	1,091	1.4	2,081	July 6	1,393	3.3	4,186
January 8	1,106	1.4	2,137	July 9	1,262	3.2	2,897
January 12	1,093	1.5	2,283	July 13	1,104	2.6	2,285
January 15	1,094	1.4	2,269	July 18	917	2.0	1,651
January 20	1,066	1.4	2,211	July 22	871	1.9	1,517
January 23	1,058	1.3	2,171	July 26	1,232	2.9	2,878
February 2	989	1.5	2,020	August 1	1,129	2.4	1,736
February 5	983	1.5	2,016	August 4	1,037	2.4	1,828
February 9	967	1.4	1,915	August 8	968	1.9	1,665
February 12	1,104	1.9	2,201	August 10	1,026	2.1	1,850
February 23	925	1.4	1,939	August 15	1,018	2.2	2,058
February 26	945	1.5	1,972	August 19	929	1.7	1,655
February 29	917	1.4	1,931	August 23	872	1.5	1,566
March 4	908	1.3	1,839	September 6	1,502	3.0	3,492
March 8	845	1.2	1,626	September 8	3,339	7.6	18,414
March 11	829	1.1	1,564	September 13	6,695	15.8	46,893
March 15	827	1.1	1,574	September 20	6,763	14.0	29,100
March 18	782	1.0	1,483	September 24	7,445	15.3	34,869
March 22	803	1.0	1,678	September 27	5,450	10.7	23,203
March 25	803	.9	1,461	September 30	5,045	9.1	20,304
April 5	2,217	3.9	7,767	October 7	4,779	7.3	18,912
April 8	1,460	2.3	2,552	October 11	3,892	6.2	15,235
April 12	1,059	1.4	1,581	October 14	4,496	6.9	17,081
April 15	911	1.2	1,397	October 18	5,495	9.4	26,139
April 19	765	1.0	1,243	October 20	5,649	9.7	28,661
April 22	843	1.2	1,470	October 28	5,071	8.4	22,373
April 26	724	.9	1,171	October 31	3,830	7.1	17,163
May 3	809	1.2	1,329	November 4	4,062	7.4	18,132
May 9	2,849	5.65	13,461	November 9	3,759	6.3	12,944
May 13	1,002	1.5	1,300	November 15	2,969	5.3	11,136
May 16	3,490	6.95	14,058	November 18	2,786	5.0	10,159
May 20	1,445	2.8	2,851	November 22	2,606	4.7	8,561
May 24	963	1.8	1,428	November 25	2,531	4.5	7,743
May 27	834	1.6	1,264	November 28	2,447	4.6	7,797
June 1	2,407	5.0	8,959	December 2	2,167	4.1	6,716
June 6	3,791	8.6	23,287	December 6	3,017	4.5	7,702
June 9	1,937	4.1	5,855	December 9	3,215	4.4	7,338
June 14	1,938	4.3	5,969	December 16	3,160	4.6	8,036
June 17	1,518	3.3	3,569	December 21	2,655	4.8	9,063
June 21	1,456	3.2	3,266	December 26	2,620	4.5	8,434
June 24	1,375	2.9	2,685	December 28	2,866	4.4	7,508

Discharge measurements of Rio Grande near Roma, Tex., in 1907.

[By H. P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	2,349	5.4	5,605	July 12	2,141	5.3	5,173
January 7	2,181	5.0	4,827	July 17	2,663	6.3	7,357
January 14	2,126	4.9	4,550	July 21	2,447	5.6	5,725
January 19	2,090	4.8	4,304	July 25	2,037	5.2	4,971
January 26	2,216	5.1	4,961	July 29	2,066	4.9	4,506
February 2	2,187	5.0	4,956	August 2	2,184	5.0	4,894
February 5	2,319	5.3	5,648	August 6	2,595	5.3	5,828
February 11	2,063	4.8	4,525	August 24	1,983	3.8	4,429
February 14	1,976	4.6	4,165	August 28	1,719	3.1	3,705
February 23	1,913	4.4	3,820	August 31	2,414	5.2	5,533
March 2	1,832	4.2	3,107	September 2	2,323	4.9	5,007
March 5	1,701	4.0	3,000	September 6	2,856	6.2	11,201
March 12	1,588	3.7	2,998	September 10	2,892	6.1	10,279
March 19	1,540	3.5	2,648	September 14	3,199	7.1	13,467
March 26	1,456	3.3	2,444	September 18	2,666	5.5	7,877
April 2	1,537	2.9	2,598	September 24	3,380	7.3	15,489
April 8	1,278	2.4	2,299	September 28	2,741	5.9	9,256
April 12	1,744	3.0	3,102	October 2	2,619	5.7	8,231
April 15	1,541	2.9	2,611	October 7	3,350	7.3	13,883
April 20	1,507	2.85	2,568	October 11	2,174	5.0	4,931
April 29	1,412	2.7	2,358	October 15	2,315	4.7	4,048
May 3	2,407	4.7	5,056	October 19	2,084	4.3	3,304
May 7	2,883	5.1	5,609	October 24	2,180	5.0	4,912
May 11	2,097	4.5	5,019	October 29	2,405	5.5	5,812
May 16	2,030	4.1	3,807	November 2	2,182	5.0	4,943
May 25	2,425	4.3	4,160	November 6	2,736	5.9	6,841
May 27	5,390	10.6	32,091	November 11	3,796	8.3	17,336
May 30	2,631	4.5	4,991	November 15	2,851	6.5	10,588
June 3	1,932	4.0	3,904	November 20	2,505	5.6	6,071
June 7	2,023	4.7	4,193	November 25	2,576	5.3	5,738
June 11	2,166	5.0	4,560	November 29	2,449	5.2	5,354
June 15	2,671	5.9	6,511	December 2	2,459	5.2	5,479
June 19	2,503	5.7	5,863	December 6	3,487	8.0	15,328
June 24	2,355	5.6	5,765	December 11	2,872	6.1	10,305
June 28	2,300	5.4	5,456	December 15	2,620	5.8	6,240
July 2	2,368	5.5	5,592	December 20	2,254	5.4	5,347
July 4	4,948	11.3	21,054	December 24	2,243	5.0	5,065
July 8	4,051	9.0	12,315	December 30	2,236	4.9	4,888

Discharge measurements of Rio Grande near Roma, Tex., in 1908.

[By H. P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	2,330	5.0	5,303	July 7	2,408	5.0	4,795
January 6	2,334	5.0	5,336	July 10	2,901	6.5	9,761
January 11	2,166	4.8	4,724	July 14	2,616	6.0	7,878
January 15	2,011	4.6	4,137	July 18	1,675	3.0	2,186
January 20	1,925	4.4	3,758	July 22	1,643	2.9	2,130
January 24	1,867	4.3	3,670	July 26	2,000	3.7	2,894
January 30	1,727	3.7	3,203	July 30	2,896	5.9	8,274
February 1	1,879	4.2	3,568	August 2	2,976	6.0	8,256
February 5	1,811	3.7	3,292	August 7	4,646	10.0	19,689
February 10	1,788	3.6	3,202	August 11	3,413	7.2	14,417
February 14	1,755	3.4	3,073	August 15	3,585	8.2	16,987
February 19	1,730	3.3	3,019	August 19	3,420	7.6	15,818
February 23	1,736	3.3	3,037	August 23	3,333	7.1	13,796
February 28	1,678	3.2	3,033	August 27	2,991	6.3	10,067
March 2	1,674	3.2	3,020	August 30	2,928	6.0	8,535
March 6	1,592	2.8	2,791	September 2	3,012	6.4	10,207
March 10	1,493	2.6	2,524	September 6	4,705	11.0	21,033
March 14	1,419	2.5	2,380	September 10	3,987	8.6	18,717
March 18	1,423	2.3	2,372	September 14	3,415	7.3	15,070
March 22	1,395	2.3	2,220	September 18	3,293	7.0	13,443
March 26	1,299	2.3	2,041	September 22	2,519	5.5	7,085
March 30	1,191	2.2	1,766	September 26	2,212	4.8	4,820
April 2	1,147	2.0	1,723	September 29	2,126	4.4	3,493
April 7	1,146	2.0	1,769	October 2	2,003	4.0	3,205
April 11	2,077	5.2	5,074	October 6	1,957	3.9	3,114
April 13	3,419	7.2	14,439	October 10	2,227	4.8	4,885
April 17	2,536	5.2	7,347	October 14	1,906	3.7	3,007
April 21	5,994	13.0	31,249	October 18	1,696	3.3	2,540
April 24	2,594	6.0	8,185	October 23	4,663	11.0	21,092
April 29	1,208	3.7	2,761	October 26	1,820	3.5	2,920
May 2	1,148	3.3	2,470	October 30	1,788	3.4	2,880
May 6	1,145	3.3	2,502	November 2	1,716	3.3	2,760
May 10	1,326	3.9	2,916	November 6	1,561	3.0	2,428
May 15	4,862	11.8	20,812	November 10	1,507	3.0	2,209
May 19	2,685	4.5	4,074	November 14	2,050	4.3	3,372
May 23	2,350	3.7	3,253	November 18	1,542	3.0	2,463
May 26	4,654	10.8	20,616	November 22	1,551	3.0	2,449
May 30	2,130	4.3	3,144	November 26	1,519	3.0	2,389
June 2	2,148	4.4	3,217	November 29	1,451	2.8	2,029
June 6	1,593	3.9	2,030	December 2	1,492	2.9	2,157
June 10	2,146	4.4	3,160	December 6	1,469	2.9	2,132
June 14	1,671	3.5	2,505	December 10	1,472	2.9	2,151
June 18	1,490	2.9	2,223	December 14	1,462	2.9	2,128
June 22	1,424	2.7	2,096	December 18	1,383	2.8	2,071
June 26	1,393	2.6	2,000	December 22	1,395	2.8	2,066
June 29	1,886	3.7	2,732	December 26	1,361	2.8	2,065
July 2	1,697	3.2	2,364	December 30	1,369	2.8	2,063

Daily gage height, in feet, of Rio Grande near Roma, Tex., from 1900 to 1904, 1907, and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.[a]												
1									5.4	6.4	4.9	4.2
2									5.2	7.15	5.0	4.1
3									6.05	6.6	4.85	4.1
4									5.6	6.2	4.85	4.15
5									5.5	6.35	5.05	4.1
6									5.8	6.25	4.75	4.1
7									5.9	6.05	4.7	4.15
8									7.65	5.8	4.6	4.1
9									6.25	5.65	4.6	4.1
10									5.35	5.65	4.55	4.1
11									4.85	5.4	4.5	4.1
12									4.75	5.4	4.55	4.2
13									4.6	5.3	4.5	4.15
14								7.8	4.7	5.15	4.45	4.2
15								7.6	4.95	5.1	4.4	4.15

[a] Gage heights for 1900 complete so far as Mexican records exist.

Daily gage height, in feet, of Rio Grande near Roma, Tex., from 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.												
16	.....	.....	.....	.....	.....	.....	.....	7.1	5.45	5.1	4.4	4.15
17	.....	.....	.....	.....	.....	.....	.....	6.85	5.6	5.0	4.4	4.1
18	.....	.....	.....	.....	.....	.....	.....	6.7	5.35	4.9	4.4	4.1
19	.....	.....	.....	.....	.....	.....	.....	6.4	5.25	5.55	4.45	4.1
20	.....	.....	.....	.....	.....	.....	.....	6.35	5.2	5.7	4.45	4.05
21	.....	.....	.....	.....	.....	.....	.....	6.1	5.1	5.5	4.4	4.0
22	.....	.....	.....	.....	.....	.....	.....	5.9	4.95	5.7	4.4	4.0
23	.....	.....	.....	.....	.....	.....	.....	6.55	4.9	6.3	4.35	4.0
24	.....	.....	.....	.....	.....	.....	.....	6.6	8.95	5.7	4.3	3.9
25	.....	.....	.....	.....	.....	.....	.....	6.4	12.95	5.35	4.25	3.9
26	.....	.....	.....	.....	.....	.....	.....	6.15	12.9	5.35	4.2	3.9
27	.....	.....	.....	.....	.....	.....	.....	5.7	8.45	5.6	4.2	3.95
28	.....	.....	.....	.....	.....	.....	.....	5.3	6.75	5.55	4.2	4.0
29	.....	.....	.....	.....	.....	.....	.....	5.3	5.85	5.35	4.1	4.0
30	.....	.....	.....	.....	.....	.....	.....	5.75	6.2	6.3	4.1	4.0
31	.....	.....	.....	.....	.....	.....	.....	5.5	.....	5.3	.....	3.95
1901.												
1	3.9	3.9	3.55	3.0	4.05	4.0	4.2	4.15	3.55	3.9	5.3	3.55
2	3.95	3.9	3.6	2.9	6.7	3.9	3.55	4.3	3.35	3.8	4.75	3.6
3	4.05	3.9	3.85	2.9	5.7	4.0	3.35	4.25	5.2	3.7	4.6	3.6
4	4.0	3.9	3.8	2.8	4.25	4.35	3.25	4.8	5.2	3.6	4.45	3.65
5	4.05	3.8	3.8	2.8	3.9	4.75	3.05	4.75	4.55	3.7	4.3	3.7
6	4.05	3.9	3.7	2.7	3.8	4.05	2.9	4.6	5.0	3.65	4.1	3.75
7	3.95	3.9	3.65	2.7	3.8	4.0	2.9	4.6	3.8	3.6	4.0	3.75
8	3.95	3.8	3.6	2.8	3.95	4.0	2.9	4.8	3.5	3.65	4.0	3.8
9	3.9	3.8	3.6	2.8	5.65	4.0	3.35	4.75	3.5	3.85	4.0	3.75
10	3.9	3.8	3.55	2.8	6.0	4.0	3.25	4.65	3.35	3.75	4.0	3.7
11	3.9	3.8	3.5	2.9	4.7	4.05	2.95	4.75	7.25	3.6	3.9	3.65
12	4.0	3.8	3.5	2.9	4.2	4.15	2.95	4.8	5.2	4.05	3.95	3.6
13	4.0	3.8	3.5	2.9	4.1	4.2	3.0	4.8	4.85	5.05	4.15	3.55
14	3.85	3.7	3.5	2.9	3.85	4.15	2.9	4.7	4.45	4.8	4.25	3.5
15	3.8	3.7	3.45	2.9	3.7	4.0	2.8	4.65	4.0	3.9	4.2	3.5
16	3.8	3.7	3.4	2.8	3.7	3.95	2.8	4.45	4.15	3.65	4.2	3.45
17	3.85	3.7	3.4	2.75	3.7	3.95	2.75	4.25	4.85	3.55	4.2	3.5
18	3.9	3.7	3.3	2.7	3.6	4.0	2.7	3.9	4.8	3.45	4.2	3.5
19	3.75	3.7	3.3	2.65	4.3	4.1	2.7	4.0	4.65	3.45	4.2	3.45
20	3.8	3.7	3.2	2.6	4.25	4.1	3.05	3.9	4.2	3.5	4.2	3.4
21	3.8	3.65	3.2	2.6	3.95	4.1	2.85	3.75	3.95	3.5	4.15	3.4
22	3.8	3.65	3.2	2.6	3.6	3.85	3.4	3.55	3.95	5.15	4.05	3.4
23	3.8	3.6	3.15	2.6	3.65	3.6	3.8	3.45	4.75	4.05	3.95	3.4
24	3.9	3.6	3.1	2.6	3.7	3.35	3.6	3.95	5.1	3.55	3.85	3.3
25	3.95	3.6	3.1	2.6	3.95	3.25	3.3	4.5	5.0	4.25	3.75	3.3
26	4.0	3.5	3.05	2.6	6.6	3.15	3.35	4.7	5.35	4.0	3.65	3.25
27	4.1	3.5	3.0	2.55	4.65	3.2	3.35	4.55	4.85	4.0	3.6	3.2
28	4.05	3.5	3.0	2.5	4.35	4.85	3.15	4.45	4.6	4.0	4.4	3.2
29	4.0	.....	3.0	2.55	3.95	6.55	3.4	4.35	4.35	3.95	4.8	3.2
30	3.95	.....	3.0	2.6	3.75	5.3	3.9	4.1	4.2	4.25	3.9	3.2
31	3.9	.....	3.0	.....	4.0	.....	3.95	3.75	.....	5.3	.....	3.2
1902.												
1	3.2	2.9	2.75	1.95	1.85	2.65	2.25	7.3	4.85	5.1	3.0	4.4
2	3.15	2.9	2.65	1.95	1.8	2.6	2.35	6.85	5.35	4.9	3.05	4.2
3	3.1	2.9	2.55	1.85	1.8	2.5	2.25	6.25	6.3	7.15	3.4	6.6
4	3.1	2.9	2.45	1.85	1.75	2.95	2.15	5.75	7.15	6.7	3.6	5.5
5	3.1	2.9	2.4	1.9	1.85	3.05	4.0	5.5	6.25	5.0	3.0	4.55
6	3.1	2.9	2.4	1.9	5.9	3.0	3.6	5.25	5.75	4.5	3.0	3.85
7	3.1	2.9	2.35	1.85	7.15	2.8	3.15	5.05	6.1	4.45	2.8	3.55
8	3.1	2.9	2.3	1.8	5.6	2.55	2.65	4.80	7.0	4.4	2.9	4.0
9	3.1	3.0	2.3	1.9	4.2	2.45	2.35	4.35	7.7	4.4	3.35	3.8
10	3.1	3.0	2.3	1.9	3.85	2.35	2.15	4.3	7.6	4.35	3.7	3.0
11	3.1	3.0	2.3	1.8	3.65	2.3	2.1	4.6	9.3	3.75	3.35	5.0
12	3.25	3.0	2.25	1.8	3.3	2.25	2.05	4.15	10.5	3.75	3.4	3.55
13	3.4	2.95	2.2	1.8	3.05	2.05	2.05	3.95	9.7	3.7	3.5	2.9
14	3.5	2.9	2.2	2.25	2.9	2.0	2.3	3.8	8.7	6.05	3.7	2.9
15	3.55	2.9	2.15	3.3	2.9	2.0	2.65	4.0	8.15	7.7	3.0	3.1
16	3.75	2.9	2.15	3.65	2.8	2.0	3.7	3.95	7.75	8.65	2.95	2.95
17	3.5	2.9	2.15	3.5	2.7	2.1	5.25	5.85	6.85	6.65	2.9	2.9
18	3.4	2.9	2.1	4.25	2.6	2.45	4.45	5.3	6.3	5.45	2.9	2.9
19	3.35	2.9	2.1	4.6	2.5	2.65	4.0	4.8	6.55	4.4	2.95	2.9
20	3.3	2.85	2.1	3.4	4.8	2.55	3.65	4.85	6.5	4.3	2.65	2.9

Daily gage height, in feet, of Rio Grande near Roma, Tex., from 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
21	3.25	2.8	2.05	3.0	7.95	2.45	3.5	4.9	6.65	4.1	2.85	2.85
22	3.2	2.8	2.05	2.85	4.95	2.5	3.5	4.65	5.6	3.7	2.85	2.8
23	3.15	2.7	2.05	2.55	3.85	3.05	3.5	4.8	5.1	3.6	4.4	2.8
24	3.1	2.6	2.1	2.4	3.4	2.75	3.5	4.7	5.1	3.45	3.8	2.8
25	3.05	2.6	2.0	2.25	3.25	2.9	3.8	4.5	5.6	3.4	3.5	2.8
26	3.0	2.7	2.1	2.15	3.2	3.05	3.95	4.75	4.85	3.3	3.0	2.8
27	3.0	2.65	2.05	2.0	3.15	3.0	5.55	4.65	4.6	3.2	3.15	2.8
28	2.9	2.6	2.0	2.0	3.0	2.6	9.95	5.05	4.45	3.15	3.0	2.8
29	2.9	.....	2.0	2.0	2.9	2.35	9.5	4.85	4.3	3.1	3.1	2.8
30	2.9	.....	1.9	1.9	2.9	2.2	7.6	3.65	4.75	3.05	3.6	2.8
31	2.9	.....	1.9	.....	2.9	.....	7.5	4.3	.....	3.0	.....	2.8
1903.												
1	2.8	2.65	.....	.....	5.6	3.6	6.35	12.65	4.25	5.25	2.2	1.5
2	2.8	2.7	.....	.....	4.45	3.95	6.0	9.4	5.0	4.7	1.95	1.5
3	2.75	2.65	.....	.....	3.25	4.0	5.75	7.05	4.05	4.7	2.0	1.5
4	2.7	2.65	.....	.....	3.35	5.25	5.45	5.1	3.55	5.15	1.95	1.5
5	2.7	2.65	.....	.....	3.35	3.85	6.1	4.3	3.55	5.75	1.9	1.5
6	2.7	2.7	.....	.....	3.55	3.65	8.6	3.8	5.3	5.5	1.9	1.5
7	2.75	2.75	.....	.....	2.85	3.65	8.65	3.55	5.5	5.9	1.8	1.4
8	2.75	2.8	.....	.....	2.7	3.65	6.45	3.3	5.3	5.7	1.9	1.4
9	2.7	2.7	.....	.....	2.8	3.2	5.45	3.8	5.3	5.9	1.8	1.4
10	2.7	2.7	.....	.....	3.25	3.55	5.35	3.7	5.0	4.6	1.7	1.4
11	2.7	2.65	.....	.....	3.65	4.35	5.6	3.7	12.85	4.15	1.7	1.4
12	2.65	2.6	.....	.....	3.15	4.95	5.8	4.25	8.85	3.95	1.7	1.4
13	2.75	2.6	.....	1.9	3.5	10.9	5.9	3.6	5.8	3.8	1.7	1.4
14	2.8	2.5	.....	1.8	5.25	15.75	5.9	3.3	4.65	3.7	1.7	1.4
15	2.9	2.45	.....	1.8	5.25	18.5	5.85	3.2	3.75	3.5	1.6	1.4
16	3.0	2.4	.....	1.8	3.9	19.25	5.6	4.5	3.45	3.45	1.6	1.4
17	3.0	2.4	.....	1.9	3.35	17.0	5.25	4.8	3.25	3.45	1.6	1.4
18	2.85	3.45	.....	1.75	4.25	11.4	5.0	4.15	3.35	2.85	1.6	1.4
19	2.8	3.2	.....	1.7	6.35	8.3	4.8	3.95	5.0	2.7	1.6	1.4
20	2.75	3.2	.....	1.65	5.1	8.2	4.3	4.15	4.25	2.65	1.6	1.4
21	2.9	3.1	.....	1.6	4.05	7.6	4.2	4.0	3.9	2.6	1.6	1.4
22	3.0	3.0	.....	1.6	3.5	7.3	3.95	3.45	3.95	2.6	1.55	1.4
23	2.9	3.1	.....	1.55	3.4	7.05	3.7	3.3	3.85	2.5	1.5	1.4
24	2.9	3.0	.....	1.5	4.15	6.95	3.5	3.25	3.65	2.45	1.5	1.4
25	2.9	3.0	.....	1.6	4.15	6.8	3.4	3.3	3.5	2.4	1.5	1.4
26	2.75	3.0	.....	1.95	3.7	6.8	3.35	4.2	3.7	2.4	1.5	1.4
27	2.7	3.0	.....	2.15	3.6	6.95	3.15	4.35	3.55	2.35	1.5	1.4
28	2.7	3.15	.....	1.85	3.6	6.75	5.05	4.1	3.7	3.6	1.5	1.4
29	2.7	.....	.....	3.3	3.65	6.55	6.9	3.75	4.85	2.8	1.5	1.4
30	2.7	.....	.....	3.1	3.6	6.45	4.9	3.4	6.25	2.4	1.5	1.4
31	2.7	.....	.....	.....	4.05	.....	10.9	3.25	.....	2.25	.....	1.4
1904.												
1	1.4	1.5	1.4	.95	.9	5.25	9.0	2.4	1.95	8.75	7.3	4.2
2	1.4	1.5	1.4	1.0	1.55	4.05	5.95	2.7	2.2	8.1	8.3	4.1
3	1.4	1.5	1.3	4.3	1.6	3.55	4.75	2.65	2.75	8.65	7.6	4.1
4	1.4	1.5	1.3	4.6	7.0	3.35	4.3	2.4	2.85	8.15	7.4	4.1
5	1.4	1.5	1.3	4.15	4.45	3.2	3.65	2.2	2.7	7.65	7.05	4.1
6	1.4	1.5	1.3	3.05	2.65	7.87	3.35	2.1	2.85	7.2	6.7	4.35
7	1.4	1.5	1.3	2.75	1.8	7.05	3.2	2.0	3.6	7.25	6.45	4.05
8	1.4	1.5	1.2	2.4	1.8	6.8	3.2	1.9	7.2	6.6	6.5	4.35
9	1.4	1.45	1.1	2.0	4.8	4.2	3.1	2.0	10.7	6.3	6.3	4.5
10	1.4	1.5	1.1	1.75	3.0	4.35	3.0	2.1	9.85	6.1	6.2	4.85
11	1.45	1.7	1.1	1.55	1.9	4.35	2.85	2.3	11.15	6.15	6.1	4.85
12	1.5	2.05	1.1	1.4	1.75	3.9	2.7	2.65	9.9	6.1	5.85	4.6
13	1.4	1.6	1.0	1.3	2.6	3.2	2.6	2.55	16.0	6.2	5.6	4.45
14	1.4	1.5	1.0	1.25	4.6	4.4	2.6	2.4	17.5	6.9	5.4	4.3
15	1.4	1.6	1.1	1.2	4.5	4.1	2.45	2.25	22.65	7.3	5.3	4.3
16	1.4	1.75	1.1	1.1	7.25	4.0	2.25	2.3	25.75	8.8	5.2	4.6
17	1.5	1.6	1.0	1.1	6.5	3.45	2.05	2.0	25.7	9.95	5.15	4.2
18	1.5	1.5	1.0	1.0	5.45	3.4	2.0	1.95	24.75	9.5	5.0	4.2
19	1.5	1.4	1.0	1.0	3.8	3.4	1.9	1.75	18.25	9.75	5.0	4.3
20	1.4	1.45	1.0	.9	2.85	3.2	1.9	1.65	14.4	9.7	4.9	4.4
21	1.4	1.5	1.0	.9	2.65	3.05	1.95	1.65	13.65	10.35	4.8	4.7
22	1.4	1.5	1.0	1.2	2.4	3.5	1.9	1.5	13.4	10.65	4.7	4.4
23	1.3	1.4	1.0	1.05	2.05	3.15	1.9	1.5	14.85	9.5	4.7	4.4
24	1.3	1.4	1.0	1.0	1.85	2.9	2.0	1.5	15.1	9.4	4.6	4.4
25	1.3	1.5	.9	.9	1.8	2.6	3.35	1.7	14.1	9.35	4.5	4.25

Daily gage height, in feet, of Rio Grande near Roma, Tex., from 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
26	1.4	1.5	0.9	0.9	1.75	3.0	2.9	1.65	12.0	9.05	4.55	4.4
27	1.4	1.4	1.0	1.0	1.65	3.55	4.5	1.55	10.9	8.8	4.6	4.4
28	1.4	1.4	.9	1.6	1.5	3.25	3.55	1.6	10.15	8.45	4.6	4.4
29	1.4	1.4	.9	1.15	3.1	3.0	3.15	1.45	9.7	8.05	4.7	3.9
30	1.4	.....	.9	1.1	3.35	9.0	2.95	1.45	9.2	7.55	4.6	3.9
31	1.4	.....	.9	.....	3.5	.....	2.8	1.65	.....	7.15	.....	3.8
1907.												
1	5.4	4.9	4.25	3.05	2.8	4.9	5.45	5.4	5.25	5.8	5.1	5.2
2	5.4	4.95	4.2	2.9	4.3	4.35	5.55	5.25	4.9	5.7	5.0	5.2
3	5.3	5.2	4.0	2.9	4.75	4.05	5.7	5.3	4.8	5.7	5.4	5.4
4	5.15	5.3	4.0	2.8	5.4	4.0	10.25	5.45	4.95	5.4	5.5	5.3
5	5.1	5.25	3.95	2.8	5.5	4.0	6.5	5.5	5.65	5.15	5.7	6.8
6	5.0	5.0	3.9	2.65	5.2	4.65	6.0	5.3	6.2	5.0	6.0	7.6
7	5.0	5.0	3.8	2.5	5.1	4.75	6.25	5.15	5.85	7.6	6.0	7.5
8	5.0	5.1	3.8	2.4	4.9	4.9	8.0	4.95	6.25	9.0	6.1	6.9
9	5.0	5.0	3.7	2.4	4.6	4.95	6.75	4.8	6.2	6.8	6.3	6.55
10	5.0	4.9	3.7	2.4	5.0	5.05	5.75	4.95	6.25	5.05	8.5	6.35
11	5.0	4.8	3.7	2.9	4.5	5.2	5.4	5.1	7.45	5.0	9.1	6.25
12	5.0	4.7	3.7	3.05	4.15	5.2	5.4	4.85	6.4	4.9	8.5	6.1
13	5.0	4.6	3.7	3.1	4.45	5.4	5.5	4.75	7.1	4.8	7.55	6.0
14	4.9	4.55	3.7	3.0	4.35	5.9	5.8	4.55	7.3	4.55	6.9	5.95
15	5.0	4.4	3.7	2.9	4.25	5.85	5.95	4.45	6.35	4.5	6.4	5.85
16	5.0	4.4	3.7	2.95	4.1	5.65	6.15	4.55	5.95	4.5	6.25	5.75
17	5.0	4.4	3.6	3.0	4.1	5.5	6.2	4.6	5.8	4.5	6.1	5.55
18	5.0	4.4	3.5	3.0	4.3	5.5	5.75	4.45	5.5	4.4	6.0	5.4
19	4.9	4.4	3.5	2.95	4.3	5.6	5.65	4.35	5.5	4.4	5.85	5.4
20	4.9	4.4	3.5	2.85	4.3	5.3	5.85	4.15	5.95	4.3	5.65	5.4
21	4.95	4.4	3.5	3.0	4.5	5.3	5.75	4.05	5.7	4.3	5.55	5.3
22	5.0	4.4	3.5	3.0	5.5	5.25	5.6	3.85	6.75	4.2	5.5	5.15
23	5.0	4.4	3.5	2.9	5.4	5.45	5.5	3.8	7.35	4.35	5.4	5.0
24	5.0	4.4	3.4	2.8	4.95	5.6	5.45	3.7	7.25	5.05	5.4	5.0
25	5.0	4.4	3.35	2.8	4.25	5.7	5.3	3.25	6.9	4.95	5.3	4.95
26	5.05	4.4	3.3	2.8	4.15	5.6	5.2	3.1	6.4	4.85	5.3	4.9
27	4.9	4.4	3.3	2.8	8.8	5.4	5.25	3.1	5.85	4.95	5.2	4.9
28	4.9	4.4	3.3	2.8	6.25	5.4	5.05	3.05	5.85	5.5	5.1	4.9
29	4.8	.....	3.3	2.7	4.85	5.4	5.1	3.0	5.7	5.5	5.15	4.9
30	4.8	.....	3.3	2.7	4.35	5.35	5.25	3.0	5.75	5.5	5.2	4.9
31	4.8	.....	3.2	.....	4.0	.....	5.25	5.3	.....	5.5	.....	4.85
1908.												
1	4.9	4.2	3.2	2.1	3.5	4.25	3.5	5.1	6.65	4.15	3.2	2.9
2	5.0	4.0	3.2	2.3	3.3	4.3	3.15	6.05	6.3	4.0	3.3	2.95
3	5.05	3.8	3.0	2.3	3.2	3.95	3.0	6.2	7.1	3.95	3.15	3.0
4	5.0	3.7	2.9	2.2	3.2	3.75	2.95	5.4	6.8	3.9	3.0	3.0
5	4.95	3.65	2.9	2.3	4.0	3.6	2.75	5.25	8.35	3.8	3.0	2.95
6	4.9	3.6	2.75	2.1	4.0	3.85	3.1	5.15	9.75	3.7	3.0	2.9
7	4.9	3.6	2.7	2.05	4.0	4.45	4.95	9.75	8.65	3.6	3.0	2.9
8	4.8	3.6	2.7	2.0	4.0	4.4	4.2	8.45	8.45	5.3	3.0	2.9
9	4.8	3.5	2.6	2.35	4.0	4.35	3.2	8.55	8.65	5.75	3.0	2.9
10	4.8	3.6	2.6	2.7	4.0	4.35	6.25	7.9	8.55	4.85	3.0	2.9
11	4.7	3.45	2.6	5.05	4.0	4.05	5.0	7.15	7.8	4.5	2.9	2.9
12	4.65	3.4	2.5	7.4	4.0	3.85	4.75	6.8	7.1	4.15	3.05	2.9
13	4.6	3.4	2.5	6.95	4.0	3.65	4.6	6.65	6.65	4.0	3.75	2.9
14	4.6	3.4	2.5	5.9	4.0	3.45	5.9	6.5	7.4	3.7	4.2	2.9
15	4.5	3.3	2.5	5.75	11.6	3.25	4.55	7.45	8.95	3.5	3.75	2.9
16	4.5	3.3	2.4	4.25	6.8	3.1	4.05	10.0	8.15	3.35	3.45	2.9
17	4.4	3.3	2.4	5.2	5.9	3.05	3.65	10.1	7.25	3.3	3.25	2.8
18	4.4	3.3	2.3	4.7	5.2	2.95	3.15	8.85	6.85	3.3	3.05	2.8
19	4.4	3.3	2.3	4.0	4.25	2.9	2.95	7.5	6.25	3.2	3.0	2.8
20	4.4	3.3	2.3	3.8	3.5	2.9	2.75	7.2	5.85	3.15	3.0	2.8
21	4.4	3.3	2.3	10.15	3.2	2.8	2.65	7.1	5.65	3.0	3.05	2.8
22	4.3	3.3	2.3	10.8	3.1	2.7	2.75	7.1	5.45	2.9	3.0	2.8
23	4.3	3.3	2.3	7.15	3.55	2.6	2.5	6.7	5.25	9.1	3.0	2.75
24	4.3	3.3	2.3	5.95	3.0	2.6	2.45	6.45	5.05	5.5	3.0	2.75
25	4.2	3.2	2.3	4.7	11.0	2.6	2.5	6.45	4.85	4.05	3.0	2.8
26	4.2	3.1	2.3	4.45	10.75	2.7	3.55	6.3	4.65	3.45	2.95	2.8
27	4.1	3.0	2.3	4.2	7.95	2.6	3.55	6.3	4.55	3.4	2.9	2.8
28	4.1	3.1	2.2	3.65	6.65	3.1	4.45	6.45	4.35	3.35	3.0	2.8
29	3.8	3.1	2.2	3.6	5.2	4.0	5.8	6.75	4.25	3.35	2.85	2.8
30	3.7	.....	2.2	3.6	4.3	3.7	5.4	6.4	4.2	3.35	2.9	2.8
31	4.0	.....	2.2	.....	4.3	.....	5.1	6.25	.....	3.25	.....	2.9

RIO GRANDE NEAR BROWNSVILLE, TEX.

This station was established in 1900 by the International Boundary Commission. It is about 1 mile above Brownsville, Tex., and opposite Matamoros, Tamaulipas, Mexico, 900 miles by river below El Paso.

Between Roma and Brownsville there are many lagoons (old river beds) which take river water during moderate floods, and a large area overflows rather deeply in larger floods. Much of this water returns slowly to the river as the flood subsides, so that the flow passes Brownsville more uniformly than it does at Roma. Large quantities of water also leave the river entirely, reaching the Gulf of Mexico through channels remote from the Rio Grande. Local run-off, however, keeps the total water at Brownsville well up toward the combined flow of the San Juan and the Rio Grande at Roma. Both banks are alluvial and are just about level with high water. The right bank is protected by piling.

As the bed of the river is constantly shifting, frequent discharge measurements are made to determine closely the daily flow.

Discharge measurements and gage heights for the years 1900 to 1904, which have not hitherto been published by the United States Geological Survey, are given herewith, together with data for 1907–8.

The observations at this station have been made under the direction of the Mexican section of the International Boundary Commission.

Discharge measurements of Rio Grande near Brownsville, Tex., in 1900.

[By P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
December 19.....	2,017	3.0	4,192	December 25.....	1,972	2.5	4,118
December 22.....	2,119	3.2	4,768	December 29.....	1,909	2.3	4,014

NOTE.—Discharge measurements for 1900 complete so far as Mexican records exist.

Discharge measurements of Rio Grande near Brownsville, Tex., in 1901.

[By P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	1,864	2.2	3,587	June 26	1,598	1.4	2,812
January 7	1,818	2.0	3,579	June 30	2,586	4.4	9,806
January 11	1,826	2.05	3,744	July 1	4,548	11.0	27,956
January 12	1,798	2.0	3,662	July 5	1,642	4.0	4,427
January 16	1,854	2.05	3,836	July 8	1,770	3.2	3,386
January 19	1,758	2.0	3,548	July 12[a]	2,780	6.0	9,834
January 22	1,726	1.9	3,440	July 16[a]	1,857	3.0	2,813
January 26	1,663	1.8	3,335	July 20	1,678	1.8	2,434
January 30	1,677	1.7	3,237	July 24	1,538	1.5	2,152
February 2	1,698	1.6	3,644	July 28	1,714	1.8	2,451
February 5	1,660	1.5	3,655	August 1	1,487	1.5	2,217
February 9	1,590	1.5	3,502	August 5	1,833	2.2	3,116
February 13	1,600	1.4	3,505	August 9	2,136	2.9	3,775
February 16	1,594	1.4	3,150	August 13	2,129	2.9	3,753
February 20	1,560	1.2	3,128	August 17	2,190	3.0	4,125
February 24	1,581	1.15	3,117	August 21	1,946	2.2	3,461
February 27	1,521	1.1	3,000	August 25	1,734	1.6	2,816
March 2	1,470	1.0	2,745	August 29	2,008	2.2	3,621
March 6	1,481	1.05	2,773	September 2	2,020	2.1	3,473
March 9	1,550	1.2	3,189	September 6	3,744	7.9	14,731
March 13	1,462	.9	2,870	September 10	2,012	2.9	3,907
March 17	1,431	.8	2,762	September 14	2,934	5.45	9,680
March 20	1,393	.7	2,592	September 18	2,280	3.7	4,937
March 24	1,338	.6	2,463	September 22	2,943	4.75	6,236
March 28	1,302	.3	2,336	September 26	3,011	4.9	7,662
April 1	1,294	.3	2,306	September 30	3,278	7.3	14,461
April 4	1,273	.1	2,206	October 4	2,767	5.2	9,898
April 8	1,225	.0	1,996	October 8	2,666	4.0	4,834
April 12	1,213	.0	2,002	October 12	2,546	3.4	4,483
April 16	1,182	−.1	1,914	October 16	2,921	5.7	9,774
April 20	1,182	−.1	1,914	October 20	1,930	3.0	3,758
April 24	1,120	−.3	1,751	October 24	3,625	6.5	14,352
April 28	1,097	−.5	1,691	October 28	2,481	4.4	7,310
May 2	1,079	−.55	1,638	November 1	3,036	4.6	6,639
May 3	1,077	−.5	1,639	November 5	2,251	5.2	6,661
May 4	2,986	5.5	12,721	November 9	2,799	4.1	5,521
May 5	2,825	5.6	10,771	November 13	2,610	3.6	5,063
May 9	1,386	2.2	3,561	November 17	2,633	3.6	5,433
May 13	1,983	4.2	6,502	November 21	2,628	3.7	5,184
May 17	1,786	2.7	3,747	November 25	2,470	3.4	4,887
May 21	1,972	2.7	4,066	November 29	2,332	3.05	5,017
May 25	2,231	2.8	3,933	December 3	2,011	3.75	5,480
May 29	2,528	4.3	7,256	December 7	2,031	2.8	4,274
June 1	2,093	2.9	4,300	December 11	2,012	2.4	3,854
June 5	1,914	2.4	3,505	December 15	1,939	2.0	3,483
June 7	2,957	5.4	9,663	December 19	1,757	1.6	2,877
June 11	1,750	2.4	3,452	December 23	1,741	1.6	2,849
June 15	1,786	2.2	3,493	December 27	1,773	1.7	2,927
June 18	1,740	2.0	3,364	December 31	1,693	1.3	2,660
June 22	1,600	1.7	2,943				

[a] Measurements, July 12 and 16, 1901, by E. Zayas.

Discharge measurements of Rio Grande near Brownsville, Tex., in 1902.

