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# Sixth Biennial Report of the State Engineer and Surface Water Supply of New Mexico for the 11th and 12th Fiscal Years, December 1, 1922 to November 30, 1924

James A. French

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SIXTH BIENNIAL REPORT  
OF THE  
STATE ENGINEER  
AND  
SURFACE WATER SUPPLY  
OF  
NEW MEXICO

FOR THE 11th AND 12th FISCAL YEARS  
DECEMBER 1, 1922 TO NOVEMBER 30, 1924.

OFFICE COPY  
STATE ENGINEER  
SANTA FE, NEW MEXICO  
THIS COPY MUST NOT BE  
REMOVED FROM OFFICE

JAMES A. FRENCH  
STATE ENGINEER  
SANTA FE, N. M.



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Hon. James F. Hinkle,  
Governor of New Mexico.

Sir:

I have the honor to submit to you herewith the  
Sixth Biennial Report of the State Engineer covering  
the period ending November 30th, 1924.

Respectfully,

JAMES A. FRENCH,  
State Engineer.

Santa Fe, New Mexico,  
December 1st, 1924.



# BIENNIAL REPORT OF STATE ENGINEER

## INTRODUCTION

This report covers the activities of the State Engineer's Office for the Sixth Biennial Period ending November 30th, 1924.

It is not deemed advisable to include in it the mass of detailed data that have been gathered in the several branches of the work, nor is it possible to give a full synopsis of those special investigations provided for by the last legislature and not yet completed.

## PERSONNEL

The personnel of the State Engineer's Office during this biennial period has been as follows:

State Engineer.....	James A. French
Deputy State Engineer.....	George M. Neel
Water Rights Attorney.....	Bradley M. Thomas
Assistant State Engineer.....	Mark Lambert
Hydrographer.....	A. M. Archer
Draftsman.....	Sam Houston
Office Engineer.....	C. E. Perkins
Field Engineers.....	{ J. S. Ledlie H. G. Neel Hugo Marek, Jr.
Stenographer and Bookkeeper.....	Miss Elizabeth G. Phelps

Much of the accounting and disbursing is handled through a co-operative agreement with the Accounting Department of the Highway Engineer's Office.

SUMMARY OF FILINGS FOR WATER RIGHTS AND ACTION THEREON DURING THE PERIOD  
FROM DECEMBER 1, 1922, TO NOVEMBER 30, 1924

No. filed for Irrigation Purposes.	No. of Acres to be Irrigated.	Ac. Ft. of Water to be Used.	Ac. Ft. of Water to be Stored.	No. filed for Power Purposes.	No. of H. P. Generated.	No. filed for Miscellaneous Purposes.	Ac. Ft. of Water to be Used.	Estimated Cost of Construction.	Aver. Duty of Water in Ac. Ft. per Acre.
Notice of Intention to make Formal Application .....	42	466,064.50	580,841.50	352,663.50	17	139,846.00	3	2,586.53	2,263
Notice of Intention to make Formal Application Cancelled .....	50	159,309.50	94,629.50	25,350.00	9	62,708.00	4	1,390.20	2,298
Formal Application to Appropriate Water .....	68	75,678.48	115,928.57	136,326.93	2	10,007.50	4	349.22	2,924
Formal Application to Appropriate Water Cancelled .....	57	194,832.25	78,493.70	261,551.50	5	5,505.00		\$2,912,435.00	2,390
Formal Application to Appropriate Water Approved .....	70	61,389.43	70,550.76	13,228.14	3	34.80	9	1,835.94	2,420
Certificates of Construction Issued .....	73							\$ 899,923.01	
Licenses to Appropriate Water Issued .....	59	15,506.13	21,399.46	1,015.32	2		7	122.92	2,289
Applications to Change Place of Use or Point of Diversion Filled and Approved .....	10								
Extensions of Time Granted .....	148								

## IRRIGATION FEES ACCOUNT

## ELEVENTH FISCAL YEAR

Balance in First National Bank, Nov. 30, 1922..... \$6,410.59

## Receipts to June 8, 1923:

Applications ..... \$2,038.57  
Interest on Deposits ..... 79.03  
Total Balance and Receipts ..... \$8,528.19

## Disbursements to June 8, 1923:

Expense of Inspections and Hearings ..... 184.00  
Refunds to Applicants ..... 533.13  
Earned Fees to State Treasury ..... 4,119.41  
Miscellaneous Expense ..... 40.00  
Balance June 8, 1923 (First National Bank)..... \$3,651.65  
Transferred from First National Bank to State Treasury, June 8, 1923 ..... 3,651.65  
Balance June 8, 1923 (State Treasury) ..... \$3,651.65

## Receipts:

Applications ..... \$2,307.59  
Total Balance and Receipts ..... \$5,959.24

## Disbursements:

Expense of Inspections and Hearings ..... \$ 460.90  
Refunds to Applicants ..... 524.20  
Earned Fees to State Treasury ..... 1,077.84  
Balance Nov. 30, 1923 (State Treasury) ..... \$3,896.30

## TWELFTH FISCAL YEAR

Balance in State Treasury, Nov. 30, 1923 ..... \$3,896.30

## Receipts:

Applications ..... \$3,706.33  
Total Balance and Receipts ..... \$7,602.63

## Disbursements:

Expense of Inspections and Hearings ..... \$ 222.49  
Refunds to Applicants ..... 447.65  
Earned Fees to State Treasury ..... 2,690.19  
Balance Nov. 30, 1924 (State Treasury) ..... \$4,242.30



STATE OF NEW MEXICO  
OFFICE OF THE STATE ENGINEER  
EX-OFFICIO SECRETARY OF THE  
BOARD OF EXAMINING SURVEYORS  
SANTA FE

December 15, 1924,

Hon. J. F. Hinkle,  
Governor of the State of New Mexico,  
Santa Fe, New Mexico.

Sir:

I have the honor to herewith present my report of the Board of Examining Surveyors for the 11th and 12th Fiscal Years.

Respectfully,

(Signed) JAMES A. FRENCH,  
State Engineer and Ex-Officio  
Secretary of the Board of Ex-  
amining Surveyors.

### SURVEYORS' LICENSE LAW

Chapter 102, Laws of 1917. An Act Defining Surveying and Licensing Surveyors. Approved March 13, 1917.

Under this Act, a Board of Examining Surveyors is appointed, who pass on the fitness of applicants.

The present members of the Board are:

Geo. M. Neel.....	President
James A. French.....	Secretary
N. Howard Thorpe.....	Member

The following is a complete list of licenses issued from November 30, 1922 to November 30, 1924.

No. 197	C. B. Beyer.....	Albuquerque, New Mexico
No. 198	Allison L. Kroeger.....	Durango, Colorado
No. 199	Rollin Ritter.....	Durango, Colorado
No. 200	F. T. Beckett.....	Tucumcari, New Mexico
No. 201	A. E. St. Morris.....	Los Lunas, New Mexico
No. 202	Neal Hanson.....	Cimarron, New Mexico
No. 203	Wm. H. Wigglesworth.....	Durango, Colorado
No. 204	Kenneth S. Ferguson.....	Durango, Colorado
No. 205	R. G. Balcomb.....	Algodones, New Mexico
No. 206	Harry A. Aurand.....	Denver, Colorado
No. 207	Martin J. Dwyer.....	Santa Fe, New Mexico
No. 208	Paul M. Bowen.....	E. Las Vegas, New Mexico
No. 209	Iley N. Selph.....	Ranches of Taos, New Mexico
No. 210	John J. Etter.....	Albuquerque, New Mexico
No. 211	Edw. D. White.....	Raton, New Mexico
No. 212	F. H. Todd.....	Tularosa, New Mexico
No. 213	J. F. Thomas.....	Manassa, Colorado
No. 214	Albert Suter.....	Albuquerque, New Mexico
No. 215	Charles H. Laidlaw.....	Fairview, New Mexico

No. 216	T. O. James.....	Des Moines, New Mexico
No. 217	John L. Kleiner.....	Gallup, New Mexico
No. 218	J. Pendleton Wood.....	Vermejo Park, New Mexico
No. 219	W. Chester Campbell.....	E. Las Vegas, New Mexico
No. 220	Wm. S. Post.....	Los Angeles, California
No. 221	Glenn R. Haste.....	Santa Fe, New Mexico
No. 222	David W. Thornburg.....	Santa Fe, New Mexico
No. 223	L. M. Armstrong.....	E. Las Vegas, New Mexico
No. 224	R. J. Davis.....	Farmington, New Mexico

### FINANCIAL STATEMENT SURVEYORS' LICENSE FUND

#### ELEVENTH FISCAL YEAR.

##### Receipts:

Balance December 1, 1922 .....	\$217.86
Receipts from Licenses issued .....	80.00

##### Disbursements:

Printing .....	\$ 60.30
Balance November 30, 1923 .....	237.56
	\$297.86
	\$297.86

#### TWELFTH FISCAL YEAR.

##### Receipts:

Balance December 1, 1923 .....	\$237.56
Receipts .....	60.00
Balance November 30, 1924 .....	\$297.56
	\$297.56
	\$297.56

### RIO GRANDE IMPROVEMENT

There has been only such work done on Rio Grande Improvement as could be taken care of by the unexpended balance remaining in that fund from an appropriation made by the 1919 Legislature. These funds have been very sparingly placed where the destructive flood conditions in the valley made it most imperative, and then only when the beneficiaries agreed to match the State funds with an equal amount in cash, labor or materials. In some cases the cost of work has been distributed equally to State, County and Community whose lands are affected.

There are points along the Rio Grande which are much in need of assistance in protection against floods. Notable among these is San Marcial which is now several feet below the river channel, and which owes its present existence largely to its own heroic efforts and assistance given by the State and the Santa Fe Railroad.

#### Financial Statement

Balance December 1, 1922 .....	\$4,848.78
Wages .....	\$3,181.92
Subsistence .....	15.55
Supplies .....	220.17
Transportation .....	251.80
Printing .....	100.19
Balance December 1, 1924 .....	1,079.15
	\$4,848.78
	\$4,848.78



## PECOS RIVER COMPACT COMMISSION

Chapter 64 of the Session Laws of 1923 is entitled, "An Act to Provide for the Appointment of a Commission on Behalf of the State of New Mexico to Negotiate a Compact or Agreement Between the United States of America, the States of New Mexico and Texas, Respecting the Use, Storage and Distribution of the Waters of the Pecos River and the Rights of Said States thereto, and Making an Appropriation Therefor."