[By P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	1,664	1.1	2,653	July 9	1,113	0.4	1,917
January 8	1,637	1.0	2,637	July 13	1,271	.8	2,092
January 12	1,651	1.0	2,646	July 18	898	−.4	1,251
January 16	1,653	1.0	[a]2,517	July 21	2,420	3.7	4,957
January 20	1,842	1.5	2,885	July 25	1,872	2.2	3,594
January 24	1,726	1.1	2,560	July 30	4,314	8.7	19,957
January 28	1,622	.9	2,259	August 3	4,436	9.0	21,254
February 1	1,592	.7	2,192	August 7	2,705	5.8	8,488
February 5	1,530	.6	2,092	August 11	2,726	4.6	5,660
February 9	1,544	.6	2,103	August 15	2,411	3.6	4,305
February 13	1,566	.6	2,213	August 19	3,040	5.1	7,677
February 17	1,525	.5	1,999	August 21	3,032	5.0	6,715
February 21	1,497	.45	2,001	August 21 [b]	3,038	5.0	6,922
February 25	1,437	.3	1,875	August 28	2,648	3.9	5,224
March 1	1,406	.2	1,932	August 30	2,700	4.0	5,622
March 5	1,352	.0	1,766	September 4	2,889	4.9	6,776
March 9	1,280	−.1	1,625	September 8	2,983	6.4	11,062
March 13	1,234	−.3	1,599	September 13	4,574	10.8	19,486
March 17	1,207	−.4	1,489	September 15	5,180	11.9	23,509
March 21	1,181	−.5	1,360	September 19	3,677	8.8	14,023
March 25	1,159	−.6	1,325	September 23	3,889	9.1	14,493
March 29	1,095	−.7	1,322	September 28	3,872	6.85	9,422
April 3	1,037	−.8	1,276	October 2	3,932	7.2	10,362
April 7	1,037	−.8	1,278	October 6	3,210	7.5	11,533
April 11	1,029	−1.0	1,178	October 10	2,518	4.7	5,506
April 15	1,023	−1.0	1,177	October 14	2,402	3.8	4,326
April 19	1,751	1.0	2,630	October 18	5,461	11.95	24,325
April 23	1,919	2.5	3,430	October 22	2,526	5.25	6,108
April 27	1,141	.5	1,799	October 26	2,300	3.9	4,046
May 3	829	−.8	1,126	October 29	2,106	3.3	3,368
May 7	815	−.9	1,099	November 3	2,232	3.8	4,047
May 10	2,707	5.8	10,258	November 7	1,857	2.7	3,144
May 15	1,719	2.45	2,737	November 11	1,944	3.1	3,525
May 20	1,268	1.0	1,674	November 14	1,918	3.0	3,556
May 24	2,592	4.7	7,075	November 18	1,653	2.1	2,786
May 28	1,561	2.0	2,389	November 23	1,455	1.5	2,210
June 2	1,206	.9	1,656	November 27	1,688	1.95	2,870
June 6	1,031	.3	1,381	December 2	1,645	1.7	2,727
June 10	1,132	.6	1,565	December 5	4,202	8.4	15.232
June 13	947	.1	1,254	December 10	2,490	3.8	4,746
June 18	794	−.3	1,025	December 15	2,040	2.1	3,182
June 23	895	−.1	1,198	December 17	1,938	1.9	2,937
June 27	900	−.1	1,201	December 21	1,772	1.5	2,571
July 1	1,023	.3	1,601	December 26	1,708	1.2	2,443
July 5	822	−.4	1,216				

[a] Measurement, January 16, 1902, affected by wind, rejected.
[b] Measurement, August 21, 1902, by E. Zayas.

Discharge measurements of Rio Grande near Brownsville, Tex., in 1903.

[By P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	1,646	1.1	2,361	August 2	5,941	12.2	29,898
January 7	1,584	1.0	2,294	August 7	4,113	8.2	11,146
January 12	1,559	.9	2,257	August 11	3,094	5.3	5,752
January 16	1,594	1.0	2,313	August 15	3,078	5.2	5,624
January 20	1,710	1.45	2,797	August 19	5,809	12.2	31,670
January 25	1,755	1.5	2,830	August 23	3,151	6.8	9,695
January 29	1,636	1.1	2,534	August 28	2,817	5.3	8,308
February 3	1,624	1.0	2,492	September 1	2,843	4.8	4,952
February 7	1,524	.8	2,174	September 5	2,978	5.3	5,533
February 11	1,522	.8	2,185	September 10	3,361	6.2	7,757
February 15	1,509	.8	2,129	September 15	5,670	11.0	19,434
February 19	1,549	.9	2,239	September 19	2,870	5.3	6,072
February 23	1,951	1.8	3,132	September 24	2,935	5.5	6,275
February 27	1,915	1.7	3,100	September 28	2,672	4.7	5,471
May 1	1,276	.5	1,790	October 2	3,340	7.4	10,714
May 4	3,133	4.9	7,925	October 7	3,438	6.9	10,448
May 8	2,172	2.3	4,242	October 11	3,485	7.5	11,356
May 13	2,322	2.8	4,904	October 15	2,882	4.9	5,671
May 17	3,296	5.7	9,188	October 19	2,785	4.3	5,862
May 21	3,702	6.8	11,616	October 23	2,310	3.1	4,456
May 25	1,808	2.5	4,022	October 26	2,131	2.7	4,249
May 29	1,891	2.6	4,307	October 29	2,111	2.6	4,080
June 2	1,644	1.7	3,511	November 2	1,895	2.5	3,579
June 5	2,233	3.1	5,736	November 6	1,843	2.0	3,441
June 9	2,201	3.0	5,462	November 11	1,775	1.8	3,160
June 12	2,090	2.6	4,278	November 15	1,720	1.4	2,846
June 16	5,758	12.2	31,158	November 20	1,670	1.3	2,677
June 19	5,995	12.7	33,699	November 24	1,629	1.2	2,611
June 25	4,153	9.6	14,015	November 28	1,581	1.1	2,541
June 29	4,535	9.1	12,731	December 2	1,575	1.0	2,429
July 3	4,276	8.1	10,173	December 6	1,557	1.0	2,430
July 7	5,064	10.1	19,159	December 10	1,533	.9	2,236
July 12	3,109	7.1	7,685	December 14	1,487	.8	2,173
July 16	3,317	7.6	8,596	December 18	1,471	.8	2,140
July 20	3,682	6.2	7,776	December 22	1,467	.8	2,129
July 24	3,356	5.3	6,425	December 26	1,464	.8	2,135
July 29	2,902	4.2	5,495	December 30	1,443	.7	2,086

NOTE.—Discharge measurements for 1903 complete so far as Mexican records exist. None for March and April, 1903.

Discharge measurements of Rio Grande near Brownsville, Tex., in 1904.

[By P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	1,430	0.7	2,077	June 29	2,065	2.4	3,351
January 7	1,424	.7	2,050	July 3	5,078	10.8	22,487
January 11	1,422	.7	2,054	July 7	2,664	4.5	5,711
January 15	1,418	.6	2,039	July 11	2,260	3.2	3,748
January 19	1,403	.5	1,981	July 16	1,714	2.0	2,336
January 23	1,397	.5	1,954	July 21	1,444	1.2	1,925
January 28	1,382	.4	1,910	July 25	1,339	.9	1,436
February 1	1,322	.2	1,876	July 29	2,791	4.6	5,945
February 5	1,338	.2	1,878	August 2	2,118	2.5	3,075
February 9	1,332	.2	1,853	August 6	1,802	1.5	2,398
February 13	1,340	.2	1,872	August 10	1,663	1.0	2,090
February 16	1,513	.7	2,299	August 14	2,029	1.9	2,677
February 20	1,300	.0	1,885	August 18	2,250	2.5	3,146
February 24	1,302	.0	1,889	August 22	1,703	1.3	2,341
February 28	1,358	.2	2,009	August 26	1,479	.5	1,945
March 3	1,316	.0	1,912	August 30	1,433	.4	1,736
March 7	1,213	— .3	1,678	September 3	1,299	.1	1,443
March 11	1,180	— .4	1,544	September 7	1,497	.7	1,718
March 15	1,159	— .6	1,382	September 11	5,537	11.7	25,168
March 19	1,157	— .6	1,451	September 14	5,888	12.5	27,490
March 23	1,147	— .7	1,420	September 19	6,068	12.9	29,203
March 27	1,133	— .7	1,373	September 24	6,068	12.9	29,407
March 30	1,141	— .7	1,391	September 29	6,146	12.7	27,874
April 3	1,084	— .5	1,278	October 3	5,890	12.5	27,369
April 5	3,897	7.6	7,901	October 12	4,769	10.2	22,087
April 10	1,594	2.7	3,863	October 16	5,056	10.9	23,900
April 14	1,338	1.0	1,998	October 20	5,897	12.5	27,276
April 19	975	— .0	1,328	October 24	5,871	12.7	27,516
April 23	903	— .3	1,205	October 29	5,926	12.6	28,586
April 28	914	— .3	1,208	November 3	5,843	12.4	25,218
May 2	1,158	.1	1,578	November 7	5,449	11.4	21,546
May 6	4,237	8.5	8,626	November 11	5,079	10.4	19,295
May 10	2,490	4.6	5,529	November 15	4,558	9.0	16,741
May 14	1,766	2.85	3,702	November 19	3,956	8.1	12,956
May 18	4,486	10.25	10,138	November 23	3,894	7.6	10,308
May 23	1,969	3.3	3,830	November 28	3,714	7.0	9,298
May 27	1,624	1.9	2,192	December 2	3,792	7.1	9,683
May 31	1,161	1.1	1,525	December 6	3,676	6.7	9,288
June 4	2,926	5.2	6,136	December 10	3,522	6.4	8,647
June 9	5,006	10.9	22,180	December 14	3,404	7.0	9,627
June 13	2,641	5.5	7,898	December 18	3,277	6.6	9,031
June 17	2,880	4.9	5,767	December 22	3,139	6.2	8,470
June 21	2,374	3.5	4,061	December 26	3,117	6.3	8,561
June 26	2,530	4.0	4,652	December 30	3,088	5.9	8,076

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Discharge measurements of Rio Grande near Brownsville, Tex., in 1907.

By P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	2,767	5.3	6,199	July 6	6,013	13.4	30,296
January 7	2,731	5.0	6,148	July 10	6,126	13.7	30,885
January 11	2,649	4.7	5,797	July 14	3,528	7.3	8,675
January 15	2,593	4.5	5,573	July 18	3,715	7.75	9,648
January 19	2,566	4.4	5,437	July 22	3,487	6.8	8,221
January 23	2,524	4.2	5,292	July 26	3,211	6.2	7,464
January 27	2,540	4.3	5,362	July 30	2,972	5.5	6,377
January 31	2,571	4.3	5,407	August 3	2,877	5.2	6,018
February 3	2,541	4.2	5,299	August 7	2,904	5.3	6,104
February 7	2,597	4.4	5,483	August 11	2,777	4.9	5,814
February 11	2,573	4.3	5,366	August 15	2,660	4.5	5,562
February 15	2,490	4.0	5,097	August 19	2,495	4.0	5,187
February 19	2,258	3.5	4,596	August 23	2,422	3.7	4,948
February 23	2,170	3.2	4,386	August 27	2,032	2.6	3,422
February 28	2,151	3.1	4,323	August 31	1,939	2.3	3,156
March 4	2,129	3.0	4,246	September 3	2,060	3.0	4,141
March 7	2,070	2.7	4,075	September 7	3,265	5.7	11,453
March 11	2,054	2.5	4,033	September 11	3,658	7.8	12,752
March 15	1,892	2.3	3,402	September 15	3,598	8.0	12,854
March 19	1,906	2.4	3,503	September 19	3,270	6.7	10,641
March 23	1,870	2.2	3,341	September 23	3,733	8.3	13,574
March 27	1,783	1.8	3,138	September 27	3,536	8.7	13,178
March 31	1,759	1.7	3,095	September 30	2,977	7.0	10,645
April 2	1,742	1.7	3,055	October 3	2,925	6.9	10,207
April 6	1,736	1.6	3,044	October 7	2,640	6.0	9,077
April 10	1,676	1.3	2,897	October 10	4,628	11.4	19,340
April 14	1,654	1.2	2,830	October 14	2,932	5.8	6,152
April 18	1,814	2.1	3,163	October 16	2,574	4.8	5,152
April 22	1,806	2.1	3,185	October 22	2,447	4.4	4,843
April 26	1,783	1.9	3,136	October 26	2,464	4.6	4,934
April 30	1,710	1.6	2,985	October 30	2,729	5.4	5,642
May 2	1,877	2.2	3,283	November 3	2,929	7.0	10,270
May 6	3,712	7.8	14,593	November 7	2,880	6.8	10,030
May 10	2,760	5.1	6,015	November 11	3,528	8.6	13,278
May 14	2,978	6.0	6,604	November 15	4,275	10.6	18,174
May 18	2,610	4.7	5,773	November 19	3,518	7.9	11,531
May 22	2,474	4.1	5,437	November 23	3,548	6.9	8,696
May 28	2,791	5.4	6,290	November 27	3,384	6.4	8,147
May 30	5,606	13.3	31,604	November 30	3,278	6.1	7,703
June 3	2,884	5.7	6,604	December 3	3,328	6.2	7,904
June 7	2,707	5.1	6,011	December 7	4,611	9.9	20,476
June 11	2,732	5.4	6,126	December 11	3,799	8.2	12,154
June 15	3,063	6.1	7,977	December 15	3,629	7.7	11,599
June 19	3,238	6.6	8,322	December 19	3,435	7.1	10,943
June 21	4,095	8.25	13,193	December 23	3,356	6.6	8,146
June 25	3,936	8.0	12,749	December 27	3,202	6.1	7,561
June 29	3,590	7.1	10,312	December 31	3,138	5.6	7,108
July 3	3,374	6.4	9,633				

Discharge measurements of Rio Grande near Brownsville, Tex., in 1908.

[By P. Guerra.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	2,749	5.3	6,325	July 6	1,940	2.5	3,042
January 7	2,665	5.1	6,033	July 10	2,350	4.6	4,130
January 11	2,646	4.6	5,615	July 14	3,039	5.4	7,030
January 15	2,285	4.1	5,173	July 18	2,583	5.0	5,399
January 19	2,415	3.9	4,931	July 22	1,858	2.3	2,907
January 23	2,370	3.8	4,769	July 26	1,696	1.7	2,452
January 27	2,282	3.6	4,550	July 30	1,907	2.4	2,837
January 31	2,278	3.6	4,540	August 2	3,916	8.6	13,124
February 3	2,104	3.3	3,180	August 6	3,308	6.0	8,034
February 7	2,004	2.9	2,993	August 9	4,944	11.2	21,862
February 11	1,923	2.6	2,763	August 13	3,888	9.0	12,790
February 15	1,920	2.6	2,728	August 17	5,134	11.8	23,148
February 19	1,883	2.5	2,628	August 19	5,644	13.0	27,785
February 23	1,744	2.2	2,593	August 23	4,031	9.3	13,629
February 27	1,764	2.1	2,563	August 27	3,728	8.1	12,033
March 2	1,733	2.0	2,257	August 31	4,022	8.8	13,662
March 6	1,719	1.9	2,232	September 3	3,800	8.2	12,336
March 10	1,612	1.6	2,179	September 7	4,825	11.0	19,897
March 14	1,553	1.3	1,959	September 11	5,323	12.1	24,561
March 18	1,527	1.2	1,914	September 15	4,441	10.0	17,626
March 22	1,517	1.1	1,873	September 18	5,135	11.8	21,726
March 26	1,506	1.0	1,842	September 22	3,136	7.8	9,315
March 30	1,505	0.9	1,839	September 26	2,828	6.8	8,153
April 3	1,488	0.8	1,756	September 30	2,519	5.6	7,135
April 7	1,469	0.6	1,634	October 3	2,742	4.9	4,371
April 11	1,455	0.5	1,600	October 7	2,635	4.3	4,096
April 14	5,619	12.7	29,014	October 11	3,094	6.1	7,477
April 18	3,571	7.1	8,508	October 15	2,573	4.1	3,804
April 20	3,362	6.5	7,732	October 19	2,372	3.3	3,376
April 24	5,962	13.4	28,805	October 23	2,312	3.1	3,212
April 28	3,002	5.4	6,552	October 25	4,444	9.8	17,125
May 3	2,158	4.0	3,612	October 29	2,528	4.0	3,590
May 7	2,030	3.6	2,594	November 2	2,338	3.2	3,407
May 11	2,090	3.8	3,409	November 6	1,717	2.6	2,325
May 15	1,988	3.4	2,525	November 10	1,572	2.3	2,087
May 17	5,675	13.6	27,705	November 14	3,101	6.1	7,488
May 21	2,872	5.0	6,058	November 18	2,532	4.0	3,651
May 25	2,584	4.0	5,298	November 22	1,745	2.7	2,424
May 27	3,901	9.1	12,999	November 26	1,559	2.3	2,039
May 29	3,742	8.3	12,089	November 30	1,526	2.0	1,932
June 2	2,905	5.1	6,215	December 3	1,525	2.0	1,950
June 6	2,214	4.2	3,760	December 7	1,555	2.1	2,058
June 10	2,116	3.8	3,445	December 11	1,496	1.9	1,850
June 15	2,107	3.2	3,315	December 15	1,462	1.8	1,723
June 18	1,994	2.8	3,080	December 19	1,448	1.7	1,731
June 22	1,824	2.3	2,802	December 23	1,442	1.6	1,726
June 26	1,749	1.9	2,552	December 27	1,442	1.5	1,722
June 30	2,150	3.9	3,578	December 31	1,442	1.5	1,730
July 2	2,182	3.4	3,466				

Daily gage height, in feet, of Rio Grande near Brownsville, Tex., for 1900 to 1904, 1907, and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.[a]												
1	.....	.....	.....	.....	6.0	6.35	4.05	10.0	6.65	9.1	.....	.....
2	.....	.....	.....	.....	8.9	6.05	3.9	9.15	6.5	8.2	.....	.....
3	.....	.....	.....	.....	10.4	10.4	6.4	8.4	6.45	8.05	.....	.....
4	.....	.....	.....	.....	9.1	12.5	7.25	8.0	6.3	8.7	.....	.....
5	.....	.....	.....	.....	6.95	10.25	6.6	7.7	6.85	8.3	.....	.....
6	.....	.....	.....	.....	5.4	8.25	5.5	7.4	7.35	7.65	.....	.....
7	.....	.....	.....	.....	4.9	11.0	4.7	7.35	7.05	7.7	.....	.....
8	.....	.....	.....	.....	4.55	10.9	4.9	8.15	7.4	7.6	.....	.....
9	.....	.....	.....	.....	4.4	8.3	6.1	8.6	8.95	7.3	.....	.....
10	.....	.....	.....	.....	4.2	6.65	5.7	9.25	10.45	6.95	.....	.....
11	.....	.....	.....	.....	4.0	6.05	5.5	9.95	8.2	6.9	.....	.....
12	.....	.....	.....	.....	3.95	6.0	5.15	12.1	6.6	6.75	.....	.....
13	.....	.....	.....	.....	3.95	6.0	4.75	12.75	5.9	6.45	.....	.....
14	.....	.....	.....	.....	3.9	5.75	4.65	12.95	5.55	6.4	.....	.....
15	.....	.....	.....	.....	3.55	5.45	4.35	12.8	5.25	6.15	.....	.....

[a] Gage heights for 1900 complete so far as Mexican records exist.

Daily gage height, in feet, of Rio Grande near Brownsville, Tex., for 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.												
16	.....	.....	.....	.....	3.45	5.3	3.95	11.95	5.1	5.95	.....	.....
17	.....	.....	.....	.....	8.7	5.15	5.85	10.75	5.3	5.8	.....	.....
18	.....	.....	.....	.....	11.95	5.0	10.05	9.8	5.85	5.55	.....	.....
19	.....	.....	.....	.....	12.55	5.0	11.0	9.35	6.55	5.5	.....	3.0
20	.....	.....	.....	.....	12.85	5.25	9.4	8.65	6.5	5.35	.....	2.85
21	.....	.....	.....	.....	11.8	5.5	7.95	8.3	6.2	5.05	.....	2.8
22	.....	.....	.....	.....	9.5	6.45	7.65	8.1	6.05	6.5	.....	3.1
23	.....	.....	.....	.....	11.45	7.85	6.5	7.7	5.85	6.55	.....	2.85
24	.....	.....	.....	.....	12.4	6.25	5.7	7.5	5.55	6.6	.....	2.65
25	.....	.....	.....	.....	11.3	5.4	5.4	7.9	6.75	7.5	.....	2.5
26	.....	.....	.....	.....	10.25	4.9	5.05	8.4	11.4	6.65	.....	2.4
27	.....	.....	.....	.....	9.25	4.45	4.9	8.1	12.45	6.05	.....	2.35
28	.....	.....	.....	.....	8.3	4.2	4.8	7.7	12.9	5.95	.....	2.3
29	.....	.....	.....	5.75	7.7	4.2	5.65	7.0	12.6	6.5	.....	2.3
30	.....	.....	.....	7.1	7.2	4.2	5.5	6.45	10.45	6.5	.....	2.3
31	.....	.....	.....	.....	6.7	.....	7.7	6.3	.....	7.1	.....	2.3
1901.												
1	2.3	1.65	1.0	.3	−.5	3.0	10.15	1.5	2.25	5.5	4.5	5.95
2	2.3	1.6	1.0	.25	−.5	2.55	11.6	1.6	2.05	4.75	5.9	4.55
3	2.2	1.6	1.0	.2	−.4	2.5	8.75	1.8	1.85	4.75	5.8	3.65
4	2.2	1.6	1.0	.15	5.3	2.5	5.35	1.95	2.1	5.2	5.35	3.25
5	2.2	1.55	1.0	.1	5.75	2.4	4.15	2.15	7.75	4.85	5.2	3.05
6	2.0	1.5	1.0	.1	3.8	3.25	3.65	2.25	7.35	4.4	4.85	2.95
7	2.0	1.5	1.1	.1	2.9	5.5	3.2	2.5	5.5	4.05	4.45	2.75
8	2.0	1.5	1.1	.0	2.4	4.2	2.95	2.9	4.6	3.95	4.25	2.6
9	2.0	1.5	1.2	.0	2.2	3.1	2.8	2.95	3.45	3.8	4.1	2.5
10	2.0	1.5	1.1	.0	2.6	2.55	2.75	2.9	2.95	3.65	3.95	2.5
11	2.0	1.5	1.0	.0	5.6	2.4	4.75	2.9	2.55	3.55	3.65	2.4
12	2.0	1.5	1.0	.0	5.95	2.3	6.1	3.0	4.25	3.5	3.6	2.3
13	2.0	1.4	.9	.0	4.4	2.25	4.75	2.95	7.65	3.35	3.55	2.2
14	2.0	1.4	.9	.0	4.2	2.2	4.05	2.9	5.15	3.85	3.5	2.1
15	2.0	1.4	.9	−.1	3.75	2.2	3.6	2.95	4.3	8.1	3.5	2.0
16	2.0	1.4	.9	−.1	2.95	2.15	3.1	3.0	3.85	6.4	3.5	1.9
17	2.0	1.4	.8	−.1	2.65	2.1	2.6	3.0	3.6	3.9	3.6	1.8
18	2.0	1.4	.8	−.1	2.35	2.0	2.3	2.8	3.7	3.35	3.65	1.75
19	2.0	1.4	.8	−.1	2.25	1.9	2.0	2.65	4.5	3.15	3.7	1.65
20	1.9	1.2	.75	−.1	2.1	1.75	1.85	2.45	5.35	2.95	3.7	1.6
21	1.9	1.2	.7	−.2	2.55	1.7	1.75	2.25	5.25	2.75	3.7	1.6
22	1.9	1.2	.6	−.2	3.55	1.7	1.55	1.95	4.75	2.6	3.7	1.6
23	1.9	1.2	.6	−.3	3.65	1.7	1.5	1.8	4.25	2.8	3.6	1.6
24	1.8	1.25	.6	−.3	3.1	1.6	1.45	1.75	3.7	6.35	3.5	1.5
25	1.8	1.1	.5	−.3	2.65	1.55	1.4	1.55	3.9	5.55	3.4	1.5
26	1.8	1.1	.45	−.35	2.35	1.45	1.6	1.45	4.85	4.6	3.25	1.5
27	1.8	1.1	.4	−.4	3.45	1.2	1.8	1.5	6.3	4.9	3.05	1.6
28	1.8	1.1	.3	−.5	5.5	1.05	1.8	1.85	9.1	4.45	2.9	1.4
29	1.8	.....	.3	−.5	4.3	.95	1.7	2.1	9.1	4.15	3.05	1.35
30	1.7	.....	.3	−.5	3.8	4.35	1.55	2.35	7.45	4.1	6.3	1.3
31	1.7	.....	.3	.....	3.55	.....	1.5	2.4	.....	4.1	.....	1.3
1902.												
1	1.2	.7	.1	−.8	−.45	1.0	.3	11.0	6.05	6.25	3.2	1.85
2	1.2	.7	.1	−.8	−.65	.85	.25	10.05	5.55	7.05	3.75	1.7
3	1.1	.6	.1	−.8	−.75	.75	.05	8.8	5.0	9.8	3.85	4.7
4	1.1	.6	.1	−.8	−.8	.65	−.15	9.1	5.0	10.15	3.4	6.6
5	1.05	.6	.0	−.8	−.8	.45	−.35	7.9	7.85	10.3	2.95	8.3
6	1.0	.6	.0	−.8	−.85	.35	−.4	6.3	7.65	8.0	2.7	6.7
7	1.0	.6	.0	−.8	−.9	.3	−.4	5.65	6.75	5.9	2.6	4.95
8	1.0	.6	−.5	−.9	3.7	.3	−.25	5.35	6.4	5.0	3.1	4.2
9	1.0	.6	−.15	−.9	7.87	.5	.5	5.1	7.5	4.7	3.5	3.65
10	1.0	.6	−.25	−1.0	6.67	.6	1.05	5.0	8.5	4.7	3.3	3.9
11	1.0	.6	−.3	−1.0	4.1	.45	1.3	4.45	9.35	4.6	3.0	3.95
12	1.0	.6	−.3	−1.0	3.2	.25	1.15	4.05	9.8	4.55	2.75	3.35
13	1.0	.6	−.3	−1.0	3.05	.05	.7	3.9	10.85	4.15	2.8	2.65
14	1.0	.6	−.35	−1.0	2.8	−.1	.25	4.0	11.6	3.8	2.95	2.25
15	1.0	.6	−.4	−1.0	2.4	−.2	−.1	3.6	11.95	3.45	2.8	2.1
16	1.0	.6	−.4	−1.0	2.05	−.2	−.25	3.2	12.0	7.6	2.55	2.0
17	1.1	.5	−.4	−.9	1.75	−.2	−.35	2.95	11.7	10.9	2.45	1.85
18	1.3	.5	−.5	−.25	1.4	−.3	−.4	2.75	10.7	12.05	2.2	1.7
19	1.35	.5	−.5	.8	1.15	−.4	−1.75	4.35	9.05	11.25	1.95	1.65
20	1.45	.5	−.5	5.1	.95	−.5	3.7	5.5	8.05	7.4	1.75	1.55

Daily gage height, in feet, of Rio Grande near Brownsville, Tex., for 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
21	1.4	0.5	−0.5	5.2	0.75	−0.55	3.8	5.15	7.65	5.75	1.65	1.5
22	1.25	.4	− .6	3.35	2.8	− .3	3.4	4.85	10.2	5.2	1.5	1.5
23	1.15	.4	− .6	2.4	6.7	− .15	3.2	4.7	8.9	5.0	1.5	1.4
24	1.1	.4	− .6	1.75	4.4	− .1	2.5	4.65	7.15	4.45	1.5	1.3
25	1.05	.3	− .6	1.35	2.9	− .1	2.15	4.45	6.6	4.15	1.45	1.3
26	1.0	.3	− .6	.9	2.4	− .1	1.95	4.3	7.45	3.85	1.45	1.2
27	.95	.3	− .6	.5	2.15	− .1	1.85	4.1	7.2	3.65	2.0	1.2
28	.9	.1	− .6	.1	1.9	.15	2.25	3.95	6.7	3.5	2.3	1.2
29	.8	.....	− .7	− .1	1.7	.2	5.55	3.85	5.85	3.35	2.15	1.2
30	.8	.....	− .7	− .35	1.4	.2	9.0	3.95	5.45	3.15	1.95	1.15
31	.7	.....	− .8	.....	1.2	.....	10.6	5.4	.....	3.1	.....	1.1
1903.[a]												
1	1.1	1.0	.....	.....	− .5	1.75	8.85	9.25	4.9	4.35	3.65	1.0
2	1.1	1.0	.....	.....	− .45	1.7	8.65	12.2	4.6	7.2	2.85	1.0
3	1.05	1.0	.....	.....	2.4	1.7	8.2	12.65	4.5	6.75	2.5	1.0
4	1.0	.9	.....	.....	4.75	1.6	7.7	12.8	5.0	5.85	2.35	1.0
5	1.0	.8	.....	.....	3.3	2.35	7.25	13.0	5.3	5.75	2.2	1.0
6	1.0	.8	.....	.....	2.5	3.75	7.0	11.5	5.1	5.9	2.05	1.0
7	1.0	.8	.....	.....	2.3	4.25	9.45	8.2	4.9	6.65	2.0	1.0
8	.9	.75	.....	.....	2.25	3.15	11.8	6.8	4.9	7.1	2.0	.9
9	.9	.7	.....	.....	2.45	3.0	11.7	6.05	5.8	7.4	1.85	.9
10	.9	.7	.....	.....	2.25	2.95	9.75	5.6	6.2	7.55	1.8	.9
11	.9	.8	.....	.....	1.8	2.7	7.5	5.3	6.7	7.45	1.8	.85
12	.85	.8	.....	.....	1.6	2.55	7.1	5.3	11.1	6.45	1.7	.8
13	.8	.8	.....	.....	2.45	3.25	7.25	5.15	12.45	5.7	1.6	.8
14	.8	.8	.....	− .4	3.1	6.8	7.45	5.15	12.65	5.2	1.55	.8
15	.9	.8	.....	− .4	4.3	10.6	7.55	5.2	11.5	4.95	1.45	.8
16	1.0	.85	.....	− .4	5.8	12.05	7.55	4.9	7.65	4.65	1.4	.8
17	1.0	.9	.....	− .4	5.9	12.25	7.35	4.55	6.0	4.35	1.4	.8
18	1.05	.9	.....	− .4	4.2	12.5	7.1	8.0	5.45	4.2	1.3	.8
19	1.1	1.05	.....	− .4	3.0	12.8	6.75	12.35	5.3	4.3	1.3	.8
20	1.45	1.3	.....	− .5	3.9	13.05	6.35	11.6	5.25	4.0	1.3	.8
21	2.15	1.55	.....	− .6	6.65	13.1	6.1	8.5	6.15	3.6	1.3	.8
22	2.4	1.7	.....	− .65	5.85	13.2	5.9	7.3	6.4	3.3	1.3	.8
23	2.15	1.8	.....	− .75	4.3	13.05	5.55	6.9	5.8	3.05	1.25	.8
24	1.85	1.8	.....	− .8	3.25	11.95	5.25	6.25	5.45	2.9	1.2	.8
25	1.6	1.9	.....	− .9	2.4	9.75	5.05	5.65	5.35	2.8	1.2	.8
26	1.4	1.75	.....	− .9	2.2	9.15	4.75	5.3	5.2	2.7	1.1	.8
27	1.25	1.65	.....	− .9	2.6	9.05	4.55	5.15	4.95	2.6	1.1	.7
28	1.15	1.6	.....	− .9	2.8	9.05	4.35	5.3	4.8	2.6	1.05	.7
29	1.1	.....	.....	− .9	2.55	9.15	4.6	5.6	4.65	2.6	1.0	.7
30	1.1	.....	.....	− .75	2.25	8.9	7.7	5.4	4.3	3.25	1.0	.7
31	1.05	.....	.....	.....	2.1	.....	8.35	5.2	.....	4.05	.....	.7
1904.												
1	.7	.2	.0	− .8	.0	1.3	2.8	2.95	.2	12.6	12.3	7.3
2	.7	.2	.0	− .65	.1	3.05	9.6	2.5	.1	12.6	12.2	7.2
3	.7	.2	.0	− .55	.0	4.7	10.7	2.1	.1	12.55	12.4	7.1
4	.7	.2	− .1	− .5	.0	5.2	7.4	1.75	.1	12.45	12.5	7.0
5	.7	.2	− .2	5.45	.7	4.25	5.8	1.55	.3	12.4	12.05	6.85
6	.7	.2	− .2	6.4	7.3	3.8	5.35	1.5	.55	12.25	11.85	6.7
7	.7	.2	− .25	5.2	6.5	3.75	4.7	1.45	.75	12.05	11.3	6.6
8	.7	.2	− .3	4.05	4.0	7.6	4.05	1.25	1.0	11.7	10.65	6.5
9	.7	.2	− .3	3.35	2.75	11.1	3.85	1.05	2.0	11.7	10.15	6.4
10	.7	.2	− .3	2.8	3.5	10.55	3.65	.95	9.25	11.15	9.95	6.4
11	.7	.2	− .35	2.25	6.7	7.5	3.3	.9	11.07	10.25	10.45	6.4
12	.7	.2	− .4	1.8	4.9	5.8	2.9	.9	12.35	10.25	10.1	6.85
13	.6	.2	− .4	1.35	3.7	5.35	2.65	1.15	12.5	10.1	9.55	7.0
14	.6	.25	− .5	.95	3.0	4.7	2.35	2.1	12.55	10.15	9.25	7.0
15	.6	.45	− .6	.7	5.7	4.4	2.15	2.95	12.7	10.4	8.9	7.0
16	.6	.65	− .6	.45	7.2	4.7	1.95	3.4	12.8	10.9	8.5	6.9
17	.6	.55	− .6	.25	7.9	4.9	1.75	2.9	12.8	11.5	8.3	6.8
18	.6	.25	− .6	.1	10.2	4.9	1.6	2.35	12.9	12.25	8.2	6.65
19	.5	.15	− .6	.0	9.3	4.6	1.45	1.8	12.9	12.4	8.1	6.45
20	.5	.0	− .6	− .1	6.6	4.0	1.3	1.45	13.0	12.5	8.0	6.3
21	.5	.0	− .6	− .15	5.05	3.4	1.2	1.4	13.0	12.5	7.9	6.2
22	.5	.0	− .6	− .25	4.15	3.2	1.1	1.25	13.0	12.5	7.75	6.2
23	.5	.0	− .7	− .3	3.55	3.45	1.0	.95	12.9	12.65	7.6	6.2
24	.4	.9	− .7	− .4	3.0	4.65	1.0	.65	12.9	12.75	7.45	6.3
25	.4	.05	− .7	− .4	2.6	4.3	.9	.5	12.8	12.8	7.25	6.4

[a] Gage heights for 1903 complete so far as Mexican records exist.

Daily gage height, in feet, of Rio Grande near Brownsville, Tex., for 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
26	0.4	0.2	−0.7	−0.3	2.2	3.9	0.9	0.5	12.8	12.7	7.1	6.3
27	.4	.2	− .7	− .2	1.85	3.25	4.25	.45	12.7	12.7	7.0	6.2
28	.4	.15	− .7	− .3	1.65	2.65	4.75	.4	12.7	12.6	7.0	6.1
29	.3	.0	− .7	− .2	1.45	2.35	4.65	.4	12.7	12.6	7.2	6.0
30	.3	.....	− .7	.0	1.25	2.15	4.15	.4	12.7	12.5	7.2	5.9
31	.2	.....	− .7	.....	1.1	.....	3.6	.3	.....	12.5	.....	5.65
1907.												
1	5.5	4.2	3.1	1.7	2.1	7.6	6.45	5.2	2.25	6.9	6.0	6.0
2	5.4	4.1	3.0	1.7	2.2	5.9	6.4	5.2	2.45	6.9	7.75	6.2
3	5.3	4.2	3.0	1.7	2.2	5.7	6.4	5.2	3.25	6.95	7.1	6.2
4	5.25	4.2	3.0	1.7	2.2	5.7	7.3	5.2	4.1	7.0	6.0	6.25
5	5.2	4.2	2.9	1.7	3.5	5.7	11.15	5.3	4.75	6.7	5.95	6.4
6	5.1	4.3	2.8	1.6	6.55	5.3	13.4	5.3	5.35	6.3	6.5	7.7
7	5.05	4.4	2.7	1.6	10.85	5.1	12.0	5.3	5.8	6.05	6.7	9.95
8	4.9	4.5	2.65	1.5	7.65	5.0	10.4	5.3	6.4	6.35	7.1	10.0
9	4.8	4.4	2.6	1.4	5.5	5.15	13.0	5.2	6.7	10.4	7.55	9.2
10	4.7	4.4	2.5	1.3	5.05	5.35	13.65	5.05	7.05	11.55	7.85	8.7
11	4.7	4.3	2.5	1.25	5.6	5.45	11.8	4.85	7.8	8.85	8.45	8.3
12	4.6	4.3	2.45	1.2	6.6	5.65	9.05	4.65	7.9	6.6	9.5	8.05
13	4.55	4.25	2.4	1.2	6.35	5.85	7.8	4.5	9.15	6.15	11.55	7.85
14	4.5	4.1	2.35	1.2	5.95	6.0	7.3	4.5	8.25	5.9	11.55	7.7
15	4.5	3.95	2.3	1.55	5.45	6.1	7.2	4.45	7.95	5.5	10.6	7.7
16	4.4	3.8	2.4	1.75	5.15	6.2	7.15	4.25	7.85	5.15	9.35	7.6
17	4.4	3.7	2.4	1.95	4.85	6.3	7.1	4.1	7.75	4.95	8.9	7.45
18	4.4	3.6	2.4	2.1	4.65	6.4	7.65	4.1	7.3	4.8	8.4	7.25
19	4.4	3.5	2.4	2.1	4.45	6.65	7.45	4.1	6.7	4.7	8.0	7.1
20	4.3	3.4	2.3	2.1	4.25	7.8	7.25	4.0	6.7	4.6	7.75	7.0
21	4.3	3.3	2.3	2.1	4.1	8.35	6.95	4.0	6.6	4.5	7.55	6.85
22	4.2	3.2	2.2	2.1	4.25	7.2	6.85	3.9	6.6	4.4	7.3	6.7
23	4.2	3.2	2.2	2.1	4.7	7.35	6.65	3.75	7.8	4.3	6.95	6.55
24	4.2	3.2	2.1	2.0	5.5	7.75	6.5	3.5	9.8	4.2	6.9	6.4
25	4.2	3.2	2.0	2.0	5.6	8.0	6.35	3.15	10.1	4.2	6.75	6.3
26	4.3	3.2	1.9	1.9	5.5	7.6	6.15	2.95	9.4	4.7	6.55	6.25
27	4.3	3.2	1.8	1.8	5.5	7.35	5.85	2.65	8.85	5.05	6.4	6.15
28	4.3	3.1	1.8	1.7	5.4	7.15	5.7	2.45	8.35	5.2	6.3	5.75
29	4.3	.....	1.7	1.6	12.0	7.05	5.6	2.3	7.65	5.3	6.2	5.6
30	4.3	.....	1.7	1.6	13.0	6.7	5.45	2.3	6.95	5.45	6.1	5.6
31	4.3	.....	1.7	.....	9.7	.....	5.25	2.25	.....	5.65	.....	5.55
1908.												
1	5.4	3.5	2.0	.85	4.4	5.1	3.55	5.4	8.0	5.35	3.3	2.0
2	5.3	3.3	2.0	.8	4.15	5.15	3.35	8.45	7.75	5.1	3.15	2.0
3	5.25	3.25	2.0	.8	3.95	5.5	3.2	7.65	8.15	4.9	2.95	2.0
4	5.2	3.1	1.9	.7	3.8	5.2	3.05	7.3	9.25	4.75	2.75	1.9
5	5.1	3.1	1.9	.7	3.75	4.75	2.8	6.95	9.2	4.55	2.7	1.9
6	5.1	3.0	1.85	.65	3.6	4.3	2.4	6.55	9.25	4.45	2.6	1.9
7	5.1	2.9	1.75	.6	3.55	4.0	2.15	5.5	10.85	4.2	2.5	2.1
8	5.0	2.85	1.7	.6	3.75	3.8	2.3	8.05	11.6	4.0	2.4	2.1
9	4.8	2.8	1.6	.5	4.1	3.8	3.45	10.9	11.7	3.85	2.4	2.0
10	4.7	2.8	1.55	.5	3.85	3.85	4.6	10.75	11.8	3.9	2.3	1.95
11	4.6	2.6	1.5	.5	3.75	4.0	5.1	10.85	12.1	6.1	2.2	1.9
12	4.5	2.6	1.4	.75	3.65	4.0	6.15	9.9	11.65	6.05	2.25	1.9
13	4.35	2.6	1.35	7.5	3.5	4.0	6.75	8.7	9.8	5.35	4.15	1.85
14	4.15	2.6	1.3	12.25	3.45	3.85	5.65	8.1	9.45	4.65	6.4	1.8
15	4.1	2.6	1.3	13.05	3.4	3.35	5.1	7.75	9.55	4.2	5.25	1.8
16	4.0	2.6	1.2	10.45	8.0	3.2	5.45	8.65	11.65	3.9	4.55	1.7
17	3.95	2.6	1.2	8.25	13.5	2.95	5.65	11.4	12.4	3.85	4.25	1.7
18	3.9	2.5	1.2	7.4	12.4	2.75	5.2	12.75	11.4	3.45	3.9	1.7
19	3.9	2.5	1.1	6.9	7.65	2.55	5.0	13.0	10.2	3.25	3.45	1.7
20	3.85	2.5	1.1	6.65	5.75	2.4	3.25	11.65	9.4	3.05	3.15	1.7
21	3.8	2.4	1.1	5.9	4.8	2.3	2.85	9.9	8.6	2.85	2.85	1.65
22	3.8	2.3	1.1	9.5	4.3	2.25	2.4	9.45	7.9	2.65	2.65	1.6
23	3.75	2.2	1.1	13.15	4.0	2.0	2.05	9.2	7.55	3.05	2.55	1.6
24	3.7	2.1	1.1	13.2	4.0	2.0	1.9	8.85	7.3	4.35	2.5	1.6
25	3.6	2.1	1.0	9.7	4.0	2.0	1.85	8.6	7.05	9.55	2.4	1.5
26	3.6	2.1	1.0	6.5	4.0	1.9	1.75	8.2	6.8	7.25	2.25	1.5
27	3.6	2.1	1.0	5.55	8.25	1.9	1.45	8.1	6.5	5.25	2.1	1.5
28	3.6	2.0	1.0	5.35	10.5	5.7	1.2	7.95	6.15	4.4	2.0	1.5
29	3.6	2.0	1.0	5.05	8.0	4.5	1.6	7.7	5.9	3.9	2.0	1.5
30	3.6	.....	.9	4.7	5.95	3.8	2.4	7.95	5.55	3.65	2.0	1.5
31	3.6	.....	.9	.....	5.0	.....	2.55	8.7	.....	3.4	.....	1.5

CONEJOS RIVER NEAR MOGOTE, COLO.

Conejos River, the most important tributary of the Rio Grande in Colorado, rises on the eastern slope of the San Juan Range, which forms the western boundary of Conejos County. It first flows southeastward, but at the town of Conejos bends northeastward and enters the Rio Grande below the mouth of Trinchera Creek.

The gaging station which was established March 21, 1907, replacing the station formerly maintained about 4 miles below, is located at a private highway bridge on Jacob's ranch, about 16 miles above Antonito, Colo., in T. 33 N., R. 6 E., New Mexico principal meridian. It is above every important diversion for irrigation, and below all the principal tributaries except the San Antonio.

The data obtained at this station show the amount of water available for irrigation.

Water taken from the Conejos by numerous ditches below the station is used to irrigate 70,000 to 80,000 acres of land. The basin above the station affords excellent opportunities for storage, none of which are utilized at the present time. It will be difficult to procure additional water rights for irrigation along this stream.

The river is covered with ice for three or four months during the winter season. The stream bed is strewn with cobblestones and bowlders, the water has a comparatively high velocity at all stages, and there are eddies around the crib piers of the bridge. The rating curve developed, however, is very good for low and medium stages.

The datum of the chain gage has not been changed since the station was established. This gage is at the same datum as the rod gage used by Mr. Antoine Jacob during 1905 and 1906. The gage heights for these years have been furnished the United States Geological Survey by him from his private records.

Discharge measurements of Conejos River near Mogote, Colo., in 1907 and 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
1907.		*Feet.*	*Sq. ft.*	*Feet.*	*Sec.-ft.*
March 21	R. I. Meeker	95	178	1.38	374
April 22	do	95	183	1.50	402
May 13	W. B. Freeman	92	228	1.77	573
June 11	do	127	376	2.77	1,990
June 27	do	127	416	3.07	2,310
July 30	do	108	250	1.88	775
August 29	C. L. Chatfield	92	174	1.22	280
October 2	J. B. Stewart	100	133	.79	134
November 8	W. B. Freeman	84.5	102	.50	83
1908.					
March 27	J. B. Stewart	86	126	.75	138
May 18	W. B. Freeman	112	259	2.03	709
June 9	J. B. Stewart	122	339	2.54	1,200
July 11	do	98	207	1.52	423
December 1	do	45	49	.70	[a]52
December 6	do	39.5	49	.82	[a]67

[a] Measurement made by wading downstream from bridge. Ice conditions at gage.

Daily gage height, in feet, of Conejos River near Mogote, Colo., for 1905 to 1908.

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Day.	May.	June.	July.	Aug.	Sept.	Oct.
1905.							1905.						
1	.....	3.4	1.95	1.4	0.6	0.5	16	2.6	3.4	1.25	0.7	0.5	.....
2	.....	3.6	1.8	1.3	.6	.5	17	2.7	3.0	1.2	.6	.5	.....
3	.....	3.85	1.65	1.3	.6	.5	18	2.9	2.9	1.3	.6	.5	.....
4	1.9	4.0	1.7	1.5	.6	.5	19	3.0	2.8	1.3	.6	.4	.....
5	1.7	4.25	.....	1.45	.6	.....	20	3.0	2.6	1.5	.6	.....	.....
6	1.55	3.75	1.55	1.25	.6	.....	21	3.15	2.5	1.35	.5	.....	.....
7	1.6	3.6	1.45	1.5	.6	.....	22	3.25	2.4	1.25	.5	.....	.....
8	1.8	3.75	1.4	1.4	.65	.....	23	3.25	2.45	1.2	.6	.....	.....
9	1.9	3.65	1.35	1.25	.65	.....	24	3.35	2.35	1.15	.6	.....	.....
10	1.8	3.4	1.4	1.25	.65	.....	25	3.4	2.5	1.05	.6	.....	.....
11	1.7	3.5	1.35	1.2	.6	.....	26	3.35	2.3	1.0	.7	.....	.....
12	1.7	3.3	1.3	1.0	.55	.....	27	3.35	2.3	1.0	.6	.....	.....
13	1.9	3.25	1.25	.8	.5	.....	28	3.15	2.2	1.15	.6	.....	.....
14	2.0	3.2	1.5	.7	.5	.....	29	3.0	2.15	1.0	.7	.....	.....
15	2.2	3.25	1.25	.7	.45	.....	30	3.0	2.05	1.2	.7	.55	.....
							31	3.2	.....	1.15	.6	.....	.....

Day.	Apr.	May.	June.	Day.	Apr.	May.	June.
1906.				1906.			
1	.....	1.45	2.55	16	.....	2.7	3.65
2	.....	1.4	2.75	17	.....	2.8	3.55
3	.....	1.4	2.6	18	.....	2.85	3.4
4	.....	1.85	.....	19	.....	3.0	3.25
5	.....	1.95	2.75	20	.....	2.95	3.15
6	.....	.....	3.25	21	.....	3.3	3.0
7	.....	2.0	3.5	22	1.8	3.25	.....
8	.....	2.4	3.4	23	1.9	3.15	.....
9	.....	2.5	3.4	24	1.9	2.85	.....
10	.....	2.75	3.5	25	1.85	.....	.....
11	.....	2.8	3.7	26	1.75	2.45	.....
12	.....	2.65	3.7	27	1.75	2.45	.....
13	.....	2.5	3.75	28	1.75	2.75	.....
14	.....	2.55	3.6	29	1.45	2.65	.....
15	.....	2.55	3.65	30	1.4	2.5	.....
				31	.....	2.45	.....

Daily gage height, in feet, of Conejos River near Mogote, Colo., for 1905 to 1908—Con.

[Francisque Jacob, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.										
1	.....	1.0	1.55	2.0	3.45	1.95	1.55	0.6	0.5	0.5
2	.....	1.0	1.4	2.15	3.4	1.9	1.5	.6	.5	.5
3	.....	1.0	1.4	2.45	3.25	1.85	1.4	.6	.5	.6
4	.....	1.05	1.4	2.7	3.1	1.8	1.3	.7	.5	.6
5	.....	1.05	1.4	2.9	3.1	1.8	1.2	.7	.5	.5
6	.....	1.1	1.4	3.0	3.0	1.7	1.2	.75	.5	.5
7	.....	1.1	1.4	3.0	3.2	1.75	1.2	.8	.5	.5
8	.....	1.2	1.4	2.95	3.0	1.6	1.2	.7	.5	.6
9	.....	1.3	1.4	2.75	2.9	1.6	1.3	.7	.5	.6
10	.....	1.5	1.45	2.7	2.95	1.55	1.2	.7	.5	.6
11	.....	1.8	1.65	2.9	2.8	1.45	1.2	.7	.5	.7
12	.....	2.0	1.9	3.0	2.7	1.4	1.05	.6	.5	.7
13	.....	2.1	1.75	3.1	2.75	1.8	.95	.6	.5	.7
14	.....	2.15	1.65	3.1	3.25	1.55	.9	.6	.4	.7
15	.....	2.2	1.6	3.2	3.25	1.45	.9	.6	.4	.7
16	.....	2.15	1.75	3.15	2.7	1.4	.9	.6	.4	.7
17	.....	2.0	2.05	3.0	2.45	1.3	.9	.6	.5	.7
18	.....	2.0	2.2	3.0	2.35	1.3	.9	.6	.5	.7
19	.....	2.0	2.45	3.0	2.35	1.3	1.0	.6	.5	.7
20	.....	2.0	2.8	2.85	2.3	1.3	1.0	.6	.5	.7
21	1.4	2.0	3.0	2.7	2.4	1.4	.9	.6	.5	.7
22	1.5	1.55	3.05	2.7	2.3	1.4	.9	.5	.5	.7
23	1.25	1.5	3.05	2.7	2.25	1.3	.8	.5	.5	.7
24	1.2	1.45	2.75	2.9	2.25	1.2	.8	.5	.5	.7
25	1.2	1.5	2.5	2.95	2.35	1.3	.8	.6	.5	.7
26	1.2	1.5	2.5	3.05	2.15	1.3	.8	.6	.5	.7
27	1.1	1.5	2.45	3.05	2.15	1.2	.7	.6	.5	.7
28	1.05	1.5	2.4	3.15	1.95	1.2	.7	.6	.5	.7
29	1.0	1.6	2.25	3.25	1.95	1.2	.7	.6	.6	.7
30	1.0	1.6	2.1	3.25	2.0	2.0	.6	.6	.6	.7
31	1.0	.....	2.05	.....	1.9	1.75	.....	.6	.....	.7
1908.										
1	.....	.55	1.4	2.05	2.0	1.35	.9	.7	.5	.7
2	.....	.6	1.65	2.2	1.85	1.6	.8	.7	.5	.....
3	.....	.65	1.75	2.35	1.85	1.5	.85	.7	.5	.....
4	.....	.75	1.5	2.35	1.8	1.35	.7	.7	.5	.....
5	.....	.75	1.8	2.4	1.7	1.25	.7	.6	.5	.....
6	.....	.75	1.7	2.4	1.75	1.15	.7	.6	.5	.....
7	.....	.75	1.3	2.25	1.7	1.1	.6	.6	.5	.....
8	.....	.75	1.55	2.15	1.8	1.15	.6	.6	.5	.....
9	.....	.75	1.65	2.55	1.6	1.1	.6	.6	.5	.....
10	.....	.75	1.5	2.75	1.5	1.1	.6	.6	.5	.....
11	.....	.75	1.55	2.9	1.5	1.15	.5	.6	.5	.....
12	.....	.75	1.65	2.75	1.7	1.1	.5	.6	.5	.....
13	.....	.8	1.4	2.75	1.6	1.0	.5	.6	.5	.....
14	.....	.95	1.3	2.8	1.55	1.15	.6	.6	.5	.....
15	0.8	1.1	1.4	2.8	1.6	1.25	.6	.6	.5	.....
16	.8	1.25	1.7	2.85	1.6	1.2	.6	.5	.5	.....
17	.8	1.2	1.9	2.75	1.65	1.7	.6	.55	.5	.....
18	.85	1.25	2.05	2.4	1.5	1.35	.5	.6	.5	.....
19	.8	1.25	2.2	2.2	1.45	1.4	.5	.6	.5	.....
20	.8	1.15	2.2	2.25	1.4	1.4	.5	.6	.5	.....
21	.8	1.25	2.0	2.25	1.35	1.5	.5	.7	.5	.....
22	.75	1.45	2.1	2.25	1.3	1.45	.5	.7	.5	.....
23	.7	1.5	1.95	2.25	1.55	1.4	.5	.7	.6	.....
24	.75	1.35	1.8	2.25	1.5	1.2	.5	.7	.6	.....
25	.75	1.3	1.8	2.25	1.55	1.15	1.2	.7	.6	.....
26	.75	1.25	1.9	2.5	1.2	1.1	1.0	.6	.6	.....
27	.75	1.2	1.8	2.5	1.15	1.05	.9	.5	.6	.....
28	.65	1.15	1.75	2.4	1.15	1.0	.8	.5	.6	.....
29	.55	1.25	1.85	2.2	1.1	1.0	.8	.5	.6	.....
30	.55	1.3	1.95	2.05	1.2	1.0	.7	.5	.6	.....
31	.55	.....	2.1	.....	1.3	.9	.....	.5	.....	.....

NOTE.—Ice conditions begin November 23, 1908. On December 1, 1908, there was 0.9 foot of ice at gage.

Rating table for Conejos River near Mogote, Colo., for 1905 to 1908.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
0.40	68	1.30	308	2.20	900	3.20	2,330
.50	83	1.40	353	2.30	1,000	3.40	2,680
.60	101	1.50	403	2.40	1,110	3.60	3,030
.70	122	1.60	458	2.50	1,230	3.80	3,380
.80	146	1.70	518	2.60	1,360	4.00	3,730
.90	172	1.80	583	2.70	1,500	4.20	4,080
1.00	200	1.90	653	2.80	1,650		
1.10	232	2.00	728	2.90	1,810		
1.20	268	2.10	810	3.00	1,980		

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on discharge measurements made during 1907 to 1908 and two measurements made in the first part of 1909 and is well defined between gage heights 0.4 foot and 2.5 feet. Above gage height 2.5 feet the curve is only approximate.

Monthly discharge of Conejos River near Mogote, Colo., for 1905 to 1908.

[Drainage area, 282 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1905.							
May 4–31	2,680	430	1,500	5.32	5.54	83,300	A.
June	4,170	769	2,160	7.66	8.55	129,000	A.
July	690	200	339	1.20	1.38	20,800	A.
August	403	83	190	.674	.78	11,700	A.
September	112	68	87.8	.311	.35	5,220	C.
The period						250,000	
1906.							
April 22–30	653	353	543	1.93	.65	9,690	A.
May	2,500	353	1,340	4.75	5.48	82,400	A.
June 1–21	3,290	1,300	2,480	8.79	6.86	103,300	B.
The period						195,000	
1907.							
March 21–31	403	200	263	.933	.38	5,740	A.
April	900	200	486	1.72	1.92	28,900	A.
May	2,070	353	848	3.01	3.47	52,100	A.
June	2,590	728	1,830	6.49	7.24	109,000	A.
July	2,770	653	1,520	5.39	6.21	93,500	A.
August	728	268	427	1.51	1.74	26,300	A.
September	430	101	216	.766	.85	12,900	B.
October	146	83	106	.376	.43	6,520	C.
November	101	68	82.7	.293	.33	4,920	D.
December	122	83	112	.397	.46	6,890	C.
The period						347,000	
1908.							
March 15–31	159	92	130	.461	.29	4,380	C.
April	403	92	219	.777	.87	13,000	B.
May	900	308	564	2.00	2.31	34,700	A.
June	1,810	769	1,170	4.15	4.63	69,600	A.
July	728	232	432	1.53	1.76	26,600	A.
August	518	172	288	1.02	1.18	17,700	A.
September	268	83	118	.418	.47	7,020	C.
October	122	83	103	.365	.42	6,330	C.
November	83	80	82.2	.191	.21	4,890	D.
The period						184,000	

NOTE.—Discharge estimated November 23–30, 1908. Values of accuracy for 1905 and 1906 are based on the assumption that the stream bed remained permanent.

SANTA FE CREEK AT SANTA FE, N. MEX.

Santa Fe Creek rises on the range east of Santa Fe and flows westward over high plains to join the Rio Grande south of the Espanola Valley.

The gaging station, which was established May 31, 1907, to determine the amount of water available for irrigation and storage, is located at the Don Gaspar Avenue Bridge in the city of Santa Fe.

No important tributaries except intermittent streams enter below the station. The drainage area at the station is about 40 square miles, and at the mouth of the river it is about 300 square miles.

The reservoir for the Santa Fe municipal supply is situated in the canyon above the station, and a water-power plant of 100-horsepower capacity is used to develop power for lighting. Very little water is diverted for irrigation above the station. One small ditch takes water out just above. In the canyon 8 miles above Santa Fe is a reservoir site where 10,000 acre-feet can be stored.

Ice is usually to be found in the stream during the winter months, though the flow is very small during that period. The low-water flow is regulated to some extent by the waterworks reservoir above.

The gage datum was changed on August 13, 1908, and again on August 22, 1908. Results obtained at this station have been very unsatisfactory owing to the torrential character of the stream, the shifting nature of the bed, and the inadequate number of discharge measurements.

Discharge measurements of Santa Fe Creek at Santa Fe, N. Mex., in 1907 and 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
1907.		*Feet.*	*Sq. ft.*	*Feet.*	*Sec.-ft.*
May 31	V. L. Sullivan	12	9.5	0.50	19.5
June 25	do	7	1.8	.17	2.7
1908.					
May 23	C. D. Miller			.48	11.8
July 18	Cooper and Miller	12	10.0	.55	34.6
Do	do	11.5	7.2	.50	24.5
Aug. 17	R. L. Cooper	16	19	.20	95
Aug. 19	do	13	11	−.10	33
Do	do	13	12	.05	38
Aug. 20	do	13	13	.00	52
Aug. 21	do	12.5	9.4	−.15	30
Nov. 24	W. B. Freeman	2	.5	−.40	.4

NOTE.—Measurements in 1908 were made by wading.

Daily gage height, in feet, of Santa Fe Creek at Santa Fe, N. Mex., for 1907 and 1908.

[V. L. Sullivan, observer.]

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.								1907.							
1	0.49	0.00	0.00	0.60	0.00	0.05	0.20	16	0.44	0.00	0.00	0.10	0.00	0.05	0.30
2	.50	.00	.00	.50	.00	.05	.30	17	.44	.00	.00	.00	.00	.05	.30
3	.50	.00	.20	.55	.00	.05	.10	18	.39	.00	.00	.05	.00	.05	.30
4	.50	.00	.10	.50	.00	.05	.08	19	.45	.00	.00	.05	.00	.00	.06	.35
5	.50	.00	.15	.40	.00	.05	.10	20	.50	.00	.00	.05	.00	.06	.35
6	.50	.00	.00	.50	.00	.08	.15	21	.40	.00	.00	.02	.05	.05	.30
7	.52	.00	.00	.40	.00	.08	.20	22	.40	.00	.00	.02	.00	.05	.25
8	.52	.00	.00	.45	.00	.08	.20	23	.35	.00	.00	.00	.00	.10	.30
9	.50	.05	.00	.42	.00	.08	.20	24	.35	.00	.00	.00	.00	.15	.25
10	.50	.00	.00	.40	.00	.06	.25	25	.28	.00	.00	.00	.00	.15	.25
11	.48	.05	.00	.30	.00	.06	.20	26	.20	.00	.00	.00	.00	.15	.25
12	.48	.00	.00	.10	.00	.05	.20	27	.15	.00	.00	.00	.00	.18	.20
13	.45	.00	.00	.00	.00	.05	.30	28	.15	.05	.00	.00	.00	.18	.20
14	.45	.00	.00	.00	.00	.05	.30	29	.10	.05	.00	.00	.02	.20	.25
15	.40	.00	.00	.00	.00	.08	.35	30	.05	.00	.80	.00	.02	.20	.20
								31	.....	.00	.60	.....	.02	.....	.25

[Avis Brumback and C. D. Miller, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	0.3	0.1	0.1	.....	0.05	0.4	0.0	0.4	−0.2	−0.4	−0.4	−0.2
2	.35	.1	.2	.....	.0	.6	.0	.7	− .3	− .4	− .4	− .2
3	.3	.15	.15	.....	.1	.3	.0	.5	− .4	− .4	− .5	− .2
4	.25	.1	.15	.....	.25	.2	.0	.4	− .4	− .4	− .4	− .4
5	.3	.1	.2	.....	.0	.25	.0	.3	− .4	− .4	− .4	− .4
6	.3	.3	.3	.....	.0	.2	.0	.25	− .4	− .4	− .4	− .4
7	.3	.3	.2	.....	.2	.15	.0	.3	− .4	− .4	− .4	− .5
8	.3	.25	.05	.....	.0	.15	.0	.4	− .5	− .4	− .5	− .5
9	.3	.2	.25	.....	.0	.15	.0	.2	.....	− .4	− .4	− .5
10	.25	.2	.05	.....	.0	.0	.0	.2	.....	− .4	− .4	− .5
11	.25	.2	.25	.....	.0	.4	.0	.25	.....	− .4	− .4	− .5
12	.25	.2	.1	.....	.1	.3	.0	.25	.....	− .4	− .4	− .5
13	.2	.2	.2	.....	.2	.25	.0	1.5	.....	− .4	− .4	− .5
14	.25	.2	.15	.....	.15	.0	.0	1.5	.....	− .4	− .4	− .5
15	.25	.25	.0	.....	.0	.0	1.0	.95	.....	− .4	− .4	− .5
16	.2	.25	.05	.....	.0	.3	.3	.....	.....	− .4	− .4	− .5
17	.2	.1	.1	.....	.15	.25	.3	.5	.....	− .4	− .4	− .5
18	.25	.2	.05	.....	.15	.0	2.0	.2	.....	− .4	− .4	− .5
19	.25	.2	.0	.....	.1	.0	.3	− .1	.....	− .4	− .4	− .4
20	.2	.15	.0	.....	.0	.0	.3	.0	.....	− .4	− .4	− .3
21	.2	.2	.0	.....	.0	.0	.4	.35	.....	− .3	− .4	− .3
22	.2	.25	.0	0.05	.35	.0	.2	.3	.....	.0	− .4	− .3
23	.25	.2	.0	.05	.55	.0	.3	.38	.....	− .1	− .4	− .3
24	.2	.2	.0	.05	.4	.0	.25	.38	.....	− .3	− .3	− .4
25	.2	.25	.0	.05	.3	.0	.3	.3	.....	− .3	− .3	− .4
26	.1	.2	.0	.1	.15	.0	.2	.1	.....	− .2	− .3	− .4
27	.1	.3	.0	.15	.1	.1	.2	.0	.....	− .2	− .3	− .4
28	.2	.2	.0	.2	.15	.0	.2	.0	.....	− .3	− .2	− .6
29	.2	.25	.0	.0	.15	.0	.1	− .2	.....	− .2	− .2	− .5
30	.2	.....	.0	.0	.0	.0	.2	− .1	.....	− .3	− .2	− .5
31	.2	.....	.0	.....	.0	.....	.35	− .1	.....	− .35	.....	− .3

NOTE.—April 1–21, 1908, no flow. All water diverted above gage for irrigation. Water standing in pools June 30–July 14, 1908. Gage heights beginning August 13, 1908, refer to new gage. August 21, old gage read 0.3 foot. September 9–30 no readings were made but a little water was flowing below the gage.

MIMBRES RIVER NEAR FAYWOOD, N. MEX.

The station, which was established April 23, 1908, is located about 6 miles southeast of Faywood Hot Springs and 10 miles from Faywood station on the Silver City branch of the Santa Fe Railway. The gage is located about 400 feet below the proposed Rio Mimbres reservoir dam site.

The data obtained here will show the amount of water available for storage. No important tributaries enter in the vicinity of the station, though numerous intermittent tributaries come in both above and below. The drainage area is about 450 square miles.

Some water is used for irrigation in the Mimbres Valley below the station, but as this is primarily a flood stream, and as storage has not been provided, such irrigation is uncertain. By storing the flood water and cutting off the underflow at the Rio Mimbres dam site, it will be possible to reclaim several thousand acres of land along this stream.

The flow of the stream at the gaging station is not usually affected by ice during the winter months. As the channel is very shifting in character, frequent measurements are necessary at high and medium stages to obtain the best results.

The datum of the gage has not been changed during the maintenance of the station. The present chain gage was installed on July 31, 1908.

Discharge measurements of Mimbres River near Faywood, N. Mex., in 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
May 12	R. L. Cooper	18	5.4	0.00	6.3
July 31	do	60	21	.20	38

Daily gage height, in feet, of Mimbres River near Faywood, N. Mex., for 1908.

[Ralph C. Trujillo, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.1	0.1	0.0	0.2	0.2	0.2	0.1	−0.1
2	.1	.1	.0	.6	.2	.2	.0	− .1
3	.2	.1	.0	.5	1.5	.3	.0	− .1
4	.2	.1	.0	.3	.5	.3	.0	.0
5	.1	.0	.0	.2	.2	.2	.0	.0
6	.1	.0	.0	.1	.2	.3	.0	.0
7	.1	.0	.0	.2	.2	.3	.0	.0
8	.1	.0	.0	.2	.2	.3	.0	.0
9	.1	.0	.1	.2	.2	.2	− .1	.0
10	.1	.0	.2	.2	.2	.3	− .1	.0
11	.1	.0	.2	.2	.2	.3	− .1	.0
12	.0	.0	.1	.1	.2	.3	− .1	.0
13	.0	.0	.0	.1	.2	.3	− .2	.1
14	.0	.0	1.1	.1	.2	.3	− .2	.2
15	.0	.0	.2	.8	.2	.3	− .1	.2
16	.0	.0	.4	.5	.2	.2	.0	.3
17	.0	.0	1.3	.3	.3	.2	.0	.2
18	.0	.0	.3	.2	.3	.2	− .1	.2
19	.0	.0	.3	.2	.2	.2	− .1	.2
20	.1	.0	.3	1.1	.3	.2	.0	.1
21	.1	.0	.2	.4	.2	.2	.0	.1
22	.1	.0	.1	.2	.3	.2	.0	.1
23	.1	.0	.0	.2	.2	.2	.0	.1
24	.1	.0	.0	.2	.2	.2	− .1	.1
25	.1	.0	1.5	.2	.2	.3	− .1	.2
26	.0	.0	1.1	.3	.3	.3	− .1	.2
27	.0	.0	1.7	2.3	.3	.3	− .1	.2
28	.0	.0	1.5	.3	.2	.2	− .1	.1
29	.0	.0	1.3	.2	.2	.2	− .1	.1
30	.0	.0	.5	2.5	.2	.2	− .1	.1
31	.0	.....	.2	.3	.....	.1	.....	.1

NOTE.—It is doubtful from the observer's records whether gage heights November 9–December 6 are plus or minus readings.

CAMERON CREEK AT FORT BAYARD, N. MEX.

This station, which was established on January 17, 1907, at the request of the United States Forest Service, to obtain data concerning flood run-off, is located near the pumping station at Fort Bayard, N. Mex., a United States Army post. The gage is a short distance above the crest of an old masonry dam, which was used to check the underflow of the creek.

For the greater part of the year the flow comes from springs, and amounts to less than 1 second-foot. Stephens Creek enters about 2 miles above this station.

The intake for the water supply of the post is above the station, and a little water is also diverted above for garden irrigation. The flood waters of this stream can probably be stored in natural depressions in the vicinity, which will make excellent reservoir sites. These can be supplied by feeder canals.

Ice conditions do not appreciably effect the flow of the stream at this point. The channel has filled up with sediment above the dam, which probably has some effect on low-water measurements. The channel is probably permanent for measurements taken at higher

stages. Unfortunately no high-water measurements have yet been made. The estimates of discharge given below are largely estimated.

No change has been made in the datum of the gage during the maintenance of the station. Gage observations have been taken gratis by Sergt. T. J. McBurney, U. S. Army.

Discharge measurements of Cameron Creek at Fort Bayard, N. Mex., in 1907 and 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
1907.		*Feet.*	*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 19	W. A. Lamb	8	3.4	2.02	[a] 14.0
May 14	do	2.5	.6	1.75	[b] 1.0
1908.					
November 9	R. L. Cooper			1.45	[c] .5

[a] Made by wading 300 feet above gage. [b] Made by floats near gage. [c] Estimated.

Daily gage height, in feet, and discharge, in second-feet, of Cameron Creek at Fort Bayard, N. Mex., for 1907 and 1908.

[Sergt. T. J. McBurney, observer.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1907.			1908.		
January 19	2.02	14.0	January 1–February 3		0.5
January 20–24		2.0	February 4		1.0
January 25–29		1.0	February 5–July 28		.5
January 30–31		2.0	July 29	2.1	18.0
February 1		1.5	July 30–August 19		.5
February 2–June 30		1.0	August 20	2.65	48.5
July 1–10		.5	August 21–December 31		.5
July 11		2.5			
July 12–20		.5			
July 21	2.2	23.5			
July 22–August 26		.5			
August 27	2.25	26.5			
August 28	2.35	32.0			
August 29–December 31		.5			

NOTE.—The gage heights for low stages are not a true index of the discharge and hence are not given. Discharges above 2.0 second-feet are estimated and are very approximate.

Monthly discharge of Cameron Creek at Fort Bayard, N. Mex., for 1907 and 1908.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).
1907.			1908.		
January 19–31	2.54	65.5	January	0.50	30.7
February	1.02	56.6	February	.52	29.9
March	1.00	61.5	March	.50	30.7
April	1.00	59.5	April	.50	29.8
May	1.00	61.5	May	.50	30.7
June	1.00	59.5	June	.50	29.8
July	1.31	80.6	July	1.06	65.2
August	2.35	144	August	2.05	126
September	.50	29.8	September	.50	29.8
October	.50	30.7	October	.50	30.7
November	.50	29.8	November	.50	29.8
December	.50	30.7	December	.50	30.7
The period		710	The year	.68	494

NOTE.—Monthly discharge, 1907 and 1908, approximate.

STEPHENS CREEK NEAR FORT BAYARD, N. MEX.

This station, which was established January 17, 1907, at the request of the United States Forest Service, is located one-fourth mile above the Fort Bayard planting station of the Forest Service, 3 miles north of Fort Bayard.

The records furnish valuable information concerning normal and flood run-off. The station is situated about 2 miles above the junction of this stream with Cameron Creek.

The normal flow of this creek is very small, but for short periods during floods it occasionally carries a large flow, which can probably be stored. The intake for the water supply of the planting station is above the gage.

The records of this station are little, if any, affected by ice. The results obtained have not been very satisfactory, owing to the small number of discharge measurements, none of which were taken when there was any considerable flow in the stream.

No change has been made in the datum of the gage since the establishment of the station.

Discharge measurements of Stephens Creek near Fort Bayard, N. Mex., in 1907.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 17	W. A. Lamb	3	0.9	1.30	2.7
May 14	do	1	.1	1.14	*a*.1

a Made by floats below gage.

Daily gage height, in feet, of Stephens Creek near Fort Bayard, N. Mex., for 1907 and 1908.

[E. F. Hadley and Amos Hedricks, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.[a]												
1	.....	1.18	1.17	.....	1.14	1.18	.....	1.15	1.16	1.15	1.18	1.19
2	.....	1.18	1.16	.....	1.14	1.18	.....	1.14	1.15	1.14	1.17	1.19
3	.....	1.18	1.15	1.17	1.14	1.17	.....	1.14	1.16	1.14	1.17	1.19
4	.....	1.18	1.15	1.16	1.14	1.18	.....	1.15	1.14	1.15	1.17	1.18
5	.....	1.17	1.15	1.17	1.14	1.18	.....	1.15	1.15	1.15	1.16	1.20
6	.....	1.17	1.15	1.17	1.14	1.18	1.18	1.14	1.15	1.15	1.17	1.19
7	.....	1.17	1.16	1.17	1.15	1.18	1.18	1.15	1.14	1.15	1.17	1.18
8	.....	1.17	1.17	1.28	1.14	1.18	1.18	1.14	1.14	1.16	1.19	1.17
9	.....	1.17	1.17	1.14	1.14	1.18	1.18	1.13	1.12	1.16	1.17	1.17
10	.....	1.18	1.15	1.14	1.14	1.17	1.20	1.18	1.13	1.16	1.17	1.16
11	.....	1.18	1.16	1.13	1.14	1.17	1.19	1.12	1.13	1.17	1.18	1.17
12	.....	1.18	1.16	1.14	1.14	1.16	1.18	1.13	1.13	1.17	1.17	1.18
13	.....	1.18	1.16	1.14	1.14	1.16	1.19	1.14	1.13	1.17	1.17	1.18
14	.....	1.17	1.16	1.14	1.15	1.17	1.18	1.15	1.18	1.16	1.17	1.18
15	.....	1.17	1.16	1.14	1.15	1.15	1.18	1.14	1.15	1.16	1.16	1.18
16	.....	1.18	1.16	1.14	1.15	1.20	1.19	1.13	1.16	1.16	1.16	1.17
17	1.30	1.18	1.16	1.14	1.15	1.18	1.16	1.14	1.15	1.17	1.17	1.16
18	.....	1.17	1.16	1.14	1.15	1.17	1.16	1.14	1.16	1.19	1.17	1.16
19	.....	1.17	1.16	1.13	1.15	1.19	1.18	1.15	1.16	1.19	1.18	1.16
20	1.18	1.16	1.16	1.13	1.15	1.18	1.18	1.19	1.17	1.18	1.18	1.17
21	1.18	1.16	1.16	1.13	1.14	1.18	1.30	1.16	1.17	1.17	1.17	1.16
22	1.17	1.16	1.17	1.14	1.15	1.18	1.28	1.17	1.17	1.17	1.17	1.16
23	1.17	1.17	.....	1.14	1.15	1.18	1.17	1.17	1.16	1.16	1.17	1.17
24	1.17	1.17	.....	1.14	1.15	1.17	1.15	1.16	1.16	1.17	1.17	1.17
25	1.17	1.17	1.16	1.14	1.15	1.18	1.15	1.16	1.15	1.17	1.17	1.16
26	1.17	1.17	1.16	1.14	.....	1.12	1.14	1.17	1.15	1.16	1.18	1.16
27	1.17	1.18	1.16	1.14	.....	1.13	1.15	1.62	1.14	1.16	1.17	1.16
28	1.17	1.17	1.16	1.14	1.16	1.13	1.13	1.19	1.14	1.16	1.16	1.16
29	1.17	.....	.....	1.15	1.16	1.16	1.12	1.18	1.15	1.16	1.17	1.16
30	1.19	.....	.....	1.14	1.20	.....	1.13	1.17	1.14	1.17	1.18	1.17
31	1.18	.....	.....	.....	1.19	.....	1.14	1.16	.....	1.19	.....	1.16
1908.[b]												
1	1.17	1.17	1.16	1.15	1.15	1.13	.00	1.13	1.15	.....	.....	.....
2	1.17	1.17	1.16	1.14	1.15	1.13	.00	1.13	1.15	.....	.....	.....
3	1.19	1.17	1.16	1.17	1.17	1.13	.00	1.13	1.19	.....	.....	.....
4	1.18	1.18	1.17	1.16	1.17	1.13	.00	1.13	1.17	.....	.....	.....
5	1.18	1.18	1.16	1.15	1.16	1.13	.00	1.13	1.17	.....	.....	.....
6	1.18	1.17	1.16	1.14	1.16	1.13	.00	1.14	.....	.....	.....	.....
7	1.18	1.17	1.17	1.15	1.16	1.13	.00	1.14	.....	.....	.....	.....
8	1.18	1.18	1.17	1.15	1.16	1.12	.00	1.14	.....	.....	.....	.....
9	1.18	1.18	1.17	1.16	1.16	1.12	.00	1.14	.....	.....	.....	.....
10	1.18	1.18	1.17	1.15	1.16	1.12	.00	1.14	.....	.....	.....	.....
11	1.18	1.18	1.17	1.15	1.16	1.12	.00	1.14	.....	.....	.....	.....
12	1.18	1.18	1.17	1.15	1.14	1.12	.00	1.14	.....	.....	.....	.....
13	1.18	1.16	1.16	1.14	1.16	1.13	.00	1.14	.....	.....	.....	.....
14	1.17	1.18	1.16	1.14	1.16	1.12	.00	1.15	.....	.....	.....	.....
15	1.17	1.19	1.16	1.14	1.15	1.12	1.12	1.15	.....	.....	.....	.....
16	1.18	1.18	1.16	1.16	1.16	1.12	1.32	1.15	.....	.....	.....	.....
17	1.18	1.16	1.16	1.16	1.16	1.12	1.13	1.15	.....	.....	.....	.....
18	1.17	1.16	1.16	1.16	1.16	1.12	1.13	1.15	.....	.....	.....	.....
19	1.17	1.16	1.16	1.16	1.15	1.12	1.13	1.15	.....	.....	.....	.....
20	1.17	1.16	1.17	1.15	1.16	1.12	1.13	1.26	.....	.....	.....	.....
21	1.17	1.16	1.17	1.15	1.16	1.12	1.13	1.25	.....	.....	.....	.....
22	1.17	1.18	1.16	1.15	1.16	1.11	1.13	1.24	.....	.....	.....	.....
23	1.17	1.18	1.16	1.17	1.17	1.11	1.13	1.24	.....	.....	.....	.....
24	1.17	1.18	1.16	1.16	1.16	1.11	1.13	1.24	.....	.....	.....	.....
25	1.18	1.17	1.16	1.15	1.17	1.11	1.13	1.23	.....	.....	.....	.....
26	1.18	1.17	1.16	1.16	1.16	1.11	1.13	1.14	.....	.....	.....	.....
27	1.18	1.17	1.17	1.16	1.16	1.11	1.13	1.14	.....	.....	.....	.....
28	1.17	1.16	1.17	1.15	1.15	1.11	1.13	1.13	.....	.....	.....	.....
29	1.17	1.16	1.16	1.15	1.16	1.11	1.15	1.13	.....	.....	.....	.....
30	1.17	.....	1.16	1.15	1.16	1.11	1.13	1.13	.....	.....	.....	.....
31	1.17	.....	1.16	.....	1.15	.....	1.13	1.13	.....	.....	.....	.....

[a] Practically dry June 30–July 5, 1907.
[b] During May and June, 1908, part of the flow was diverted for purposes of irrigation.

PECOS RIVER DRAINAGE BASIN.

DESCRIPTION.

Pecos River, the largest tributary of the Rio Grande, rises on the east side of the Santa Fe Range in northern New Mexico, flows south through eastern New Mexico, then southeast through southwestern Texas, and unites with the Rio Grande about 400 miles (by river) below El Paso. Except for some of the upper tributaries, the branches of the Pecos are intermittent, carrying large floods at times. From source to mouth the river is about 800 miles long, and the total drainage area includes more than 32,000 square miles, of which 23,000 are in New Mexico and 9,000 in Texas.

The upper Pecos flows as a typical mountain stream through narrow valleys and deeply cut gorges, but below Fort Sumner the canyon-like walls disappear and are replaced by low rolling hills, and when the river reaches Roswell the gradation from the flood plains to the prairie is imperceptible. Arroyos and gulches are rare and canyons are practically unknown. The mountain tributaries of the upper Pecos rise at an elevation of about 11,000 feet; at Santa Rosa, N. Mex., the elevation is 4,600 feet; at Roswell, 3,500 feet; at Pecos, Tex., 2,550 feet, and at the mouth of the stream it is 1,000 feet.

The main Pecos may be said to be formed by the junction of the Gallinas with the upper Pecos at La Junta, N. Mex. The most important tributaries below this point and above Roswell are the Agua Negra and the Agua Negra Chiquita, which enter just above Puerto de Luna. Except for small springs no important tributaries enter along this stretch, but some of the dry gulches and arroyos occasionally carry large quantities of flood water. Among the most important of the lower tributaries are the Hondo, Rio Felix, the Penasco, Seven Rivers, and Black River.

It is rather a striking fact that the Pecos receives practically no tributaries from the east, probably because of the pervious character of the soil of the Staked Plains, upon which there is no surface drainage system. The water sinks into limestone rocks and establishes an underground drainage.

The condition of the Pecos basin may be characterized roughly as follows: Merchantable timber land, 1,300 square miles; woodland, 2,400 square miles; 300 square miles of burnt and cut-over land, and the remaining area of about 27,000 square miles is open and sage-brush land.

The rainfall along the Pecos in New Mexico ranges from 20 to 25 inches in the mountainous sections, as above Las Vegas and at Cloudcroft, to about 15 inches in the plains country, or in the vicinity of Roswell and Carlsbad. Through Texas the rainfall is light, the annual average being about 12 inches.

During the winter period the flow of the Pecos is supplied mainly by springs. The river has been known to go dry in the neighborhood of Colonias, N. Mex.

Considerable ice forms on the upper Pecos and heavy snows are common. In the vicinity of Santa Rosa and Fort Sumner thin ice and slush ice are in evidence during a part of the winter. Lower down the valley there is an occasional light snow, which disappears very quickly, and at times there is thin ice along the edges of the river. In the lower end of the valley the climate is mild. The rainfall comes mainly in the summer months in the form of showers, and is variable and uncertain.

Irrigation in New Mexico has reached its highest stage of development in the lower Pecos Valley, the irrigated district beginning a short distance above Roswell and continuing into Texas. Thousands of acres are under cultivation, and a wise and economical system of reservoirs and canals is in force. The surface waters have been greatly augmented during the past few years by numerous artesian wells. Above this fertile belt comparatively little farming is engaged in; below it irrigation is carried on only in a small way, as the return seepage water contains, unfortunately, a great percentage of alkali, which renders it undesirable for irrigation.

The recently completed Carlsbad and Hondo projects (Pls. IV and III, *B*) of the Reclamation Service provide for the irrigation of 20,000 and 10,000 acres, respectively, while the proposed Urton Lake project, which is to be relinquished by the Reclamation Service in favor of a Carey Act project, will result in the irrigation of about 60,000 acres in the vicinity of old Fort Sumner, N. Mex.

Numerous reservoir sites are to be found along the Pecos and its tributaries. Among the reservoirs now in operation may be mentioned Lake McMillan on the Pecos, and the Hondo reservoir on the Hondo River. Urton Lake, a natural depression in the vicinity of Fort Sumner, will have a storage capacity of 190,000 acre-feet. It is to be supplied by a feeder canal from the Pecos River. On account of the large amount of silt carried by this stream the prevention of its deposition must be taken into account and provided for in the construction of reservoirs.

On account of its long periods of low water, this stream does not offer many favorable opportunities for the development of power. At present there are no water-power plants of any importance in operation in the basin, except a public-utility plant of about 300 horsepower at Carlsbad, N. Mex. Later there may be some power development in connection with irrigation projects.

The records along this stream are very fragmentary, and most of them were taken within the last five or six years. From them it would appear that 1903 was a very low year and 1905 an unusually high one.