Under the provisions of this Act Hon. Richard H. Hanna, Albuquerque, New Mexico, was appointed by the Governor, as the New Mexico Member of the Commission. A representative of this office has been called upon to be present at many meetings and conferences, and in a general way to act as engineering advisor to the New Mexico Member of the Commission.

The final meeting was held in El Paso, Texas, December 16th to 19th, 1924, at which time and place a final draft of a compact was duly signed by the members of the Commission. This compact, which becomes effective only after being ratified by the legislatures of the States of New Mexico and Texas, and consented to by the Federal Congress, is as follows:

### LETTER OF TRANSMITTAL.

El Paso, Texas, February 10, 1925.

Hon. Hubert Work,  
Secretary of the Interior,  
Washington, D. C.

Hon. Miriam Ferguson,  
Governor of Texas,  
Austin, Texas.

Hon. A. T. Hannett,  
Governor of New Mexico,  
Santa Fe, New Mexico.

On December 19, 1924, the undersigned submitted to the Secretary of the Interior and the Governors of Texas and New Mexico a form of compact relative to the division of the waters of the Pecos River proposed to be entered upon between the States of Texas and New Mexico. Upon the convening of the New Mexico Legislature it was found serious objections existed to some of its provisions that might lead to its rejection by that body. Another meeting of the Commission was therefore called and met at Santa Fe, New Mexico, on February 4, 1925. After a long discussion minor changes have been made in the proposed compact which it is believed will not materially affect the interests of the water users of either State. All those who objected to the original form of the compact and others present expressed themselves as satisfied with the revision which is herewith submitted.

In view of the facts stated it is requested that the compact dated

December 19, 1924, be cancelled or withdrawn and in its place the one attached hereto, dated February 10, 1925, be substituted and submitted to your respective Legislatures for their approval.

RICHARD H. HANNA,  
Commissioner for New Mexico.  
R. E. THOMASON,  
Commissioner for Texas.  
C. T. PEASE.

## PECOS RIVER COMPACT

The State of Texas and the State of New Mexico having resolved to enter into a compact, under the acts of their respective legislatures, have, through their governors, appointed as their commissioners: R. E. Thomason for the State of Texas, Richard H. Hanna for the State of New Mexico, who, after negotiations participated in by C. T. Pease, appointed by the Secretary of the Interior of the United States, as representative of the Bureau of Reclamation, have agreed upon the following articles:

### ARTICLE I.

Present rights to the beneficial use of the water of the Pecos River and its tributaries are unimpaired by this compact, the major purposes of which are to provide for the equitable division and apportionment of the unappropriated and flood waters of the Pecos River system; to promote interstate comity; to remove causes of present and future controversies and to secure the expeditious agricultural development of the Pecos River Basin by the conservation and economical distribution of the waters therein.

### ARTICLE II.

In this compact:

(a) The State of New Mexico and the State of Texas are designated respectively as "New Mexico" and "Texas" and these terms include the citizens and corporations of each State.

(b) The term "Pecos River System" means the Pecos River and all of its tributaries, including springs and swamps, from its sources in New Mexico to the Kansas City, Mexico and Orient Railroad as now constructed between the towns of Alpine and Sherwood in Texas.

(c) The term "Pecos River Basin" means all of the drainage area of the Pecos River system.

(d) The term "Upper Basin" means that part of the Pecos River Basin above and north from a due east and west line crossing the Pecos River on the boundary between Townships Six (6) and Seven (7) North, Range Twenty-two (22) East of the New Mexico Principal Meridian.

(e) The term "Middle Basin" means that part of the Pecos River Basin below and south from a prolongation of the boundary line between Townships Six (6) and Seven (7) North, Range Twenty-Two (22) East of the New Mexico Principal Meridian to the Texas-New Mexico State line.



(f) The term "Lower Basin" means that part of the Pecos River Basin within the State of Texas lying above and northwest of the Kansas City, Mexico and Orient Railroad.

(g) The term "domestic use" shall include the use of water for household, stock, municipal, milling, industrial, railroad and other like purposes.

(h) The term "Carlsbad Project" means certain tracts of land in Townships Twenty (20), Twenty-one (21), Twenty-two (22), Twenty-three (23), Twenty-four (24), Twenty-five (25), and Twenty-six (26), South, Ranges Twenty-six (26), Twenty-seven (27), Twenty-eight (28) and Twenty-nine (29) East of the New Mexico Principal Meridian, and all reservoirs, dams, canals, drains, and other works, constructed or that may hereafter be constructed, by the United States for the reclamation, use and benefit thereof.

### ARTICLE III.

The right to appropriate and use for irrigation and domestic purposes the natural flow of the Pecos River system in the Upper Basin shall not be limited or abridged by this compact but no permit or permits for the construction of any additional storage reservoir or reservoirs or for the enlargement of any existing reservoir within the Upper Basin, having an aggregate capacity or capacities of more than ten thousand (10,000) acre feet, shall be granted by the State of New Mexico prior to the first day of January, 1940.

### ARTICLE IV.

Within the Middle Basin New Mexico shall have in perpetuity infeasible rights in the waters of the Pecos River system to divert and use from either or both natural flow or storage reservoirs, constructed or to be constructed, sufficient water, whenever available, for all domestic purposes and the irrigation of seventy-six thousand (76,000) acres of land.

### ARTICLE V.

Texas shall at all times, subject to the provisions of Articles III, IV and IX of this compact, have the right:

1. To divert all the natural flow of the Pecos River system in the Lower Basin for domestic and agricultural purposes.

2. To build, maintain and operate a storage reservoir or reservoirs at or below what is commonly known as the Red Bluff Reservoir site, in Eddy County, New Mexico, for the use and benefit of forty thousand (40,000) acres of land in Loving, Reeves, Ward, Crane and Pecos Counties, Texas, and to store any surplus waters to which Texas may be entitled, and to acquire by purchase, prescription or the exercise of eminent domain, such rights of way, easements, or lands as may be necessary for the construction, maintenance and operation of said reservoir; *Provided*, that said reservoir shall be constructed and in operation on or before the first day of January, 1940, and, *Provided Further*, that the construction, maintenance and operation of said reservoir shall not vest

in Texas any prior, preferred or superior servitude upon or claim or right to the waters of the Pecos River in New Mexico.

### ARTICLE VI.

All surplus water flowing in the Pecos River within the Middle and Lower Basins, over and above that required for domestic use, and the adequate and proper irrigation of seventy-six thousand (76,000) acres of land in the Middle Basin and forty thousand (40,000) acres of land in the Lower Basin, shall be divided equally between the signatory states. All permits issued by either New Mexico or Texas, prior to January first, 1940, for the use of the surplus waters shall specifically state that the rights granted by said permits are and shall be subservient to prior rights for seventy-six thousand (76,000) acres of land in the Middle Basin and forty thousand (40,000) acres of land in the Lower Basin.

### ARTICLE VII.

1. Texas and New Mexico, at their joint expense, shall maintain a stream gaging station upon the Pecos River at or near Malaga, Eddy County, New Mexico, for the purpose of ascertaining the amount of surplus water flowing in said river. The location of said gaging station may, by mutual consent, be changed from year to year as conditions of the river may require.

2. The State Engineer of New Mexico and the Board of Water Engineers for Texas shall make provisions for the cooperative gaging of and the details of operating said station and for the exchange and publication of records and data relative to the discharge of the river at said station.

### ARTICLE VIII.

The use of any impounded water of the Pecos River system for the generation of electrical power shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent the use for such dominant purposes.

### ARTICLE IX.

Notwithstanding any limitations or restrictions, either expressed or implied, in this compact upon the area to be irrigated in the Middle Basin, New Mexico shall have the right on and after January first, 1940, to extend and increase the irrigated area within the Middle Basin, over and above seventy-six thousand (76,000) acres, one-fifth (1/5) of an acre:

- (1) For each and every acre foot that the aggregate effective storage capacity of all reservoirs, now or hereafter constructed for the use of the Lower Basin shall be less than two hundred and fifty thousand (250,000) acre feet;

- (2) For each and every acre foot of the original capacity or capacities, of any and all reservoirs, constructed for the use and benefit of the Lower Basin that have been or may be abandoned or unused for a period of five (5) years, or longer.



## ARTICLE X.

Nothing in this compact shall be construed as affecting the rights of the United States of America in the waters of the Pecos River system or in the Carlsbad Project.

## ARTICLE XI.

It shall be the duty of the State Engineer of New Mexico and the Board of Water Engineers for Texas to supervise the carrying out of the provisions of this compact, within their respective states, and they may from time to time formulate rules and regulations for that purpose, which, when promulgated by them, shall be binding until amended or terminated.

## ARTICLE XII.

Whenever any official of either State is designated to perform any duty under this compact, such designation shall include the State official or officials upon whom the duties now performed by such designated official or officials may hereafter devolve.

## ARTICLE XIII.

Should any claim or controversy arise between the signatory states (a) with respect to the waters of the Pecos River system not covered by the terms of this compact; (b) over the meaning or performance of any of the terms of this compact; (c) as to the allocation of the burdens incident to the performance of any article of this compact; or (d) as to the construction, maintenance or operation of storage works within New Mexico for the use and benefit of Texas; the governors of the signatory states, upon the request of either one of them, shall forthwith appoint commissioners with power to consider and adjust such claim or controversy, subject to ratification by the legislatures of New Mexico and Texas.

## ARTICLE XIV.

Nothing in this compact shall be construed to limit or prevent either State or the United States from instituting or maintaining any action or proceeding, legal or equitable, for the protection of any right under this compact or the enforcement of any of its provisions.

## ARTICLE XV.

Nothing in this compact shall be construed to affect the right to appropriate, under the laws and regulations of New Mexico and Texas, any waters that if unappropriated and unused would not contribute to the flow of the Pecos River.

## ARTICLE XVI.

This compact may be modified or terminated at any time by mutual consent of the signatory states. In the event of such termination the rights established under it shall continue unimpaired.

## ARTICLE XVII.

This compact shall become binding and operative when approved by the legislatures of each of the signatory states and consented to by the Congress of the United States. Notice of approval by the legislatures shall be given by the governor of each State to the governor of the other State and to the President of the United States, and the President of the United States is requested to give notice to the signatory states of consent by the Congress of the United States.

IN WITNESS WHEREOF, the Commissioners have signed this compact in triplicate originals, one of which shall be deposited with the Department of the Interior of the United States and one with the governor of each of the signatory states.

Done at El Paso, Texas, this 10th day of February, A. D. 1925.