Following is a list of gaging stations maintained in this drainage, together with the length of record:

Pecos River near Santa Rosa, N. Mex., 1903–1906.
Pecos River near Fort Sumner, N. Mex., 1904–1908.
Pecos River near Roswell, N. Mex., 1903–1906.
Pecos River near Dayton, N. Mex., 1905–1908.
Pecos River near Lakewood, N. Mex., 1906–1908.
Pecos River at Avalon, N. Mex., 1906–7
Pecos River at Carlsbad, N. Mex., 1903–1908.
Pecos River near Pecos, Tex., 1898–1907.
Marguerreta flume near Pecos, Tex., 1898, 1900–1907.
Pecos River near Moorhead, Tex., 1900–1908.
Pecos River at High Bridge, near Lozier, Tex., 1898.
Gallinas River near Las Vegas, N. Mex., 1903–1908.
Taylor Moore ditch near Roswell, N. Mex., 1905.
Hondo River below Hondo reservoir, N. Mex., 1903–1906.
Hondo reservoir inlet near Hondo reservoir, N. Mex., 1906–1908.
Hondo reservoir scour gate No. 1 near Hondo reservoir, N. Mex., 1906.
Hondo River near Roswell, N. Mex., 1903–1906.
Penasco River near Dayton, N. Mex., 1905–1908.
Lake McMillan at Lakewood, N. Mex., 1906–7.

PECOS RIVER NEAR FORT SUMNER, N. MEX.

The station, which was established on June 12, 1904, to determine the amount of water available for the Urton Lake project of the United States Reclamation Service, is located at a place known as Arinosa, about 12 miles northwest of old Fort Sumner, N. Mex., and 4 miles upstream from Fort Sumner, a station on the Belen cut-off of the Atchison, Topeka and Santa Fe Railway, and is near the site of the proposed diversion dam and a few miles below Arroyo Salada.

All the tributaries for a long distance above and below the station are intermittent in character, and only occasionally carry large amounts of water. The drainage area at the station is about 5,300 square miles.

Some irrigation is practiced along the bottom land at various localities above the station, but not enough to materially affect the flow of the stream. The proposed Urton Lake project will divert a considerable portion of the stream flow at this point.

Slush ice sometimes forms at this station, and thin ice forms along the edges of the river, but results are not greatly affected by the ice conditions.

On July 5, 1905, the gage and station were moved downstream and a new gage established at the present datum. Otherwise there has been no change in datum.

A. LAKE McMILLAN RESERVOIR, CARLSBAD PROJECT, NEW MEXICO.

B. MAIN AVALON CANAL FROM HEAD-GATES OF AVALON DAM, CARLSBAD PROJECT, NEW MEXICO.

On account of the extremely shifting character of the channel, it is impossible to make reliable estimates of discharge unless very frequent gagings are taken. The funds available for 1907 and 1908 were entirely inadequate to permit any but very rough estimates of discharge for 1907, and did not permit any estimates for 1908.

Discharge measurements of Pecos River near Fort Sumner, N. Mex., in 1907 and 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
1907.		*Feet.*	*Sq. ft.*	*Feet.*	*Sec.-ft.*
February 15	W. A. Lamb	61	49	2.10	93
March 4	do	162	67	2.03	86
April 16	do	185	146	2.20	390
April 24	do	165	135	2.20	365
May 7	do	189	222	2.40	633
May 23	do	166	147	2.35	483
June 12	do	188	204	2.45	593
June 22	do	184	157	2.40	503
September 27	V. L. Sullivan	140	53	2.20	117
December 23	do	215	101	2.20	[a] 132
1908.					
April 20	R. L. Cooper	191	160	2.30	287
August 8	do	190	211	2.70	630
November 5	do	122	77	2.25	102

[a] Made 1 mile below gage.

Daily gage height, in feet, of Pecos River near Fort Sumner, N. Mex., for 1907 and 1908.

[J. C. Pacheco, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.92	2.02	2.10	2.05	2.35	2.32	2.18	2.42	2.38	2.00	2.05	2.20
2	1.90	2.02	2.10	2.02	2.40	2.32	2.12	2.15	2.35	2.00	2.02	2.20
3	1.90	2.02	2.15	2.05	2.25	2.45	2.10	2.32	2.40	2.02	2.12	2.22
4	1.95	2.00	2.05	2.20	2.35	2.35	2.10	2.48	2.35	2.05	2.02	2.22
5	2.02	2.05	2.05	1.95	2.30	2.35	2.10	2.22	2.42	2.05	2.08	2.25
6	2.00	2.02	2.00	1.98	2.32	2.50	2.10	2.02	2.32	2.28	2.10	2.25
7	2.02	2.00	2.00	1.98	2.35	2.42	2.05	2.12	2.30	2.30	2.10	2.22
8	2.00	2.00	2.02	2.10	2.40	2.35	2.05	2.12	2.42	2.22	2.12	2.25
9	2.05	2.00	2.02	2.10	2.35	2.35	2.08	2.02	2.42	2.22	2.10	2.25
10	2.05	2.02	2.05	2.05	2.35	2.35	2.10	2.02	2.42	2.22	2.15	2.22
11	2.05	2.00	2.05	2.02	2.48	2.45	2.10	2.00	2.40	2.25	2.10	2.20
12	2.00	2.05	2.02	2.05	2.32	2.50	2.25	2.02	2.30	2.22	2.15	2.20
13	2.00	2.05	2.02	2.05	2.42	2.35	2.05	1.92	2.18	2.00	2.12	2.22
14	2.00	2.05	2.05	2.02	2.42	2.28	2.02	1.90	2.10	2.05	2.08	2.25
15	2.05	2.02	2.02	2.08	2.62	2.52	2.22	1.90	2.12	2.25	2.22	2.22
16	2.05	2.00	2.00	2.22	2.52	2.72	2.10	1.92	2.08	2.25	2.25	2.25
17	1.95	2.02	2.00	2.12	2.52	2.65	1.95	1.92	2.08	2.22	2.22	2.25
18	1.92	2.02	2.05	2.20	2.45	2.70	2.42	1.92	2.12	2.25	2.25	2.25
19	2.95	2.12	2.00	2.12	2.42	2.58	2.60	1.92	2.22	2.22	2.35	2.25
20	2.82	2.12	2.02	2.12	2.50	2.55	2.58	1.92	2.12	2.25	2.32	2.25
21	2.02	2.12	2.05	2.05	2.40	2.52	2.10	2.25	2.12	3.05	2.30	2.25
22	2.00	2.12	2.10	2.22	2.48	2.42	2.75	2.80	2.08	2.32	2.22	2.22
23	2.00	2.15	2.22	2.20	2.50	2.40	2.35	2.28	2.02	2.12	2.22	2.25
24	2.02	2.10	2.20	2.25	2.42	2.45	2.20	2.18	2.02	2.62	2.22	2.20
25	2.00	2.10	2.20	2.22	2.32	2.38	2.22	2.18	2.00	2.52	2.20	2.32
26	2.02	2.15	2.15	2.25	2.42	2.32	2.52	2.18	2.00	2.08	2.22	2.25
27	2.02	2.10	2.22	2.32	2.42	2.30	2.10	2.45	2.12	2.02	2.25	2.20
28	2.02	2.05	2.22	2.18	2.40	2.28	2.18	2.22	2.22	2.15	2.25	2.25
29	1.95	.....	2.05	2.28	2.32	2.22	3.92	2.22	2.22	2.12	2.22	2.25
30	1.95	.....	2.00	2.32	2.35	2.20	2.45	2.22	2.10	2.05	2.22	2.25
31	2.00	.....	2.00	.....	2.52	.....	1.95	2.35	.....	2.03	.....	2.22

Daily gage height, in feet, of Pecos River near Fort Sumner, N. Mex., etc.—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	2.3	1.9	2.05	2.1	2.3	2.15	2.3	2.5	2.3	2.1	2.2	2.4
2	2.3	1.95	2.0	2.1	2.3	2.2	2.2	2.85	2.2	2.1	2.25	2.35
3	2.3	2.05	2.1	2.15	2.2	2.25	2.55	2.9	2.3	2.1	2.25	2.35
4	2.3	2.15	2.1	2.1	2.2	2.2	2.2	2.8	2.55	2.1	2.25	2.3
5	2.35	2.05	2.1	2.1	2.2	2.15	2.1	2.75	2.3	2.1	2.2	2.35
6	2.3	2.0	2.1	2.1	2.3	2.15	2.05	2.7	2.3	2.1	2.25	2.3
7	2.3	2.0	2.15	2.1	2.3	2.1	2.0	2.7	2.15	2.1	2.25	2.25
8	2.25	2.0	2.15	2.1	2.2	2.15	2.05	3.1	2.1	2.2	2.2	2.3
9	2.2	2.0	2.1	2.15	2.2	2.2	2.05	3.0	2.0	2.2	2.2	2.3
10	2.2	2.0	2.15	2.15	2.2	2.1	2.05	2.55	2.05	2.2	2.2	2.35
11	2.2	2.0	2.1	2.1	2.15	2.1	2.1	2.4	2.0	2.25	2.2	2.3
12	2.2	2.05	2.1	2.1	2.15	2.15	2.1	2.4	2.0	2.2	2.2	2.3
13	2.2	2.0	2.1	2.1	2.2	2.05	2.1	2.5	2.0	2.2	2.25	2.35
14	2.1	2.05	2.15	2.05	2.3	2.05	2.1	3.0	2.0	2.2	2.25	2.3
15	2.05	2.0	2.15	2.05	2.3	2.05	2.2	3.1	2.0	2.2	2.25	2.2
16	2.05	2.0	2.05	2.1	2.25	2.05	2.15	2.65	2.1	2.2	2.25	2.2
17	1.95	1.95	2.1	2.1	2.25	2.1	2.3	2.5	2.05	2.2	2.25	2.2
18	1.9	1.95	2.05	2.1	2.25	2.1	2.3	2.5	2.1	2.2	2.25	2.25
19	1.9	2.05	2.05	2.3	2.25	2.05	2.85	2.5	2.0	2.15	2.2	2.2
20	1.9	2.05	2.0	2.3	2.2	2.0	2.3	2.6	2.15	2.2	2.2	2.25
21	1.9	2.05	2.05	2.3	2.2	2.0	2.6	4.95	2.1	2.2	2.25	2.25
22	1.9	2.0	2.05	2.3	2.25	2.0	2.5	3.2	2.0	2.2	2.25	2.2
23	1.9	2.1	2.05	2.3	2.8	2.0	2.4	3.25	2.0	2.25	2.25	2.3
24	1.9	2.15	2.15	2.25	2.2	1.95	2.4	2.6	2.1	2.25	2.25	2.3
25	1.95	2.15	2.05	2.2	2.25	1.95	2.4	2.0	2.15	2.2	2.2	2.3
26	1.9	2.1	2.0	2.3	2.2	2.0	2.4	2.05	2.1	2.25	2.25	2.3
27	1.9	2.1	2.0	2.45	2.2	2.0	2.5	2.05	2.2	2.2	2.25	2.35
28	1.9	2.0	2.05	2.4	2.3	2.3	2.5	2.4	2.2	2.2	2.25	2.3
29	1.9	2.05	2.05	2.3	2.25	2.3	2.4	2.4	2.2	2.2	2.25	2.35
30	1.9	.....	2.05	2.3	2.2	2.3	2.75	2.5	2.1	2.2	2.3	2.35
31	1.9	.....	2.1	.....	2.2	.....	2.6	2.0	.....	2.2	.....	2.35

Daily discharge, in second-feet, of Pecos River near Fort Sumner, N. Mex., for 1907.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	45	65	110	215	560	340	250	440	290	60	60	120
2	40	65	110	200	630	340	210	200	270	60	60	120
3	40	65	135	215	430	590	200	340	310	60	90	130
4	50	60	95	345	560	460	200	520	270	70	60	130
5	65	75	95	160	500	460	200	220	330	70	80	150
6	60	65	95	175	520	670	200	110	240	160	80	150
7	65	60	95	175	560	540	160	150	230	180	80	130
8	60	60	105	265	605	460	160	150	260	130	90	150
9	75	60	105	280	540	460	180	110	260	130	80	150
10	75	65	115	240	549	460	200	110	260	130	100	130
11	75	60	140	220	730	590	200	100	240	150	80	120
12	60	75	130	240	500	670	310	110	180	130	100	120
13	60	75	130	240	600	460	160	70	120	60	90	130
14	60	75	140	220	600	380	150	60	80	70	80	150
15	75	65	145	260	940	700	280	60	90	150	130	130
16	75	60	135	420	760	1,070	200	70	80	150	150	150
17	50	65	135	300	760	930	120	70	80	130	130	150
18	45	65	155	370	620	1,030	440	70	90	150	150	150
19	1,120	110	145	300	580	800	690	70	130	130	210	150
20	880	110	160	300	700	750	660	70	90	150	190	150
21	65	115	170	240	550	700	170	240	90	1,200	180	150
22	60	115	200	420	660	540	950	980	80	190	130	130
23	60	120	330	370	700	520	360	260	60	90	130	150
24	65	100	305	430	540	590	240	160	60	460	130	120
25	60	100	305	420	420	500	250	160	60	350	120	190
26	65	125	260	430	540	420	560	160	60	80	130	150
27	65	105	350	520	540	400	170	360	90	60	150	120
28	65	85	350	340	520	380	220	180	130	100	150	150
29	50	.....	205	470	420	320	3,800	180	130	90	130	150
30	50	.....	170	520	460	300	480	180	80	70	130	150
31	60	.....	170	.....	700	.....	100	270	.....	60	.....	130

NOTE.—The above discharges were obtained by the indirect method for shifting channels.

Monthly discharge of Pecos River near Fort Sumner, N. Mex., for 1907.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	1,120	40	121	7,440
February	125	60	80.9	4,490
March	350	95	171	10,500
April	520	160	310	18,400
May	940	420	590	36,300
June	1,070	300	561	33,400
July	3,800	100	402	24,700
August	980	60	201	12,400
September	330	60	158	9,400
October	1,200	60	164	10,100
November	210	60	116	6,900
December	190	120	140	8,610
The year	3,800	40	251	183,000

NOTE.—The above estimates are in general only approximate.

PECOS RIVER NEAR DAYTON, N. MEX.

This station, which was established March 24, 1905, has been maintained in connection with the Carlsbad irrigation project in New Mexico to determine the amount of water supplied by the river to the McMillan reservoir, and is located about 3 miles east of Dayton, N. Mex., about 6 miles above the dam of the reservoir, and approximately 100 feet downstream from the mouth of Penasco River.

Considerable irrigation is practiced in the vicinity of Roswell, N. Mex., and opportunities for irrigation projects exist at various points above. The winters in this vicinity are comparatively mild, and ice does not appreciably affect stream flow.

The original gage was washed out on September 6, 1905, and was relocated September 7, 1905, at a point about one-half mile upstream. Otherwise there has been no change in gage datum. Fair results can be obtained at this station if discharge measurements are taken at frequent intervals. This station was transferred March 31, 1908, to the United States Reclamation Service, by which discharge measurements have been made since.

Discharge measurements of Pecos River near Dayton, N. Mex., in 1907 and 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
1907.		*Feet.*	*Sq. ft.*	*Feet.*	*Sec.-ft.*
February 20	W. A. Lamb	98	239	3.10	338
March 27	do	80	97	2.05	104
April 26	do	103	196	3.37	351
May 17	do	143	261	3.70	479
May 31	do	133	233	3.65	467
June 28	do	140	212	3.30	323
December 30	L. E. Foster	94	182	3.40	321
1908.					
April 15	United States Reclamation Service			2.30	124
May 18	do			2.20	90
June 10	do			2.00	70
June 19	do			1.80	46
July 23	do			4.60	964
August 7	do			4.60	945
August 25	do			5.70	2,630
Do	do			6.30	3,190
August 26	do			5.40	1,560
August 31	do			3.90	350
December 6	do			3.80	301

Daily gage height, in feet, of Pecos River near Dayton, N. Mex., for 1907 and 1908.

[Lemo Weddle and Eugene Lattion, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	3.2	3.2	2.5	2.8	3.1	4.0	2.9	4.0	4.0	2.1	3.8	3.7
2	3.1	3.3	2.6	2.9	3.2	3.8	2.8	3.3	4.3	2.1	3.7	3.4
3	3.1	3.5	2.6	2.8	3.1	3.7	2.7	3.0	4.0	2.4	3.5	3.4
4	3.4	3.1	2.5	2.9	3.0	3.8	2.6	2.9	3.9	2.2	3.5	3.4
5	3.2	3.3	2.4	2.7	3.2	3.8	2.6	3.5	3.9	2.4	3.4	3.4
6	3.2	3.1	2.4	2.6	3.5	3.8	2.5	3.3	3.3	2.4	3.3	3.5
7	3.1	3.0	2.4	2.5	3.4	3.7	2.4	3.0	3.4	2.2	3.3	a8.5
8	3.0	3.0	2.5	2.5	3.4	3.6	2.2	3.0	3.5	2.2	3.3	3.6
9	3.3	3.0	2.4	2.6	3.3	3.9	2.2	3.0	3.5	2.3	3.3	3.5
10	3.5	3.4	2.3	2.5	3.5	3.9	2.2	2.9	3.4	2.3	3.3	3.4
11	3.5	3.5	2.4	2.4	3.5	3.9	2.1	2.8	3.3	2.3	3.3	3.2
12	3.4	3.3	2.2	2.3	3.5	4.0	2.1	2.7	3.1	2.5	3.2	3.5
13	3.4	3.2	2.0	2.3	3.8	3.7	2.0	2.6	2.9	2.7	3.2	3.2
14	3.4	3.1	1.9	2.2	3.7	3.8	4.0	2.6	2.9	2.4	3.4	3.4
15	3.3	3.5	2.1	2.2	3.6	3.7	3.7	2.5	2.7	2.6	3.2	3.2
16	3.3	3.4	2.3	2.1	3.5	3.6	3.2	2.3	2.7	2.5	3.3	3.5
17	3.3	3.4	2.3	2.1	3.6	3.5	2.9	2.4	2.7	2.5	3.5	3.5
18	3.4	3.0	2.3	2.2	3.6	4.2	2.9	2.2	2.6	2.5	4.0	3.5
19	3.5	3.9	2.2	2.3	3.7	4.4	2.7	2.1	2.5	2.6	4.0	3.5
20	3.6	3.1	2.2	2.8	3.6	4.7	2.5	2.6	2.5	2.7	4.1	3.5
21	3.5	3.1	2.2	3.3	3.4	4.2	2.4	2.9	2.6	2.7	4.2	3.7
22	3.5	3.0	2.2	3.1	3.4	4.2	3.9	3.9	2.6	3.0	4.1	3.6
23	3.5	3.0	2.2	3.4	3.2	4.0	4.9	3.1	2.7	4.0	3.7	3.5
24	3.5	2.9	2.2	3.5	3.1	3.9	4.3	4.9	2.7	3.8	3.5	3.5
25	3.4	3.0	2.2	3.4	3.0	3.5	3.7	4.3	2.7	4.0	3.6	3.5
26	3.2	2.9	2.1	3.3	3.2	3.4	3.5	3.8	2.6	4.2	3.5	3.6
27	3.4	2.6	2.0	3.3	3.4	3.4	3.7	3.4	2.6	4.4	3.4	3.6
28	3.4	2.6	2.0	3.0	3.4	3.2	3.7	3.5	2.5	5.0	3.3	3.6
29	3.2	.....	2.0	3.0	3.5	3.1	3.6	3.7	2.1	6.8	3.2	3.2
30	3.2	.....	2.7	3.1	3.6	3.0	7.0	4.0	2.2	5.0	3.8	3.5
31	3.2	.....	3.0	.....	3.6	.....	5.3	3.8	.....	4.5	.....	3.5
1908.												
1	3.5	3.2	2.7	.....	2.4	2.4	2.2	3.9	4.5	2.7	3.0	3.8
2	3.6	3.2	2.6	.....	2.6	2.7	2.0	4.7	5.5	2.6	3.0	4.6
3	3.5	3.3	2.5	.....	2.8	2.3	2.0	6.6	4.9	2.6	3.0	4.2
4	3.4	3.2	2.5	.....	2.6	2.1	2.7	5.6	4.6	2.5	3.0	4.2
5	3.6	3.4	2.3	.....	2.7	2.1	4.6	4.7	4.1	2.5	3.2	4.0
6	3.5	3.3	2.3	.....	2.6	2.3	4.7	4.7	4.3	2.5	3.2	4.0
7	3.5	3.3	2.3	.....	2.5	2.3	4.5	4.5	4.0	2.6	3.2	3.8
8	3.5	3.4	2.3	.....	2.4	2.3	4.0	4.5	3.9	2.7	3.2	3.8
9	3.6	3.5	2.3	.....	2.3	2.2	3.0	3.0	3.7	2.7	3.2	3.8
10	3.5	3.5	2.3	.....	2.3	2.0	3.0	2.4	3.7	2.7	3.2	4.0
11	3.8	3.5	2.3	.....	2.2	2.0	2.7	5.5	3.7	2.7	3.2	4.0
12	3.5	3.4	2.3	.....	2.3	2.0	2.7	5.4	3.5	2.6	3.2	3.8
13	3.7	3.4	2.3	.....	2.3	2.1	2.5	4.4	3.3	2.6	3.2	3.8
14	3.6	3.5	2.3	.....	2.2	2.0	2.5	5.7	3.1	2.5	3.2	4.0
15	3.6	3.5	2.3	2.3	2.2	2.0	2.7	5.0	3.3	2.5	3.2	4.0
16	3.4	3.5	2.3	.....	2.3	2.0	2.3	4.8	3.2	2.4	3.2	4.0
17	3.6	3.4	2.2	.....	2.3	2.0	2.3	5.4	3.1	2.6	3.2	4.0
18	3.7	3.0	2.2	.....	2.2	1.9	2.3	4.8	3.2	2.6	3.3	4.0
19	3.2	2.9	2.2	.....	2.3	1.8	2.3	4.7	3.0	2.6	3.3	3.8
20	3.4	2.8	2.2	.....	2.2	2.0	5.6	4.4	2.9	2.5	3.3	3.8
21	3.3	2.8	2.2	.....	2.0	1.9	3.9	6.0	2.8	2.5	3.3	3.7
22	3.4	2.8	2.1	.....	2.0	1.9	4.6	4.7	2.8	3.7	3.6	3.7
23	3.5	2.9	2.1	.....	2.0	1.8	4.6	6.4	2.9	2.7	3.7	3.7
24	3.4	2.6	2.1	.....	2.0	1.8	4.6	9.0	2.7	2.5	3.6	3.8
25	3.4	2.8	2.1	.....	2.0	2.5	4.0	b5.6	2.7	2.6	3.6	3.9
26	3.5	2.7	2.1	.....	2.1	2.4	3.6	5.4	2.7	2.6	3.5	4.0
27	3.3	2.6	2.1	.....	3.0	2.4	3.4	4.7	2.8	2.5	3.5	4.0
28	3.4	2.6	2.1	.....	2.8	2.0	3.3	4.7	2.7	2.5	3.5	3.9
29	3.3	2.6	2.1	.....	2.8	1.8	3.0	4.7	3.1	2.5	3.6	3.9
30	3.1	.....	2.1	.....	2.6	1.7	2.9	4.1	2.7	3.0	3.8	3.9
31	3.3	.....	2.1	.....	2.7	.....	3.8	3.9	.....	3.0	.....	3.9

a December 7, 1907, gage height doubtful.

b August 25, 1908, gage height is mean of observer's reading and two separate readings by hydrographer made during the day.

NOTE.—Gage heights for April, 1908, are missing.

Rating tables for Pecos River near Dayton, N. Mex.

JANUARY 1, 1907, TO APRIL 20, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1.90	90	2.50	165	3.10	355	3.70	695
2.00	100	2.60	185	3.20	395	3.80	765
2.10	110	2.70	205	3.30	445	3.90	835
2.20	120	2.80	235	3.40	505		
2.30	130	2.90	275	3.50	565		
2.40	145	3.00	315	3.60	630		

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on two discharge measurements made during the above period and on the form of preceding curves. It is not well defined.

APRIL 21, 1907, TO DECEMBER 31, 1907.

2.00	73	2.90	185	3.80	540	4.70	1260
2.10	80	3.00	210	3.90	610	4.80	1350
2.20	87	3.10	240	4.00	680	4.90	1450
2.30	95	3.20	270	4.10	750	5.00	1550
2.40	105	3.30	300	4.20	830	5.10	1650
2.50	115	3.40	340	4.30	910	5.20	1750
2.60	125	3.50	380	4.40	990	5.30	1860
2.70	140	3.60	430	4.50	1080	5.40	1970
2.80	160	3.70	480	4.60	1170	5.50	2080

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on five discharge measurements made during the above period and the form of the preceding curves. It is not well defined. Discharges above the limits of the rating table estimated.

Daily discharge, in second-feet, of Pecos River near Dayton, N. Mex., for 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	370	275	150	75	135	140	105	460	680	45	85	300
2	415	275	130	75	190	220	70	1,040	1,520	35	85	750
3	370	315	110	75	250	125	70	2,840	1,000	35	85	495
4	330	275	110	75	190	90	240	1,840	750	30	85	495
5	420	360	80	80	220	90	1,520	1,030	440	30	125	390
6	375	310	80	80	190	125	1,620	1,030	545	30	125	390
7	375	310	80	85	160	125	1,390	870	390	35	125	301
8	375	360	80	85	135	125	930	880	340	45	125	301
9	420	410	80	90	115	105	300	140	260	45	125	301
10	375	415	80	95	115	70	290	50	260	45	125	390
11	530	420	80	100	95	70	175	1,830	260	45	125	390
12	375	360	80	110	115	70	165	1,780	200	35	125	300
13	485	360	80	115	115	90	110	935	150	35	125	300
14	430	425	80	120	95	70	100	2,140	105	30	125	390
15	430	425	80	124	95	70	140	1,520	150	30	125	390
16	340	430	80	124	110	70	60	1,380	125	28	125	390
17	430	375	70	124	110	70	55	1,980	105	35	125	390
18	485	220	70	124	90	60	50	1,450	125	35	150	390
19	260	190	70	124	110	46	45	1,400	85	35	150	300
20	340	170	70	124	90	70	1,950	1,180	70	30	150	300
21	300	170	70	124	65	60	515	2,740	55	30	150	260
22	340	170	60	124	65	60	1,000	1,520	55	260	230	260
23	390	200	60	124	65	46	964	3,300	70	45	260	260
24	345	120	60	124	65	46	965	[a]7,300	45	30	230	300
25	345	170	60	124	65	175	525	2,490	45	35	230	340
26	390	140	65	124	80	150	330	1,560	45	35	200	390
27	310	125	65	130	330	150	250	950	55	30	200	390
28	350	125	65	130	250	70	220	950	45	30	200	340
29	310	125	65	130	250	46	140	950	105	30	230	340
30	235	.....	65	130	190	40	120	520	45	85	300	340
31	310	.....	65	.....	220	.....	410	350	.....	85	.....	340

[a] Estimated.

NOTE.—These discharges were obtained by the indirect method for shifting channels. Discharge for April estimated.

Monthly discharge of Pecos River near Dayton, N. Mex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1907.					
January	630	315	469	28,800	B.
February	835	185	395	21,900	B.
March	315	90	139	8,500	C.
April	380	110	210	12,500	D.
May	540	210	352	21,600	B.
June	1,200	210	562	33,400	C.
July	3,700	73	464	28,500	C.
August	1,450	80	335	20,600	C.
September	910	80	271	16,100	C.
October	3,450	80	446	27,400	C.
November	830	270	419	24,900	C.
December	2,000	270	425	26,100	C.
The year	3,700	80	374	270,000	
1908.					
January	530	235	373	22,900	C.
February	430	120	277	15,900	C.
March	150	60	78.7	4,840	C.
April	130	75	109	6,490	C.
May	330	65	138	8,480	B.
June	220	40	91.5	5,440	B.
July	1,950	45	478	29,400	C.
August	7,300	50	1,560	95,900	C.
September	1,520	45	271	16,100	C.
October	260	28	45.4	2,790	C.
November	300	85	155	9,220	C.
December	750	260	362	22,300	C.
The year	7,300	28	328	240,000	

NOTE.—Discharge estimated for July 30, October 29, and December 7, 1907, and August 24, 1908; also April, 1908.

PECOS RIVER NEAR LAKEWOOD, N. MEX.

The station, which was established January 11, 1906, and abandoned March 31, 1908, was located 3 miles southeast of Lakewood and one-half mile below McMillan reservoir dam (Pl. IV, *A*).

The station was maintained in connection with the Carlsbad project of the United States Reclamation Service for the purpose of comparing the amount of water available at the McMillan reservoir with that below the Avalon dam. The record shows the discharge from the gates of the dam, but does not include the discharge from the spillway nor any leakage from the reservoir.

The present gage was established May 8, 1906. It had been previously moved from original location on February 8, 1906.

Fair results can be obtained at this station if occasional discharge measurements are made at different stages.

Discharge measurements of Pecos River near Lakewood, N. Mex., in 1907.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
February 20	W. A. Lamb	8.5	6.4	0.19	11.9
May 17	do	77	142	[a] 1.25	230
June 28	do	76	119	.90	141

[a] Gage height recorded 1.75 feet by hydrographer; it is believed to have been in error 0.5 foot.

Daily gage height, in feet, of Pecos River near Lakewood, N. Mex., for 1907 and 1908.

[H. C. Halcomb, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	0.1	0.2	1.22	0.2	0.6	0.7	0.9	3.08	2.55	0.35	4.7	1.8
2	.1	.2	2.3	.2	.6	1.4	1.15	1.4	1.8	.35	3.2	1.8
3	.1	.2	2.28	.2	.6	2.1	1.4	1.3	1.8	.35	2.1	1.75
4	.1	.2	.2	.2	.6	2.1	1.4	1.3	1.8	.35	2.1	1.75
5	.1	.2	.2	.2	.6	2.1	1.12	1.3	1.8	.35	1.35	1.75
6	.1	.2	.2	.2	.2	1.75	.9	1.3	1.8	.35	1.45	1.7
7	1.75	.2	.2	.2	.2	1.1	.9	1.3	1.5	.35	1.55	1.7
8	2.38	.2	.2	.2	.2	1.1	.8	1.3	1.0	.35	1.55	1.65
9	2.98	1.44	.2	.2	.6	1.1	.8	1.3	1.0	.35	1.6	1.65
10	3.28	2.8	.2	.2	.6	1.1	.8	1.15	1.0	.35	1.6	1.6
11	3.42	2.75	.2	.2	.6	.75	.8	1.0	1.0	.35	1.6	1.6
12	3.52	2.68	.2	.2	2.0	.75	.8	1.0	.7	.35	1.6	1.6
13	3.45	.2	.2	.2	2.0	.75	.8	1.0	.7	.35	1.6	1.6
14	3.75	.2	.2	.2	1.45	.75	.8	1.12	.7	.35	1.6	1.6
15	.15	.2	.2	.2	1.2	.75	.8	1.25	.7	.3	1.6	1.6
16	.15	.2	.2	.2	1.2	1.42	.8	1.25	.7	.3	1.6	1.6
17	.15	.2	.2	.2	1.2	2.75	.8	1.25	.7	.3	1.6	1.6
18	.15	.2	.2	.2	1.6	2.75	.8	1.0	.35	.3	1.6	1.6
19	.15	.2	.2	.55	2.0	2.7	.8	1.0	.35	.3	1.65	1.6
20	.15	.2	.2	.55	1.5	4.0	.8	1.0	.35	.3	1.7	1.6
21	.15	.2	.2	.55	1.5	4.0	.8	1.05	.35	.3	1.75	1.6
22	.15	.2	.2	.55	1.5	3.95	.8	3.0	.35	.3	1.8	1.6
23	.15	.2	.2	.4	1.5	2.1	.8	1.2	.35	.3	1.9	1.65
24	.15	.2	.2	.4	.9	1.0	.8	1.2	.35	1.05	1.9	1.65
25	.15	.98	.2	.4	.7	1.65	.75	1.2	.35	1.8	1.9	1.7
26	3.2	2.12	.2	.2	.7	1.65	.75	1.3	.35	1.8	1.85	1.7
27	3.4	2.3	.2	.2	.7	1.6	.75	1.3	.35	2.2	1.85	1.7
28	3.3	2.25	.2	.2	.7	1.25	.75	1.3	.35	4.5	1.85	1.7
29	1.61	.....	.2	.2	.7	.9	.75	1.3	.35	5.6	1.8	1.7
30	.1	.....	.2	.2	.7	.9	3.1	1.1	.35	5.6	1.8	1.7
31	.2	.....	.2	.....	.7	.....	4.7	2.05	.....	5.2	.....	1.7

Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.
1908.				1908.				1908.			
1	1.6	1.5	0.1	11	1.6	0.8	0.1	21	1.5	0.2	0.1
2	1.6	1.4	.1	12	1.6	.8	.1	22	1.5	.2	.1
3	1.6	1.4	.1	13	1.6	.8	.1	23	1.5	.2	.1
4	1.6	.8	.1	14	1.6	.8	.1	24	1.5	.1	.1
5	1.6	.8	.1	15	1.55	.8	.1	25	1.5	.1	.1
6	1.6	.8	.1	16	1.55	.2	.1	26	1.5	.1	.1
7	1.6	.8	.1	17	1.5	.2	.1	27	1.5	.1	.1
8	1.6	.8	1	18	1.5	.2	.1	28	1.5	.1	.1
9	1.6	.8	.1	19	1.5	.2	.1	29	1.5	.1	.1
10	1.6	.8	.1	20	1.5	.2	.1	30	1.5	.....	.1
								31	1.5	.....	.1

Rating table for Pecos River near Lakewood, N. Mex., for January 1, 1907, to March 31, 1908.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-feet.*	*Feet.*	*Sec.-feet.*	*Feet.*	*Sec.-feet.*	*Feet.*	*Sec.-feet.*
0.10	5	1.20	205	2.30	585	3.80	1,320
.20	14	1.30	230	2.40	630	4.00	1,430
.30	28	1.40	260	2.50	675	4.20	1,540
.40	44	1.50	290	2.60	720	4.40	1,660
.50	60	1.60	320	2.70	765	4.60	1,780
.60	76	1.70	355	2.80	810	4.80	1,900
.70	95	1.80	390	2.90	855	5.00	2,025
.80	115	1.90	425	3.00	905	5.20	2,155
.90	135	2.00	465	3.20	1,005	5.40	2,285
1.00	155	2.10	505	3.40	1,105	5.60	2,415
1.10	180	2.20	545	3.60	1,210		

NOTE.—The above table is not applicable for ice or obstructed channel conditions. It is based on six discharge measurements made during 1906 and 1907, and is well defined. Above 1.6 feet it is the same as the rating table covering period May 8–December 31, 1906.

Monthly discharge of Pecos River near Lakewood, N. Mex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1907.					
January	1,290	5	364	22,400	A.
February	810	14	169	9,390	B.
March	577	14	56.9	3,500	B.
April	68	14	24.2	1,440	C.
May	465	14	168	10,300	B.
June	1,430	95	417	24,800	A.
July	1,840	105	212	13,000	B.
August	945	155	268	16,500	B.
September	698	36	153	9,100	B.
October	2,420	36	354	21,800	A.
November	1,840	245	430	25,600	A.
December	390	320	342	21,000	A.
The year	2,420	5	247	179,000	
1908.					
January	320	290	305	18,800	B.
February	290	5	80.4	4,620	B.
March	5	5	5.0	307	D.
The period				23,700	

PECOS RIVER AT AVALON, N. MEX.

The station, which was established on January 6, 1906, and maintained in connection with the Carlsbad project of the United States Reclamation Service, is situated just below the Avalon dam, about 6 miles north of Carlsbad, N. Mex.

The records at this point include the flow at Lakewood, the flow of certain springs between the stations, the discharge of the spillways of the Lake McMillan dam, and that portion of the leakage through the gypsum in the bottom of the reservoir that returns to the river above Avalon.

The gage is about one-half mile below the dam and below the headgates of the main canal of the Carlsbad project (Pl. IV, *B*). A large part of the 20,000 acres to be irrigated under that project was formerly under the system of the Pecos Irrigation Company.

Gage readings were discontinued on March 16, 1907. No change was made in the location or datum of the gage while it was in operation. Good results have been obtained at this station.

Discharge measurements of Pecos River at Avalon, N. Mex., in 1907.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
February 23	W. A. Lamb	67	73	0.96	206
April 3	do	30.7	28	2.10	77

Daily gage height, in feet, of Pecos River at Avalon, N. Mex., for 1907.

[W. A. Sewell, observer.]

Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.
1	.....	0.9	a 1.1	11	a 2.6	a 2.5	0.9	21	0.9	0.8	.....
2	.....	.9	a 1.9	12	a 2.5	a 2.5	.9	22	.9	.9	.....
3	.....	.9	a 2.2	13	a 2.5	1.0	.9	23	.9	.9	.....
4	.....	.8	1.0	14	a 2.4	.9	.9	24	.8	.9	.....
5	.....	.8	1.0	15	1.0	.9	.9	25	.8	a .9	.....
6	.....	.9	.9	16	1.0	.9	.9	26	a 2.3	2.0	.....
7	.....	.9	.9	17	.9	.9	.....	27	a 2.4	2.0	.....
8	.....	.9	.9	18	.9	.9	.....	28	a 2.6	2.0	.....
9	.....	.9	.9	19	.9	.9	.....	29	a 2.5	.....	.....
10	.....	.9	.9	20	.9	.8	.....	30	1.0	.....	.....
								31	.9	.....	.....

a Gage heights read when the gates at Lake McMillan were open; all others were read when the gates were closed.

Rating table for Pecos River at Avalon, N. Mex., for January 1, 1906, to March 16, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
0.80	150	1.30	365	1.80	720	2.30	1,210
0.90	180	1.40	425	1.90	810	2.40	1,320
1.00	215	1.50	490	2.00	905	2.50	1,430
1.10	260	1.60	560	2.10	1,005	2.60	1,540
1.20	310	1.70	635	2.20	1,105		

NOTE.—The above table is based on discharge measurements made during the above period and is well defined between gage heights 0.7 foot and 2.75 feet.

Monthly discharge of Pecos River at Avalon, N. Mex., for 1907.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January 11-31	1,540	150	648	27,000	A.
February	1,430	150	344	19,100	A.
March 1-16	1,100	180	286	9,080	A.
The period	.....	.....	.....	55,200	

PECOS RIVER AT CARLSBAD, N. MEX.

This station, which was established May 20, 1903, was located at the Green Street Bridge, Carlsbad, N. Mex., and about 500 feet below the station of the Pecos Valley and Northeastern Railway. Gage observations were discontinued on March 31, 1908. This bridge and the original gage were washed away in October, 1904. The station was 2,000 feet below the Hagerman power dam.

The Avalon reservoir, from which the main canal of the Carlsbad project is diverted, is located a few miles upstream from this station. Records have been maintained for the United States Reclamation Service.

The gage datum was unchanged during the maintainance of the station.

Fair results were obtained at this station, except at low-water stages, when the rough nature of the stream bed has interfered with the accuracy of measurements. Insufficient measurements were made during 1907-8 to warrant the publication of monthly discharge.

Discharge measurements of Pecos River at Carlsbad, N. Mex., in 1907.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
February 19	W. A. Lamb	76	106	1.18	[a] 289
February 28	do	255	1,610	1.95	805
March 25	do	60	48	.95	113
May 1	do	44	44	.84	86

[a] Made by wading 30 feet above gage.

Daily gage height, in feet, of Pecos River at Carlsbad, N. Mex., for 1907 and 1908.

[J. W. Lewis, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.12	1.20	1.20	1.04	0.72	0.82	0.84	2.98	1.85	0.85	3.40	1.58
2	1.13	1.20	1.90	1.05	.71	.93	.82	2.12	1.60	.83	2.88	1.58
3	1.14	1.20	1.90	1.00	.71	1.48	.80	1.55	1.45	.65	2.05	1.58
4	1.14	1.19	1.30	1.00	.71	1.52	.86	1.25	1.45	.80	1.82	1.58
5	1.14	1.18	1.20	1.00	.71	1.53	1.14	1.20	1.51	.85	1.55	1.58
6	1.18	1.18	1.20	.97	.72	1.34	1.17	1.20	1.52	.83	1.60	1.55
7	1.58	1.18	1.20	.95	.71	1.14	.96	1.19	1.52	.64	1.49	1.52
8	1.88	1.18	1.20	.98	.71	.90	.98	1.18	1.39	.85	1.43	1.52
9	2.45	1.18	1.22	.98	.71	.70	.98	1.18	1.25	.91	1.46	1.56
10	2.45	2.18	1.20	.96	.70	.60	.96	1.40	1.20	.94	1.48	1.62
11	2.52	2.20	1.19	.86	.70	.63	.94	1.43	1.20	.95	1.50	1.60
12	2.58	2.20	1.18	.80	.85	.23	.92	1.40	1.15	.95	1.46	1.60
13	2.60	1.20	1.18	.80	1.42	.64	.90	1.38	1.25	92	1.42	1.59
14	2.30	1.20	1.18	.62	1.34	1.33	.90	1.35	1.00	.92	1.42	1.52
15	1.20	1.20	1.18	.67	1.27	1.33	.90	1.18	1.00	.90	1.50	1.48
16	1.20	1.20	1.18	.85	1.18	1.34	.90	.97	1.35	.97	1.48	1.48
17	1.20	1.20	1.18	.72	1.12	1.95	.91	.95	1.25	.96	1.47	1.48
18	1.20	1.20	1.18	.70	1.12	1.96	.91	.95	.96	.92	1.47	1.48
19	1.20	1.20	1.18	.70	1.22	1.99	.91	.90	.98	.96	1.51	1.48
20	1.20	1.20	1.18	.68	1.47	2.22	.94	.88	1.00	.90	1.54	1.48
21	1.20	1.20	1.18	.66	1.56	2.64	.95	.75	1.00	2.25	1.51	1.48
22	1.20	1.20	1.18	.68	1.50	2.50	.95	.66	1.00	1.10	1.55	1.48
23	1.24	1.20	1.00	.68	1.41	1.85	.95	.62	.98	.86	1.62	1.48
24	1.25	1.20	1.00	.72	1.18	1.28	.95	.66	.88	.90	1.64	1.48
25	2.40	1.20	.80	.70	.90	1.68	.95	.86	.85	1.35	1.62	1.48
26	2.44	1.78	.95	.70	.56	1.40	.95	.96	.85	1.54	1.61	1.48
27	2.50	1.80	1.10	.70	.88	1.51	.95	.99	.86	1.48	1.63	1.48
28	2.45	1.91	1.05	.70	.78	1.37	.95	1.10	.92	3.60	1.60	1.48
29	1.95	.....	.89	.70	.96	1.08	.92	1.00	.88	3.52	1.60	1.48
30	1.22	.....	.89	.70	.92	.91	.92	1.00	.85	3.70	1.60	1.50
31	1.20	.....	.92	.....	.89	.....	2.38	1.28	.....	3.62	.....	1.50

Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.	Day.	Jan.	Feb.	Mar.
1908.				1908.				1908.			
1	1.50	1.50	1.20	11	1.50	1.30	0.90	21	1.50	1.30	0.70
2	1.50	1.50	1.20	12	1.50	1.25	.90	22	1.50	1.30	.70
3	1.50	1.50	1.20	13	1.50	1.25	.90	23	1.48	1.30	.70
4	1.50	1.50	1.20	14	1.50	1.25	.90	24	1.48	1.30	.70
5	1.50	1.50	1.10	15	1.50	1.20	.80	25	1.45	1.30	.70
6	1.50	1.40	1.00	16	1.50	1.00	.80	26	1.48	1.30	.70
7	1.50	1.40	1.00	17	1.50	1.00	.70	27	1.48	1.30	.70
8	1.50	1.40	1.00	18	1.50	1.00	.70	28	1.50	1.25	.70
9	1.50	1.35	1.00	19	1.50	1.10	.70	29	1.50	1.25	.70
10	1.50	1.35	.90	20	1.50	1.20	.70	30	1.50	.....	.70
								31	1.50	.....	.70

NOTE.—Beginning February 11, 1908, water held back at Lake McMillan for storage.

PECOS RIVER AND MARGUERETTA FLUME NEAR PECOS, TEX.

This station, which was established on January 1, 1898, and discontinued on June 30, 1907, is located at the flume of the Barstow Irrigation Company (old Margueretta Canal Company). The canal diverts water from the west side of Pecos River about 3 miles upstream from this flume, which carries the water across to the east side of the river. The flume is a timber structure supported on pile bents. About 10 second-feet are diverted into the West Valley ditch before the canal crosses the river. The gage in the flume is at the east end and its zero is at the bottom of the flume. This gage registers amount of water used for irrigation on east side of river.

The gaging station on the river shows the amount of water in the river below the canal. The gage is nailed to one of the piles supporting the flume, and discharge measurements are taken 200 yards downstream.

No change has been made in the datum or position of this gage since its establishment. Flood measurements have been made at a highway bridge east of Pecos. The channel is shifting, and the regularity of the flow is considerably affected by the pile supports of the flume.

One measurement was made in the flume in 1899. Daily gage readings, however, were not begun until January 1, 1900.

Discharge measurements of Pecos River near Pecos, Tex., in 1907.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 14	W. A. Lamb	173	419	4.10	1,250
January 22	do	127	175	2.00	301
February 21	do	105	160	1.85	282
March 29	do	39	44	.65	35
April 29	do	20	6	.10	2.9

Mean daily gage height, in feet, of Pecos River near Pecos, Tex., for 1907.

[Lawrence Vaneter, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	1.8	2.8	2.7	0.5	0.1	0.3	16	3.65	2.3	1.1	0.3	0.1	0.9
2	1.7	2.2	2.8	.5	.1	.2	17	2.7	2.1	1.1	.3	.7	1.0
3	1.7	2.1	2.6	.5	.1	.2	18	2.45	2.0	1.1	.3	.7	1.3
4	1.7	2.0	2.4	.6	.1	.2	19	2.3	1.95	1.1	.2	.7	2.65
5	1.7	2.0	2.85	.6	.1	.2	20	2.1	1.8	1.1	.2	.7	2.8
6	1.7	2.0	2.55	.6	.1	.2	21	2.0	1.8	1.1	.2	.7	2.95
7	1.7	2.0	1.9	.5	.1	1.35	22	2.0	1.8	1.0	.2	.8	3.25
8	1.7	1.9	1.6	.5	.1	1.6	23	2.0	1.8	.9	.1	1.05	3.55
9	1.9	1.9	1.6	.5	.1	1.2	24	2.0	1.8	.8	.1	1.2	3.15
10	2.85	1.8	1.5	.4	.1	1.2	25	2.0	1.8	.8	.1	1.2	3.05
11	3.35	1.8	1.5	.4	.1	.9	26	2.0	1.7	.8	.1	1.15	1.4
12	3.6	1.8	1.45	.4	.1	.8	27	1.9	1.7	.65	.1	1.0	1.2
13	3.85	3.2	1.4	.4	.1	.5	28	2.7	1.65	.6	.1	.8	1.75
14	4.05	3.3	1.25	.3	.1	.85	29	3.8	.....	.6	.1	.8	1.55
15	4.05	2.6	1.1	.3	.1	1.0	30	3.8	.....	.5	.1	.6	1.5
							31	3.6	.....	.5	.....	.3	.....

Rating table for Pecos River near Pecos, Tex., for January 1, 1907, to June 30, 1907.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
0.10	3	1.20	110	2.30	405	3.40	850
.20	6	1.30	130	2.40	440	3.50	900
.30	10	1.40	150	2.50	475	3.60	950
.40	15	1.50	175	2.60	510	3.70	1,005
.50	20	1.60	200	2.70	550	3.80	1,060
.60	30	1.70	225	2.80	590	3.90	1,115
.70	40	1.80	250	2.90	630	4.00	1,170
.80	50	1.90	280	3.00	670	4.20	1,290
.90	65	2.00	310	3.10	715		
1.00	80	2.10	340	3.20	760		
1.10	95	2.20	370	3.30	805		

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on 15 discharge measurements made during 1906 and 1907 and is well defined.

Monthly discharge of Pecos River near Pecos, Tex., for 1907.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	1,200	225	531	32,600	A.
February	805	212	337	18,700	A.
March	610	20	185	11,400	A.
April	30	3	12.3	732	B.
May	110	3	29.9	1,840	A.
June	925	6	231	13,700	A.
The period				79,000	

Discharge measurements of Margueretta flume near Pecos, Tex., in 1907.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
February 21	W. A. Lamb	20	9.3	0.71	[a] 14.4
March 29	do	20	52	2.55	125
April 29	do	20	39	1.90	67
May 16	do	20	43	2.12	57

[a] Channel obstructed by sand bar and drift.

Daily gage height, in feet, of Margueretta flume near Pecos, Tex., for 1907.

[Lawrence Vaneter, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.4	0.4	2.3	2.5	1.9	2.0	16	0.4	0.4	2.6	2.3	2.3	2.7
2	.4	.4	2.3	2.6	1.9	2.2	17	.4	.4	2.7	2.2	2.4	2.7
3	.4	.4	2.3	2.6	1.85	2.2	18	.4	.6	2.7	2.2	2.4	2.6
4	.4	.4	2.3	2.6	1.8	2.2	19	.4	.6	2.7	2.1	2.4	2.5
5	.4	.4	2.3	2.5	1.8	2.2	20	.4	.6	2.7	2.1	2.4	2.5
6	.4	.5	2.15	2.4	1.8	2.2	21	.4	.7	2.7	2.1	2.5	2.6
7	.4	.5	2.0	2.3	1.7	2.5	22	.4	.7	2.7	2.1	2.5	2.7
8	.4	.5	2.2	2.3	1.7	2.7	23	.4	.7	2.7	2.2	2.7	2.8
9	.4	.5	2.2	2.2	1.7	2.6	24	.4	.7	2.7	2.3	2.5	2.7
10	.4	.5	2.2	2.1	1.4	2.5	25	.4	.7	2.7	2.4	2.5	2.7
11	.4	.5	2.2	2.1	1.3	2.4	26	.4	.7	2.6	2.4	2.4	2.7
12	.4	.5	2.2	2.1	1.4	2.4	27	.4	1.0	2.5	2.4	2.4	2.5
13	.4	.6	2.5	2.1	1.4	2.4	28	.4	1.8	2.5	2.3	2.1	2.6
14	.4	.6	2.6	2.3	1.4	2.55	29	.4	.....	2.5	2.1	2.0	2.7
15	.4	.6	2.6	2.3	2.0	2.7	30	.4	.....	2.5	2.0	2.0	2.65
							31	.4	.....	2.5	.....	2.0	.....

Rating tables for Margueretta flume near Pecos, Tex.

JANUARY 1, 1907, TO FEBRUARY 27, 1907.

Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
0.40	2	0.80	19
.50	6	.90	25
.60	10	1.00	31
.70	14		

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on one discharge measurement made during the above period and the shape of previous low-water curves. It is only approximate.

EFBRUARY 28, 1907, TO APRIL 30, 1907.

1.80	59	2.30	102
1.90	67	2.40	111
2.00	75	2.50	120
2.10	84	2.60	130
2.20	93	2.70	140

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on two discharge measurements made during the above period. It is only approximate.

MAY 1, 1907, TO MAY 15, 1907.

[Indirect method for shifting channels used.]

MAY 16, 1907, TO JUNE 30, 1907.

2.00	49	2.50	89
2.10	56	2.60	98
2.20	64	2.70	108
2.30	72	2.80	118
2.40	80		

NOTE.—The above table is not applicable for obstructed-channel conditions. It is based on one discharge measurement made during the above period and the form of the preceding curve. It is only approximate.

Daily discharge, in second-feet, of Margueretta flume near Pecos, Tex., May 1–15, 1907.

Day.	May.	Day.	May.	Day.	May.	Day.	May.
1	65	5	51	9	40	13	23
2	64	6	50	10	26	14	23
3	58	7	42	11	22	15	50
4	53	8	41	12	24		

NOTE.—These discharges were obtained by the indirect method for shifting channels.

Monthly discharge of Margueretta flume near Pecos, Tex., for 1907.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	2	2	2.00	123	D.
February	59	2	10.3	572	D.
March	140	75	117	7,190	C.
April	130	75	99.7	5,930	B.
May	108	22	59.7	3,670	C.
June	118	49	91.1	5,420	D.
The period				22,900	

PECOS RIVER NEAR MOORHEAD, TEX.

The station, which was established by the International Boundary Commission in April, 1900, is near Moorhead, immediately above the high bridge of the Southern Pacific Railroad.

The station is in the bottom of a canyon about 300 feet deep. Both banks are of rock, but the bottom of the stream is mud. The river here consists of a series of pools connected by rapids. The best pool was chosen for the station. Frequent discharge measurements are made to determine closely the daily discharge. The highest known flood occurred April 6, 1900, about two weeks before this gage was established. The water marks showed that it reached 35.75 feet on the gage.

The observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

Discharge measurements of Pecos River near Moorhead, Tex., in 1907.

[By E. E. Winter, D. J. Smith, I. P. Whitis, and W. H. Dodd.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	727	1.65	555	June 20	760	2.0	718
January 8	728	1.6	533	June 23	624	.9	437
January 12	734	1.6	524	June 28	601	.8	408
January 16	728	1.6	543	July 5	690	.9	285
January 21	735	2.3	603	July 12	651	.6	230
January 25	726	1.75	584	July 17	659	.6	253
January 29	715	1.6	518	July 22	658	.55	250
February 8	719	1.7	651	July 26	657	.55	251
February 12	681	1.55	536	July 31	657	.55	271
February 15	671	1.45	525	August 3	642	.45	246
February 18	706	1.7	604	August 9	642	.45	251
February 22	711	1.7	619	August 13[a]	652	.65	260
February 26	684	1.55	521	August 17	638	.45	280
March 4	685	1.4	484	August 22	619	.45	270
March 8	698	1.7	524	August 24	637	.4	252
March 12	696	1.6	531	August 29	627	.4	257
March 16	686	1.55	498	September 6	666	.4	250
March 20	675	1.4	474	September 9	643	.4	251
March 25	661	1.3	475	September 14	649	.6	243
March 29	668	1.2	467	September 28	615	.7	180
April 3	634	1.1	467	October 3	610	.85	265
April 8	630	1.0	464	October 8	666	1.3	516
April 12	624	.95	430	October 12	706	1.5	568
April 16	610	.9	417	October 19	684	1.2	443
April 19	610	.9	413	October 24	652	1.1	407
April 24	614	.9	407	October 28	802	2.5	1,231
April 29	609	.9	434	November 6	987	4.2	2,877
May 3	626	.9	442	November 11	860	2.7	1,517
May 8	613	.9	428	November 15	790	2.3	1,108
May 13	613	.85	427	November 19	766	2.1	934
May 17	611	.8	420	November 23	752	2.0	940
May 21	605	.8	418	November 27	774	2.0	1,001
May 25	603	.8	400	December 2	782	2.15	1,005
May 29	593	.8	400	December 12	756	2.1	889
June 8	613	.8	392	December 16	741	1.9	802
June 12	597	.8	393	December 20	733	1.95	848
June 15	593	.65	387	December 28	738	1.9	831

[a] Measurement made August 13, 1907, considered too small and hence rejected.

Discharge measurements of Pecos River near Moorhead, Tex., in 1908.

[By W. H. Dodd and E. E. Winter.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 6	734	1.9	769	July 3	675	1.1	374
January 10	724	1.85	800	July 8	1,037	4.4	2,927
January 14	727	1.8	779	July 13	736	1.6	642
January 18	735	1.8	784	July 17	705	1.3	479
January 22	737	1.8	771	July 22	670	1.0	374
January 27	713	1.7	691	July 26	657	1.0	381
January 31	728	1.65	683	July 30	859	2.6	1,366
February 4	706	1.6	619	August 4	815	1.6	666
February 8	701	1.6	617	August 8	813	1.5	635
February 13	711	1.6	631	August 12	793	1.4	621
February 17	694	1.4	520	August 17	798	1.6	697
February 21	692	1.35	497	August 21	811	1.7	731
February 26	671	1.3	470	August 25	808	1.7	727
March 2	660	1.25	463	August 29	861	1.85	919
March 6	666	1.2	462	September 3	902	2.8	1,416
March 11	652	1.05	421	September 8	887	2.1	1,203
March 16	669	1.1	413	September 12	900	2.5	1,288
March 19	642	1.05	373	September 16	811	1.7	800
March 23	645	1.0	379	September 20	744	1.1	563
March 28	656	.95	346	September 24	731	1.2	576
April 4	638	.9	316	September 28	710	1.0	391
April 9	637	.9	329	October 3	722	1.0	369
April 13	641	.95	340	October 8	822	2.3	905
April 17	642	.95	351	October 13	717	1.0	350
April 21	765	1.55	665	October 17	683	.9	347
April 25	673	1.1	477	October 21	727	1.0	382
April 28	642	.95	353	October 25	714	1.0	380
May 4	684	.95	375	October 29	713	1.0	378
May 8	674	.9	343	November 3	708	.95	389
May 12	676	.85	339	November 7	692	.9	394
May 16	653	.85	329	November 11	696	.9	393
May 20	671	.9	345	November 16	694	.9	381
May 25	727	1.2	434	November 20	682	.9	373
May 29	646	.85	326	November 24	691	.9	379
June 3	751	1.35	597	November 28	704	.9	387
June 8	702	1.0	362	December 3	710	.95	307
June 12	681	.9	313	December 8	703	1.0	308
June 16	653	.75	239	December 14	721	1.0	302
June 20	652	.75	243	December 18	716	.95	290
June 24	639	.65	209	December 23	719	1.1	396
June 28	763	1.6	670	December 29	734	1.0	359

Daily gage height, in feet, of Pecos River near Moorhead, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	2.05	1.5	1.4	1.15	0.9	0.8	1.75	0.5	0.4	0.8	1.9	2.1
2	1.85	1.5	1.4	1.1	.9	.8	1.6	.5	.4	.75	2.55	2.15
3	1.7	2.15	1.4	1.1	.9	.8	1.5	.45	.4	.85	3.55	2.15
4	1.65	2.35	1.4	1.1	.9	.8	1.35	.45	.4	1.25	3.7	2.1
5	1.6	2.2	1.4	1.0	.9	.8	1.0	.45	.4	1.6	3.9	2.1
6	1.6	1.95	1.4	1.0	.9	.8	.9	.45	.4	1.6	4.2	2.1
7	1.6	1.8	1.4	1.0	.9	.8	.9	.45	.4	1.45	4.05	2.1
8	1.6	1.7	1.7	1.0	.9	.75	1.35	.45	.4	1.3	3.9	2.05
9	1.6	1.7	1.8	1.0	.9	.8	.95	.45	.4	1.35	3.6	2.05
10	1.6	1.65	1.8	.95	.9	.8	.75	.45	.4	1.55	2.8	2.05
11	1.6	1.6	1.7	.95	.9	.8	.6	.85	.4	1.6	2.8	2.0
12	1.6	1.55	1.6	.95	.85	.8	2.45	.85	.6	1.55	2.6	2.1
13	1.6	1.5	1.6	.95	.85	.75	.9	.75	.6	1.4	2.45	2.0
14	1.6	1.5	1.6	.9	.85	.75	.95	.45	.6	1.35	2.4	2.0
15	1.6	1.45	1.7	.9	.8	.75	.75	.45	.6	1.25	2.3	1.95
16	1.6	1.45	1.55	.9	.8	.7	.6	.45	.6	1.4	2.25	1.9
17	2.3	1.45	1.5	.9	.8	.7	.6	.45	.6	1.4	2.25	1.9
18	2.4	1.65	1.5	.9	.8	.7	.55	.45	.6	1.4	2.2	1.9
19	2.4	1.9	1.45	.9	.8	.8	.55	.45	.6	1.25	2.15	1.95
20	2.4	1.85	1.4	.9	.8	2.0	.55	.45	.6	1.2	2.1	1.95
21	2.3	1.75	1.4	.9	.8	.95	.55	.45	.6	1.2	2.5	1.95
22	2.15	1.7	1.4	.9	.8	.9	.55	.45	.6	1.2	2.25	1.95
23	1.95	1.6	1.4	.9	.8	.9	.55	.45	.9	1.15	2.0	1.9
24	1.75	1.6	1.3	.9	.8	.75	.55	.4	.9	1.1	1.95	1.85
25	1.75	1.55	1.3	.9	.8	.7	.55	.4	.9	1.35	1.9	1.85
26	1.7	1.55	1.25	.9	.8	.7	.55	.4	.8	2.45	1.9	1.8
27	1.65	1.5	1.2	.9	.8	.8	.55	.4	.8	2.45	2.15	1.85
28	1.6	1.5	1.2	.9	.8	.8	.55	.4	.7	2.5	2.2	1.9
29	1.6	.....	1.2	.9	.8	1.15	.55	.4	.7	2.75	2.15	1.9
30	1.6	.....	1.2	.9	.8	1.6	.55	.4	.7	1.7	2.1	1.9
31	1.55	.....	1.2	.....	.8	.....	.55	.4	.....	1.4	.....	1.9
1908.												
1	1.9	1.65	1.25	.9	1.05	.9	1.2	1.95	2.4	1.0	.9	1.0
2	1.9	1.65	1.25	.9	1.05	.85	1.95	1.8	2.65	1.0	.9	.95
3	1.9	1.6	1.2	.9	1.0	1.15	1.15	1.6	2.85	1.0	.95	.95
4	1.9	1.6	1.2	.9	.95	1.1	.95	1.6	2.75	1.0	.95	.95
5	1.9	1.6	1.2	.95	.95	1.1	.9	1.55	2.4	1.0	.9	.95
6	1.9	1.6	1.2	.95	.95	1.05	.9	1.7	2.3	.95	.9	1.0
7	1.9	1.6	1.2	.9	.95	1.0	10.8	1.5	2.15	1.25	.9	1.0
8	1.9	1.6	1.1	.9	.9	1.0	3.85	1.5	2.1	2.45	.9	1.0
9	1.85	1.55	1.05	.9	.9	1.0	2.7	1.4	2.05	1.7	.9	1.0
10	1.85	1.55	1.05	.95	.9	.95	2.4	1.4	2.2	1.45	.9	1.0
11	1.85	1.55	1.05	.95	.85	.95	2.2	1.3	2.45	1.2	.9	1.0
12	1.85	1.5	1.05	.9	.85	.9	2.0	1.4	2.45	1.05	.9	1.0
13	1.85	1.55	1.1	.95	.85	.9	1.7	1.6	2.15	1.0	.9	1.0
14	1.8	1.5	1.1	.95	.9	.9	1.55	1.65	1.95	1.0	.9	1.0
15	1.8	1.5	1.1	1.0	.9	.85	1.45	1.9	1.95	1.0	.9	1.0
16	1.8	1.4	1.1	.95	.85	.75	1.35	1.9	1.75	.95	.9	1.0
17	1.8	1.4	1.1	.95	.85	.75	1.3	1.65	1.65	.9	.9	.95
18	1.8	1.35	1.1	7.55	.85	.75	1.3	1.4	1.5	1.0	.9	.95
19	1.8	1.35	1.05	3.5	.9	.75	1.15	1.4	1.3	1.0	.9	1.0
20	1.8	1.35	1.0	2.3	.9	.75	1.15	1.35	1.1	1.0	.9	1.1
21	1.8	1.35	1.0	1.6	.85	.75	1.0	1.7	1.1	1.0	.9	1.1
22	1.8	1.35	1.0	1.5	.85	.7	1.0	1.7	1.0	1.0	.9	1.1
23	1.75	1.35	1.0	1.2	.9	.7	1.0	1.6	1.05	.95	.9	1.1
24	1.75	1.35	1.0	1.2	1.05	.65	1.0	1.6	1.15	1.0	.9	1.4
25	1.75	1.3	1.0	1.1	1.2	.65	1.0	1.7	1.2	1.0	.9	1.35
26	1.75	1.3	.95	1.05	1.35	.8	1.0	1.7	1.1	1.0	.9	1.15
27	1.75	1.3	.95	1.05	1.1	1.6	.95	1.7	1.1	1.0	.9	1.1
28	1.7	1.25	.95	.95	.9	1.6	.95	1.65	1.0	1.0	.9	1.05
29	1.7	1.25	.95	1.0	.85	1.15	2.25	1.85	1.0	1.0	1.0	1.0
30	1.7	.....	.95	1.0	.85	.95	2.55	1.85	1.0	.95	1.0	1.0
31	1.7	.....	.95	.....	.85	.....	2.35	1.8	.....	.9	.....	1.0

Daily discharge, in second-feet, of Pecos River near Moorhead, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	675	490	485	465	435	395	630	260	250	235	980	1,000
2	615	490	485	465	440	395	570	255	250	210	a1,510	a1,010
3	570	735	485	a 465	a 440	395	530	a 245	250	a 265	2,330	995
4	a 555	810	a 485	465	440	395	470	245	250	465	2,460	965
5	540	775	485	465	440	395	a 325	245	250	640	2,630	955
6	540	705	485	465	435	390	285	250	250	640	a2,880	945
7	535	670	485	465	430	390	285	250	250	575	2,740	935
8	a 535	a 650	a 525	a 465	a 430	a 380	365	250	250	a 515	2,600	905
9	530	635	565	460	435	390	295	a 250	a 250	530	2,330	895
10	530	600	575	440	440	390	260	250	240	580	1,610	885
11	525	570	555	435	445	395	230	425	230	595	a1,610	855
12	a 525	a 535	a 530	a 430	425	a 395	a 850	425	260	a 580	1,420	a 890
13	530	525	525	430	a 425	385	295	390	250	525	1,260	845
14	535	535	520	420	430	385	310	280	a 245	505	1,210	845
15	540	a 525	545	415	420	a 385	275	280	245	465	a1,110	825
16	a 545	525	a 500	a 415	420	375	250	280	240	525	1,060	a 800
17	705	525	490	415	a 420	375	a 255	a 280	240	525	1,060	810
18	730	a 590	490	415	420	375	245	280	235	525	1,020	815
19	730	670	480	a 415	420	395	245	275	235	a 465	a 980	840
20	730	655	a 475	410	420	a 720	245	275	230	445	945	a 845
21	a 605	630	480	410	a 420	445	250	270	230	445	1,120	845
22	595	a 620	485	410	415	435	a 250	a 270	230	445	1,030	845
23	570	575	490	410	410	a 435	250	265	280	425	a 940	830
24	550	565	475	a 410	405	400	250	a 250	270	a 405	935	815
25	a 585	535	a 475	415	a 400	390	250	250	260	555	930	815
26	560	a 520	470	420	400	390	a 250	255	230	1,200	945	800
27	540	505	470	425	400	410	255	255	220	1,200	a1,060	815
28	520	505	465	430	400	a 410	260	255	a 180	a1,230	1,070	a 830
29	a 520	.....	a 465	a 435	a 400	480	265	a 255	180	1,380	1,040	830
30	520	.....	465	435	400	570	265	255	180	750	1,010	830
31	505	.....	465	.....	400	.....	a 270	255	.....	570	.....	830
1908.												
1	830	670	455	325	400	340	490	900	1,240	385	345	390
2	820	660	a 465	325	405	325	930	800	1,350	375	345	340
3	805	630	460	320	390	a 485	a 410	665	a1,440	a 370	a 390	a 305
4	795	a 620	460	a 315	a 375	430	315	a 665	1,400	370	395	300
5	780	620	460	335	370	430	295	650	1,300	370	380	295
6	a 770	620	a 460	335	365	395	295	695	1,270	350	385	315
7	780	615	460	325	360	360	11,700	635	1,220	470	a 395	310
8	795	a 615	435	330	a 345	a 360	a2,480	a 635	a1,200	a 970	395	a 310
9	790	600	420	a 330	345	360	1,530	620	1,190	650	395	310
10	a 800	605	420	340	350	335	1,300	620	1,220	540	395	310
11	800	605	a 420	340	340	335	1,130	605	1,280	435	a 390	305
12	800	590	415	330	a 340	a 315	970	a 620	a1,260	370	390	305
13	800	a 610	425	a 340	340	315	a 725	710	1,070	a 350	390	305
14	a 780	585	420	345	345	315	615	730	950	360	335	a 300
15	780	575	415	360	340	290	560	840	950	365	385	305
16	780	525	a 415	350	a 330	a 240	505	840	a 830	355	a 380	310
17	780	a 520	405	a 350	330	240	a 480	a 720	780	a 345	380	290
18	a 785	495	395	8,020	335	240	480	630	720	380	380	a 290
19	780	495	a 375	2,840	345	245	425	630	640	380	375	320
20	780	495	375	1,500	a 345	a 245	425	610	a 565	380	a 375	370
21	775	a 495	375	a 720	330	240	375	a 730	555	a 380	375	375
22	a 770	495	380	645	330	225	a 375	730	510	380	375	385
23	745	495	a 380	520	345	225	375	700	520	365	380	a 395
24	735	495	375	520	390	a 210	380	700	a 555	380	a 380	515
25	730	470	370	a 475	a 435	210	380	a 725	550	a 380	380	500
26	720	a 470	355	435	480	280	a 380	725	480	380	380	425
27	a 710	470	350	415	405	670	360	725	455	380	385	405
28	690	450	a 345	a 355	340	a 670	360	710	a 390	330	a 385	390
29	690	450	345	375	a 325	445	1,090	a 920	390	a 380	420	a 360
30	690	.....	345	375	325	345	a1,330	920	390	360	420	360
31	a 690	.....	345	.....	325	.....	1,170	870	.....	345	.....	360

a Dates of measurement.

Monthly discharge of Pecos River near Moorhead, Tex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907.				
January	730	505	574	35,286
February	810	490	595	33,064
March	575	465	496	30,496
April	465	410	434	25,825
May	445	400	421	25,904
June	570	375	415	24,724
July	630	230	324	19,894
August	425	245	275	16,909
September	280	180	239	14,202
October	1,380	210	594	36,526
November	2,880	930	1,461	86,926
December	1,010	800	869	53,445
The year	2,880	180	558	403,201
1908.				
January	830	690	767	47,157
February	670	450	553	31,815
March	465	345	404	24,833
April	8,020	315	763	45,402
May	480	325	359	22,066
June	670	210	337	20,072
July	11,700	295	1,053	64,731
August	920	610	719	44,182
September	1,440	390	889	52,899
October	970	345	409	25,150
November	420	345	384	22,869
December	515	290	347	21,332
The year	11,700	210	582	422,508

GALLINAS RIVER NEAR LAS VEGAS, N. MEX.

The station, which was established August 13, 1903, and is maintained primarily for the purpose of determining the amount of water available for diversion and storage in the San Guyjella basin about 6 miles northwest of Las Vegas, is located at Las Vegas Hot Springs, 6 miles above Las Vegas, N. Mex.

The altitude of the station is about 6,700 feet. It is below all perennial tributaries. The drainage area at the station is about 90 square miles, while the total for the river is over 600 square miles.

Very little water is diverted above the station, though practically all of the ordinary flow is used for irrigation in the valley below. The reservoir mentioned above has a capacity of about 40,000 acre-feet, and is to be used for the irrigation of 10,000 acres of land. It will be filled from the Gallinas, the Sapello, and other small streams in that vicinity. The flow of the stream at this point is not usually affected by ice conditions.

The gage was washed out on September 29, 1904, and replaced by the present rod gage on October 19, 1904. The zero of the new rod gage is 0.71 foot lower than that of the old one. Results at this station have been fairly satisfactory.

Discharge measurements of Gallinas River near Las Vegas, N. Mex., in 1907 and 1908.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
1907.		*Feet.*	*Sq. ft.*	*Feet.*	*Sec.-ft.*
March 18	W. A. Lamb	34	21	2.08	26
April 19	do	30	26	2.25	42
May 12	do	34	46	2.65	124
May 26	do	34	37	2.35	68
June 8	do	34	40	2.48	85
June 25	do	35	23	2.12	33
August 27	V. L. Sullivan	26	10	2.00	12.7
October 7	do	4	1.3	1.70	1.3
1908.					
March 24	V. L. Sullivan	20	7.4	1.85	5.9
April 30	R. L. Cooper	30	21	2.20	[a] 41
July 15	do	23	10.3	1.85	[a] 11.7
August 13	do	26	18.5	2.10	[a] 29.3
October 30	do	.....	.....	1.60	[b] 1.0
December 15	J. B. Stewart	21.6	8.7	1.78	[c] 4.2

[a] Made by wading above gage. [b] Estimated. [c] Made by wading at regular section.

Daily gage height, in feet, of Gallinas River near Las Vegas, N. Mex., for 1907 and 1908.

[William Prager, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.95	2.0	2.0	2.1	2.5	2.6	2.0	2.3	2.3	1.9	1.7	1.8
2	1.9	2.0	2.0	2.1	2.55	2.7	2.0	2.5	2.4	1.8	1.7	1.8
3	1.95	2.0	2.0	2.1	2.6	2.7	2.0	2.4	2.35	1.8	1.7	1.8
4	2.0	2.0	2.12	2.1	2.6	2.6	2.0	2.3	2.3	1.8	1.7	1.8
5	2.0	2.0	2.05	2.1	2.6	2.6	2.1	2.25	2.25	1.8	1.7	1.8
6	2.0	2.0	2.05	2.1	2.6	2.6	2.05	2.2	2.2	1.7	1.7	1.8
7	1.95	2.0	2.05	2.1	2.55	2.55	2.0	2.15	2.2	1.7	1.75	1.8
8	1.95	2.0	2.2	2.2	2.5	2.5	2.0	2.15	2.15	1.7	1.8	1.8
9	2.0	2.0	2.1	2.2	2.5	2.5	2.0	2.15	2.1	1.7	1.8	1.8
10	2.0	2.05	2.15	2.2	2.55	2.4	2.0	2.05	2.1	1.7	1.8	1.8
11	2.0	2.05	2.05	2.25	2.55	2.4	2.0	2.0	2.1	1.7	1.8	1.8
12	1.95	2.05	2.0	2.25	2.6	2.4	2.1	2.0	2.05	1.7	1.8	1.8
13	2.0	2.0	2.0	2.3	2.6	2.35	2.0	2.0	2.0	1.7	1.8	1.8
14	2.0	2.05	2.05	2.25	2.55	2.3	2.0	2.0	2.0	1.7	1.8	1.8
15	2.0	2.0	2.15	2.25	2.5	2.3	1.95	2.0	2.0	1.7	1.8	1.8
16	2.0	2.0	2.0	2.2	2.5	2.2	1.95	2.0	2.0	1.7	1.8	1.8
17	2.0	2.0	2.0	2.2	2.45	2.2	2.16	1.9	2.0	1.7	1.8	1.8
18	2.05	2.0	2.05	2.2	2.4	2.2	2.0	1.95	2.0	1.7	1.8	1.8
19	2.05	2.0	2.1	2.2	2.4	2.3	2.0	1.95	2.0	1.7	1.8	1.8
20	2.0	2.0	2.2	2.1	2.4	2.3	2.15	2.15	2.0	1.7	1.8	1.8
21	2.0	2.0	2.2	2.15	2.5	2.25	2.0	2.15	1.95	1.7	1.8	1.8
22	2.0	2.0	2.3	2.4	2.5	2.2	2.0	2.1	1.9	1.6	1.8	1.8
23	2.0	2.0	2.25	2.3	2.5	2.2	2.1	2.0	1.9	1.6	1.8	1.8
24	2.0	2.0	2.25	2.3	2.5	2.2	2.15	2.0	1.9	1.7	1.8	1.8
25	2.0	2.0	2.2	2.35	2.4	2.1	2.1	2.0	1.9	1.7	1.8	1.8
26	2.0	2.0	2.2	2.3	2.4	2.1	2.15	2.0	1.9	1.7	1.8	1.8
27	2.0	2.0	2.2	2.3	2.35	2.1	2.35	2.0	1.9	1.7	1.8	1.8
28	2.0	2.0	2.2	2.3	2.3	2.1	2.2	2.0	1.9	1.7	1.8	1.8
29	2.0	.....	2.1	2.4	2.4	2.0	2.35	2.0	1.9	1.7	1.8	1.8
30	2.0	.....	2.1	2.4	2.4	2.0	2.35	2.15	1.9	1.7	1.8	1.8
31	2.0	.....	2.1	.....	2.55	.....	2.3	2.2	.....	1.7	.....	1.8
1908.												
1	1.8	1.7	2.0	1.9	2.2	2.0	1.75	2.45	2.1	1.8	1.6	1.8
2	1.8	1.7	1.8	1.9	2.2	2.0	1.7	2.75	2.1	1.7	1.6	1.8
3	1.8	1.7	1.8	1.8	2.2	2.0	1.7	2.8	2.1	1.7	1.6	1.8
4	1.8	1.7	1.8	1.8	2.2	1.95	1.75	2.65	2.05	1.7	1.6	1.8
5	1.8	1.7	1.8	1.8	2.15	1.9	1.85	2.5	2.0	1.7	1.6	1.8

Daily gage height, in feet, of Gallinas River near Las Vegas, N. Mex., for 1907 and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
6	1.8	1.75	1.8	1.8	2.1	1.9	1.75	2.35	2.0	1.7	1.6	1.8
7	1.8	1.8	[a]2.0	1.8	2.1	1.9	1.7	2.3	2.0	1.7	1.6	1.8
8	1.8	1.8	1.85	1.8	2.1	1.9	1.7	2.55	1.95	1.7	1.6	1.8
9	1.8	1.8	[a]2.05	1.8	2.1	1.9	1.7	2.35	1.9	1.7	1.6	1.8
10	1.8	1.8	1.9	1.9	2.1	1.8	1.7	2.2	1.9	1.6	1.6	1.8
11	1.8	1.8	1.85	1.95	2.1	1.8	1.7	2.2	1.9	1.6	1.6	1.8
12	1.8	1.8	[a]2.0	2.0	2.05	1.8	1.7	2.15	1.9	1.5	1.6	1.8
13	1.8	1.8	[a]2.0	2.0	2.0	1.8	1.7	2.25	1.9	1.5	1.6	1.8
14	1.8	1.8	1.85	2.0	2.0	1.8	1.75	2.4	1.9	1.5	1.6	1.8
15	1.8	1.8	1.8	2.1	2.05	1.8	1.9	2.3	1.9	1.5	1.6	1.8
16	1.8	1.8	1.8	2.1	2.1	1.8	1.9	2.35	1.9	1.5	1.65	1.8
17	1.8	1.8	1.8	2.1	2.1	1.8	1.9	2.15	1.9	1.5	1.7	1.8
18	1.8	1.8	1.8	2.1	2.1	1.8	2.2	2.1	1.9	1.5	1.7	1.8
19	1.8	1.8	1.85	2.15	2.05	1.8	2.05	2.2	1.9	1.5	1.7	1.8
20	1.8	1.8	1.9	2.3	2.0	1.8	2.1	2.4	1.9	1.5	1.7	1.8
21	1.8	1.8	1.9	2.35	2.0	1.75	2.0	2.2	1.9	1.5	1.7	1.8
22	1.8	1.8	1.9	2.5	2.0	1.7	1.95	2.6	1.8	1.6	1.7	1.8
23	1.8	1.8	1.9	2.5	2.1	1.7	1.9	2.3	1.8	1.6	1.7	1.8
24	1.75	[a]2.05	1.9	2.45	2.1	1.7	1.9	2.25	1.8	1.6	1.7	1.8
25	1.7	1.8	1.9	2.35	2.1	1.7	1.9	2.2	1.8	1.6	1.7	1.8
26	1.7	1.8	1.9	2.3	2.1	[b]2.15	1.9	2.15	1.8	1.6	1.7	1.8
27	1.7	1.8	1.9	2.25	2.05	1.85	2.0	2.1	1.8	1.6	1.7	1.8
28	1.7	[a]2.10	1.9	2.2	2.0	1.8	1.9	2.35	1.8	1.6	1.8	1.8
29	1.7	2.20	1.9	2.2	2.0	1.8	1.9	2.35	1.8	1.6	1.8	1.8
30	1.7	.....	1.9	2.0	2.0	1.8	2.05	2.3	1.8	1.6	1 8	1.8
31	1.7	.....	1.9	.....	2.0	.....	2.65	2.2	.....	1.6	.....	1.8

[a] Fluctuations in February and March, 1908, marked (*a*) due to discharge from Aqua Pura Company's dam into river.

[b] Cloudburst. Gage height 2 a. m., =3.5 feet.

Rating tables for Gallinas River near Las Vegas, N. Mex.

JANUARY 1, 1907, TO APRIL 24, 1908.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1.60	0.0	2.10	25	2.60	113
1.70	1.3	2.20	39	2.70	135
1.80	3.5	2.30	55	2.80	158
1.90	7.0	2.40	73		
2.00	14	2.50	92		

NOTE.—The above table is not applicable for ice or obstructed channel conditions. It is based on 14 discharge measurements made during 1907 and 1908 and is well defined.

APRIL 25, 1908, TO SEPTEMBER 3, 1908.

1.60	0.8	1.90	13	2.20	41
1.70	4	2.00	20	2.30	55
1.80	8	2.10	29		

NOTE.—The above table is not applicable for obstructed-channel conditions. It is based on discharge measurements made during 1907 and 1908 and is fairly well defined. Above gage height 2.30 feet use 1907 table.

SEPTEMBER 4, 1908, TO DECEMBER 31, 1908.

1.50	0.0	1.80	5.0	2.10	29
1.60	0.3	1.90	10.5		
1.70	1.8	2.00	19		

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on discharge measurements made during 1908 and 1909 and is well defined.

Monthly discharge of Gallinas River near Las Vegas, N. Mex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1907.					
January	20	7	13.6	836	C.
February	20	14	14.9	828	C.
March	55	14	27.6	1,700	B.
April	73	25	43.5	2,590	B.
May	113	55	91.3	5,610	A.
June	135	14	64.0	3,810	A.
July	64	10.5	24.7	1,520	B.
August	92	7	27.3	1,680	B.
September	73	7	22.8	1,360	B.
October	7	0	1.68	103	
November	3.5	1.3	3.02	180	
December	3.5	3.5	3.50	215	
The year	135	0	28.2	20,400	
1908.					
January	3.5	1.3	2.97	183	
February	39	1.3	5.62	323	
March	20	3.5	7.07	435	
April	92	3.5	29.4	1,750	B.
May	41	20	27.5	1,690	B.
June	35	4	10.7	637	B.
July	124	4	15.6	959	B.
August	158	29	64.8	3,980	A.
September	29	5	12.2	726	B.
October	5	0	.74	46	
November	5	.3	1.34	80	
December	5	5	5.0	307	
The year	158	0	15.2	11,100	

NOTE.—No accuracy indicated for mean monthly discharge less than 10 second-feet; these months are in general roughly approximate.

HONDO RESERVOIR INLET NEAR ROSWELL, N. MEX.

This station which has been maintained by the United States Reclamation Service for the purpose of determining the amount of water going into the Hondo reservoir, has been known as the "inlet canal" at Hondo reservoir, N. Mex. It is located 12 miles southwest of Roswell, just below the sand check at the lower end of the inlet canal (Pl. III, *B*). It was established on August 7, 1906, and gage observations were discontinued on March 31, 1908. The reservoir is to store water for the irrigation of about 10,000 acres of land.