(Signed) RICHARD H. HANNA,  
Commissioner for New Mexico.

(Signed) R. E. THOMASON,  
Commissioner for Texas.

Approved:

(Signed) C. T. PEASE.

## RIO GRANDE COMPACT COMMISSION

Chapter 112 of the Session Laws of 1923 is entitled "An Act Providing for the Appointment of a Commissioner on Behalf of the State of New Mexico to Negotiate a Compact or Agreement Respecting the Use, Control and Disposition of the Waters of the Rio Grande River and for Other Purposes."

Under the provisions of this Act, Hon. Julian O. Seth, of Santa Fe, was appointed by the Governor to act as the New Mexico Member of the Commission. Numerous meetings and conferences were held and many data compiled. It was decided at a meeting held in Colorado Springs, October 26th, 1924, when Mr. J. O. Seth for New Mexico, D. E. Carpenter for Colorado, and Hon. Herbert Hoover for the Federal Government were present, that all interests could be best served by continuing the Commission to give the State of Texas an opportunity to be represented on the Commission and take part in the negotiations. This will necessitate additional legislation on the part of each of the three states.

The formulation of a pact between the three states fixing and determining the right of those states to the use, control and disposition of the waters of the Rio Grande system, opens up many intricate and far reaching phases of the subject and a great deal of work has been done looking toward their final solution. Because of incomplete records or a total absence of necessary data along many lines, assumptions and estimates must eventually be made and such work must finally be acceptable to the engineering departments of all three states.

This work, and a recognition and understanding of the many complicated engineering problems of the Rio Grande places upon this de-



partment a grave responsibility and it is hoped that adequate financial provision will be made, that the work may proceed without hindrance.

## HYDROGRAPHIC SURVEYS

### PECOS

The Pecos Hydrographic Survey, which was started in 1920, has been finished and final report made to the District Federal Court.

### DRY CIMARRON

Under date of March 6th, 1923, this office received an order from the court of the Eighth Judicial District for a hydrographic survey of the Dry Cimarron Stream System in Union County. There were practically no funds available for this work, and finally on agreement of the water users on the river, through their attorney, D. A. Paddock of Clayton, under which they were to advance the additional funds necessary, the work was undertaken.

Because of the failure of the water users to advance the funds agreed upon and because there were none in the Hydrographic Survey Fund, the work had to be abandoned.

### MIMBRES

There has also been filed with this office under date of October 11th, 1923, an order from the Court of the Sixth Judicial District, for a hydrographic survey of the Mimbres River Stream System in Grant and Luna Counties, New Mexico. This work could not be undertaken because there was no money available for that purpose in the Hydrographic Survey Fund.

## PECOS HYDROGRAPHIC SURVEY

### Financial Statement—Total Expenditures

Total Receipts from U. S. Reclamation Service..	\$18,000.00
Sale of Equipment .....	200.00
State Funds .....	31,931.15
Expenditures—1920 .....	\$11,649.51
1921 .....	15,556.73
1922 .....	15,460.67
1923 .....	7,464.24
1924 .....	493.16
Additional State Funds .....	493.16
	\$50,624.31
	\$50,624.31

## PECOS HYDROGRAPHIC SURVEY

### Financial Statement

Balance December 1, 1922 .....	\$8,279.75
Salaries .....	\$5,257.01
Subsistence .....	563.20
Miscellaneous Supplies .....	615.87
Transportation .....	1,521.32
Balance December 1, 1924 .....	322.35
	\$8,279.75
	\$8,279.75

## DRY CIMARRON HYDROGRAPHIC SURVEY

### Financial Statement

Balance December 1, 1922 .....	\$ 535.00	\$1,056.56
Salaries .....	207.95	
Subsistence .....	62.72	
Miscellaneous Supplies .....	235.02	
Transportation .....	25.87	
Balance December 1, 1924 .....		\$1,056.56
		\$1,056.56

## SAN JUAN BASIN INVESTIGATIONS

### CHAPTER 144.

An Act to Appropriate Money for the Establishment of Permanent Water Reservoirs for Irrigation Purposes, by Surveys, Investigations and Borings, to Determine the Substrata for Dam Sites and Storage Reservoirs on the San Juan River Water Shed and for Reclamation Purposes.

H. B. No. 228; Approved March 13, 1923.

*Be It Enacted by the Legislature of the State of New Mexico:*

Section 1. That the State Engineer is hereby directed, with all convenient speed, to make, or cause to be made, investigations as to feasibility of storage reservoirs for the purposes of flood control and for the reclamation of unproductive lands; to make surveys of the capacities thereof, and to make borings at the sites for such dams in order to determine the sub-strata for foundations, cut-off walls and under-pinnings therefor and to make cross-sections, maps and reports thereof on the San Juan River water shed at the sites selected by State Engineer, as may, upon investigation and survey, be deemed advisable, and feasible.

The State Engineer shall proceed to make such borings to determine the sub-strata for the purpose of determining the condition thereof for foundations for dams, as herein provided, in the order mentioned herein, and shall make complete maps, cross-sections and reports thereof, which shall be public records and filed in the office of the State Engineer.

The State Engineer is hereby authorized to cooperate with the U. S. Government or with any Department, Bureau, Agency or official thereof to attain the purposes herein specified.

That the sum of Twelve Thousand Five Hundred (\$12,500) Dollars or so much thereof as may be necessary, be and the same is hereby appropriated for the purpose of paying for the said borings, and for all purposes as provided in this Act.

Said sums of money hereby appropriated shall be paid out on warrants of the State Auditor, supported by proper itemized vouchers signed by the State Engineer, out of any monies in the Treasury to the credit of the "Water Reservoirs for Irrigation Purposes Income Fund" not otherwise appropriated.

In accordance with the provisions of this Act, under date of September 12th, 1923, a cooperative contract was entered into with the Bureau of Reclamation under which that Department agreed to carry on the work contemplated by the Act and furnish funds up to \$10,000 for one-half its cost.

This work was completed and report submitted to this office on December 1st, 1924. In order to give a general idea of the conditions



and results, there is reproduced hereafter the introduction, synopsis, conclusions and recommendations of the report.

## REPORT AND ESTIMATE ON ANIMAS PROJECT

New Mexico-Colorado.

By C. C. Fisher, Engineer.

August, 1924.

### INTRODUCTION

The proposed Animas Project is located in the San Juan Basin in southwestern Colorado and northwestern New Mexico. The plan of the project is for a storage reservoir on the Animas River above Durango; a diversion from the Animas just below Durango; a main canal from this point running southwesterly for 45 miles and discharging into the La Plata River above the State line; a diversion from the La Plata about one mile below the State line; a main canal from this point running southwesterly for 12 miles and discharging into the Meadows reservoir; and a distribution system from these two main canals and from the Meadows reservoir for the irrigation of the arable lands thereunder extending from the Animas River on the east to the range of mountains known as the "Hogback" on the west, and to the San Juan River on the south. The arable lands of the project are greatly scattered over a large tract which nearly 80% is waste land of a mountainous or "bad lands" character. The required canals and principal laterals are long for the area covered, and they will generally be located in difficult territory of deeply eroded sandstone or shale hills, often with precipitous slopes. Cross drainage will be a serious problem, both in construction and operation, owing to frequent heavy summer rains and to the easily eroded surface. The storage problem is comparatively simple as a low dam will provide large capacity at the Animas reservoir site, except that a heavy right of way expense will be involved as the lands to be submerged are highly improved, and also two highways and a railroad paralleling the river must be removed. It is likely that considerable opposition will be raised to the construction of this reservoir, especially on the part of the city of Durango, as it would destroy the beautiful little Animas valley which is the only agricultural land in the immediate vicinity of the city and it would also submerge Trimble Springs, a popular hot springs resort; and also, the D. & R. G. W. Railroad Company will likely oppose the reservoir as it would result in a less favorable location for their road changing it from a valley to a mountain line with increased curvature. The Meadows reservoir is planned for secondary storage only in order to insure a more dependable water supply at the lower end of a long canal system. It is a favorable site and its construction problems are simple.

2. The investigation of the Animas project was occasioned by frequent inquiries or statements regarding large unappropriated water supplies in the San Juan Basin and large areas of undeveloped arable lands, and therefore, large irrigation possibilities. Also, the State of New Mexico in 1923, appropriated \$12,500 for irrigation investigation in the San Juan Basin, which Act provided for cooperation with the

Federal Government, and the State Engineer of New Mexico invited the Bureau of Reclamation to make the investigation in behalf of the State on a cooperative basis. Accordingly, a contract was entered into between the United States and the State of New Mexico in which each party allotted \$10,000 for such investigation. The first step in this work was to make a reconnaissance of the Basin as a whole, including a review of previous irrigation reports and data thereon, both public and private, with a view to determining the most probable feasible project or projects, that would include lands in the State of New Mexico. This reconnaissance resulted in deciding on the Animas project as the most favorable outlook on which to make a more detailed survey, which was accordingly done and the results of which surveys and studies are outlined in this report.

### SYNOPSIS OF REPORT

3. *Area.*—The gross area within the outer limits of the project is 270,000 acres. The net irrigable area is 60,000 acres of which 6,950 acres have a partial water right from the La Plata River. Nine thousand seven hundred acres of the net area lies in Colorado and the balance is in New Mexico.

4. *Status of Lands.*—Three thousand three hundred acres of the net area are in the Southern Ute Indian Reservation. Ninety per cent of the balance is estimated as entered or patented, and 10 per cent as public. The holdings are generally in tracts of 160 acres or less of irrigable land, though there are a few larger ones.

5. *Transportation.*—Freight rates are high due to high mountain grades and to narrow gauge railroads.

6. *Markets.*—Market conditions are unfavorable due to limited local market and to high freight rates.

7. *Population.*—The project area and the Basin as a whole is sparsely settled. The largest town in the Basin is Durango with a population of 4,100.

8. *Industries.*—Durango is a mining and smelter town. The other towns in the vicinity of the project are purely agricultural including fruit raising and livestock. There are large coal, natural gas, and oil deposits in the Basin.

9. *Previous Investigations.*—This project was investigated by the Reclamation Service in 1904-05 on the plan of diverting above Durango from the Animas reservoir dam; the results of this were unfavorable. Several private or State investigations have been made for diversions from the Animas River or its branches, both above and below Durango. None of these schemes have materialized and none look favorable.