On August 7, 1906, the gage was moved and the present vertical-rod gage was established at a different datum. This gage is fastened to the east end of the first partition from the east end of the sand-check gate, and the zero rests on the sill of the gate.

Sufficient discharge measurements have not been made at this station to form the basis for very reliable estimates of the daily discharge. As there was practically no flow in Hondo River during the entire season of 1908, there was very little inflow at the reservoir.

Discharge measurements of Hondo reservoir inlet near Roswell, N. Mex., in 1907.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 5	W. A. Lamb	33	18	0.20	[a] 28
January 23	do	56	57	.50	[a] 177
November 20	Freeman and Boscoe	34	38	.10	[a] 48

[a] Made by wading below gage.

Daily gage height, in feet, of Hondo reservoir inlet near Roswell, N. Mex., for 1907 and 1908.

[John F. Boscoe, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	0.30	0.35	.....	.....	.....	.....	.....	.....	0.40	.....	0.30	0.05
2	.30	.38	.....	.....	.....	.....	.....	.....	.10	.....	.30	.05
3	.32	.30	.....	.....	.....	.....	.....	.....	.10	.....	.30	.05
4	.28	.30	.....	.....	.....	.....	.....	0.05	.05	.....	.25	.05
5	.22	.30	.....	.....	.....	.....	.....	.....	.10	.....	.25	.05
6	.18	.25	.....	.....	.....	.....	.....	.....	.08	.....	.20	.05
7	.20	.20	.....	.....	.....	.....	.....	.....	.08	.....	.20	.05
8	.15	.25	.....	.....	.....	.....	.....	.....	.05	.....	.20	.05
9	.18	.20	.....	.....	.....	.....	.....	.....	.05	.....	.05	.05
10	.25	.12	.....	.....	.....	.....	.....	.....	.....	.....	.05	.05
11	.30	.12	.....	.....	.....	.....	.....	.....	.....	.....	.05	.....
12	.30	.15	.....	.....	.....	.....	.....	.....	.....	.....	.05	.....
13	.25	.15	.....	.....	.....	.....	0.15	.....	.....	.....	.05	.....
14	.30	.15	.....	.....	.....	.....	.08	.....	.....	.....	.05	.....
15	.25	.10	.....	.....	.....	.....	.....	.....	.....	.....	.05	.....
16	.28	.05	.....	.....	.....	.....	.....	.....	.15	.....	.05	.....
17	.80	.05	.....	.....	.....	.....	.....	.....	.15	.....	.05	.....
18	1.00	.05	.....	.....	.....	.....	.....	.....	.10	.....	.05	.....
19	1.00	.05	.....	.....	.....	.....	.....	.....	.05	.....	.08	.....
20	1.00	.05	.....	.....	.....	.....	.10	.....	.10	.....	.08	.....
21	.75	.05	.....	.....	.....	0.05	.02	.10	.05	0.02	.05	.....
22	.58	.05	.....	.....	.....	.....	.....	.10	.08	.05	.05	.....
23	.50	.00	.....	.....	.....	.05	.12	.05	.05	.05	.05	.....
24	.50	.00	.....	.....	.....	.05	.02	.02	.....	.05	.05	.05
25	.50	.....	.....	.....	.....	.....	.....	.....	.....	.05	.05	.05
26	.45	.....	.....	.....	.....	.....	.....	.15	.....	.10	.05	.05
27	.50	.....	.....	.....	.....	.....	.10	.18	.....	.10	.05	.05
28	.40	.....	.....	.....	.....	.....	.20	.30	.....	.10	.05	.05
29	.38	.....	.....	.....	.....	.....	.15	.50	.....	.40	.05	.05
30	.30	.....	.....	.....	.....	.....	.20	.50	.....	.30	.05	.05
31	.25	.....	.....	.....	.....	.....	.08	.45	.....	.30	.....	.05

Day.	Jan.	Feb.	Day.	Jan.	Feb.	Day.	Jan.	Feb.
1908.			1908.			1908.		
1	0.05	.....	11	0.05	.....	21	.....	.....
2	.05	.....	12	.05	.....	22	.....	.....
3	.05	.....	13	.....	.....	23	.....	.....
4	.05	.....	14	.....	.....	24	.....	.....
5	.20	0.20	15	.....	.....	25	.....	.....
6	.20	.30	16	.....	.....	26	.....	.....
7	.05	.....	17	.....	.....	27	.....	.....
8	.05	.....	18	.....	.....	28	.....	.....
9	.05	.....	19	.....	.....	29	.....	.....
10	.05	.....	20	.....	.....	30	.....	.....
						31	.....	.....

NOTE.—The canal was dry on days when the gage was not read.

HONDO RIVER BELOW HONDO RESERVOIR OUTLET CANAL, NEAR ROSWELL, N. MEX.

This station was established about December 1, 1907, at the bridge across Hondo River, a short distance below the outlet canal of the Hondo reservoir, near Roswell, N. Mex., for the purpose of determining the amount of water passing the reservoir. A temporary gage was set up and gage readings were made from January 1 to March 31, 1908, at which date the station was discontinued.

There was probably no flow during December, 1907, and very little in Hondo River during the entire season of 1908, consequently no water went into the Hondo reservoir.

Daily gage height, in feet, of Hondo River below Hondo reservoir outlet canal, Roswell N. Mex., for 1908.

[John F. Boscoe, observer.]

Day.	Jan.	Feb.	Day.	Jan.	Feb.	Day.	Jan.	Feb.
1	.....	.....	11	0.9	1.1	21	1.0	.....
2	.....	.....	12	1.0	1.1	22	1.0	.....
3	.....	.....	13	1.0	1.1	23	1.0	0.9
4	.....	0.95	14	1.0	.9	24	1.0	.3
5	.....	.9	15	1.0	.9	25	1.0	.3
6	0.9	1.1	16	1.0	.9	26	1.0	.3
7	1.0	1.1	17	1.0	.9	27	1.0	.3
8	.9	1.1	18	1.0	.9	28	.9	.3
9	.9	1.1	19	1.0	.9	29	.9	.....
10	.9	1.1	20	1.0	.9	30	.3	.....
						31	.....	.....

NOTE.—The canal was dry on days when the gage was not read, from January 1 to March 31.

PENASCO RIVER NEAR DAYTON, N. MEX.

This station was established September 12, 1905, about 2 miles east and 1 mile north of Dayton, N. Mex., and about 1 mile above the mouth of the river. Daily gage observations were discontinued March 31, 1908, but one or two gage observations were made during the remainder of 1908 when there was water in the stream.

The records show the amount of water which the Penasco contributes to Pecos River, and are used by the United States Reclamation Service in connection with the Carlsbad project. The station is below all tributaries. The drainage area is about 1,300 square miles.

Ice conditions have little effect on stream flow in this locality.

The datum of the gage has remained constant during the maintenance of the station. Sufficient discharge measurements have not been made from which to work up estimates of daily discharge. Fair results, however, can be obtained if frequent measurements are taken. The discharge at high water gage heights has not been defined by discharge measurements.

Discharge measurements of Penasco River near Dayton, N. Mex., in 1907.

Date.	Hydrographer.	Width.	Area of section.	Gage height.	Discharge.
		Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
February 20	W. A. Lamb	23	14.0	1.28	a 25
March 27	do	3	.45	.93	.4

a Made by wading 30 feet below gage.

Daily gage height, in feet, of Penasco River near Dayton, N. Mex., for 1907 and 1908.

[Lemo Weddle, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	1.3	1.3	1.0	1.0	0.9	0.7	0.4	.....	.....	.....	0.7	1.0
2	1.3	1.3	1.0	1.0	.9	.7	.4	.....	.....	.....	.7	1.0
3	1.3	1.4	1.0	.9	.9	.6	.4	.....	.....	.....	.6	1.0
4	1.3	1.4	1.0	.9	.9	.6	.4	.....	.....	.....	.5	1.0
5	1.3	1.4	1.0	.9	.8	.6	.4	.....	.....	.....	.4	1.0
6	1.3	1.4	1.0	.8	.8	.6	.3	.....	.....	.....	.3	1.0
7	1.3	1.3	1.0	.8	.8	.6	.3	.....	.....	.....	.3	1.0
8	1.2	1.3	1.0	.8	.8	.6	.8	.....	.....	.....	.3	1.0
9	1.2	1.3	1.0	.9	.8	.6	.8	.....	.....	.....	.3	1.0
10	1.3	1.3	1.0	.9	.8	.6	.7	.....	.....	.....	.3	1.0
11	1.3	1.3	1.0	.9	.8	.6	.6	.....	.....	.....	.4	1.0
12	1.3	1.2	1.0	.9	.7	.6	.5	.....	.....	.....	1.0	1.0
13	1.3	1.2	.9	.9	.7	.5	.4	.....	.....	.....	1.0	1.0
14	1.3	1.1	.9	.8	.7	.5	.4	.....	.....	.....	1.0	1.0
15	1.3	1.2	1.0	.8	.7	.6	.4	.....	.....	.....	1.0	1.0
16	1.3	1.3	1.0	.8	.9	.6	.4	.....	.....	.....	1.0	1.0
17	1.3	1.3	1.0	.8	.7	.6	.....	.....	.....	.....	1.0	1.0
18	1.4	1.3	1.0	.8	.7	.6	.....	.....	.....	.....	1.0	1.0
19	1.4	1.4	1.0	.8	.7	.6	.....	.....	.....	.....	1.0	1.0
20	1.5	1.2	1.0	.8	.7	1.5	.....	.....	.....	.....	1.0	1.0
21	1.5	1.3	1.0	.9	.7	1.0	.....	.....	.....	.....	1.0	1.0
22	1.5	1.3	1.0	.8	.7	.9	.....	.....	.....	.....	1.0	1.0
23	1.5	1.3	1.0	.9	.7	.9	.....	.....	.....	.....	1.0	1.0
24	1.5	1.2	.9	.9	.7	.8	.....	.....	.....	.....	1.0	.8
25	1.5	1.2	.9	.9	.7	.8	.....	.....	.....	.....	1.0	.8
26	1.5	1.3	.9	.9	.7	.8	.....	.....	.....	.....	1.0	.....
27	1.5	1.2	.9	.9	.7	.8	.....	.....	.....	.....	1.0	.....
28	1.5	1.1	.9	.9	.7	.4	.....	.....	.....	.....	1.0	.....
29	1.5	.....	.9	.9	.8	.4	.....	.....	.....	2.1	1.0	.....
30	1.4	.....	1.0	.9	.7	.5	.....	.....	.....	1.5	1.0	.....
31	1.4	.....	1.0	.....	.7	.....	.....	.....	.....	.8	.....	.....

NOTE.—River was dry July 17–October 27 and December 26, 1907–March 31, 1908.
The following gage heights in feet were observed in 1908: July 20, 1.8; July 21, 1.6; July 22, 1.1; July 23, 1.6; Aug. 5, 1.4. The stream was practically dry during the entire season of 1908, except for one or two occasional freshets.

LAKE MCMILLAN AT LAKEWOOD, N. MEX.

During part of 1907 gage readings were taken showing the height of the water in the McMillan reservoir. After July 13 it contained very little water.

Daily gage height, in feet, of Lake McMillan at Lakewood, N. Mex., for 1907.

[H. C. Halcomb, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1....	17.4	15.3	15.6	13.5	15.1	15.9	14.8	16....	14.4	15.9	14.0	13.7	16.2	16.8	.....
2....	17.6	15.5	15.4	13.6	15.2	16.3	14.7	17....	14.8	16.1	13.9	13.6	16.2	16.4	.....
3....	17.8	15.7	14.3	13.6	15.3	16.2	14.4	18....	15.1	16.3	13.9	13.6	16.3	16.2	.....
4....	17.9	16.0	13.8	13.6	15.4	16.1	14.1	19....	15.4	16.4	13.9	13.6	16.2	16.0	.....
5....	17.9	16.2	13.9	13.6	15.5	16.0	13.7	20....	15.7	16.6	13.8	13.6	16.0	16.0	.....
6....	18.0	16.4	14.0	13.6	15.6	15.9	13.5	21....	16.0	16.7	13.8	13.7	15.8	16.0	.....
7....	18.0	16.5	14.0	13.6	15.8	15.9	12.9	22....	16.3	16.8	13.8	13.9	15.7	15.5	.....
8....	17.9	16.7	14.1	13.6	16.0	15.9	12.6	23....	16.6	16.9	13.7	14.1	15.6	15.6	.....
9....	17.5	16.9	14.1	13.6	16.0	15.9	12.3	24....	16.8	17.0	13.7	14.3	15.6	15.5	.....
10....	16.9	16.5	14.1	13.6	16.1	16.1	12.0	25....	17.0	17.1	13.6	14.5	15.5	15.3	.....
11....	16.3	16.0	14.0	13.7	16.2	16.5	11.9	26....	16.5	16.8	13.6	14.6	15.7	15.2	.....
12....	15.6	15.5	14.0	13.7	16.3	16.5	11.5	27....	16.0	16.3	13.5	14.7	15.6	15.2	.....
13....	14.7	15.5	14.0	13.7	16.2	16.6	10.6	28....	15.4	15.8	13.5	14.9	15.6	15.1	.....
14....	13.9	15.8	14.0	13.7	16.2	16.7	.....	29....	14.5	.....	13.4	15.0	15.7	15.0	.....
15....	13.9	15.8	14.0	13.7	16.2	16.7	.....	30....	14.8	.....	13.4	15.0	15.8	14.9	.....
								31....	15.1	.....	13.4	.....	15.8	.....	.....

NOTE.—July 14–December 31, 1907, reservoir nearly empty.

DEVILS RIVER AT DEVILS RIVER, TEX.

This station, which was established in April, 1900, by the International Boundary Commission, is opposite the Southern Pacific Railroad station at Devils River.

The river is about 50 miles long, has a perennial flow, and during flood periods is subject to great fluctuations. No good location for a gaging station exists on this stream where it would be accessible from the railroad station. The right bank is the talus of a cliff, the left bank is a bottom heavily timbered. At the site chosen the bed of the stream is nearly all a rock ledge, but seamed and faulted so as to be rough. The current changes in such a way as to give materially different discharges for the same gage height. It is therefore necessary to make frequent measurements to determine closely the daily flow.

The highest water on record occurred April 6, 1900, about two weeks before this gage was established. It reached a height of 25.4 feet on the gage, but this is 8 feet higher than any other known flood. Low water is 2 feet on the gage.

The observations at this station during 1907–8 have been made under the direction of the United States section of the International Boundary Commission.

Discharge measurements of Devils River at Devils River, Tex., in 1907.

[By E. E. Winter, D. J. Smith, I. P. Whitis, and W. H. Dodd.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 9	492	2.6	718	July 5	407	2.5	502
January 14	485	2.6	689	July 11	405	2.45	555
January 22	483	2.6	684	July 20	405	2.5	546
January 30	483	2.6	678	July 29	393	2.5	550
February 9	486	2.6	676	August 4	395	2.5	551
February 16	481	2.6	651	August 14	371	2.4	520
February 23	481	2.6	638	August 25	371	2.4	521
February 28	483	2.6	623	August 30	371	2.4	523
March 10	474	2.6	653	September 7 [a]	331	2.4	463
March 18	468	2.55	609	September 12	341	2.4	509
March 27	465	2.55	593	September 29	345	2.4	525
March 31	464	2.55	571	October 4	374	2.5	606
April 9	462	2.5	567	October 13	335	2.4	523
April 13	458	2.5	550	October 22	370	2.4	593
April 20	456	2.5	529	October 30	507	2.6	723
April 25	455	2.5	534	November 12	378	2.4	606
April 30	455	2.5	533	November 16	380	2.4	582
May 9	454	2.5	543	November 25	379	2.4	631
May 14	449	2.45	499	November 29	360	2.4	610
May 22	448	2.45	483	December 3	375	2.4	594
June 9	442	2.45	523	December 10	361	2.4	568
June 16	443	2.45	507	December 18	341	2.35	532
June 24	457	2.5	523	December 30	322	2.3	512
June 30	448	2.45	496				

[a] Measurement September 7, 1907, too small; hence rejected.

Discharge measurements of Devils River at Devils River, Tex., in 1908.

[By W. H. Dodd and E. E. Winter.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec -ft.*
January 3	329	2.3	491	July 23	389	2.4	579
January 12	335	2.3	513	July 31	397	2.55	707
January 21	338	2.3	502	August 5	398	2.5	597
January 29	346	2.3	523	August 13	405	2.5	601
February 2	325	2.25	494	August 18	386	2.45	554
February 11	335	2.3	504	August 26	363	2.4	533
February 22	338	2.25	501	August 30	365	2.4	529
February 28	322	2.25	494	September 9	363	2.4	530
March 3	324	2.3	504	September 13	362	2.4	520
March 13	327	2.3	518	September 21	347	2.35	493
March 20	318	2.25	492	September 25	344	2.3	473
March 30	321	2.25	487	September 29	342	2.3	470
April 6	321	2.25	491	October 10	337	2.3	444
April 14	328	2.3	515	October 18	342	2.35	481
April 22	386	2.5	686	October 26	371	2.4	541
April 29	371	2.4	649	October 30	346	2.35	494
May 6	350	2.35	534	November 4	335	2.3	472
May 13	343	2.35	520	November 12	337	2.3	466
May 26	460	2.8	829	November 17	334	2.3	471
May 30	419	2.6	655	November 29	367	2.45	554
June 4	402	2.5	630	December 4	335	2.3	474
June 13	390	2.45	614	December 9	337	2.3	469
June 21	380	2.4	597	December 15	334	2.3	472
June 29	362	2.35	536	December 20	332	2.3	475
July 5	388	2.4	565	December 26	336	2.3	484
July 10	875	3.95	2,209	December 30	331	2.3	479
July 14	396	2.5	592				

Daily gage height, in feet, of Devils River at Devils River, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	2.65	2.6	2.55	2.5	2.45	2.5	2.4	2.45	2.4	2.4	3.0	2.4
2	2.65	2.6	2.55	2.5	2.45	2.5	2.6	2.45	2.4	2.4	2.75	2.4
3	2.65	2.6	2.6	2.5	2.45	2.45	2.5	2.45	2.4	2.4	2.9	2.4
4	2.65	2.6	2.6	2.5	2.45	2.45	2.5	2.45	2.4	2.55	2.75	2.4
5	2.65	2.6	2.6	2.5	2.45	2.45	2.45	2.45	2.4	3.3	2.6	2.4
6	2.6	2.6	2.6	2.5	2.45	2.45	2.4	2.45	2.4	2.4	2.6	2.4
7	2.6	2.6	2.6	2.5	2.45	2.45	2.4	2.45	2.4	2.4	2.6	2.4
8	2.6	2.6	2.6	2.5	2.6	2.45	2.65	2.45	2.4	2.4	2.55	2.4
9	2.6	2.6	2.6	2.5	2.6	2.45	2.5	2.45	2.4	2.4	2.55	2.4
10	2.6	2.6	2.6	2.5	2.5	2.45	2.45	2.45	2.4	2.4	2.4	2.4
11	2.6	2.6	2.6	2.5	2.5	2.45	2.4	2.4	2.4	2.4	2.4	2.4
12	2.6	2.6	2.6	2.5	2.5	2.45	2.55	2.4	2.4	2.4	2.4	2.4
13	2.6	2.6	2.6	2.5	2.5	2.45	2.6	2.4	2.4	2.4	2.4	2.4
14	2.6	2.6	2.55	2.5	2.45	2.45	2.7	2.4	2.4	2.4	2.4	2.4
15	2.6	2.6	2.55	2.5	2.45	2.45	2.7	2.4	2.4	2.5	2.4	2.4
16	2.6	2.6	2.55	2.5	2.45	2.45	2.7	2.4	2.4	2.5	2.4	2.4
17	2.6	2.6	2.55	2.5	2.45	2.45	2.65	2.4	2.4	2.5	2.4	2.4
18	2.6	2.6	2.55	2.5	2.45	2.45	2.5	2.4	2.4	2.5	2.4	2.35
19	2.6	2.6	2.55	2.5	2.45	2.45	2.5	2.4	2.4	2.5	2.4	2.35
20	2.6	2.6	2.55	2.5	2.45	2.55	2.5	2.4	2.4	2.4	2.4	2.35
21	2.6	2.6	2.55	2.5	2.45	2.65	2.5	2.4	2.4	2.4	2.4	2.35
22	2.6	2.6	2.55	2.5	2.45	2.5	2.5	2.4	2.4	2.4	2.4	2.35
23	2.6	2.6	2.55	2.5	2.45	2.5	2.5	2.4	2.4	2.4	2.4	2.35
24	2.6	2.6	2.55	2.5	2.45	2.5	2.5	2.4	2.4	2.4	2.4	2.35
25	2.6	2.6	2.55	2.5	2.45	2.5	2.4	2.4	2.4	2.4	2.4	2.35
26	2.6	2.6	2.55	2.5	2.45	2.45	2.4	2.4	2.4	2.4	2.4	2.3
27	2.6	2.6	2.55	2.5	2.45	2.45	2.4	2.4	2.4	2.4	2.55	2.3
28	2.6	2.6	2.55	2.5	2.45	2.45	2.45	2.4	2.4	2.4	2.6	2.3
29	2.6	.....	2.55	2.5	2.45	2.45	2.5	2.4	2.4	2.5	2.45	2.3
30	2.6	.....	2.55	2.5	2.65	2.45	2.45	2.4	2.4	2.75	2.4	2.3
31	2.6	.....	2.55	.....	2.5	.....	2.45	2.4	.....	2.4	.....	2.3
1908.												
1	2.3	2.3	2.3	2.25	2.4	2.7	2.35	2.5	2.4	2.3	2.3	2.4
2	2.3	2.25	2.3	2.25	2.4	2.6	2.35	2.45	2.35	2.3	2.3	2.3
3	2.3	2.25	2.3	2.25	2.4	2.5	2.35	2.4	2.35	2.3	2.3	2.3
4	2.3	2.25	2.3	2.25	2.4	2.5	2.35	2.4	2.35	2.35	2.3	2.3
5	2.3	2.3	2.3	2.25	2.4	2.5	2.4	2.5	2.35	2.35	2.3	2.3
6	2.3	2.3	2.3	2.25	2.4	2.5	2.4	2.7	2.35	2.35	2.3	2.3
7	2.3	2.25	2.3	2.25	2.35	2.5	2.4	4.0	2.4	2.45	2.3	2.3
8	2.3	2.25	2.3	2.25	2.35	2.5	2.45	2.75	2.4	2.4	2.3	2.3
9	2.3	2.3	2.3	2.25	2.35	2.5	3.5	2.6	2.4	2.3	2.3	2.3
10	2.3	2.3	2.3	2.25	2.35	2.5	3.9	2.55	2.4	2.3	2.3	2.3
11	2.3	2.3	2.3	2.25	2.35	2.5	3.0	2.5	2.4	2.3	2.3	2.3
12	2.3	2.3	2.3	2.4	2.35	2.45	2.65	2.5	2.4	2.3	2.3	2.3
13	2.3	2.3	2.3	2.35	2.35	2.45	2.5	2.5	2.4	2.3	2.3	2.3
14	2.3	2.3	2.3	2.3	2.35	2.45	2.5	2.5	2.4	2.3	2.3	2.3
15	2.3	2.3	2.3	2.3	2.35	2.45	2.5	2.5	2.4	2.35	2.3	2.3
16	2.3	2.3	2.25	2.3	2.35	2.4	2.45	2.5	2.4	2.35	2.3	2.3
17	2.3	2.3	2.25	2.3	2.35	2.4	2.45	2.45	2.4	2.35	2.3	2.3
18	2.3	2.3	2.25	2.35	2.35	2.4	2.45	2.45	2.4	2.35	2.3	2.3
19	2.3	2.3	2.25	2.4	2.35	2.4	2.45	2.45	2.4	2.35	2.3	2.3
20	2.3	2.25	2.25	2.75	2.35	2.4	2.5	2.5	2.4	2.35	2.3	2.3
21	2.3	2.25	2.25	2.65	2.35	2.4	2.5	2.55	2.35	2.35	2.3	2.3
22	2.3	2.25	2.25	2.5	2.35	2.4	2.5	2.5	2.35	2.35	2.3	2.3
23	2.3	2.3	2.25	2.5	2.35	2.4	2.45	2.45	2.35	2.35	2.3	2.3
24	2.3	2.3	2.25	2.5	4.2	2.4	2.4	2.4	2.3	2.3	2.3	2.3
25	2.3	2.3	2.25	2.5	3.4	2.4	2.4	2.4	2.3	2.3	2.3	2.3
26	2.3	2.3	2.25	2.5	2.8	2.4	2.4	2.4	2.3	2.4	2.3	2.3
27	2.3	2.3	2.25	2.45	2.7	2.4	2.4	2.4	2.3	2.35	2.3	2.3
28	2.3	2.25	2.25	2.4	2.7	2.35	2.4	2.4	2.3	2.35	2.4	2.3
29	2.3	2.25	2.25	2.4	2.7	2.35	2.45	2.4	2.3	2.35	2.45	2.3
30	2.3	.....	2.25	2.4	2.65	2.35	2.5	2.4	2.3	2.35	2.4	2.3
31	2.3	.....	2.25	.....	2.7	.....	2.55	2.4	.....	2.35	.....	2.3

Daily discharge, in second-feet, of Devils River at Devils River, Tex., for 1907 and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	695	675	605	570	520	545	465	525	520	525	1,050	600
2	700	675	605	570	520	545	560	530	520	525	855	600
3	705	675	635	570	520	525	510	535	520	525	980	a 595
4	710	675	635	570	520	525	505	a 535	520	a 645	865	590
5	715	675	640	570	520	525	a 475	535	520	1,250	745	585
6	700	675	645	570	520	525	465	535	515	560	750	580
7	705	675	645	570	520	525	480	535	a 515	555	755	580
8	710	675	650	565	630	525	620	535	515	550	715	575
9	a 715	a 675	650	a 565	a 630	a 525	555	535	515	545	715	570
10	710	675	a 655	565	540	525	545	535	510	540	600	a 570
11	705	675	650	560	540	520	a 530	520	510	535	605	570
12	700	670	650	555	540	520	600	520	a 510	530	a 605	570
13	695	665	645	a 550	540	515	620	520	510	a 525	600	570
14	a 690	660	620	550	a 500	515	665	a 520	510	530	595	570
15	690	655	615	545	500	510	660	520	510	620	590	565
16	690	a 650	615	545	495	a 505	660	520	510	625	a 585	565
17	690	650	610	540	495	505	630	520	515	635	585	565
18	685	650	a 610	535	490	505	550	520	515	645	590	a 530
19	685	645	605	530	490	505	545	520	515	650	595	535
20	685	645	605	a 530	485	545	a 545	520	515	580	600	535
21	685	640	605	530	485	585	545	520	520	585	605	535
22	a 685	640	600	530	a 485	525	545	520	520	a 595	610	535
23	685	a 640	600	530	485	525	545	520	520	590	615	535
24	685	635	600	535	480	a 525	550	520	520	585	620	540
25	685	635	600	a 535	480	525	500	a 520	520	580	a 630	540
26	680	630	595	535	480	500	500	520	520	575	625	505
27	680	625	a 595	535	475	500	500	520	525	570	740	505
28	680	a 625	590	535	475	495	525	520	525	565	775	505
29	680	.....	585	535	475	495	a 550	525	a 525	645	a 650	510
30	a 675	.....	575	a 535	670	a 495	525	a 525	525	845	605	a 510
31	675	.....	a 570	.....	545	.....	525	525	.....	565	.....	510
1908.												
1	510	525	500	485	635	740	535	645	530	465	470	520
2	500	a 495	500	485	620	685	535	585	510	465	470	480
3	a 490	490	a 505	485	605	630	535	520	510	460	470	480
4	495	490	505	490	590	a 630	535	510	510	480	a 470	a 475
5	495	520	505	490	575	630	a 565	a 595	510	475	470	475
6	495	515	510	490	a 560	630	565	800	510	470	470	475
7	500	480	510	a 490	535	630	565	2,260	530	510	470	470
8	500	475	510	490	530	630	620	850	530	485	470	470
9	505	510	515	490	530	630	1,730	700	a 530	445	470	a 470
10	505	505	515	490	525	630	a2,160	650	530	a 445	470	470
11	510	a 505	515	490	525	630	1,150	600	525	445	465	470
12	a 515	505	520	565	520	615	760	600	525	450	a 465	470
13	510	510	a 520	540	a 520	a 615	590	a 600	a 520	450	465	470
14	510	515	520	a 515	520	615	a 590	600	520	450	465	470
15	510	515	515	515	515	615	590	600	520	475	470	a 470
16	510	520	495	515	515	595	585	600	520	475	470	470
17	510	520	495	515	510	595	585	555	520	480	a 470	475
18	505	525	495	545	510	595	585	a 555	520	a 480	470	475
19	505	530	495	575	505	595	585	555	520	485	470	475
20	505	495	a 490	785	505	595	590	600	520	490	470	a 475
21	a 500	500	490	745	500	a 595	590	650	a 495	495	470	475
22	505	a 500	490	a 685	500	590	590	600	495	500	470	475
23	510	535	490	685	500	585	a 585	555	495	505	470	480
24	510	535	490	685	2,550	580	580	535	475	490	470	480
25	515	535	490	685	1,570	575	580	535	a 475	495	470	485
26	515	530	490	685	a 830	565	580	a 535	475	a 540	470	a 485
27	520	530	485	665	740	560	580	535	475	515	470	485
28	525	a 495	485	650	740	540	580	535	470	505	525	485
29	a 525	495	485	a 650	740	a 535	620	530	a 470	500	a 555	480
30	525	.....	a 485	650	a 695	535	665	a 530	470	a 495	525	a 480
31	525	.....	485	.....	740	.....	a 705	530	.....	495	.....	480

a Dates of measurement.

Monthly discharge of Devils River at Devils River, Tex., for 1907 and 1908.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907.				
January	715	675	693	42,595
February	675	625	657	36,466
March	655	570	616	37,894
April	570	530	549	32,648
May	670	475	518	31,835
June	585	495	520	30,952
July	665	465	548	33,709
August	535	520	525	32,271
September	525	510	517	30,774
October	1,250	525	606	37,279
November	1,050	585	682	40,572
December	600	505	553	34,017
The year	1,250	465	582	421,012
1908.				
January	525	490	508	31,259
February	535	475	510	29,355
March	520	485	500	30,744
April	785	485	574	34,175
May	2,550	500	676	41,564
June	740	535	606	36,079
July	2,160	535	697	42,863
August	2,260	510	647	39,769
September	530	470	507	30,159
October	540	445	481	29,583
November	555	465	476	28,314
December	520	470	477	29,345
The year	2,550	445	555	403,209

RIO SALADO NEAR GUERRERO, TAMAULIPAS, MEXICO.

The Salado is a torrential stream, entering the Rio Grande from the Mexican side about 60 miles below Laredo, or 730 miles by river below El Paso. The town of Guerrero is located on the Salado some 4 miles above its mouth, and the gaging station is 2 miles above the town. The gaging station was established in 1900 by the International Boundary Commission.

The river is a series of pools and rapids. The best pool available was chosen for the station. The banks are sandy clay, not subject to erosion. The bottom is mud. In low water the river is measured by wading among the rocks below the station. Frequent discharge measurements are made to determine closely the daily flow. The highest recorded flood, on June 16, 1903, gave 17.7 on the gage.

The observations at this station have been made under the direction of the Mexican section of the International Boundary Commission.

Discharge measurements and gage heights for the years 1900 to 1904, which have not hitherto been published by the United States Geological Survey, are given herewith, together with data for 1907 and 1908.

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Discharge measurements of Rio Salado near Guerrero, Tamaulipas, Mexico, in 1900.

[By C. Treviño.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
December 27	914	2.45	382	December 30	924	2.5	393

Discharge measurements of Rio Salado near Guerrero, Tamaulipas, Mexico, in 1901.

[By C. Treviño and D. de Lassaulx.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec. ft.*		*Sq. ft.*	*Feet.*	*Sec. ft.*
January 2	829	2.4	268	July 7	505	0.8	120
January 6	806	2.3	287	July 11	598	1.0	162
January 10	795	2.2	280	July 15	437	.1	94
January 14	776	2.1	226	July 19	388	−.2	55
January 18	735	2.15	242	July 23	348	−.4	42
January 21	740	2.0	211	July 27	327	−.6	37
January 24	702	1.9	202	August 3	296	−.8	31
January 27	666	1.8	171	August 7	254	−1.0	25
February 1	661	1.7	180	August 11	236	−1.1	24
February 5	666	1.75	185	August 15	233	−1.1	24
February 9	657	1.5	173	August 19	221	−1.2	*a* 00
February 13	663	1.45	158	August 23	199	−1.4	*a* 00
February 17	645	1.3	141	August 27	185	−1.5	*a* 00
February 21	583	1.2	117	September 3	1,425	3.6	1,824
February 25	587	1.1	112	September 7	781	2.3	325
March 1	564	1.0	99	September 11	891	2.8	499
March 5	562	.9	94	September 14	463	.5	88
March 9	553	1.1	101	September 17	438	.4	83
March 13	525	.6	88	September 21	363	−.1	48
March 17	561	.55	87	September 25	329	−.4	55
March 21	491	.45	75	September 29	676	2.3	273
March 25	457	.2	63	October 3	569	1.5	136
March 28	441	.15	56	October 7	666	2.1	239
April 1	423	.1	54	October 10	640	2.0	205
April 5	429	.05	48	October 13	1,332	5.7	3,042
April 9	396	−.1	47	October 18	582	1.6	162
April 13	369	−.2	41	October 21	561	1.5	142
April 17	327	−.3	33	October 23	950	4.0	1,445
April 21	304	−.5	30	October 25	1,065	4.8	2,068
April 25	304	−.6	35	October 28	1,033	4.5	1,587
April 28	318	−.75	41	November 1	976	4.2	1,191
May 1	289	−.7	36	November 4	961	4.1	1,220
May 9	2,510	9.22	11,526	November 8	918	3.7	988
May 13	1,100	3.15	861	November 12	855	3.4	792
May 17	1,015	2.85	600	November 16	818	3.2	643
May 21	1,210	3.85	1,118	November 20	782	3.0	521
May 25	1,427	4.72	1,936	November 23	760	2.9	466
May 29	1,108	3.32	802	November 27	713	2.7	391
June 1	955	2.55	560	November 29	1,157	4.85	2,371
June 4	1,148	3.52	1,322	December 2	693	2.6	354
June 8	772	1.85	525	December 6	649	2.3	264
June 12	729	1.7	373	December 10	618	2.1	239
June 16	650	1.3	182	December 14	595	2.0	167
June 20	597	1.0	149	December 18	578	1.9	153
June 24	519	.7	113	December 22	574	1.8	163
June 29	1,826	6.35	5,160	December 26	576	1.8	163
July 3	730	2.2	293	December 30	560	1.7	150

a No flow August 19, 23, and 27, 1901.

Discharge measurements of Rio Salado near Guerrero, Tamaulipas, Mexico, in 1902.

[By D. de Lassaulx.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	542	1.5	132	July 15	178	— 1.0	[c]0
January 7	533	1.5	127	July 19	167	— 1.1	[c]0
January 11	522	1.4	117	July 23	155	— 1.2	[c]0
January 15	516	1.4	111	July 26	143	— 1.3	[c]0
January 19	504	1.3	85	July 28	555	+ 1.9	127
January 23	484	1.2	73	July 29	1,009	4.2	747
January 27	462	1.1	[a]167	August 2	438	1.1	59
January 31	466	1.1	62	August 6	296	.1	24
February 4	447	1.0	65	August 11	244	— .4	18
February 8	456	1.1	82	August 15	218	— .6	12
February 12	475	1.1	85	August 19	193	— .8	[c]0
February 16	466	1.0	61	August 23	174	— 1.0	[c]0
February 20	470	1.0	73	August 28	163	— 1.1	[c]0
February 24	455	.9	58	September 1	150	— 1.2	[c]0
February 28	439	.8	103	September 5	137	— 1.3	[c]0
March 4	397	.6	51	September 8	672	2.05	271
March 8	376	.4	46	September 9	910	3.3	792
March 12	359	.3	42	September 14	601	1.7	165
March 17	335	.0	29	September 19	430	.6	86
March 21	311	— .2	26	September 20	1,860	7.75	7,198
March 26	308	— .2	27	September 24	753	2.5	352
March 30	296	— .3	23	September 28	542	1.4	164
April 3	276	— .5	21	September 30	918	3.4	917
April 7	263	— .6	10	October 2	1,619	6.7	4,884
April 11	249	— .8	0	October 6	872	3.0	716
April 15	1,214	4.75	[b]2,222	October 11	620	1.7	154
April 20	589	1.9	212	October 15	1,883	7.6	6,955
April 25	485	1.2	115	October 16	2,666	11.1	14,257
April 29	420	.8	74	October 19	879	3.0	585
May 3	371	.5	48	October 23	662	1.5	168
May 7	988	3.9	1,360	October 27	553	.9	70
May 10	786	3.3	697	November 1	504	.5	61
May 14	603	2.2	259	November 5	478	.4	55
May 19	453	1.1	70	November 6	755	2.1	254
May 24	536	1.5	136	November 9	638	1.4	148
May 28	395	.8	73	November 14	510	.6	69
June 2	306	.2	35	November 18	447	.2	41
June 5	252	— .2	32	November 22	418	.0	27
June 9	251	— .4	20	December 2	883	2.85	513
June 13	226	— .6	10	December 4	1,410	5.35	2,942
June 17	198	— .8	[c]0	December 6	914	3.1	596
June 21	183	— .9	[c]0	December 10	688	1.8	188
June 23	579	2.0	200	December 15	576	1.1	81
June 25	447	1.1	78	December 20	502	.6	58
June 29	304	.0	30	December 24	472	.4	55
July 8	226	— .7	8	December 28	446	.2	34
July 11	204	— .8	[c]0				

[a] Measurement, January 27, 1902, rejected.
[b] Measurement, April 15, 1902, made by floats.
[c] June 17, 21, July 11, 15, 19, 23, 26, August 19, 23, 28, September 1, 5, 1902; no flow.

Discharge measurements of Rio Salado near Guerrero, Tamaulipas, Mexico, in 1903.

[By D. de Lassaulx.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-feet.*		*Sq. ft.*	*Feet.*	*Sec.-feet.*
January 2	410	0.0	25	July 31	2,719	7.4	6,841
January 6	30	— .1	a 8	August 2	3,241	9.75	11,242
January 10	29	— .2	a 6	August 7	1,728	2.7	424
January 16	735	2.0	a 207	August 11	1,995	4.7	1,876
January 21	473	.4	a 60	August 15	1,452	2.0	259
January 25	414	.0	a 25	August 17	1,896	4.2	1,483
January 29	31	— .1	a 9	August 19	1,668	2.95	463
February 2	30	— .2	a 7	August 24	1,468	2.1	278
February 6	29	— .3	a 6	August 28	1,291	1.4	b 319
February 10	29	— .3	a 6	September 2	1,271	1.3	153
February 14	29	— .4	a 6	September 6	1,245	1.1	142
February 18	29	— .4	a 5	September 12	1,483	2.3	343
February 22	29	— .4	a 5	September 16	1,291	1.3	156
February 28	29	— .4	a 5	September 19	1,887	4.5	1,719
May 8	590	1.3	143	September 24	1,456	2.3	346
May 20	442	.5	187	September 29	1,303	1.5	315
May 23	396	.2	132	October 2	1,745	3.85	1,164
May 24	844	2.95	559	October 7	1,495	3.0	636
May 26	661	1.9	211	October 10	1,552	3.0	620
May 29	541	1.1	145	October 14	1,413	2.5	412
June 1	536	1.1	100	October 18	1,344	2.1	296
June 3	874	3.1	682	October 22	1,277	1.9	231
June 7	610	1.6	137	October 26	1,240	1.6	179
June 11	790	2.7	483	October 30	1,354	2.2	345
June 13	2,040	8.6	10,005	November 3	1,224	1.5	178
June 15	3,431	14.25	20,220	November 7	1,193	1.4	162
June 23	2,411	5.6	2,792	November 11	1,137	1.1	136
June 27	2,294	5.0	2,297	November 15	1,108	1.0	123
June 30	2,282	5.0	2,172	November 19	82	.8	a 66
July 4	2,123	4.3	1,391	November 23	107	.9	a 128
July 6	2,498	6.1	4,634	December 7	17	.5	a 14
July 7	2,706	7.05	6,065	December 11	16	.5	a 14
July 11	2,006	4.0	1,224	December 15	15	.5	a 14
July 15	1,950	3.7	906	December 19	15	.5	a 14
July 19	1,867	3.3	575	December 23	17	.6	a 16
July 23	1,795	3.0	473	December 27	16	.5	a 15
July 28	2,190	5.05	2,455				

a Measurement made by wading at rocks January 6 to February 28, and November 19 to December 27, 1903.

b Strong wind up stream August 28, 1903. Measurement rejected.

NOTE.—No records available for March and April, 1903.

Discharge measurements of Rio Salado near Guerrero, Tamaulipas, Mexico, in 1904.

[By D. de Lassaulx.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq.-ft.	*Feet.*	*Sec.-ft.*		*Sq.-ft.*	*Feet.*	*Sec.-ft.*
January 1	90	0.9	[b]67	June 22	72	0.30	[a]43
January 5	90	.7	[a]65	June 27	71	.20	[a]41
January 9	91	.7	[a]64	July 1	65	−.1	[a]16
January 13	81	.6	[a]56	July 5	67	.0	[a]21
January 21	16	.5	[a]16	July 9	67	.0	[a]21
January 25	15	.4	[a]15	July 13	64	−.3	[a]15
February 1	73	.4	[a]45	July 29	102	.8	85
February 5	72	.4	[a]44	August 2	66	.0	[a]19
February 9	73	.5	[a]47	August 6	63	−.3	[a]16
February 13	82	.7	[a]60	August 14	1,066	1.6	206
February 17	75	.5	[a]49	August 18	1,107	1.0	124
February 22	71	.3	[a]44	August 22	72	.2	[a]40
February 26	71	.3	[a]43	August 25	72	.3	[a]45
March 1	67	.1	[a]33	August 29	66	.0	[a]19
March 5	68	.0	[a]21	September 2	63	−.3	[a]15
March 9	65	−.1	[a]15	September 7	2,134	7.0	6,148
March 13	64	−.2	[a]15	September 11	2,333	8.1	8,142
March 17	63	−.3	[a]13	September 20	2,409	7.9	6,111
March 21	63	−.3	[a]13	September 24	2,654	9.0	8,089
March 25	61	−.4	[a]11	September 28	2,272	7.2	5,123
March 29	61	−.4	[a]11	October 2	2,500	6.6	4,848
April 3	1,110	1.0	121	October 6	2,385	6.4	4,392
April 6	1,385	2.4	338	October 10	3,313	6.1	3,890
April 10	1,111	1.0	122	October 14	2,276	5.9	3,591
April 14	72	.3	[a]43	October 18	2,227	5.7	3,236
April 18	68	.1	[a]34	October 23	2,194	5.6	2,955
April 23	63	−.3	[a]14	October 28	2,194	5.6	2,986
April 27	61	−.4	[a]13	November 2	2,229	5.8	3,287
May 1	61	−.4	[a]13	November 6	2,102	5.2	2,442
May 4	2,598	8.05	7,964	November 10	2,039	5.0	2,174
May 8	1,005	1.0	111	November 14	2,022	4.9	2,038
May 12	1,156	1.2	142	November 18	1,977	4.7	1,974
May 16	2,633	8.55	8,752	November 22	1,932	4.5	1,660
May 20	1,408	3.4	776	November 27	2,056	5.1	2,320
May 24	1,109	1.9	255	December 1	1,950	4.7	1,811
May 28	973	1.3	201	December 6	1,912	4.4	1,578
June 1	1,034	1.60	234	December 10	1,871	4.2	1,442
June 6	2,800	9.45	11,249	December 15	1,879	4.1	1,385
June 10	1,418	3.50	809	December 19	1,844	3.9	1,174
June 14	1,081	1.70	200	December 24	1,843	3.9	1,159
June 18	92	.90	[a]70	December 28	1,808	3.7	967

[a] Measurements made by wading at rocks below station.

NOTE.—River dry July 14–28, 1904.

Discharge measurements of Rio Salado near Guerrero, Tamaulipas, Mexico, in 1907.

[By D. de Lassaulx.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	1,884	3.9	816	July 6	1,867	4.1	839
January 6	1,892	3.8	742	July 10	1,630	3.2	573
January 10	1,845	3.7	740	July 14	1,494	2.5	357
January 14	1,842	3.7	748	July 18	1,511	2.6	390
January 18	1,818	3.6	675	July 22	1,477	2.4	400
January 22	1,806	3.6	671	July 26	1,451	2.3	371
January 26	1,775	3.5	604	July 29	1,438	2.2	335
January 29	1,772	3.5	594	August 2	1,350	2.1	297
February 2	1,770	3.5	606	August 6	1,313	1.9	258
February 6	1,782	3.4	601	August 10	1,290	1.8	235
February 10	1,775	3.3	584	August 14	1,266	1.7	216
February 14	1,764	3.3	571	August 18	1,227	1.5	185
February 18	1,728	3.2	544	August 22	1,196	1.3	184
February 22	1,723	3.1	511	August 26	1,163	1.1	164
February 26	1,702	3.0	489	August 29	1,152	1.0	160
March 2	1,653	2.9	439	September 2	30	.8	20
March 6	1,661	2.8	429	September 6	29	.7	13
March 10	1,638	2.7	407	September 10	26	.5	9
March 14	1,618	2.6	386	September 14	25	.4	9
March 18	1,608	2.5	353	September 18	24	.3	8
March 22	1,639	2.4	423	September 22	24	.3	7
March 26	1,643	2.3	425	September 25	1,590	2.8	383
March 29	1,654	2.2	341	September 27	1,452	2.1	350
April 2	1,627	2.1	307	October 2	1,298	1.5	196
April 6	1,595	2.0	284	October 6	1,246	1.3	185
April 10	1,591	2.0	282	October 7	2,868	9.45	9,607
April 15	1,570	1.9	267	October 8	3,311	10.8	13,159
April 19	1,572	1.9	267	October 10	1,793	4.4	884
April 23	1,543	2.2	388	October 14	1,587	3.4	582
April 27	1,450	1.8	254	October 18	1,527	3.1	504
May 2	1,467	1.8	259	October 22	1,628	3.6	644
May 6	1,657	2.8	442	October 26	1,842	4.6	907
May 10	2,079	3.9	865	October 29	1,737	4.2	768
May 13	1,959	4.3	1,216	November 2	1,801	4.6	1,686
May 17	1,559	2.3	394	November 6	2,001	5.4	2,135
May 21	1,503	2.0	283	November 10	1,928	5.2	1,897
May 25	1,505	2.0	289	November 15	1,862	4.9	1,795
May 27	2,295	6.0	2,847	November 19	1,830	4.7	1,782
May 29	1,748	3.3	556	November 25	1,784	4.5	1,295
June 2	1,463	1.8	260	November 27	1,766	4.4	1,232
June 6	1,373	1.4	213	December 2	1,747	4.5	1,204
June 11	1,339	1.1	194	December 6	1,755	4.5	1,209
June 15	1,285	1.0	178	December 10	1,672	4.4	1,104
June 19	1,502	2.0	289	December 14	1,694	4.3	1,033
June 24	1,731	3.6	662	December 19	1,669	4.2	959
June 27	1,631	3.1	383	December 23	1,669	4.2	969
July 2	1,577	2.8	352	December 28	1,651	4.1	900
July 4	2,561	7.5	5,834				

Discharge measurements of Rio Salado near Guerrero, Tamaulipas, Mexico, in 1908.

[By D. de Lassaulx.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 2	1,631	4.0	834	July 10	1,165	2.1	168
January 6	1,601	3.9	783	July 14	1,727	4.6	1,438
January 12	1,566	3.7	732	July 18	1,115	2.0	156
January 16	1,539	3.6	625	July 22	72	1.4	*a* 59
January 20	1,523	3.5	581	July 26	123	1.7	*a* 75
January 24	1,503	3.4	544	July 30	141	2.1	*a* 124
January 28	1,485	3.3	515	August 3	1,648	4.4	1,130
February 2	1,492	3.1	391	August 7	1,485	3.7	596
February 6	1,467	3.0	362	August 8	1,962	6.0	2,792
February 10	1,467	3.0	356	August 11	2,079	5.8	3,203
February 15	1,429	2.8	318	August 15	1,783	5.0	1,774
February 19	1,411	2.7	292	August 19	1,742	4.9	1,519
February 23	1,391	2.6	268	August 23	1,762	5.3	1,953
February 27	1,370	2.5	249	August 27	1,603	4.5	1,146
March 2	1,352	2.4	243	September 2	1,465	4.2	927
March 6	1,323	2.3	234	September 6	1,419	4.0	816
March 10	1,323	2.3	232	September 10	1,386	3.8	665
March 14	1,305	2.2	219	September 15	1,656	5.2	1,910
March 18	1,273	2.0	200	September 18	1,555	4.8	1,707
March 22	1,280	2.0	201	September 22	1,265	3.6	501
March 24	1,526	3.2	442	September 27	1,227	3.4	439
March 28	1,372	2.4	258	October 2	1,180	3.3	334
April 2	1,272	1.9	194	October 6	1,176	3.3	347
April 6	1,249	1.8	182	October 8	2,281	7.3	5,931
April 11	2,034	5.8	2,746	October 10	1,418	4.4	1,141
April 15	1,802	4.6	1,717	October 14	1,133	3.2	257
April 19	1,601	3.5	575	October 18	1,129	3.2	256
April 23	1,701	4.2	883	October 22	1,082	3.0	179
April 27	1,517	3.1	494	October 23	1,860	6.2	3,442
May 2	1,362	2.6	273	October 26	1,133	3.3	289
May 6	1,281	2.2	237	October 29	1,033	2.9	153
May 10	1,224	1.9	217	November 3	1,044	2.9	153
May 15	1,908	5.6	2,586	November 7	1,031	2.9	146
May 19	1,495	3.0	468	November 11	1,002	2.7	133
May 23	1,305	2.1	221	November 15	1,019	2.9	143
May 28	1,112	1.3	173	November 19	1,000	2.7	135
June 2	1,486	3.7	566	November 23	994	2.7	136
June 6	1,339	2.2	203	November 27	1,014	2.7	133
June 10	1,169	1.6	178	December 2	995	2.6	125
June 14	1,095	1.2	164	December 6	987	2.6	124
June 18	1,059	1.0	156	December 10	983	2.6	123
June 23	29	.7	*a* 16	December 14	979	2.6	128
June 27	1,324	2.4	259	December 18	956	2.5	119
July 2	64	.9	*a* 29	December 22	950	2.5	118
July 5	1,207	2.2	179	December 26	951	2.5	120
July 7	1,839	4.95	1,627	December 30	948	2.5	119

a Measurement made by wading at rocks below station June 23, July 2, 22 to 30, 1908.

Daily gage height, in feet, of Rio Salado near Guerrero, Tamaulipas, Mexico, for 1900 to 1904, 1907, and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.[a]												
1	.....	.....	.....	.....	6.35	5.4	2.35	4.6	3.9	3.9	.....	.....
2	.....	.....	.....	.....	5.4	4.1	5.35	3.7	4.55	3.8	.....	.....
3	.....	.....	.....	.....	4.3	4.3	5.6	3.15	4.25	3.75	.....	.....
4	.....	.....	.....	.....	3.9	4.25	4.1	3.2	4.15	3.7	.....	.....
5	.....	.....	.....	.....	2.9	6.85	3.05	2.55	5.6	3.65	.....	.....
6	.....	.....	.....	.....	2.6	7.7	2.7	3.3	5.3	3.6	.....	.....
7	.....	.....	.....	.....	2.4	3.95	2.95	3.4	4.65	3.55	.....	.....
8	.....	.....	.....	.....	2.3	3.6	2.55	4.45	3.95	3.5	.....	.....
9	.....	.....	.....	.....	2.15	3.25	2.35	5.2	3.8	3.5	.....	.....
10	.....	.....	.....	.....	1.95	2.95	2.15	6.55	3.75	3.5	.....	.....
11	.....	.....	.....	.....	1.85	2.8	2.0	7.65	3.7	3.5	.....	.....
12	.....	.....	.....	.....	1.75	2.65	1.85	7.75	3.6	3.5	.....	.....
13	.....	.....	.....	.....	1.7	2.55	1.75	6.85	3.55	3.45	.....	.....
14	.....	.....	.....	.....	1.55	2.45	3.25	5.35	3.5	3.4	.....	.....
15	.....	.....	.....	.....	1.85	2.4	4.9	4.75	3.5	3.4	.....	.....
16	.....	.....	.....	.....	3.8	2.25	9.3	4.55	3.5	3.4	.....	2.8
17	.....	.....	.....	.....	7.25	2.2	8.2	4.7	3.45	3.35	.....	2.8
18	.....	.....	.....	.....	8.2	2.1	4.4	4.6	3.4	3.3	.....	2.8
19	.....	.....	.....	.....	5.35	2.05	3.05	4.5	3.35	3.35	.....	2.7
20	.....	.....	.....	.....	4.7	1.95	2.95	4.4	3.3	3.4	.....	2.7
21	.....	.....	.....	.....	4.3	5.9	2.55	4.3	3.3	3.5	.....	2.65
22	.....	.....	.....	.....	4.55	4.75	2.4	4.2	3.3	3.65	.....	2.6
23	.....	.....	.....	.....	4.55	3.9	2.3	4.4	3.3	3.7	.....	2.6
24	.....	.....	.....	2.85	4.8	2.75	2.2	4.3	3.2	3.7	.....	2.6
25	.....	.....	.....	2.65	4.05	2.4	2.15	4.3	3.2	3.75	.....	2.5
26	.....	.....	.....	2.55	3.55	2.55	2.1	4.2	4.6	3.85	.....	2.5
27	.....	.....	.....	2.45	3.45	2.2	2.05	4.15	4.25	4.05	.....	2.5
28	.....	.....	.....	2.35	3.35	1.95	2.45	4.1	4.15	3.8	.....	2.5
29	.....	.....	.....	2.35	3.25	1.85	2.25	4.0	4.05	3.75	.....	2.5
30	.....	.....	.....	3.6	3.15	1.7	4.55	4.0	4.0	3.7	.....	2.5
31	.....	.....	.....	.....	3.05	.....	4.9	3.9	.....	3.7	.....	2.45
1901.[b]												
1	2.4	1.7	1.0	.1	— .7	2.52	2.7	— .7	1.55	1.65	4.2	2.6
2	2.4	1.7	1.0	.1	7.65	2.42	2.1	— .8	1.6	1.5	4.1	2.55
3	2.4	1.65	1.0	.1	4.7	2.32	2.1	— .8	4.0	1.7	4.1	2.45
4	2.4	1.6	1.0	.1	3.4	4.18	1.6	— .8	4.7	2.25	4.05	2.4
5	2.3	1.75	.9	.05	2.85	3.05	1.22	— .9	5.35	2.3	4.0	2.3
6	2.3	1.6	1.1	.0	3.15	2.15	.95	— .9	2.7	2.2	3.9	2.25
7	2.3	1.5	1.1	— .1	3.45	1.95	.75	— .95	2.3	2.15	3.8	2.2
8	2.3	1.5	1.1	— .1	4.9	1.82	.6	— .9	2.15	2.1	3.7	2.2
9	2.3	1.5	1.05	— .1	9.05	1.95	.8	—1.0	1.75	2.05	3.6	2.1
10	2.2	1.5	.95	— .2	5.85	2.0	1.2	—1.0	1.55	2.0	3.5	2.1
11	2.2	1.5	.75	— .2	4.6	1.82	1.0	—1.1	2.35	2.0	3.4	2.05
12	2.2	1.45	.6	— .2	3.7	1.65	.65	—1.1	1.2	2.0	3.35	2.0
13	2.2	1.4	.6	— .25	3.15	1.52	.35	—1.1	.85	4.45	3.3	2.0
14	2.15	1.4	.6	— .3	3.0	1.48	.2	—1.1	.5	3.1	3.25	1.95
15	2.2	1.4	.6	— .3	2.9	1.38	.1	—1.1	.6	2.2	3.2	1.9
16	2.1	1.4	.6	— .3	2.88	1.28	.0	—1.1	.4	1.85	3.2	1.9
17	2.1	1.3	.55	— .32	2.82	1.2	.35	—1.1	.4	1.75	3.1	1.9
18	2.1	1.3	.5	— .38	2.72	1.12	.05	—1.2	.45	1.6	3.1	1.9
19	2.1	1.3	.45	— .4	3.30	1.02	— .2	—1.2	.25	1.6	3.05	1.85
20	2.0	1.2	.4	— .4	4.5	.95	— .3	—1.2	.05	1.6	3.0	1.8
21	1.95	1.2	.4	— .5	3.7	.82	— .35	—1.25	.10	1.5	3.0	1.8
22	1.9	1.2	.3	— .5	3.1	.72	— .4	—1.3	.25	3.05	2.9	1.8
23	1.9	1.1	.25	— .62	2.85	.7	— .45	—1.4	.30	3.65	2.9	1.8
24	1.9	1.1	.2	— .6	2.72	.7	— .5	—1.4	.35	4.5	2.8	1.8
25	1.9	1.1	.2	— .6	3.95	.65	— .5	—1.4	.4	4.8	2.75	1.8
26	1.88	1.1	.2	— .6	4.7	.6	— .55	—1.4	2.6	4.65	2.7	1.8
27	1.8	1.0	.2	— .75	3.95	.65	— .6	—1.5	3.65	4.55	2.7	1.7
28	1.8	1.0	.15	— .72	4.05	2.45	— .6	—1.5	3.0	4.45	4.15	1.7
29	1.8	.....	.15	— .7	3.18	6.25	— .6	—1.5	2.3	4.35	4.3	1.7
30	1.75	.....	.15	— .7	2.85	4.12	— .7	—1.5	1.85	4.3	3.0	1.65
31	1.7	.....	.12	.....	3.15	.....	— .7	—1.5	.....	4.2	.....	1.6

[a] Gage heights for 1900 complete as far as Mexican records exist. [b] No flow August 19–31, 1901.

Daily gage height, in feet, of Rio Salado near Guerrero, Tamaulipas, Mexico, for 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.[a]												
1	1.55	1.1	0.8	−0.4	0.6	0.25	−0.3	1.2	−1.2	2.05	0.45	4.1
2	1.5	1.1	.75	− .5	.55	.15	− .35	1.1	−1.2	6.65	.4	2.85
3	1.5	1.1	.65	− .5	.45	.05	− .4	.8	−1.3	6.2	.9	3.1
4	1.5	1.05	.6	− .5	.4	− .1	− .5	.45	−1.3	5.0	.55	5.15
5	1.5	1.1	.5	− .55	.3	− .2	− .55	.25	−1.3	4.1	.95	3.7
6	1.5	1.1	.5	− .6	4.15	− .25	− .6	.05	−1.4	2.95	2.0	3.0
7	1.5	1.1	.4	− .6	3.8	− .3	− .7	− .05	−1.4	3.5	1.65	2.8
8	1.5	1.1	.4	− .7	2.95	− .35	− .7	− .1	2.15	2.35	1.4	3.5
9	1.45	1.1	.3	− .7	3.6	− .4	− .7	− .2	3.1	2.2	1.35	2.05
10	1.4	1.1	.3	− .7	3.1	− .45	− .8	− .3	2.6	1.95	1.25	1.7
11	1.4	1.1	.3	− .8	2.55	− .5	− .8	− .4	2.1	1.65	1.05	1.5
12	1.4	1.1	.3	− .8	2.1	− .55	− .8	− .5	2.0	1.45	.85	1.5
13	1.4	1.0	.2	− .8	1.95	− .6	− .9	− .5	2.0	1.25	.75	1.4
14	1.4	1.0	.2	−3.65	2.05	− .65	− .9	− .55	1.6	2.1	.6	1.25
15	1.4	1.0	.1	4.85	1.65	− .7	−1.0	− .6	1.45	8.0	.5	1.1
16	1.4	1.0	.0	4.05	1.4	− .75	−1.0	− .7	1.05	10.6	.4	1.0
17	1.3	1.0	.0	3.1	1.2	− .8	−1.0	− .7	.9	6,1	.3	.9
18	1.3	1.0	− .1	2.5	1.25	− .85	−1.1	− .8	.75	3.95	.2	.8
19	1.3	1.0	− .1	2.2	1.05	− .9	−1.1	− .8	.55	2.9	.2	.7
20	1.3	1.0	− .1	1.9	.8	− .9	−1.1	− .9	7.25	2.6	.1	.6
21	1.2	.9	− .2	1.95	.55	− .9	−1.2	− .9	4.7	2.05	.1	.55
22	1.2	.9	− .2	1.75	.35	−1.0	−1.2	−1.0	4.1	1.75	.0	.5
23	1.2	.9	− .2	1.55	.75	1.8	−1.2	−1.0	2.95	1.45	1.65	.4
24	1.2	.9	− .2	1.35	1.5	1.25	−1.3	−1.0	2.4	1.25	1.45	.4
25	1.2	.9	− .2	1.2	1.35	1.05	−1.3	−1.0	2.05	1.05	1.6	.3
26	1.15	.85	− .2	1.05	1.15	.7	−1.3	−1.0	1.85	1.0	2.1	.25
27	1.1	.8	− .25	.95	.95	.35	−1.3	−1.1	1.55	.9	1.7	.2
28	1.1	.8	− .3	.85	.75	.15	2.05	−1.1	1.35	.8	1.45	.2
29	1.1	.....	− .3	.8	.55	− .05	4.4	−1.1	1.2	.7	1.25	.15
30	1.1	.....	− .35	.7	.45	− .2	2.05	−1.1	4.4	.6	1.25	.1
31	1.1	.....	− .4	.....	.3	.....	1.55	−1.2	.....	.5	.....	.05
1903.[b]												
1	.0	− .2	.....	.....	2.2	.95	4.9	9.55	1.35	2.6	1.6	.6
2	.0	− .2	.....	.....	1.85	3.3	4.55	9.4	1.25	3.8	1.6	.5
3	− .05	− .2	.....	.....	1.55	2.95	4.35	5.8	1.05	3.3	1.55	.5
4	− .1	− .25	.....	.....	1.35	2.35	4.25	4.15	1.0	3.0	1.65	.5
5	− .1	− .3	.....	.....	1.15	2.2	5.75	3.35	.9	3.0	1.5	.5
6	− .1	− .3	.....	.....	1.0	1.9	6.6	3.0	1.2	3.0	1.45	.5
7	− .1	− .3	.....	.....	.9	1.5	6.75	2.65	1.1	3.3	1.35	.5
8	− .15	− .3	.....	.....	2.05	1.3	5.4	2.45	1.0	3.15	1.3	.5
9	− .2	− .3	.....	.....	2.8	1.25	4.5	2.3	.9	5.35	1.2	.5
10	− .2	− .3	.....	.....	2.1	1.5	4.15	2.2	.85	2.95	1.15	.5
11	− .2	− .3	.....	.....	3.45	2.7	3.95	4.65	2.05	2.75	1.1	.5
12	− .2	− .3	.....	.....	4.3	2.8	3.85	3.4	2.15	2.6	1.1	.5
13	− .2	− .3	.....	.....	3.2	8.85	3.75	2.8	1.45	2.5	1.0	.5
14	− .05	− .4	.....	− .6	2.45	11.8	3.7	2.2	1.05	2.45	1.0	.5
15	.1	− .4	.....	− .6	1.9	14.85	3.65	2.3	1.15	2.4	1.0	.5
16	1.75	− .4	.....	− .6	1.4	17.5	3.55	4.05	1.3	2.45	.95	.5
17	1.6	− .4	.....	− .7	1.05	14.2	3.5	4.15	1.15	2.2	.9	.5
18	1.0	− .4	.....	− .7	.85	9.15	3.4	3.65	3.25	2.1	.8	.55
19	.7	− .4	.....	− .7	.65	7.05	3.3	2.9	4.45	2.0	.75	.5
20	.45	− .4	.....	− .7	.45	6.45	3.2	3.75	3.5	1.9	.7	.5
21	.35	− .4	.....	− .8	.35	6.05	3.15	2.95	3.35	1.9	.7	.5
22	.2	− .4	.....	− .8	.25	5.75	3.1	2.4	2.8	1.85	.7	.6
23	.15	− .4	.....	− .8	1.95	5.55	3.0	2.2	2.45	1.8	.9	.6
24	.1	− .4	.....	− .9	2.85	5.35	2.95	2.1	2.25	1.75	.7	.6
25	.0	− .4	.....	− .9	2.25	5.25	2.85	2.0	2.05	1.7	.65	.5
26	.0	− .4	.....	− .9	1.85	5.3	2.8	1.65	1.9	1.6	.6	.5
27	− .05	− .4	.....	− .9	1.55	5.0	3.2	1.45	1.75	1.55	.6	.5
28	− .1	− .4	.....	2.45	1.3	4.85	4.75	1.35	1.65	2.0	.6	.5
29	− .1	.....	.....	4.0	1.05	5.5	4.2	1.25	1.5	1.95	.6	.55
30	− .1	.....	.....	2.8	.95	5.15	3.45	1.2	1.5	2.1	.6	.6
31	− .2	.....	.....	.....	1.7	.....	7.35	1.1	.....	1.85	.....	.7

[a] No flow April 8–13, June 15–22, July 11–27, and August 17–September 7, 1902.
[b] Gage heights for 1903 complete so far as Mexican records exist.

Daily gage height, in feet, of Rio Salado near Guerrero, Tamaulipas, Mexico, for 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.[a]												
1	0.9	0.4	0.1	−0.5	−0.4	1.5	−0.1	0.1	−0.3	6.6	5.65	4.7
2	.8	.4	.1	.17	− .5	1.25	− .1	.0	− .4	6.6	5.8	4.6
3	.8	.4	.1	1.1	− .5	1.15	− .2	− .1	− .4	6.6	5.7	4.5
4	.8	.4	.0	.85	6.6	.95	− .1	− .2	− .5	6.55	5.4	4.45
5	.7	.4	.0	1.0	3.2	1.25	.0	− .3	− .5	6.5	5.3	4.4
6	.7	.4	.0	2.35	2.1	8.45	.0	− .35	− .5	6.4	5.2	4.35
7	.7	.4	.0	2.05	1.4	8.45	− .1	− .4	4.35	6.25	5.2	4.3
8	.7	.5	− .1	1.7	1.1	6.3	.0	− .4	7.9	6.2	5.1	4.3
9	.7	.55	− .1	1.3	4.0	4.25	.0	− .45	6.55	6.1	5.1	4.3
10	.65	.65	− .1	.95	1.9	3.35	− .1	− .5	7.8	6.0	5.0	4.2
11	.7	.7	− .1	.75	1.2	2.55	− .2	− .5	7.95	6.0	5.0	4.2
12	.65	.7	− .1	.55	.9	2.0	− .2	− .5	8.85	5.95	4.95	4.2
13	.6	.7	− .2	.4	.65	1.8	− .3	− .5	8.6	5.9	4.9	4.1
14	.6	.6	− .2	.3	3.4	1.65	− .3	1.75	11.0	5.85	4.8	4.1
15	.6	.6	− .3	.2	4.55	1.45	− .4	1.75	14.5	6.15	4.8	4.1
16	.6	.5	− .3	.1	8.6	1.25	− .4	1.45	13.05	6.05	4.8	4.0
17	.6	.5	− .3	.0	8.05	1.05	− .5	1.15	12.5	5.8	4.7	4.0
18	.6	.4	− .3	− .1	6.1	.9	− .5	.95	12.45	5.7	4.7	4.0
19	.6	.4	− .3	− .15	4.3	.8	− .5	.75	10.2	5.7	4.7	3.9
20	.6	.35	− .3	− .2	3.35	.65	− .6	.55	7.95	5.85	4.6	3.9
21	.5	.3	− .3	− .25	2.7	.45	− .6	.4	8.2	6.0	4.6	3.9
22	.5	.3	− .3	− .3	2.35	.3	− .6	.3	8.7	5.7	4.5	3.9
23	.5	.3	− .3	− .3	2.05	.35	− .7	.2	8.95	5.6	4.5	3.9
24	.5	.3	− .4	− .4	1.85	.45	− .7	.1	9.2	5.5	4.5	3.9
25	.4	.3	− .4	− .4	1.65	.3	− .7	.35	10.4	5.7	4.45	3.8
26	.4	.25	− .4	− .4	1.5	.3	− .8	.45	8.6	5.5	4.4	3.8
27	.4	.2	− .4	− .4	1.4	.2	− .8	.25	7.5	5.6	4.95	3.8
28	.4	.2	− .4	− .4	1.85	.15	.85	.05	7.15	5.55	5.15	3.7
29	.4	.2	− .45	− .4	2.4	.1	.7	.05	6.95	5.4	5.0	3.7
30	.4	.....	− .5	− .4	2.35	.0	.3	− .15	6.65	5.4	4.8	3.7
31	.4	.....	− .5	.....	1.9	.....	.25	− .25	.....	5.3	.....	3.7
1907.												
1	3.9	3.5	3.0	2.1	1.9	1.9	2.9	2.1	.8	1.6	4.5	4.4
2	3.9	3.5	2.9	2.1	1.95	1.75	2.8	2.1	.8	1.5	4.6	4.5
3	3.9	3.4	2.9	2.1	1.95	1.6	7.2	2.0	.8	1.4	4.75	4.5
4	3.8	3.4	2.9	2.1	2.25	1.5	8.6	2.0	.7	1.3	4.95	4.6
5	3.8	3.4	2.8	2.1	2.55	1.45	6.05	1.95	.7	1.3	5.15	4.6
6	3.8	3.4	2.8	2.1	2.7	1.4	3.95	1.9	.65	1.5	5.4	4.5
7	3.8	3.4	2.8	2.0	2.25	1.3	4.6	1.9	.6	9.9	5.3	4.5
8	3.8	3.3	2.8	2.0	1.95	1.2	3.95	1.8	.6	11.15	5.3	4.5
9	3.8	3.3	2.7	2.0	1.75	1.2	3.4	1.8	.5	5.6	5.2	4.5
10	3.7	3.3	2.7	2.0	4.8	1.2	3.2	1.8	.5	4.25	5.15	4.4
11	3.7	3.3	2.7	2.0	3.7	1.1	3.05	1.75	.5	3.85	5.0	4.4
12	3.7	3.3	2.7	1.9	3.9	1.1	2.8	1.7	.4	3.65	5.0	4.4
13	3.7	3.3	2.6	1.9	4.2	1.0	2.55	1.7	.4	3.5	4.9	4.3
14	3.7	3.2	2.6	1.9	3.45	1.0	2.45	1.65	.4	3.4	4.9	4.3
15	3.7	3.2	2.6	1.9	2.85	1.0	2.9	1.6	.4	3.3	4.9	4.3
16	3.6	3.2	2.6	1.9	2.55	.8	3.25	1.5	.4	3.2	4.8	4.3
17	3.6	3.2	2.6	1.8	2.25	.8	2.8	1.5	.4	3.2	4.8	4.3
18	3.6	3.2	2.5	1.8	2.15	1.35	2.55	1.45	.3	3.1	4.7	4.3
19	3.6	3.2	2.5	2.4	2.1	1.8	2.4	1.55	.3	3.1	4.7	4.2
20	3.6	3.1	2.5	2.7	2.0	1.55	2.4	1.55	.3	3.15	4.6	4.2
21	3.6	3.1	2.5	2.4	1.95	1.85	2.55	1.4	.3	3.35	4.6	4.2
22	3.55	3.1	2.4	2.35	2.25	1.75	2.4	1.3	.45	3.7	4.5	4.2
23	3.5	3.1	2.4	2.15	2.25	3.3	2.4	1.2	.85	4.45	4.5	4.15
24	3.5	3.0	2.4	2.0	2.05	3.6	2.4	1.1	2.3	4.6	4.4	4.1
25	3.5	3.05	2.3	1.9	1.95	3.25	2.3	1.1	2.75	4.65	4.4	4.1
26	3.5	3.0	2.3	1.9	1.9	3.1	2.3	1.1	2.35	4.65	4.4	4.1
27	3.5	3.0	2.2	1.9	5.9	3.1	2.2	1.0	2.05	4.45	4.4	4.1
28	3.5	3.0	2.2	1.8	3.85	3.0	2.2	1.0	1.85	4.35	4.3	4.05
29	3.5	.....	2.2	1.8	3.1	3.0	2.2	.95	1.7	4.2	4.3	4.0
30	3.5	.....	2.1	1.7	2.4	2.9	2.2	.9	1.75	4.15	4.2	4.0
31	3.5	.....	2.1	.....	2.05	.....	2.2	.8	.....	4.05	.....	4.0

[a] No flow July 15–27, 1904.

Daily gage height, in feet, of Rio Salado near Guerrero, Tamaulipas, Mexico, for 1900 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	4.0	3.2	2.4	1.9	2.7	4.25	1.0	4.15	4.2	3.3	2.9	2.6
2	4.0	3.1	2.4	1.9	2.6	3.65	.9	4.8	4.15	3.3	2.9	2.6
3	3.9	3.1	2.3	1.9	2.5	3.2	.9	4.2	4.85	3.3	2.9	2.6
4	3.9	3.1	2.3	1.9	2.4	2.55	1.9	3.75	4.2	3.2	2.8	2.6
5	3.9	3.1	2.3	1.9	2.3	2.3	2.1	3.6	4.1	3.2	2.8	2.6
6	3.9	3.0	2.3	1.8	2.2	2.2	2.75	3.8	4.0	3.3	2.8	2.6
7	3.8	3.0	2.2	1.8	2.1	1.95	5.05	3.7	3.95	3.35	2.9	2.6
8	3.8	3.0	2.2	1.8	2.0	1.75	3.95	6.15	3.9	7.0	2.8	2.6
9	3.8	3.0	2.25	1.7	1.9	1.6	2.55	6.85	3.9	5.6	2.8	2.6
10	3.7	3.0	2.3	1.7	1.9	1.6	2.1	5.5	3.8	4.05	2.7	2.6
11	3.7	2.9	2.2	5.7	1.9	1.5	2.05	5.8	3.95	3.55	2.7	2.6
12	3.7	2.9	2.1	5.7	1.8	1.4	1.65	5.25	3.85	3.4	2.7	2.6
13	3.6	2.9	2.1	5.4	1.8	1.3	1.5	5.1	3.8	3.3	3.2	2.6
14	3.6	2.8	2.2	2.85	3.4	1.2	4.35	5.1	4.4	3.2	3.05	2.6
15	3.6	2.8	2.1	4.5	6.1	1.1	3.4	5.0	4.85	3.2	2.9	2.6
16	3.6	2.8	2.2	3.95	6.2	1.1	2.8	5.0	4.0	3.1	2.9	2.6
17	3.5	2.7	2.1	3.6	4.35	1.0	2.25	4.9	4.75	3.1	2.9	2.6
18	3.5	2.7	2.0	3.45	3.35	1.0	1.9	4.9	4.6	3.15	2.8	2.5
19	3.5	2.7	2.0	3.35	2.85	.9	1.65	4.9	3.95	3.1	2.7	2.5
20	3.5	2.6	2.0	3.85	2.35	.9	1.5	4.8	3.8	3.1	2.7	2.5
21	3.5	2.6	2.0	4.2	2.25	.8	1.4	5.35	3.75	3.0	2.7	2.5
22	3.4	2.6	2.0	5.9	2.25	.8	1.6	5.85	3.65	3.15	2.7	2.5
23	3.4	2.6	2.0	4.95	2.05	.7	1.85	5.15	3.55	6.15	2.7	2.5
24	3.4	2.5	3.1	4.2	1.9	.7	1.65	4.75	3.5	3.7	2.7	2.5
25	3.4	2.5	2.8	3.55	1.8	.85	1.5	4.7	3.5	3.35	2.7	2.5
26	3.3	2.5	2.5	3.25	1.65	2.15	1.6	4.6	3.5	3.3	2.6	2.5
27	3.3	2.5	2.4	3.05	1.45	2.25	1.4	4.5	3.4	3.3	2.7	2.5
28	3.3	2.4	2.35	2.95	1.3	1.75	1.25	4.5	3.4	2.9	2.6	2.5
29	3.3	2.4	2.15	2.85	1.3	1.5	1.1	4.4	3.4	2.9	2.6	2.5
30	3.3	.....	2.05	2.75	1.2	1.15	2.2	4.35	3.4	2.9	2.65	2.5
31	3.2	.....	2.0	.....	1.2	.....	3.75	4.3	.....	2.9	.....	2.5

RIO SAN JUAN NEAR LA QUEMADA AND SANTA ROSALIA RANCH, TAMAULIPAS, MEXICO.

The San Juan is a long torrential stream entering the Rio Grande 15 miles below Roma and 790 miles by river below El Paso. Six miles above its mouth is the town of Camargo.

The station was first established in 1900 near La Quemada, 12 miles above Camargo, by the International Boundary Commission, but in time of heavy flood in the Rio Grande backwater reached the station, and on July 14, 1902, it was moved 6 miles farther upstream to its present location near Santa Rosalia ranch, Tamaulipas, Mexico. It is now above backwater.

The river bed at both stations shifts constantly and frequent discharge measurements have been made to determine closely the daily flow. Both banks are of sandy clay which are above high water and do not erode. The bottom of the river is sand which erodes slightly in flood.

Low water (no flow) is zero on the gage. The highest recorded flood, on September 16, 1904, reached 27 feet on the gage.

The observations at both stations have been made under the direction of the Mexican section of the International Boundary Commission.

Discharge measurements and gage heights, 1900 to 1904, which have not hitherto been published by the United States Geological Survey, are given herewith, together with data for 1907–8.

Discharge measurements of Rio San Juan near La Quemada, Tamaulipas, Mexico, in 1900.

[By S. Jaso.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
October 3	591	2.6	461	November 23	188	1.0	237
October 5	257	1.75	64	November 25	200	1.1	343
October 8	256	1.45	66	November 28	199	1.0	187
October 19	231	.9	14	December 4	207	1.0	371
October 23	269	1.8	89	December 10	222	1.1	449
October 28	269	1.9	89	December 14	229	1.2	478
October 30	228	1.2	51	December 18	418	3.15	1,737
November 11	181	.7	312	December 21	434	1.5	840
November 13	186	.8	117	December 26	251	1.05	418
November 16	181	.7	168	December 30	249	1.2	436
November 20	204	.95	129				

NOTE.—Discharge measurements for 1900 complete so far as Mexican records exist.

Discharge measurements of Rio San Juan near La Quemada, Tamaulipas, Mexico, in 1901.

[By S. Jaso and A. Argándar.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	263	1.2	219	July 14	474	3.2	697
January 7	272	1.3	234	July 18	363	1.5	218
January 11	272	1.25	[a] 168	July 22	314	.8	111
January 15	263	1.15	210	July 26	193	.5	40
January 20	272	1.3	228	July 30	291	.7	97
January 24	272	1.3	224	August 3	227	1.0	54
January 28	272	1.3	214	August 7	255	1.6	144
February 3	244	1.0	123	August 11	217	1.1	30
February 8	251	1.1	140	August 15	203	.8	16
February 12	251	1.05	125	August 19	194	.6	11
February 23	200	.95	92	August 23	176	.7	13
February 25	200	.9	90	August 27	173	.4	11
February 28	194	.8	74	August 31	231	1.2	44
March 3	194	.8	72	September 3	1,799	14.2	6,398
March 7	194	.8	74	September 7	393	1.8	571
March 11	189	.7	63	September 11	952	7.6	2,716
March 15	184	.6	61	September 15	319	2.1	257
March 20	174	.5	54	September 19	455	3.05	747
March 24	168	.4	48	September 23	397	2.3	394
March 28	155	.2	19	September 26	2,323	15.6	8,251
April 2	149	.1	18	September 30	887	6.25	2,430
April 6	144	.0	15	October 4	883	6.3	2,301
April 10	144	.0	16	October 8	480	3.7	1,052
April 14	144	.0	16	October 12	448	3.2	784
April 19	125	.0	14	October 16	435	3.0	675
April 23	125	.0	14	October 20	453	2.6	722
April 28 [b]	86	.0	0	October 30	798	4.3	1,787
May 5 [b]	0	.0	0	November 1	758	4.1	1,518
May 11	483	3.5	732	November 5	424	3.5	709
May 15	241	1.1	127	November 9	385	2.8	625
May 19	216	.7	75	November 13	413	2.9	766
May 24	271	1.4	151	November 17	356	2.6	442
May 27	315	2.0	397	November 21	386	2.6	492
May 31	271	1.5	160	November 25	388	2.6	454
June 5	1,531	12.6	[c] 7,097	November 29	1,483	11.7	5,302
June 9	243	1.3	134	December 3	516	3.5	1,062
June 13	217	.8	84	December 7	413	2.9	636
June 17	205	.5	60	December 11	389	2.6	550
June 21	188	.4	37	December 15	281	2.5	509
June 25	188	.4	37	December 19	351	2.3	427
June 30	2,470	19.35	[c] 15,742	December 23	368	2.5	465
July 6	372	1.8	229	December 27	343	2.3	423
July 10	1,565	10.0	[c] 7,991	December 31	354	2.4	435

[a] Measurement January 11, 1901, rejected.
[b] No flow April 28 to May 9, 1901.
[c] Measurements June 5 and 30, and July 10, 1901, made by floats.

Discharge measurements of Rio San Juan near La Quemada, Tamaulipas, Mexico, in 1902.

[By A. Argándar.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	330	2.1	274	April 10	169	0.3	10
January 9	327	2.1	308	April 14	261	1.4	139
January 12	321	2.0	275	April 17	1,463	11.5	6,439
January 16	316	2.0	277	April 22	292	1.9	203
January 22	299	1.9	216	April 26	276	1.4	161
January 26	294	1.8	205	May 3	215	.8	30
January 30	288	1.7	146	May 7	1,534	12.7	6,987
February 1	290	1.6	129	May 11	375	2.4	436
February 5	293	1.6	128	May 15	229	1.1	68
February 9	302	1.65	169	May 19	210	.8	27
February 13	304	1.7	175	May 23	241	1.2	87
February 17	309	1.7	184	May 28	196	.7	33
February 21	275	1.5	150	June 1	187	.5	27
February 25	273	1.5	166	June 5 [a]	157	.3	17
February 28	268	1.3	143	June 9	146	.2	0
March 5	238	1.1	96	June 13	145	.1	0
March 9	232	.9	54	June 17	141	.0	0
March 13	224	.85	47	June 21	137	— .1	0
March 17	210	.8	27	June 25	125	— .3	0
March 21	209	.7	22	June 29	122	— .4	0
March 25	190	.6	17	July 3	103	— .5	0
March 29	188	.55	15	July 7	782	4.5	1,991
April 2	180	.5	13	July 11	375	2.7	564
April 6	174	.4	12				

[a] River dry June 6–July 5, 1902.

NOTE.—This station was moved to Santa Rosalia ranch, 6 miles upstream, July 14, 1902.