10. *Geology.*—The San Juan Basin is of sedimentary origin. The strata are alternately a sandstone and shale; the older are a marine deposit and the latter a fresh water deposit. The beds generally lie nearly horizontal except near the "Hogback" to the west where they dip sharply toward the center of the Basin. The surface strata in the lower



end of the project is the older or marine deposit and that on the upper end is the recent or fresh water deposit.

11. *Soils*.—The soils of the project are of shale and sandstone origin. They are generally a medium heavy sandy loam of good texture and are quite deep. The soil fertility is generally good.

12. *Drainage and Alkali*.—Surface drainage conditions are favorable, due to the heavy fall to the south and to the many deep arroyos. These arroyos will serve as trunk line drains for any artificial drainage required. In localities where shale soils predominate, especially of the marine deposits, the presence of alkali is evident, and it is expected that tile drainage will be required. This is especially the case at the lower end of the project in the basin known as "The Meadows" and also in the lower end of the McDermott Glade in the La Plata Valley.

13. *Floods and Flood Protection*.—The Animas River is not subject to extreme floods. The La Plata River has occasional high floods of short duration but no material damage results. Summer floods are prevalent in the foothill arroyos and considerable cutting of the high earth banks results, but the areas damaged are comparatively small. No flood protection is contemplated.

14. *Land Values*.—Land values in the Basin range from a minimum of \$5.00 per acre for unimproved grazing land to \$200.00 per acre for the best improved lands in the Animas and San Juan Valleys.

15. *Elevation and Latitude*.—The elevation of the project lands ranges from 5,200 to 6,400 feet above sea level. The latitude is 37° north.

16. *Temperature and Growing Season*.—The mean monthly temperature ranges from a minimum of 24 degrees in January at Durango to a maximum of 73 degrees in July at Aztec or Farmington. The growing season is about 150 days on the upper end of the project and 180 days on the lower end.

17. *Precipitation*.—The mean annual precipitation at Durango is 20 inches of which 39½% falls during the growing season, and that at Farmington is 8½ inches of which 56% falls during the growing season.

18. *Duty of Water*.—The duty of water in acre-feet per acre adopted for prior rights and for project lands, is as follows:

Month	%	P R I O R   R I G H T S				Project Lands	
		Animas in Colo.	Animas in New Mexico	La Plata in N. Mex.		Net	Gross
May	20	1.0	0.60	0.90	0.80	0.50	0.80
June	30	1.5	0.90	1.35	1.20	0.75	1.20
July	20	1.6	0.60	0.90	0.80	0.50	0.80
August	20	1.0	0.60	0.90	0.80	0.50	0.80
September	10	0.5	0.30	0.45	0.40	0.25	0.40
Total	100	5.0	3.00	4.50	4.00	2.50	4.00

19. *Canal Capacities*.—The canals and principal laterals are designed with a capacity ranging from one second foot to 50 acres at the head of the main canal to one second foot to 70 acres at the lower end of the system.

20. *Source of Water Supply*.—The project's water supply will come from the Animas River at Durango, Colorado. No water is figured as available from the La Plata River.

21. *Runoff*.—The mean annual runoff of the Animas River at Durango, Colorado, for the 28-year period 1896 to 1923, is 741,000 acre feet. The lowest year of record is 1902 with a runoff of 306,000 acre-feet. There is a period in the record of four consecutive low years, namely 1899 to 1902, with a mean runoff of 393,000 acre-feet.

22. *Prior Rights and Return Flow*.—The prior rights from the Animas River diverting below Durango, including the Aztec power right of 200 second feet and the Farmington power right of 150 second feet, require a maximum diversion in June of 1,119 second feet. The estimated return flow available for rediversion is 608 second feet. The net maximum requirement that must be deducted from the gage record at Durango is therefore 500 second feet. This requirement expressed in acre-feet per annum amounts to 168,000 acre-feet.

23. *Water Supply and Project Requirements*.—The mean annual available water supply at Durango for project lands is 573,000 acre feet. The available supply for the low year of 1902 was 145,000 acre feet. The project water requirement is 226,000 acre-feet per annum at the point of diversion.

24. *Water Supply from La Plata River*.—The waters of the La Plata River are greatly over appropriated, both in Colorado and New Mexico. The "La Plata River Compact" permits the State of Colorado to store for its own use practically all of the flood and winter flow of the stream. There is, therefore, no dependable storage water supply from the La Plata River for New Mexico lands.

25. *Return Flow in La Plata Valley*.—The low summer flow of the La Plata at the State line is mainly return water from Colorado irrigation. This return flow will increase with storage development in Colorado and it may eventually be sufficient for the needs of the 6,900 acres of prior right lands in New Mexico. No return flow is figured for project lands in the La Plata valley, or to the west of this valley.

26. *Storage Requirements*.—A 100,000 acre-foot reservoir is proposed at the Animas site on the Animas River just above Durango, with provision in the plans for increasing this to 150,000 acre-feet at some future time. This capacity will result in four years of deficiency in the 28 years of record, with a maximum deficiency of 38% for the year 1902.

27. *Reservoir Losses*.—The net evaporation loss on the Animas reservoir, evaporation minus rainfall, is estimated at 2.57 feet in depth per annum, and the seepage loss at 2.40 feet in depth, making a total loss of approximately 5 feet in depth over the water surface.

28. *Future Depletion of Water Supply*.—There is no probability of future depletion of the Animas River water supply from that herein figured as available. Any possible depletion would be small and may be provided for when required by increasing the Animas reservoir capacity.

29. *Excess Water Supply*.—For the project considered and after providing for prior rights with their possible extensions, there is a mean annual reservoir spill or excess water supply of 27,800 acre-feet. For the four consecutive low years above mentioned the total spill with a 100,000 acre-feet reservoir is 89,000 acre-feet and the total deficiency,



111,000 acre-feet, with a 150,000 acre-foot reservoir the spill is about 9,000 acre-feet in excess of the deficiency.

30. *Silt*.—The Animas River is a comparatively clear stream and no troubles from silt deposits are expected.

31. *Secondary Storage*.—The Meadows reservoir, located near the lower end of the project, is proposed with a capacity of 11,400 acre-feet. The sole purpose of this reservoir is to furnish a more dependable service at the lower end of a long and treacherous canal, and to provide a spillway. The irrigable area under this reservoir is 10,670 acres.

32. *Animas Reservoir*.—This is a favorable storage site. A dam 4 feet in height from river surface to spillway crest will furnish the proposed capacity of 100,000 acre-feet. A height of 57 feet would impound 150,000 acre-feet and 86 feet, 300,000 acre-feet. The dam will be founded in a glacial moraine which has formed the Animas Valley and through which the river has cut a narrow channel. This moraine material is well graded from clay to very large granite boulders. It is anticipated that seepage will occur under and around the dam but not to a dangerous degree. An earth-fill type of dam is proposed. A 40,000 second feet spillway will be provided around the left abutment. The outlet will have a capacity of 3,000 second feet and will discharge back into the river.

33. *Animas River Diversion Dam*.—This damsite is located just below the city of Durango. A low overfall concrete weir is proposed with a crest length of 170 feet. The site is especially favorable; it is narrow and the abutments and river bed are sandstone bedrock. The main canal will divert from the right abutment with a headgate capacity of 1,430 second feet.

34. *La Plata River Diversion Dam*.—This damsite is located about one mile below the State line at the point where the "Hogback" crosses the river. An overfall concrete weir is proposed with a maximum height above low water of 11 feet. It will be founded on gravel except for the right abutment which will be in sandstone. A crest length of 300 feet is proposed. The main canal will divert from the right abutment with a headgate capacity of 530 second feet. A small headgate will be provided on the left side to pass the prior rights.

35. *Meadows Reservoir*.—This reservoir site is located just over the summit to the west of the La Plata, in the head of the basin locally known as "The Meadows." The lower rim of the reservoir basin is formed by a spur of the Hogback which crosses The Meadows. A narrow gap in this tilted sandstone reef forms the damsite. A dam 56 feet in height from ground surface to spillway crest and with a crest length of 810 feet will provide a capacity of 11,400 acre-feet, which is about the limit available due to the height of the rock reef. An earth-fill type of dam is proposed. A 220 second feet capacity outlet gate is provided in the north end of the dam, to discharge into a stilling pool from which the two distributing canals will divert. A spillway capacity of 300 second feet is provided.

36. *Canal and Lateral System*.—One hundred seventy and four tenths miles of canals and principal laterals are proposed. A considerable portion of this length will be in difficult country both from the

point of view of construction and operation. Nearly 50% of the main canal from the Animas to the La Plata River requires a higher type of construction than an unlined or earth section. A summary of the types of construction required for the entire system is tabulated as follows:

Types of Construction	Miles	Per Cent.
Unlined Canal	130.6	76.6
Concrete Lined Canal	26.5	15.6
Bench Flume	4.5	2.6
Siphon	1.5	0.9
Tunnel	7.3	4.3
Totals	170.4	100.0

37. *Power Possibilities*.—There are no commercial power possibilities in connection with the project. Many canal drops are required, but there are no attractive pumping areas nearby. Pumping is not contemplated.

38. *Alternative Irrigation Plans*.—A number of plans for diversion from the Animas River or its branches have been considered by different parties. None of these, in the judgment of the writer, appear feasible. These plans are listed as follows:

- The "Interstate Irrigation System," which proposed to divert from the Animas about 25 miles north of Durango for the irrigation of the La Plata Valley in Colorado and New Mexico.
- The "Trans-Mountain Diversion Project" which proposed to divert from Hermosa Creek about 17 miles north of Durango, and to pick up Junction and Lightner Creeks for the irrigation of the La Plata valley in Colorado.
- The "La Plata Project" which was surveyed by the U. S. Reclamation Service in 1904-05. This proposed a diversion from the Animas River in the Animas reservoir dam just above Durango.
- The "Eden Canal Project" which proposed a west side diversion from the Animas River about 5 miles north of the State line, the canal to siphon back to the east side for the irrigation of lands along the east side of the Animas and the north side of the San Juan River.
- The "Lower Animas Project" which proposed a diversion at the same point as the Eden Canal Project but to run to the west for the irrigation of a portion of the lands under the project proposed in this report. This project was surveyed in connection with the present investigation.
- The "Overland Project" which proposed a diversion from the west side of the Animas about two miles south of the State line for the irrigation of a portion of the lands under the present proposed project.
- The "La Plata River Project" which proposed a storage and diversion on the La Plata at the State line and storage in the Meadows reservoir for the irrigation of the La Plata valley in New Mexico and the Meadows, which is a part of the area under the present proposed project.