Discharge measurements of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, in 1902.

[By A. Argándar and S. Jaso.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
July 15	252	1.3	157	October 6	397	3.4	579
July 19	128	.4	56	October 10	291	2.5	315
July 23	83	.0	28	October 14	188	1.5	146
July 27	64	— .2	7	October 16	2,494	15.35	12,539
July 29	720	5.9	2,456	October 19	473	4.4	991
July 30	2,350	16.0	9,904	October 23	294	2.8	399
August 3	823	7.0	2,822	October 27	211	2.0	223
August 7	82	.8	30	October 30	1,901	8.6	5,351
August 11	56	.5	16	November 4	177	1.6	162
August 15	46	.4	9	November 9	146	1.5	119
August 19	41	.1	5	November 13	113	1.1	57
August 23	31	.0	4	November 17	98	1.0	39
August 27 [a]	24	— .2	0	November 21	87	.8	28
August 31	22	— .3	0	November 25	229	2.15	233
September 3	11	— .3	0	November 29	96	.9	46
September 8	320	2.4	362	December 2	1,667	7.5	[b] 5,297
September 12	268	2.0	222	December 7	196	1.8	172
September 16	450	3.4	599	December 11	179	1.7	146
September 20	199	.4	35	December 16	135	1.2	85
September 24	281	1.9	225	December 20	126	1.1	78
September 28	1,725	10.9	6,832	December 23	126	1.1	82
October 1	2,471	15.05	10,818	December 28	118	1.0	68

[a] River dry August 25–September 5; also September 21 and 22, 1902.
[b] Measurement made by floats December 2, 1902.

Discharge measurements of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, in 1903.

[By S. Jaso.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
June 23	233	1.9	188	September 30	365	1.9	186
June 27	194	1.5	103	October 3	327	1.5	117
July 3	203	1.6	118	October 8	287	1.1	46
July 7	783	6.2	2,215	October 13	296	1.3	65
July 11	217	1.7	147	October 18	236	.8	42
July 15	131	.8	31	October 22	227	.7	29
July 21	100	.4	6	October 26	369	1.95	193
July 25	87	.2	4	October 30	272	1.0	51
July 29	72	.0	4	November 4	260	.9	37
August 1	3,177	21.0	26,677	November 9	274	1.0	53
August 5	275	3.4	478	November 13	256	.9	39
August 10	78	1.7	79	November 19	248	.8	30
August 14	115	2.0	144	November 23	251	.8	45
August 17	3,778	24.0	30,826	November 27	252	.9	38
August 27	654	3.75	823	November 30	249	.9	33
August 31	577	3.3	580	December 5	245	.9	37
September 4	826	4.95	1,548	December 9	257	1.0	43
September 9	501	2.9	416	December 14	256	1.0	34
September 14	395	2.1	228	December 18	259	1.1	45
September 18	535	2.75	506	December 22	272	1.1	50
September 22	352	2.4	159	December 26	266	1.1	44
September 26	498	2.8	455	December 30	263	1.0	49

NOTE.—Discharge measurements for 1903 complete so far as Mexican records exist.

Discharge measurements of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, in 1904.

[By S. Jaso.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	272	1.0	49	July 4	416	2.45	282
January 8	270	1.1	44	July 9	271	1.30	39
January 13	262	1.0	40	July 14	183	.5	17
January 18	265	1.0	41	July 18	158	.3	13
January 23	250	.9	26	July 22	146	.2	12
January 27	235	.8	22	July 31	254	1.1	72
February 3	239	.8	22	August 4	190	.7	38
February 6	233	.8	24	August 8	154	.4	14
February 12	225	.7	24	August 13	774	4.6	1,432
February 15	243	.8	26	August 17	492	3.0	545
February 20	318	1.7	181	August 22	211	.9	22
February 24	257	1.0	45	August 26	222	1.0	37
February 28	215	.6	19	August 30	152	.4	14
March 3	193	.5	16	September 3	130	.0	5
March 7	182	.4	*a* 8	September 7	781	4.55	1,302
March 11	180	.3	*a* 7	September 8	1,157	6.65	2,659
March 15	166	.2	*a* 7	September 9	1,680	9.3	5,209
March 19	168	.2	*a* 7	September 10	2,149	11.7	6,523
March 25	153	.1	*a* 6	September 13	2,537	13.45	9,092
March 29	391	2.05	226	September 17	4,672	24.5	37,578
April 3	2,791	18.45	*b* 12,687	September 22	2,797	15.05	9,954
April 9	308	1.4	99	September 25	1,401	6.0	2,037
April 13	246	.8	23	September 29	1,765	9.65	4,039
April 16	224	.6	20	October 3	1,026	4.95	1,482
April 21	190	.4	14	October 7	1,248	5.65	1,847
April 24	605	3.85	700	October 12	842	3.9	629
April 28	278	1.1	52	October 16	759	3.1	408
May 2	1,576	9.4	3,861	October 20	695	2.7	261
May 6	380	2.0	210	October 25	625	2.3	187
May 9	1,615	9.35	4,525	October 30	615	2.2	169
May 14	1,292	6.4	3,192	November 4	620	2.3	176
May 18	384	1.8	212	November 8	706	2.8	328
May 24	243	.9	36	November 14	696	2.8	310
May 28	230	.8	26	November 19	754	3.15	441
June 4	245	1.1	52	December 6	764	3.3	446
June 7	2,743	13.25	9,234	December 10	757	3.2	422
June 14	321	1.6	114	December 14	713	3.0	375
June 18	265	1.3	64	December 19	707	2.8	333
June 24	511	2.95	498	December 23	711	2.8	309
June 27	255	1.0	59	December 28	669	2.5	192
June 30	192	.7	21	December 31	662	2.6	211

a Approximate, March 7 to 25, 1904. *b* Made by floats, April 3, 1904.

Discharge measurements of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, in 1907.

[By S. Jaso.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 4	397	2.85	253	July 10	766	5.0	1,534
January 8	376	2.7	222	July 11	580	3.95	815
January 13	362	2.6	206	July 13	651	4.35	946
January 17	337	2.5	172	July 15	388	2.85	280
January 22	321	2.4	165	July 19	225	1.7	65
January 25	318	2.3	158	July 23	203	1.5	48
January 28	318	2.3	157	July 26	227	1.7	50
February 2	320	2.35	162	July 29	196	1.4	29
February 8	284	2.1	118	August 2	187	1.2	16
February 12	278	2.1	118	August 6	146	1.1	13
February 15	277	2.0	112	August 10	137	1.0	12
February 18	270	1.95	103	August 14	126	.9	4
February 24	241	1.8	55	August 18	123	.8	4
February 27	236	1.7	53	August 22	214	1.5	56
March 4	243	1.8	68	August 26	173	1.1	15
March 8	234	1.7	43	August 29	150	.9	13
March 13	210	1.5	20	September 2	118	.8	4
March 16	202	1.45	18	September 6	114	.7	5
March 20	188	1.4	17	September 10	101	.6	0
March 25	161	1.2	12	September 12	304	2.25	128
March 29	144	1.0	8	September 13	587	3.95	661
April 2	138	1.0	7	September 14	389	2.8	270
April 6	134	.9	6	September 18	227	1.4	36
April 10	122	.8	2	September 22	509	3.4	465
April 13	320	2.4	183	September 23	654	4.5	922
April 18	234	1.7	57	September 25	265	1.8	99
April 23	247	1.8	75	September 28	566	3.85	643
April 28	614	4.25	782	October 2	220	1.6	63
May 2	226	1.6	49	October 7	374	2.6	226
May 5	3,819	23.6	17,663	October 9	905	5.75	1,693
May 6	1,338	8.8	3,477	October 12	352	2.6	239
May 9	295	2.8	261	October 16	211	1.6	52
May 11	2,724	13.9	8,602	October 19	176	1.3	24
May 16	280	2.3	167	October 22	299	2.3	183
May 20	215	1.9	88	October 23	455	3.4	394
May 21	1,160	7.6	2,816	October 24	621	4.35	718
May 27	3,819	23.6	17,663	October 26	673	4.55	782
June 2	1,544	7.7	2,993	October 29	433	3.1	348
June 8	382	1.9	93	November 2	349	2.65	218
June 13	330	1.5	29	November 6	282	2.3	135
June 17	298	1.4	26	November 12	401	3.1	333
June 18	840	4.45	1,051	November 16	325	2.6	203
June 19	1,631	8.2	3,177	November 26	250	1.9	103
June 20	934	5.15	1,201	November 28	270	2.0	137
June 27	366	1.9	82	December 2	565	3.9	670
July 2	308	1.5	30	December 6	418	3.0	408
July 4	3,869	18.7	16,080	December 10	360	2.7	287
July 5	2,169	10.55	5,594	December 16	314	2.3	213
July 6	1,784	10.25	4,418	December 20	288	2.2	181
July 7	1,133	6.5	2,389	December 23	282	2.1	160
July 8	3,653	17.6	14,756	December 27	269	2.0	141
July 9	2,107	10.6	5,979	December 29	257	1.95	126

Discharge measurements of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, in 1908.

[By S. Jaso.]

Date.	Area of section.	Gage height.	Discharge.	Date.	Area of section.	Gage height.	Discharge.
	Sq. ft.	*Feet.*	*Sec.-ft.*		*Sq. ft.*	*Feet.*	*Sec.-ft.*
January 3	242	1.9	113	July 9	539	3.85	696
January 8	240	1.9	115	July 13	198	1.45	54
January 12	235	1.8	90	July 14	571	4.05	825
January 17	225	1.7	87	July 17	313	2.15	162
January 21	218	1.65	87	July 23	180	1.0	7
January 25	213	1.6	74	July 29	147	.9	7
January 28	291	2.2	173	July 31	3,193	15.85	12,932
February 3	220	1.7	88	August 5	243	2.1	168
February 7	219	1.6	80	August 8	164	1.4	53
February 11	211	1.6	77	August 12	153	1.2	43
February 16	193	1.4	67	August 15	126	.9	13
February 21	186	1.4	59	August 18	117	.8	5
February 26	178	1.3	55	August 21	631	4.65	1,396
March 2	172	1.2	42	August 24	193	1.65	97
March 10	143	1.0	20	August 28	138	1.1	20
March 13	130	.85	9	September 2	111	.8	.4
March 16	128	.8	10	September 7	97	.6	4
March 21	126	.8	9	September 11	122	.9	14
March 24	120	.8	7	September 15	146	1.25	34
April 4	96	.6	3	September 17	453	3.6	485
April 9	95	.6	4	September 19	309	2.65	260
April 12	2,765	14.05	8,086	September 23	491	3.8	685
April 14	2,346	11.35	6,734	September 28	153	1.3	51
April 17	459	3.05	391	October 1	302	2.65	276
April 20	2,390	12.3	6,856	October 3	183	1.55	80
April 22	1,218	7.6	2,930	October 6	142	1.2	32
April 26	335	2.1	167	October 9	125	1.0	24
April 28	289	1.8	111	October 12	169	1.4	57
May 4	229	1.3	53	October 17	116	.9	22
May 7	202	1.1	28	October 22	109	.7	5
May 14	507	3.3	480	October 23	474	3.95	660
May 15	3,413	16.95	14,164	October 25	518	3.9	634
May 16	1,105	7.8	3,310	October 28	210	1.8	97
May 18	388	3.35	530	November 3	141	1.2	25
May 25	104	1.2	24	November 7	128	.9	12
May 28	130	1.4	57	November 11	107	.8	4
May 31	1,857	9.1	5,351	November 12	3,173	15.85	10,280
June 2	395	3.15	428	November 14	510	4.55	896
June 6	145	1.3	46	November 17	277	2.4	217
June 9	110	1.0	19	November 21	114	1.4	45
June 14	90	.7	2	November 25	105	1.2	33
June 19	67	.5	2	December 3	280	2.8	268
June 23	52	.4	0	December 8	110	1.3	43
June 25	1,008	7.15	3,002	December 13	100	1.1	28
June 27	457	3.45	565	December 16	98	1.0	17
July 2	222	1.8	109	December 21	101	1.0	23
July 5	939	6.3	2,317	December 26	96	1.0	18
July 7	352	2.6	276				

Daily gage height, in feet, of Rio San Juan near La Quemada, Tamaulipas, Mexico, for 1900, 1901, and 1902.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.[a]												
1	.....	.....	.....	.....	6.75	4.35	.....	7.75	.....	0.75	0.95	0.9
2	.....	.....	.....	.....	6.05	11.6	.....	7.65	.....	1.75	.85	.95
3	.....	.....	.....	.....	4.5	9.25	.....	8.35	.....	2.65	.8	1.15
4	.....	.....	.....	.....	3.8	5.5	.....	6.45	0.95	2.05	1.05	1.1
5	.....	.....	.....	.....	2.6	6.8	.....	4.6	.85	1.75	.8	1.1
6	.....	.....	.....	.....	2.2	7.75	.....	4.85	3.0	1.55	.8	1.15
7	.....	.....	.....	.....	2.1	6.7	.....	5.1	2.2	1.45	.8	1.05
8	.....	.....	.....	.....	2.25	4.55	.....	6.1	10.45	1.45	.75	1.05
9	.....	.....	.....	.....	2.2	3.6	.....	8.1	5.0	1.85	.8	.95
10	.....	.....	.....	.....	1.9	3.2	.....	9.95	2.55	1.65	.8	1.15
11	.....	.....	.....	.....	1.85	3.0	.....	13.05	2.45	1.55	.75	1.1
12	.....	.....	.....	.....	1.7	2.9	.....	12.6	2.1	1.5	.7	1.15
13	.....	.....	.....	.....	1.45	2.75	.....	11.25	1.85	1.0	.8	1.15
14	.....	.....	.....	.....	1.4	2.35	.....	9.2	1.6	.9	.8	1.1
15	.....	.....	.....	.....	4.5	2.25	.....	7.6	1.15	.75	.7	.95
16	.....	.....	.....	.....	14.85	2.15	.....	5.95	.8	.75	.65	.95
17	.....	.....	.....	.....	14.8	2.0	.....	.....	.45	.75	.7	1.1
18	.....	.....	.....	.....	10.05	2.8	.....	.....	.8	.85	.95	2.55
19	.....	.....	.....	.....	6.65	2.45	.....	.....	.45	.9	1.05	2.6
20	.....	.....	.....	.....	4.5	.....	.....	.....	.55	.9	.95	1.8
21	.....	.....	.....	.....	6.6	.....	.....	.....	.35	1.8	.85	1.65
22	.....	.....	.....	.....	14.0	.....	4.15	.....	.35	1.7	1.25	1.65
23	.....	.....	.....	.....	14.8	.....	3.45	.....	.25	1.75	1.1	1.45
24	.....	.....	.....	.....	9.95	.....	2.9	.....	.0	1.8	.85	1.45
25	.....	.....	.....	.....	6.50	.....	2.65	.....	.1	1.85	.95	1.15
26	.....	.....	.....	.....	5.15	.....	2.45	.....	.0	1.75	1.05	1.1
27	.....	.....	.....	.....	4.4	.....	3.25	.....	.35	3.05	1.0	.85
28	.....	.....	.....	4.85	4.0	.....	2.85	.....	.25	1.9	1.05	.75
29	.....	.....	.....	3.1	3.6	.....	2.6	.....	.2	1.55	.95	1.1
30	.....	.....	.....	3.6	3.25	.....	7.7	.....	.55	1.15	1.1	1.15
31	.....	.....	.....	.....	3.0	.....	10.9	.....	.....	1.05	.....	1.2
1901.[b]												
1	1.25	1.1	0.8	.1	.0	1.35	9.65	.45	.95	11.05	4.05	7.65
2	1.2	1.0	.8	.1	.0	1.1	5.85	.4	.8	9.55	3.95	3.95
3	1.15	1.0	.8	.1	.0	.95	4.9	.25	12.15	7.2	3.8	3.75
4	1.2	1.0	.8	.1	.0	.85	4.0	1.25	8.6	5.8	3.6	3.35
5	1.2	1.0	.8	.0	.0	10.3	1.95	1.1	4.7	4.9	3.5	3.15
6	1.2	1.0	.8	.0	.0	9.25	1.85	1.3	3.6	4.3	3.35	3.00
7	1.25	1.0	.8	.0	.0	8.85	1.7	1.6	2.35	3.9	3.15	2.85
8	1.25	1.1	.8	.0	.0	8.0	1.75	1.35	3.15	3.65	2.9	2.75
9	1.3	1.1	.75	.0	.0	1.3	5.95	1.3	3.15	3.6	2.8	.55
10	1.25	1.05	.7	.0	3.55	1.35	6.4	1.3	6.05	3.4	2.75	2.15
11	1.25	1.2	.7	.0	3.75	1.15	5.85	1.15	8.4	3.25	3.2	2.75
12	1.3	1.1	.7	.0	2.55	.95	4.15	1.0	5.6	3.2	3.05	2.75
13	1.35	1.1	.6	.0	1.7	.8	3.2	1.0	3.65	12.0	2.9	2.7
14	1.55	1.1	.6	.0	1.45	.75	3.2	.9	3.35	8.75	2.75	2.7
15	1.3	1.0	.6	.0	1.25	.7	3.05	.8	2.05	4.2	2.55	2.5
16	1.35	1.1	.5	.0	1.15	.6	2.6	.8	2.75	3.1	2.55	2.5
17	1.25	1.0	.5	.0	.95	.5	1.5	.8	4.5	2.85	2.7	2.45
18	1.15	1.0	.5	.0	.8	.5	1.5	.8	5.15	2.7	2.55	2.35
19	1.2	1.0	.5	.0	.7	.5	1.35	.7	3.4	2.6	2.5	2.3
20	1.3	1.0	.5	.0	.65	.4	1.55	.7	4.5	2.5	2.55	2.35
21	1.25	1.0	.4	.0	2.6	.4	1.55	.7	3.35	2.5	2.7	2.45
22	1.2	1.0	.4	.0	2.25	.4	1.1	.65	2.55	7.05	2.6	2.5
23	1.2	.95	.4	.0	1.85	.4	.7	.65	2.3	11.4	2.6	2.5
24	1.25	.9	.4	.0	1.4	.4	.6	.6	2.05	10.35	2.6	2.4
25	1.1	.9	.3	.0	1.3	.4	.4	.4	1.95	9.0	2.5	2.4
26	1.2	.9	.2	.0	5.0	.4	.5	.4	16.35	7.0	2.5	2.3
27	1.2	.9	.2	.0	2.0	.35	.35	.4	17.1	5.55	2.45	2.3
28	1.2	.8	.2	.0	3.15	.45	2.6	.4	13.3	5.0	9.35	2.4
29	1.2	.....	.2	.0	2.2	22.0	2.35	1.2	8.1	4.55	11.3	2.35
30	1.3	.....	.15	.0	1.85	19.55	.65	1.7	5.8	4.25	12.1	2.4
31	1.3	.....	.1	.....	1.65	.....	.55	1.15	.....	4.25	.....	2.4

[a] Gage heights at this station affected by Rio Grande. Gage heights for 1900 complete so far as Mexican records exist.

[b] No flow April 28–May 9, 1901.

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Daily gage height, in feet, of Rio San Juan near La Quemada, Tamaulipas, Mexico, for 1900, 1901, and 1902—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	Day.	Jan.	Feb.	Mar.	Apr.	May.
1902.						1902.					
1	2.4	1.6	1.3	0.55	0.9	16	2.0	1.7	0.8	0.85	.....
2	2.5	1.6	1.3	.5	.85	17	2.1	1.7	.8	11.55	.....
3	2.75	1.6	1.2	.45	.8	18	2.0	1.6	.8	8.8	.....
4	2.6	1.6	1.15	.45	.75	19	1.85	1.6	.75	8.25	.....
5	2.55	1.6	1.1	.5	.85	20	2.2	1.55	.7	4.85	.....
6	2.55	1.6	1.0	.5	1.6	21	1.9	1.5	.7	3.1	.....
7	2.55	1.6	1.0	.4	13.4	22	1.9	1.5	.65	2.15	.....
8	2.6	1.6	.9	.45	8.4	23	1.85	1.55	.65	1.8	.....
9	2.55	1.65	.9	.45	4.55	24	1.85	1.55	.6	1.45	.....
10	2.6	1.6	.9	.45	2.35	25	1.8	1.5	.6	1.35	.....
11	2.6	1.6	.9	.4	1.95	26	1.75	1.5	.6	1.35	.....
12	2.0	1.7	.85	.35	1.65	27	1.8	1.4	.6	1.25	.....
13	2.05	1.7	.85	.3	1.45	28	1.8	1.3	.55	1.2	.....
14	2.0	1.7	.85	1.2	1.35	29	1.8	.....	.55	1.05	.....
15	2.0	1.7	.8	.85	.....	30	1.8	.....	.55	.95	.....
						31	1.7	.....	.5	.....	.....

NOTE.—Gage heights at this station affected by Rio Grande.

Daily gage height, in feet, of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, for 1902 to 1904, 1907, and 1908.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
1	.....	.....	.....	.....	.....	0.5	−0.45	2.95	−0.3	14.9	2.75	6.3
2	.....	.....	.....	.....	.....	.5	− .5	9.1	− .3	12.35	2.1	7.5
3	.....	.....	.....	.....	.....	.4	− .5	5.55	− .3	8.6	1.9	4.6
4	.....	.....	.....	.....	.....	.3	− .55	3.4	− .3	6.65	2.7	3.3
5	.....	.....	.....	.....	.....	.3	− .6	1.8	− .2	4.4	2.85	2.6
6	.....	.....	.....	.....	.....	.3	− .6	1.25	1.6	2.75	2.2	2.15
7	.....	.....	.....	.....	.....	.3	3.75	.7	3.8	3.45	1.8	1.75
8	.....	.....	.....	.....	.....	.3	3.0	.55	4.45	3.25	1.55	4.9
9	.....	.....	.....	.....	.....	.2	2.9	.5	7.25	2.85	1.45	2.3
10	.....	.....	.....	.....	.....	.2	2.9	.5	3.55	2.5	1.35	1.85
11	.....	.....	.....	.....	.....	.2	2.65	.5	2.45	2.05	1.2	1.75
12	.....	.....	.....	.....	.....	.1	2.0	.5	2.2	1.9	1.1	1.45
13	.....	.....	.....	.....	.....	.1	1.85	.4	5.65	1.8	1.05	1.25
14	.....	.....	.....	.....	.....	.1	1.8	.4	3.75	1.5	1.0	1.1
15	.....	.....	.....	.....	1.15	.1	1.3	.4	3.08	14.15	1.0	1.3
16	.....	.....	.....	.....	1.0	.0	1.3	.3	2.7	13.75	1.0	1.2
17	.....	.....	.....	.....	.95	.0	.8	.3	1.55	9.05	1.0	1.2
18	.....	.....	.....	.....	.9	− .05	.5	.25	1.05	5.5	1.0	1.2
19	.....	.....	.....	.....	.8	− .1	.4	.1	.65	4.3	1.0	1.2
20	.....	.....	.....	.....	.8	− .1	.3	.1	.45	3.8	.9	1.1
21	.....	.....	.....	.....	1.05	− .1	.15	.05	.25	3.3	.85	1.1
22	.....	.....	.....	.....	1.3	− .2	.05	.0	.15	3.05	.8	1.1
23	.....	.....	.....	.....	1.1	− .2	.0	.0	.35	2.75	.8	1.1
24	.....	.....	.....	.....	.95	− .2	.0	.0	2.6	2.5	1.1	1.1
25	.....	.....	.....	.....	.9	− .3	− .1	.0	4.45	2.3	2.1	1.1
26	.....	.....	.....	.....	.8	− .3	− .1	− .1	5.8	2.15	1.5	1.1
27	.....	.....	.....	.....	.75	− .35	− .2	− .2	4.0	1.95	1.4	1.0
28	.....	.....	.....	.....	.7	− .4	− .2	− .2	7.4	1.8	1.4	1.0
29	.....	.....	.....	.....	.6	− .4	−2.65	− .2	8.7	1.7	.95	1.0
30	.....	.....	.....	.....	.55	− .4	11.95	− .25	4.55	8.05	.9	1.0
31	.....	.....	.....	.....	.5	.....	4.25	− .3	.....	4.25	.....	1.0
1903.												
1	1.0	0.7	.....	.....	3.95	.3	2.5	21.5	3.2	1.75	1.0	.9
2	.95	.7	.....	.....	2.6	.2	1.85	14.3	3.3	1.65	.95	.9
3	.9	.7	.....	.....	3.6	.2	1.55	7.25	3.35	1.55	.9	.9
4	.9	.6	.....	.....	2.15	1.55	1.35	4.0	4.9	1.45	.9	.9
5	.9	.6	.....	.....	1.65	1.4	2.8	3.3	3.85	1.35	1.05	.9
6	.9	.6	.....	.....	2.95	2.9	7.0	2.85	3.4	1.25	2.05	.9
7	.9	.6	.....	.....	4.7	4.95	5.6	2.45	3.0	1.15	1.5	.9
8	.9	.6	.....	.....	2.75	3.2	3.95	2.25	2.85	1.1	1.15	1.0
9	.9	.6	.....	.....	2.2	2.25	2.65	2.0	2.85	1.05	1.0	1.0
10	.9	.55	.....	.....	2.0	2.6	2.0	1.65	2.7	1.0	.95	1.0

Daily gage height, in feet, of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, for 1902 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
11	0.9	0.5	.....	.....	3.3	3.5	1.6	1.45	2.45	1.95	0.9	1.0
12	.9	.5	.....	.....	3.45	2.5	1.25	2.0	2.35	1.45	.9	1.0
13	.9	.5	.....	.....	2.65	11.75	1.05	2.65	2.25	1.25	.9	1.0
14	.9	.5	.....	.....	2.05	13.25	.85	1.95	2.1	1.05	.9	1.0
15	1.0	.5	.....	.....	1.85	6.45	.75	2.4	2.8	.95	.9	1.1
16	1.05	.5	.....	.....	2.05	4.6	.65	12.3	2.85	.9	.9	1.1
17	1.0	.5	.....	.....	1.55	3.8	.6	24.3	2.55	.8	.9	1.1
18	1.1	.5	.....	.....	1.35	3.3	.5	15.6	2.65	.8	.9	1.1
19	1.1	.4	.....	.....	2.5	2.85	.5	9.7	2.15	.7	.8	1.1
20	1.05	.4	.....	.....	2.25	2.3	.4	9.8	2.55	.7	.8	1.1
21	1.0	.4	.....	.....	1.5	2.05	.4	9.1	2.2	.7	.8	1.1
22	.95	.4	.....	.....	1.25	1.95	.3	7.4	2.35	.7	.8	1.1
23	.9	.4	.....	.....	.95	1.85	.3	6.2	2.3	.7	.8	1.1
24	.9	.3	.....	.....	.85	1.75	.2	5.35	2.3	.7	.9	1.1
25	.9	.3	.....	.....	.75	1.65	.2	5.1	3.9	2.7	.9	1.1
26	.9	.3	.....	.....	.65	1.55	.1	4.5	3.45	1.85	.9	1.1
27	.9	.3	.....	.....	.55	1.45	.1	3.8	2.6	1.35	.9	1.1
28	.8	.3	.....	.....	.45	5.35	.0	3.65	2.25	1.2	.9	1.1
29	.8	.....	.....	.....	.35	5.15	.0	3.5	2.05	1.1	.9	1.1
30	.8	.....	.....	.....	.3	3.65	2.2	3.4	1.85	1.05	.9	1.0
31	.8	.....	.....	.....	.3	.....	7.5	3.25	.....	1.2	.....	1.0
1904.												
1	1.0	.8	0.5	0.95	1.05	1.65	.65	1.05	.25	6.95	2.2	3.8
2	1.0	.8	.5	.9	6.0	1.45	.55	.85	.05	6.4	2.2	3.8
3	1.0	.8	.5	13.76	4.1	1.25	.45	.75	.0	5.55	2.25	3.7
4	1.0	.8	.4	5.6	3.1	1.05	3.05	.65	.0	5.5	2.3	3.6
5	1.0	.8	.4	5.15	4.6	.85	1.9	.55	.0	5.15	2.45	3.45
6	1.1	.8	.4	3.95	2.0	1.5	3.4	.5	.0	6.7	2.5	3.3
7	1.1	.8	.4	1.95	1.55	11.5	2.2	.4	4.6	5.45	2.65	3.3
8	1.1	.8	.35	1.65	1.6	12.2	1.5	.35	7.6	4.7	2.8	3.3
9	1.1	.8	.3	1.45	8.3	8.2	1.15	6.0	7.7	4.4	2.8	3.25
10	1.1	.7	.3	1.25	8.0	4.8	.9	3.65	8.9	4.1	2.9	3.15
11	1.1	.7	.3	1.05	4.7	2.5	.8	3.55	6.75	3.95	2.9	3.1
12	1.05	.7	.3	.9	2.55	2.1	.7	4.7	2.75	3.85	2.8	3.1
13	1.0	.7	.3	.8	2.0	1.85	.6	5.1	12.2	3.7	2.8	3.0
14	1.0	.7	.2	.75	7.35	1.55	.5	3.25	6.15	3.45	2.8	3.0
15	1.0	.8	.2	.65	11.25	1.95	.4	2.35	15.25	3.25	2.8	2.95
16	1.0	.8	.2	.6	7.85	1.75	.4	2.85	27.0	3.1	2.7	2.9
17	1.0	.8	.2	.5	3.75	1.55	.35	2.65	22.5	3.0	2.7	2.9
18	1.0	.75	.2	.5	2.3	1.35	.3	2.3	13.8	2.9	2.55	2.85
19	1.0	.7	.2	.5	1.65	1.15	.25	1.7	9.6	2.8	3.1	2.8
20	1.0	2.0	.2	.4	1.45	2.0	.2	1.3	6.75	2.7	2.8	2.8
21	.9	2.3	.1	.4	1.3	6.5	.2	.95	6.1	2.6	2.8	2.8
22	.9	1.5	.1	.4	1.15	4.1	.2	.9	16.6	2.55	2.7	2.8
23	.9	1.1	.1	.35	.95	2.55	.1	.8	15.6	2.5	2.7	2.8
24	.9	.95	.1	2.0	.9	3.0	.1	.75	8.45	2.4	2.7	2.8
25	.9	.85	.1	2.75	.9	2.05	6.8	1.15	6.5	2.35	2.7	2.8
26	.85	.7	.1	1.75	.9	1.35	4.8	.95	10.2	2.25	2.7	2.7
27	.8	.6	.1	1.3	.8	.95	3.4	.65	18.45	2.2	2.7	2.6
28	.8	.6	2.7	1.05	.8	.85	2.55	.55	15.6	2.2	2.7	2.5
29	.8	.6	1.9	1.05	1.15	.75	2.15	.45	9.65	2.2	2.7	2.5
30	.8	.....	1.3	1.3	3.3	.65	1.7	.4	8.0	2.2	2.7	2.6
31	.8	.....	1.1	.....	2.15	.....	1.25	.35	.....	2.2	.....	2.6
1907.												
1	2.9	2.3	1.7	1.0	1.85	5.05	1.55	1.2	.8	1.75	2.55	3.5
2	2.9	2.35	1.7	1.0	1.6	6.6	1.45	1.2	.8	1.55	2.6	3.85
3	2.9	2.3	1.7	1.0	1.5	3.6	1.4	1.2	.8	1.4	2.4	3.55
4	2.85	2.3	1.8	1.0	6.1	3.05	18.2	1.1	.8	1.3	2.4	3.35
5	2.8	2.2	1.75	1.0	20.75	2.55	9.7	1.1	.8	1.2	2.35	3.2
6	2.8	2.2	1.7	.9	8.15	2.2	9.0	1.05	.7	1.1	2.3	3.05
7	2.7	2.15	1.7	.9	5.0	2.05	8.0	1.0	.7	2.55	2.3	2.9
8	2.7	2.1	1.7	.9	3.15	1.85	17.4	1.0	.7	2.0	2.25	2.8
9	2.7	2.1	1.6	.8	2.75	1.75	9.25	1.0	.65	3.6	2.2	2.75
10	2.7	2.1	1.6	.8	2.55	1.65	4.8	1.0	.6	3.9	2.2	2.7
11	2.7	2.1	1.6	.8	11.9	1.6	3.85	.95	.6	3.25	2.2	2.6
12	2.6	2.1	1.5	2.65	5.5	1.5	3.7	.9	2.05	2.5	3.3	2.55
13	2.6	2.1	1.5	2.5	4.15	1.5	4.2	.9	3.8	2.15	3.0	2.5
14	2.6	2.0	1.5	2.2	2.95	1.4	3.45	.9	2.65	1.85	3.1	2.4
15	2.6	2.0	1.5	2.05	2.7	1.4	2.75	.85	2.0	1.7	2.7	2.4

Daily gage height, in feet, of Rio San Juan near Santa Rosalia ranch, Tamaulipas, Mexico, for 1902 to 1904, 1907, and 1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
16	2.5	2.0	1.45	1.9	2.25	1.4	2.35	0.8	1.6	1.6	2.6	2.3
17	2.5	2.0	1.4	1.8	2.15	1.4	2.1	.8	1.5	1.5	2.55	2.3
18	2.5	1.95	1.4	1.7	2.05	5.65	1.95	.8	1.45	1.4	2.5	2.3
19	2.5	1.9	1.4	1.7	1.9	7.4	1.75	.9	1.45	1.3	2.5	2.25
20	2.5	1.9	1.35	1.6	6.95	4.8	1.7	1.0	1.4	1.3	2.4	2.2
21	2.4	1.9	1.3	1.5	8.25	3.95	1.6	.9	1.35	1.6	2.3	2.2
22	2.4	1.8	1.3	1.7	4.7	3.15	1.55	1.5	3.15	1.95	2.2	2.2
23	2.35	1.8	1.3	1.8	2.95	2.75	1.5	1.35	4.0	3.2	2.1	2.1
24	2.3	1.8	1.2	1.6	2.5	2.55	1.4	1.2	2.4	4.1	2.0	2.1
25	2.3	1.8	1.2	1.5	2.25	2.3	1.7	1.15	1.7	3.55	2.0	2.1
26	2.3	1.7	1.2	1.4	2.05	2.05	1.65	1.1	1.55	4.45	1.9	2.0
27	2.3	1.7	1.1	3.85	16.6	1.9	1.55	1.0	2.2	3.85	1.95	2.0
28	2.3	1.7	1.1	4.15	20.8	1.85	1.45	9.5	3.6	3.4	2.0	2.0
29	2.3	.....	1.0	2.8	8.6	1.75	1.4	.9	2.6	3.1	2.1	1.95
30	2.3	.....	1.0	2.15	5.2	1.65	1.3	.9	2.0	2.85	2.5	1.9
31	2.3	.....	1.0	.....	3.9	.....	1.3	.85	.....	2.65	.....	1.9
1908.												
1	1.9	1.8	1.2	.6	1.5	4.1	2.0	6.25	.8	2.5	1.3	1.0
2	1.9	1.7	1.2	.6	1.45	2.9	1.9	4.9	.8	2.3	1.3	1.0
3	1.9	1.7	1.2	.6	1.35	2.15	1.9	3.15	.7	1.6	1.15	2.55
4	1.9	1.7	1.1	.6	1.3	1.75	2.15	2.4	.7	1.4	1.0	2.25
5	1.9	1.7	1.1	.6	1.25	1.4	4.85	2.0	.7	1.25	1.0	1.85
6	1.9	1.7	1.1	.6	1.2	1.3	3.9	1.75	.6	1.15	.95	1.55
7	1.9	1.6	1.0	.6	1.1	1.2	2.45	1.5	.6	1.0	.9	1.4
8	1.9	1.6	1.0	.6	1.0	1.1	1.95	1.35	.6	1.0	.9	1.3
9	1.85	1.6	1.0	.6	1.0	1.0	2.7	1.35	.65	.95	.8	1.2
10	1.8	1.6	1.0	.6	.9	.9	2.95	1.55	1.0	.9	.8	1.2
11	1.8	1.6	.9	6.8	.9	.8	1.95	1.4	.9	.9	.8	1.1
12	1.8	1.5	.9	14.05	.8	.8	1.65	1.15	.8	1.35	15.95	1.1
13	1.8	1.5	.85	13.75	1.3	.75	1.45	1.0	.7	1.25	5.85	1.1
14	1.75	1.5	.8	11.05	3.15	.7	2.7	.95	.7	1.0	4.4	1.0
15	1.7	1.5	.8	5.6	17.5	.7	3.75	.9	1.15	1.0	3.5	1.0
16	1.7	1.4	.8	3.8	10.3	.65	2.55	.85	.9	.95	3.0	1.0
17	1.7	1.4	.8	3.0	4.8	.6	2.1	.8	2.3	.9	2.45	1.0
18	1.7	1.4	.8	2.4	3.35	.6	1.8	.8	3.4	.9	2.15	1.0
19	1.7	1.4	.8	2.0	2.65	.5	1.65	.7	3.05	.9	1.75	1.0
20	1.65	1.4	.7	11.0	2.15	.5	1.5	.7	2.25	.8	1.55	1.1
21	1.6	1.4	.8	10.05	1.85	.5	1.35	4.2	2.35	.7	1.45	1.0
22	1.6	1.4	.8	7.25	1.65	.5	1.15	1.8	2.85	.7	1.3	1.0
23	1.6	1.3	.8	3.85	1.3	.4	.9	1.35	3.7	4.05	1.2	1.0
24	1.6	1.3	.8	2.7	1.2	1.75	1.45	1.7	2.5	5.0	1.2	1.0
25	1.6	1.3	.8	2.3	1.35	10.45	1.3	1.7	1.9	3.9	1.2	1.0
26	1.55	1.3	.8	2.1	1.8	6.6	1.15	1.45	1.6	2.9	1.2	1.0
27	1.5	1.3	.8	1.8	1.6	3.35	1.0	1.25	1.45	2.2	1.1	1.0
28	2.2	1.3	.8	1.75	1.35	5.4	.95	1.05	1.3	1.75	1.0	1.0
29	2.05	1.3	.7	1.7	1.25	3.75	.9	1.0	1.15	1.6	1.0	1.0
30	1.9	.....	.7	1.55	1.15	2.7	.9	.9	1.15	1.5	1.0	1.0
31	1.8	.....	.6	.....	8.35	.....	13.1	.85	.....	1.3	.....	1.0

MISCELLANEOUS MEASUREMENTS IN RIO GRANDE DRAINAGE BASIN.

The following miscellaneous discharge measurements were made in the Rio Grande drainage basin in 1907 and 1908:

Miscellaneous discharge measurements in Rio Grande basin in 1907 and 1908.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Nov. 10, 1907	Willow Creek	Rio Grande	Creede, Colo		[a] 20
Mar. 17, 1908	Dry Gulch	do	Wason, Colo		[a] 2
June 11, 1907	Fox Creek	Conejos	Mogote, Colo		[a] 30
June 27, 1907	do	do	do		[a] 2
July 30, 1907	do	do	do		0
Nov. 8, 1907	do	do	do		0
May 18, 1908	do	do	do		[a] 2
June 9, 1908	do	do	do		0
July 31, 1907	San Antonio	do	Antonito, Colo		[a] 50
May 18, 1908	do	do	do	[b] 11.37	723
June 9, 1908	do	do	do	[b] 12.55	282
May 5, 1908	Lucero Creek	Rio Taos	In canyon 10 miles above Taos, N. Mex.		43.7
Do	do	do	Above ditch near Taos, N. Mex.		33.2
Do	do	do	Above Pueblo pasture near Taos.		7.1
Nov. 13, 1907	Mimbres River	Rio Grande	At dam site near Faywood Hot Springs, N. Mex.		19.4
May 17, 1907	Bonita Creek	Hondo River	Fort Stanton, N. Mex.		10.6
May 18, 1907	do	do	Below diversions at Peter's farm, above Fort Stanton, N. Mex.		8.2
Do	Bonita Creek, West Fork.	do	Just above forks, near Parsons, N. Mex.		4.5
Do	Bonita Creek, South Fork.	do	Just above forks, near Parsons, N. Mex.		8.0
Oct. 25, 1907	Fresnal River	Penasco River	High Rolls, N. Mex		10.3
Oct. 24, 1907	Alamo River	do	At Wood's ranch, 10 miles southeast of Alamo Gordo, N. Mex.		3
Feb. 1, 1907	Black River	Pecos River	Kennon's ranch, sec. 8, T. 27 N., R. 26 E, New Mexico.		0.25
Sept. 22, 1907	do	do	Above Judkins's ranch, sec. 3, T. 27 N., R. 26 E.		1.1
Do	do	do	Below Judkins's ranch, sec. 24, T. 28 N., R. 26 E.		9.6
Mar. 26, 1907	Black River canal	Black River	U. S. R. S. canal at spillway, 600′ below headgate and between R. 27 and R. 28 E, New Mexico.	.34	2.1
Do	do	do		.41	2.4
Do	do	do		1.02	11.1
Do	do	do		.84	7.8
Do	do	do		.58	4.2
Feb. 1, 1907	Blue Spring Creek	do	Judkins's ranch, sec. 27, T. 28 N., R. 26 E.		15
Sept. 22, 1907	do	do	Above Judkins's dam, sec. 28, T. 28 N., R. 26 E.		15.2
Do	do	do	Below Judkins's dam, sec. 27, T. 28 N., R. 26 E.		0.25
Feb. 1, 1907	Blue Spring canal, North Branch.	Blue Spring Creek	do		0.9
Do	Blue Spring canal, South Branch.	do	do		1.8

[a] Estimated.

[b] Water surface measured down from cross painted at foot of truss post, downstream side of bridge, 33 feet from right abutment of bridge. Highway bridge 1 mile south of Antonito.

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