39. *Possible Project Extensions.*—By extending the proposed Canal from the Meadows reservoir it is possible to cover an irrigable area estimated at 85,000 acres on the mesa lying between the San Juan River on the south and the Hogback on the east and the Mancos River on the northwest. This area is mainly in the Navajo Indian Reservation with a smaller portion in the Southern Ute Indian Reservation. The water supply is sufficient for 60,000 acres of this tract except for the four consecutive low years above mentioned. This could be increased to 75,000 acres by the extinguishment of the Aztec and Farmington power rights which could be done by the construction of 44 miles of power line. Surveys into the Navajo Reservation were not made in this investigation because of disapproval of the plan by the Office of Indian Affairs.

40. *Estimated Cost of Project:*

Animas Reservoir .....	\$ 1,715.9
Animas Diversion Dam .....	29.9
Main "A" Canal .....	7,555.5
La Plata Diversion Dam .....	65.1
Main "C" Canal .....	503.5
Meadows Reservoir .....	324.6
Main Distributaries .....	2,206.1
Miscellaneous, including sub-laterals and drainage....	1,928.1
Total Cost.....	\$14,329.1

41. *Estimated Cost per Acre:*

New lands .....	53,150 A. @ \$257.4
Partial right lands.....	6,950 A. @ 96.6
Total.....	60,100 A. @ \$238.4

42. *Operation and Maintenance Cost.*—The operation and maintenance cost of the Animas project is estimated at from 40% to 50% in excess of the average for the Government projects, or, based on the 1923 costs, about \$2.00 per acre of irrigable land.

43. *Legal Status.*—The prior water rights involved are adjudicated except as to the Animas River in New Mexico. There are no organizations of the project lands.

44. *Demand for Irrigated Lands.*—There is no material demand for further irrigation in the San Juan Basin at the present time.

### CONCLUSIONS

45. As a result of the investigations of the Animas Project as herein outlined, it is concluded that the project is infeasible at the present time for the following reasons:

- Transportation and marketing conditions are unfavorable.
- There is no material demand for further irrigation development in the basin at this time.
- The available acreage outside of the Navajo Indian Reservation is not sufficient in comparison to the magnitude of the major structures required.
- The cost per acre is excessive.

### RECOMMENDATIONS

46. It is recommended:
- That no further action be taken on the Animas Project at the present time, or until such time as transportation and marketing conditions are favorable and there is a keen demand for further agricultural development in the San Juan Basin.
  - That no further consideration be given the project without the inclusion of the Navajo and Southern Ute Indian Reservation lands that may be brought thereunder, lying north of the San Juan River.
  - That the adjudication of the Animas River waters in New Mexico be required prior to the approval of any Project diverting from this stream.

C. C. FISHER,  
Engineer.

### SAN JUAN INVESTIGATIONS

#### Financial Statement.

Appropriation, 1923 .....		\$12,500.00
Salaries .....	\$ 4,786.84	
Subsistence .....	57.99	
Transportation .....	2,319.06	
Miscellaneous Supplies .....	173.61	
Balance, December 1, 1924 .....	5,162.50	
	<hr/>	<hr/>
	\$12,500.00	\$12,500.00

### REPORT OF PROGRESS UPON THE ESTANCIA VALLEY IRRIGATION INVESTIGATION

The Legislature of New Mexico in its session of 1923 enacted as follows:

#### CHAPTER 40

An Act to appropriate Money for the Establishment of Permanent Water Reservoirs, for Irrigation by Drilling Wells in and Testing the Water Supply of the Estancia Valley and Providing for Surveys and Reports and the Making of Other Investigations and Tests Relative to Said Matters.

H. B. No. 60, Approved March 6, 1923.

Be It Enacted by the Legislature of the State of New Mexico:

Section 1. That the sum of twenty-five thousand dollars (\$25,000) or so much thereof as may be necessary, be, and the same is hereby appropriated for the purpose of locating and establishing permanent water reservoirs, whether under or above ground, for irrigation purposes and for making the necessary investigations, tests, surveys and development in the shallow water belt of Estancia Valley in and about the vicinity of the towns of Moriarty, McIntosh, Estancia and Willard, in Torrance County, New Mexico, and for the purpose of investigating and reporting on the feasibility of reclaiming and irrigating the lands in said vicinity by means of artesian wells, pumping plants, dams and reservoirs or by any of said means; which lands



are now unfit for agricultural purposes other than by the processes of dry farming. Said investigations, tests, surveys and developments shall be made by or under the direction of the State Engineer or with his permission under Federal authority, and the State Engineer is hereby authorized to co-operate with the U. S. Reclamation Service or any other Federal agencies. Said money hereby appropriated shall be paid out on the warrants of the State Auditor supported by proper itemized vouchers signed by the State Engineer, out of any moneys in the treasury to the credit of the "Water Reservoirs for Irrigation Purposes Income Fund" not otherwise appropriated."

In conformity to the above Act of the Legislature, the State Engineer communicated with and entered into a co-operative contract with the U. S. Bureau of Reclamation, under which the said Bureau undertook to execute the investigations as contemplated and to co-operate to the extent of \$10,000 of Federal aid towards the cost thereof.

Mr. O. E. Meinzer, engineer in charge of ground water investigations for the U. S. Geological Survey and Mr. Charles H. Lee, a specialist in the same line of work, were then detailed for the preliminary investigations.

These two, in company with Deputy State Engineer, George M. Neel, proceeded to Estancia Valley and made a ten days' study of the local conditions, the results of which were codified into a report by Mr. Lee. This included plans and method proposed to be followed in the investigation and also a preliminary report on the probable amount of water that is available for irrigation by pumping in the valley. In addition to the plans as submitted by Mr. Lee, Mr. Meinzer in a memorandum advised and recommended additional activities to an extent which would aggregate a cost for experimental purposes far in excess of the total appropriations and allotments.

This data was submitted to the Chief Engineer of the Bureau and in a letter from him to the State Engineer he recommended as follows: "The funds available from State appropriations and Federal allotments as provided by the co-operative contract will, of course, be entirely inadequate for any such program, even if the possibilities of the development were sufficiently attractive to justify so large an expenditure, but under the decidedly unfavorable tentative conclusions reached it appears doubtful if expenditures of additional funds for any part of the program is advisable." On January 1, 1924, the Commissioner recommended to the Secretary of the Interior that the contract be terminated. The State Engineer was of the opinion that the funds provided by appropriation and allotment were sufficient, with certain modifications, to adequately determine the questions involved in the act of the legislature.

Meantime a committee of citizens from the Estancia Valley urgently requested the State Engineer to procure the annulment of the contract with the Department of the Interior and proceed with an independent investigation. On February 23, 1924, the Secretary of the Interior formally authorized the termination of the contract, which was done on April 8, 1924. The State Engineer, after obtaining an opinion from the Attorney General of the State that he was legally authorized to do so, determined to proceed with the investigation by drilling experimental wells, and subjecting them to a series of tests and modifications which would ultimately develop many of the pertinent data.

On April 24, 1924, a representative was employed to procure necessary data from measurements of the existing wells in various parts of the valley and in July, 1924, an experienced engineer was detailed and upon his findings and report active work commenced.

Three sites were selected for drilling test wells, located as follows:

Well No. 1 on Sec. 16 T. 9 N., R. 8 E near Moriarty.

Well No. 2 on Sec. 23 T. 7 N., R. 8 E. near Estancia.

Well No. 3 on Sec. 36 T. 5 N., R. 8 E. near Willard.

It will be noted that two of these locations are upon state owned land. Well No. 2 was located on privately owned land on account of its peculiarly favorable position, not far from Estancia and topographically indicative of the central valley zone which is thought to be most susceptible of irrigation. In this case the proposed activities of the State were safeguarded by a formal agreement with the owner.

A reconnaissance of the Valley tended to show that the central zone extending from north to south was most favorable for experimental purpose in so far as irrigation requirements controlled. This belt is subject to the minimum rainfall and is apparently free from alkali saturation.

The requisite amount of casing and supplies were purchased in open market after several quotations had been requested and received. In response to an advertisement four bids for drilling were submitted, varying in price for the first hundred feet from \$4.00 per foot to \$17.00 per foot for 12" diameter holes and from \$8.00 to \$24.00 per foot for 18" diameter holes. The lowest bidder, D. H. Cowley of Estancia, was awarded the contract.

Drilling upon Well No. 2 commenced on October 20, 1924, and was continuous until its completion.

Previous investigation of adjacent wells indicated that quicksand would be encountered at about 60 feet and provision was made for this in the large size hole so that a gravel strainer could be used around an inner 12" casing.

An accurate log of materials entered was recorded and samples procured from each stratification. At a depth of three feet a sluggish sheet of water was developed. This was in soft pink limestone, disappearing after a depth of four feet and the amount was so small that it must be considered negligible for utilitarian purposes. Upon reaching a depth of one hundred feet the drill hole was reduced in size from 18" diameter to 12" and at a depth of one hundred and thirty-two feet a live water bearing strata of brown porous sandstone was encountered which continued to a depth of one hundred and forty-two feet.

A perforated 12" casing was then inserted and the intermediate space between the two casings filled with screened gravel and the outer one withdrawn. A tentative pumping test obtained a continuous discharge of some over 200 minute gallons with a drawdown of 47 feet.

Drilling is now being conducted at Well No. 1 near Moriarty. It is planned to drill, test and conduct experiments at all three of the well locations in such a manner as to develop all possible data in regard to water supply, reclamation and costs pertaining to drilling, pumping and distribution. When these items have been determined it can then be



decided what further work is indicated to complete the investigation and a complete and detailed report then made.

Following is the report made by Mr. Lee:

*Charles H. Lee*

## PROPOSED GROUND WATER INVESTIGATIONS IN

### ESTANCIA VALLEY, NEW MEXICO

#### PRELIMINARY STUDY OF AVAILABLE WATER

The Estancia Valley has no drainage outlet, the precipitation upon the valley and bordering slopes and runoff from tributary hill and mountain drainage areas either being absorbed by the bed rock and valley fill or collected in surface depressions and lakes. In either case practically all the water is finally dissipated by evaporation locally from the valley. The nature and structure of the geological formations surrounding and underlying the valley precludes the existence of subterranean drainage outlets with one possible exception. The Magdalena limestone formation as exposed on the East slope of the Manzano Mountains, is traversed by the principal stream channels entering the valley. This formation extends southward beneath rocks of a later period and is found beyond the drainage limits of the valley at much lower elevations to the South and Southeast. This formation is bedded and blocky and may absorb appreciable amounts of water where exposed. Whether such water is entirely accounted for in the flow of limestone springs along the margin of the valley, or whether some of it finds its way out of the valley by subterranean channels, can only be determined by intensive observation and study.

The possibility of any source of ground water in Estancia Valley, other than local precipitation and runoff is remote. The floor of the valley lies at an elevation of over one thousand (1,000) feet higher than the adjacent Rio Grande Valley to the West, or the Pecos Valley to the East, and well drillings indicate that igneous rocks underlie the valley at a comparatively shallow depth. Sedimentary rock at higher elevation borders the valley on the Northeast but lies in a narrow neck transversely intersected by two igneous dykes of unusual length and thickness. The probability of water entering the sedimentary rocks underlying the valley from this direction is very remote.

It thus appears, that in solving the problem of determining the quantity of ground water available for development in Estancia Valley, the more or less standardized methods applicable to closed basins can be used. These involve a study of intake and discharge from the basin and water table fluctuations. With present information, roughly approximate figures can be stated as the probable results of the intensive application of such methods.

The total area of Estancia Valley and its tributary drainage area is approximately two thousand (2,000) square miles. This area may be roughly segregated as follows:

Open valley .....	1,150	Square miles
Mesa, hills and steeper marginal slopes.....	550	" "
Pedernal Hills .....	150	" "
Manzano Mts.—Tajique Canyon South to but not including Barranco Canyon (high) .....	82	" "
Manzano Mts., North of Tajique Canyon (low) .....	68	" "

Total.....2,000 " "

The only portion of the tributary drainage area productive of important runoff is the higher portion of the Manzano Mountains from Tajique Canyon South. A small amount of runoff, largely in the form of floods from summer thunder storms, reaches the valley from the lower portion of the Manzano Mountains north of Tajique Canyon, and from the Pedernal Hills.

Precipitation records have been kept in or adjacent to Estancia Valley more or less intermittently by the U. S. Weather Bureau as indicated in the following table:

Station	Elevation Feet	Location	Years of Complete Record	Length Record Years	Av. Annual Precipitation as Observed.
Stanley .....	6,317	Valley	1909-10-12-13-19 to 22	10	12.00
Moriarty .....	6,200	"	1909 to 12 1916 to 19	8	13.25
Estancia .....	6,100	"	1890-91, 1906-07-11, 13 to 17	9	13.41
Willard .....	6,100	"	1913 to 1917	5	
Barton .....	6,875	Foothills (N.W.)	1915 to 1922	8	16.18
Mountainair .....	6,487	Foothills (S.W.)	1903 to 1905 1907 to 1912 1914-17-19 1920-21	14	16.69
Tajique (near) .....	9,820	Crest Manzano Mts.	1913 to 16, 1918	5	
Tajique .....	7,100	"	1920 to 22	3	
Torrance .....	6,433	Outside (S.E.)	1910 to 22	13	12.86
Duran .....	6,272	Outside	1909 to 22	14	13.81
Palma .....		" (E)	1916 to 22	7	
Galisteo .....	6,074	" (N)	1894 to 1903	10	12.61
Tijeras Canyon .....	6,500	" (N.W.)	1911 to 22	12	15.11

Detailed analysis of these observations indicates that the average annual depth of precipitation for typical areas is approximately as follows:

Open Valley—6,100-6,300 ft. elevation—13 inches.  
Foothills—6,400-6,800 ft. elevation—15 to 17 inches.  
Manzano Mts.—6,900-9,800 ft. elevation—17 to 32 inches.

The months of heaviest precipitation are July and August, those of lightest, November and December and occasionally May and June.



Nine dry years have occurred during the past twenty-nine years, often two following in succession, and in one instance, 1902, 1903 and 1904, three in succession.

The total precipitation falling upon Estancia Valley during a normal year is approximately as follows:

	Sq. Mi.	Inches	Ac. Ft.
Open Valley .....	1,150	13	796,000
Foothills .....	550	16.5	484,000
Pedernal Hills .....	150	18	144,000
Manzano Mountains (high) .....	82	25	109,000
Manzano Mountains (low) .....	68	21	76,000
Total .....			1,600,000

Of this total more than fifty (50%) percent falls during the hot summer months and is almost immediately lost by evaporation or collects in the mountain canyons in sudden floods, which rush out upon the alluvial slopes. Precipitation during the balance of the year is in such small amounts that it largely evaporates, except that which falls as snow upon the mountain drainage areas and later appears as sustained runoff during March, April, May and June.

The canyons of the east slope of the Manzano Mountains yield most of the runoff reaching the valley, and are the only drainage areas tributary to the valley which yield runoff with sufficient regularity to make measurements feasible. The following table shows the results of stream flow observations made by the State Engineer of New Mexico on certain of these canyons:

#### Mountain Drainage Area (High)

Stream	Approx. Drainage Area Sq. Miles	Annual Runoff—Acre Feet				
		1916	1917	1918	Av. Total	Average Per Sq. Mile
Tajique Creek .....	11.5	7,330	440	185	2,652	230
Torreón Creek .....	20.3	18,000	2,050	179	6,743	332
Canon Nueva .....	14.4	2,660	8	41	936	190
Arroyo del Ojo .....		3,120	691	106	1,306	
Arroyo de los Pinos Reales .....		1,340	18	8	455	
Arroyo Colorado .....	5.5	2,230	75	45	783	142
Total .....	51.3	34,680	3,282	664	12,842	
Average .....		675				250

#### Mountain Drainage Area (Low)

Canon de Los Gallegos	23.4	590	207	244	347	15
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The last two of the three years of record were deficient in precipitation. The first year was above normal. The averages in the last two columns are less than they would be for a longer series of years more evenly balanced as between wet and dry years. Applying the data as it stands to the whole east slope of the Manzano Mountains the following figures are obtained for estimated runoff into Estancia Valley from this source. The total of 21,500 acre feet can certainly be considered as more than half of the runoff annually yielded by the 1,600,000 acre-feet falling as precipitation over the entire valley.

Canyons	Drainage Area		Runoff in Ac. Ft. Total	Percent of Precipitation on Drainage Area
	Sq. Mi.	per Sq. Mi.		
Tajique Creek South .....	82	250	20,500	19.0
North of Tajique Creek .....	68	15	1,040	1.3
Total .....	150		21,500	

The almost entire absence of freshly cut drainage lines, east of the New Mexico Central Railroad and other evidence, indicates that little of this water reaches the lowest depression of the valley even at time of flood. The water must therefore be absorbed by the porous formations adjacent to stream channels or lying beneath the areas flooded. A portion undoubtedly returns to the surface and evaporates, but much of this water reaches the water table, and together with the small amounts absorbed directly from rainfall and from flood runoff in other parts of the valley, replenishes the ground water supply. The intake method, if intensively applied as suggested in the program of field investigations' outlines above, should furnish a more accurate statement of the annual ground water intake, but the above figure of 21,500 acre-feet gives an approximate figure for preliminary use.

The discharge method involves the determination of evaporation and transpiration losses from shallow water areas in the valley. The salt grass area lies in one body west of the New Mexico Central Railroad between McIntosh and Willard. The salt basins on the center of the valley occupy the lowest depression of the old lake bed and are apparently the result of wind erosion cutting down the lake sediments to the water table. Between these two areas and to the north are a number of isolated depressions with shallow water table, probably incipient salt basins, which support a strong growth of red top. These three areas represent the principal areas from which ground water escapes although it is possible that the scattered chamisa brush in the valley is a habitual phreatophyte and draws from ground water. During the preliminary field trip the salt grass area was roughly mapped and the depth to water ascertained at typical points. Borings to the water table were also made in the red top areas and salt basins. From these preliminary field examinations and the writer's previous experience in measuring evaporation from various types of moist surfaces, average annual depths of evaporation were assigned to the various areas and an approximate estimate made of total ground water discharge from ground water having its source on the west side of the valley. The following table embodies the data used:

Discharge Area	Area—Acres	Assumed Depth of Evaporation Ft. per year	Total Ground Water Discharge—Acre-feet
Salt Grass .....	10,360	1.20	12,430
Red Top .....	6,700+	.75	5,025
Salt Basin .....	9,000	.50	4,500
Total .....			21,955

The total of practically 22,000 acre-feet representing ground water discharge is roughly comparable with the figure of 21,000 acre-feet representing total runoff and is in approximate agreement, the direct evaporation losses from runoff being offset by addition to ground water from direct rainfall absorption from local runoff in the valley, etc.



The runoff figures might be increased if available for a series of normal years. Similarly, the ground water discharge figures would probably be larger if the salt grass and red top areas were determined after a period of normal rainfall instead one of drought, the writer's experience having been that discharge areas are somewhat responsive to the annual variations of precipitation and runoff.

Ground water intake and discharge figures represent the maximum possible amount of water available for development. There are certain residual losses, however, due to physical or economic conditions which usually prevent full development of a ground water supply. For complete recovery of the ground water supply in this instance, the water table would have to be lowered throughout the valley possibly as much as ten feet in order to stop natural evaporation. Whether this would be possible in the salt basin area is a question, as the excavation process might be rejuvenated and the lake bottoms drop with the water table. It would appear quite reasonably feasible, however, to lower the water table ten (10) feet in the salt grass area without affecting that within the salt basin area and with but slight lowering in the red top area. With these changed conditions, which might be brought about by pumping properly located wells, the dependable ground water yield from wells between McIntosh and Willard, a distance of twenty (20) miles, might be as much as 15,000 acre-feet annually. As the average width of irrigable land between these two basins which overlies water free from excessive mineralization, is about four (4) miles, the above supply would irrigate 15,000 acres, or about thirty percent (30%) of the available land, at a duty of one acre-foot per acre. Less acreage could be served with greater use per acre. There are two limitations, however, which might operate to prevent the annual extraction of even 15,000 acre-feet from wells, namely, the economic pumping limit and the danger of drawing into the fresh water zone the highly mineralized water now confined to the center of the valley.

The data available in Water Supply Paper 275, confirmed by supplemental observations made by the writer, indicates that at the east edge of the salt grass zone the water table drops suddenly from 12 to 20 feet and from thence toward the area of highly mineralized water in the center of the valley maintains a very flat slope. Heavy pumping along the last margin of the salt grass zone, which in the vicinity of Estancia is but three (3) miles from the area of highly mineralized water, might easily lower the water table to such an extent that reversal of flow would occur with movement of mineralized water toward the west instead of fresh water toward the east, as exists under natural conditions. It is even possible that the controlling factor in determining the maximum depth from which water could be pumped would be the salt danger and not economics. Rough data available as to water table elevations and slopes indicate that very little irrigation pumping would be advisable east of the salt grass zone and that maximum lifts from wells in the salt grass zone should not exceed forty (40) feet if danger from salt water is to be avoided. This figure may be either increased or decreased by more complete data, but taken into consideration with the

fact that economics may limit the pumping to some figure between thirty (30) and fifty (50) feet, it is apparent that considering the probable non-uniformity of distribution of pumping wells and the necessary wide spacing, the complete suppression of the salt grass area is problematical. To the extent that the salt grass area persists will the available supply from wells be decreased.

The conclusions stated herein are tentative, based upon preliminary and very incomplete information, and are not to be considered as in any way limiting or foreshadowing the final conclusions to be reached after a year's intensive field work. It is believed that they may be of value, however, in making the distribution of funds available for the Estancia Valley investigation.

## ESTANCIA VALLEY INVESTIGATIONS

### Financial Statement

Appropriation, 1923 .....		\$25,000.00
Refund .....		34.16
Salaries .....	\$ 4,255.70	
Subsistence .....	172.05	
Transportation .....	1,471.58	
Supplies and Drilling .....	3,103.03	
Balance, December 1, 1924 .....	16,031.80	
	<hr/>	<hr/>
	\$25,034.16	\$25,034.16

## SANGRE DE CRISTO INVESTIGATION

### CHAPTER 145.

An Act to Appropriate Money for the Establishment of Permanent Reservoirs for Irrigating Purposes on the Streams and Water Courses on the Western Slope of the Sangre de Cristo Range in the State of New Mexico.

H. B. No. 271; Approved March 13, 1923.

*Be It Enacted by the Legislature of the State of New Mexico:*

Section 1. That the sum of Ten Thousand (\$10,000) Dollars, or so much thereof as may be necessary, be and the same is hereby appropriated for the purpose of the establishment of permanent reservoirs for irrigation purposes on the western water shed of the Sangre de Cristo Range and east of the Rio Grande, in the State of New Mexico, from State Line on the north to the south boundary line of Santa Fe County on the south; surveys and investigations and report to be made by, or under the direction of the State Engineer, and the State Engineer is authorized to co-operate with the U. S. Reclamation Service or other Federal agencies in the conduct of such work said investigations to be made looking towards the storage and diversion of all the unappropriated flood, normal, surface and underground waters of the natural streams and water courses on said western water shed of the Sangre de Cristo Range for irrigation purposes in the Counties of Taos, Rio Arriba and Santa Fe, State of New Mexico; and said monies to be paid out on warrants of the State Auditor supported by proper itemized vouchers signed by the State Engineer, out of any monies in the Treasury and not otherwise appropriated to the credit of the "Water Reservoirs for Irrigation Purposes Income Fund."



Sec. 2. That, because of the existing and prolonged drouth and resulting serious conditions for lack of food among the inhabitants of the State of New Mexico, it is necessary for the preservation of the public peace and safety of the inhabitants of the State of New Mexico that the provisions of this Act shall become effective at the earliest possible time, and, therefore, an emergency is hereby declared to exist and this Act shall take effect and be in full force and effect from and after its passage and approval.

In accordance with the provisions of the above law the matter of co-operation was taken up with the Bureau of Reclamation, but that bureau was of the opinion, that, since the proposed investigation did not include any features that might develop into a federal project, they could not co-operate.

This office has caused to be made surveys on those reservoir sites on the western slope of the Sangre de Cristo range that appeared to have merit. The sites surveyed are sixteen in number and located as shown in the following table:

#### RESERVOIR SITES AND THEIR APPROXIMATE LOCATION

No.	Stream	Location.
1	Rio Santa Fe.	10 Miles above Santa Fe.
2	Rio Santa Fe.	Near Lake Peak, 20 Miles above Santa Fe.
3	Rio Tesuque.	2 Miles from Bishop's Lodge on Road to Catron's Cabin.
4	Rio Nambe.	6 Miles from Nambe (At the Falls).
5	Rio Frijoles.	At Cundiyo.
6	Rio Medio.	At Tres Ranchos, 4 Miles from Cundiyo.
7	Rio Cordova.	1 Mile below Cordova.
8	Rio Santa Cruz.	At Junction of Rio Medio and Rio Frijoles, 1 Mile from Cundiyo.
9	Rio Santa Cruz.	1 Mile above Chimayo.
10	Rio Ranchos de Taos.	5 Miles from Ranchos de Taos.
11	Rio Ranchos de Taos.	6 Miles from Ranchos de Taos.
12	Rio Ranchos de Taos.	7 Miles from Ranchos de Taos.
13	Rio Fernando de Taos.	1 Mile below P. O. Gursdorf, 14 miles from Taos.
14	Red River.	½ Mile below Zwergle, 7 Miles above Red River Town.
15	Red River.	1 Mile below Red River Town.
16	Rio Latir.	10 Miles above Sunshine.

The contour maps of these sites are being finished and tracings prepared and the areas and capacities computed. In addition to these surveys, during the summer of 1924 special hydrographic studies have been made of the different streams and the ditches diverting from them. These studies include ditches distributed as follows:

Stream.	No. of Ditches	Stream.	No. of Ditches
Rio Santa Fe.....	16	Rio Taos.....	4
Rio Tesuque.....	10	Rio Pueblo.....	15
Rio Nambe.....	25	Rio Lucero.....	10
Rio Frijoles.....	2	Rio Seco.....	15
Rio Medio.....	4	Rio Hondo.....	8
Rio Chiquito (Cordova).....	4	Rio Colorado.....	2
Rio Santa Cruz.....	14	Rio Cabresto.....	6
Rio Ranchos.....	8		
Rio Chiquito.....	3	Total.....	146

It is expected that this investigation will be completed and report made some time this coming summer.

#### SANGRE DE CRISTO INVESTIGATION

##### Financial Statement

Appropriation, 1923 .....		\$10,000.00
Salaries .....	\$ 4,273.48	
Subsistence .....	401.51	
Transportation .....	1,139.43	
Miscellaneous Supplies .....	121.54	
Office Supplies .....	103.02	
Balance, December 1, 1924 .....	3,961.02	
	<hr/>	
	\$10,000.00	\$10,000.00

The following table shows the approximate location of the various sites mentioned in the text. The sites are numbered 1 through 14, and their locations are given in relation to the city of San Francisco. The locations are given in terms of distance from the city and the direction in which they are located.

APPROXIMATE SITES AND THEIR APPROXIMATE LOCATION

No.	Site	Location
1	San Francisco	San Francisco
2	San Francisco	San Francisco
3	San Francisco	San Francisco
4	San Francisco	San Francisco
5	San Francisco	San Francisco
6	San Francisco	San Francisco
7	San Francisco	San Francisco
8	San Francisco	San Francisco
9	San Francisco	San Francisco
10	San Francisco	San Francisco
11	San Francisco	San Francisco
12	San Francisco	San Francisco
13	San Francisco	San Francisco
14	San Francisco	San Francisco

The above table shows the approximate location of the various sites mentioned in the text. The sites are numbered 1 through 14, and their locations are given in relation to the city of San Francisco. The locations are given in terms of distance from the city and the direction in which they are located.

No.	Site	Location
1	San Francisco	San Francisco
2	San Francisco	San Francisco
3	San Francisco	San Francisco
4	San Francisco	San Francisco
5	San Francisco	San Francisco
6	San Francisco	San Francisco
7	San Francisco	San Francisco
8	San Francisco	San Francisco
9	San Francisco	San Francisco
10	San Francisco	San Francisco
11	San Francisco	San Francisco
12	San Francisco	San Francisco
13	San Francisco	San Francisco
14	San Francisco	San Francisco

OFFICE OF THE STATE ENGINEER

San Francisco, California

January 10, 1914

SURFACE WATER SUPPLY

I have the honor to acknowledge the receipt of the letter of the State Engineer, dated January 10, 1914, and to inform you that the same has been forwarded to the proper authorities for their consideration.

Very respectfully,

JAMES A. HARRIS

State Engineer

OFFICE OF THE STATE ENGINEER

Santa Fe, New Mexico

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September 30, 1924.

To His Excellency,  
Hon. James F. Hinkle,  
Governor of New Mexico.

Sir:

I have the honor to submit herewith my report on the investigations of the surface water supply of New Mexico for Climatic years 1923 and 1924 as carried on under the authority of House Bill No. 77, approved June 8, 1912.

Respectfully yours,

JAMES A. FRENCH,  
State Engineer.



# SURFACE WATER SUPPLY

OF NEW MEXICO, 1923-1924

This report is the tenth of a series containing results of stream gaging on New Mexico Streams, said series covering nine calendar years from 1911 to 1919 inclusive, a nine month period from January 1, to September 30, 1920, and four climatic years; and is published as a continuation of former reports for the information of anyone interested in the surface water supply of New Mexico.

In addition to the above series, the first and second biennial reports of the Territorial Engineer contain results for the years 1907, 1908, 1909 and 1910.

For a list of New Mexico Gaging Stations and length of record for each station, with reference to the U. S. G. S. publication in which such records may be found prior to 1911 see pages 25-28 of the State Engineer's Report on the Surface Water Supply of New Mexico, 1911-1912.

## DIVISION OF WORKS

Eugene W. Griffin was in charge of this work for the period October 1, 1922 to March 1, 1923, and was succeeded by Mark Lambert who has served in that capacity for the rest of the entire period. Samuel Houston, Almon Archer and Homer G. Neel have given able assistance as Hydrographers. Miss Elizabeth G. Phelps was employed as clerk and stenographer for a short time.

## ACCOMPLISHMENT

There are run-off records for 67 stations in this report distributed among the drainage basins of the State as follows:

Canadian .....	14	Rio Grande .....	27
Gila .....	1	San Francisco .....	1
Mimbres .....	2	San Juan .....	12
Pecos .....	10		

During the two years 791 discharge measurements were made at the regular stations by State Hydrographers.

## COOPERATION AND ACKNOWLEDGMENT

Of the 67 stations for which run-off records are published, the records for four were furnished by the State Engineer of Colorado, two by the Project Manager of the Carlsbad Project, U. S. R. S., the record for the Rio Grande at San Marcial by the Project Manager of the Rio Grande Project, U. S. R. S., at El Paso, and the record for the Pecos River at Carlsbad by the District Engineer, U. S. G. S., Austin, Texas.

The gage heights on the Whitewater near Mogollon were furnished by the Socorro Mining and Milling Company. The gage heights on the Vermejo at Dawson were furnished by Phelps, Dodge and Company, Dawson, New Mexico.



## FINANCIAL STATEMENT

## STREAM GAGING FUND

## 11th Fiscal Year

Balance Dec. 1, 1922 .....		\$ 1,680.24
Appropriation 11th Fiscal Year .....		15,000.00
Salary Gauge Observers .....	\$ 3,690.00	
Salary Hydrographers .....	4,408.60	
New Equipment .....	557.22	
Gauge Supplies .....	638.86	
Hydrographers Travel Expense .....	3,312.86	
Printing Biennial Report .....	1,100.00	
Other Printing .....	112.18	
Freight and Express .....	61.30	
Office Equipment .....	137.00	
Postage and Telephone .....	224.45	
Balance unexpended .....	2,437.77	
	\$16,680.24	\$16,680.24

## 12th Fiscal Year

Balance Dec. 1, 1923 .....		\$ 2,437.77
Appropriation 12th Fiscal Year .....		15,000.00
Salary Gauge Observers .....	\$ 3,918.00	
Salaries Hydrographers .....	4,269.30	
New Equipment .....	1,142.12	
Gauge Supplies .....	383.28	
Hydrographer's Travel Expense .....	3,528.01	
Printing Forms and Stationery .....	240.17	
Freight and Express .....	41.08	
Postage and Telephone .....	189.75	
Office Equipment .....	134.75	
Balance unexpended .....	3,591.31	
	\$17,437.77	\$17,437.77

## CANADIAN RIVER BASIN

## CHICORICO CREEK NEAR RATON, N. MEX.

*Location*—About 5 miles southwest of Raton, 4 miles below the mouth of East Fork, 2 miles above the highway bridge on the Raton-Des Moines main highway, in section 3, township 30 north, range 24 east.

*Records available*—June 28, 1919, to September 30, 1924. Records of former station, about five miles south of this station are available from July 29, 1910 to September 30, 1924.

*Drainage area*—64 square miles.

*Gage*—Vertical staff.

*Channel*—West bank is of shale. An outcrop of shale a short distance below the gage tends to control the gage heights, although, on account of successive filling and scouring at the gage section, the channel is subject to shifts during and after high water. Channel straight for several hundred feet below gage and curved above gage.

*Discharge measurements*—Made by wading or from auto runway a short distance above the gage.

*Winter conditions*—The flow is likely to be obstructed by ice during January, February and March. There is a small flow during the entire winter.

*Diversions*—The greater part of the normal flow is diverted for the town of Raton and for irrigation above the station. Part of the flood water is stored in the Hebron Reservoir a few miles below the station.

*Discharge measurements of Chicorico Creek near Raton, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
Oct. 22. 1923	Griffin-Lambert	3.00	e 0.3
Jan. 12. ....	Mark Lambert	i 3.09	e 0.4
Mar. 31. ....	do	2.93	* 2.1
June 1. ....	Lambert-Archer	2.93	e 0.20
July 9. ....	Mark Lambert	3.05	e 1.1
Sept. 2. ....	do		
Nov. 4. 1924	Mark Lambert	3.31	24.2
Feb. 5. ....	do	i 3.70	e 1.1
Apr. 13. ....	do	2.57	86.5
June 18. ....	do	2.58	0.8
Aug. 20. ....	do	2.58	0.1
Sept. 22. ....	do	2.58	0.2

e=Estimated.  
i=Ice.



Daily discharge in second-feet of Chicorico Creek near Raton, N. Mex., for climatic years 1923-24.  
[Gladys Horner, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	0.6	0.3	0.3	0.4	0.4	0.5	0.5	2.4	0.5	308	1.0	203
2.....	6	.3	.3	.4	.4	.5	.5	.5	.5	70	3.0	23
3.....	.6	.3	.3	.4	.4	.5	.5	.5	2.4	20	3.0	23
4.....	.5	.3	.3	.4	.4	.5	.5	.5	2.4	20	3.0	23
5.....	3.3	.3	.3	.4	.4	.5	2.4	2.4	2.4	20	3.0	3.0
6.....	.5	.3	.3	.4	.4	.5	.5	.5	2.4	9.0	3.0	3.0
7.....	.5	.3	.3	.4	.4	2.4	.5	.5	2.4	9.0	509	3.0
8.....	.5	.3	.3	.4	.5	.5	.5	.4	6.0	2.4	3.0	23
9.....	.5	.3	.3	.4	.5	.5	2.4	.5	6.0	.5	3.0	1.0
10.....	.5	.3	.3	.4	.5	.5	.5	.5	.5	3.0	1.0	1.0
11.....	.5	.3	.3	.4	.5	.5	.5	.5	.5	3.0	3.0	3.0
12.....	.4	.3	.3	.4	.5	.5	.5	2.4	.5	3.0	1.0	59
13.....	.4	.3	.3	.4	.5	.5	.5	2.4	6.0	1.0	149	1.0
14.....	.4	.3	.3	.4	.5	.5	.5	.5	.5	1.0	3.0	3.0
15.....	.4	.3	.3	.4	.5	.5	.5	.5	.5	1.0	3.0	149
16.....	.4	.3	.3	.4	.5	.5	.5	2.4	.5	1.0	203	9.0
17.....	.4	.3	.3	.4	.5	.5	2.4	2.4	188	3.0	509	3.0
18.....	.4	.3	.3	.4	.5	.5	2.4	2.4	70	3.0	149	1.0
19.....	.4	.3	.3	.4	.5	.5	23	.5	70	1.0	23	3.0
20.....	.3	.3	.3	.4	.5	.5	20	2.4	188	1.0	23	3.0
21.....	.3	.3	.3	.4	.5	.5	6.0	.5	308	1.0	3.0	149
22.....	.3	.3	.3	.4	.5	.5	2.4	.5	70	9.0	176	3.0
23.....	.3	.3	.3	.4	.5	.5	2.4	.5	15	1.0	149	9.0
24.....	.3	.3	.3	.4	.5	2.4	.5	2.4	15	1.0	149	1.0
25.....	.3	.3	.3	.4	.5	.5	.5	2.4	2.4	1.0	149	149
26.....	.3	.3	.3	.4	.5	2.4	.5	.5	.5	1.0	23	3.0
27.....	.3	.3	.3	.4	.5	.5	.5	.5	.5	3.0	23	1.0
28.....	.3	.3	.3	.4	.5	.5	.5	2.4	.5	1.0	23	153
29.....	.3	.3	.4	.4	....	20	2.4	2.4	2.4	3.0	23	1.0
30.....	.3	.3	.4	.4	....	2.4	.5	.5	2.4	3.0	23	3.0
31.....	.3	....	.4	.4	....	2.4	....	.5	....	1.0	149	....
1924												
1.....	149	3.0	2.8	2.0	1.2	5.7	132	1.0	9.1	1.0	0.7	0.4
2.....	23	9.1	2.8	2.0	1.2	5.9	117	3.0	9.1	1.0	.7	.7
3.....	185	3.0	2.7	2.0	1.2	6.1	132	3.0	3.0	292	.7	.7
4.....	194	3.0	2.7	1.9	1.1	6.2	132	1.0	9.1	103	.7	.7
5.....	518	1.0	2.7	1.9	1.1	6.4	132	1.0	3.0	9.1	.7	.4
6.....	239	1.0	2.7	1.9	1.3	6.6	148	3.0	3.0	1.0	.4	.4
7.....	128	1.0	2.6	1.9	1.5	6.8	148	9.1	1.0	.7	.7	.4
8.....	239	1.0	2.6	1.8	1.6	7.0	148	3.0	1.0	3.0	.7	.4
9.....	509	3.0	2.6	1.8	1.8	7.2	103	1.0	1.0	103	.7	.4
10.....	527	1.0	2.6	1.8	2.0	7.4	132	1.0	.8	9.1	1.0	.4
11.....	365	3.0	2.5	1.8	2.2	7.6	148	1.0	.8	3.0	.7	.4
12.....	239	3.0	2.5	1.7	2.4	7.8	124	3.0	.8	.7	.4	.7
13.....	149	3.0	2.5	1.7	2.5	8.0	132	1.0	1.0	1.0	.4	.4
14.....	132	3.0	2.5	1.7	2.7	8.2	132	3.0	.8	204	.4	.4
15.....	115	3.0	2.4	1.6	2.9	8.3	117	8.0	.8	3.0	.4	.8
16.....	97	9.1	2.4	1.6	3.1	8.5	132	1.0	.7	1.0	.4	.7
17.....	80	15	2.4	1.6	3.3	8.7	117	1.0	.7	.7	.7	.4
18.....	62	3.0	2.4	1.6	3.4	8.9	148	3.0	.8	.7	.7	.4
19.....	45	3.0	2.3	1.5	3.6	9.1	132	3.0	.8	.7	.4	.4
20.....	27	3.0	2.3	1.5	3.8	23	103	9.1	.8	.7	.4	.7
21.....	9.1	3.0	2.3	1.5	4.0	55	71	3.0	212	.7	.4	.4
22.....	23	3.0	2.3	1.5	4.2	3.0	71	3.0	9.1	.7	.4	.4
23.....	23	3.0	2.2	1.4	4.4	9.1	71	1.0	3.0	1.0	.4	.7
24.....	3.0	3.0	2.2	1.4	4.5	39	1.0	3.0	3.0	1.0	.4	.7
25.....	9.1	3.0	2.2	1.4	4.7	71	1.0	3.0	3.0	.7	.7	.7
26.....	9.1	2.9	2.2	1.4	4.9	132	3.0	9.1	.8	.7	.7	.7
27.....	23	2.9	2.1	1.3	5.1	300	3.0	3.0	1.0	.7	.4	.7
28.....	9.1	2.9	2.1	1.3	5.3	452	3.0	3.0	1.0	.7	.4	.7
29.....	3.0	2.8	2.1	1.3	5.5	292	9.1	71	1.0	.7	.4	.7
30.....	3.0	2.8	2.1	1.3	....	132	9.1	103	3.0	.7	.4	.7
31.....	23	....	2.0	1.2	....	117	....	39	....	.4	.4	....

NOTE—Daily discharge for 1923 determined as follows: Direct from fairly well defined curve Oct. 22 to Dec. 15; Interpolate Dec. 15 to Jan. 12 to Mar. 6; Direct from well defined curve Mar. 6 to Nov. 4.

1924—Direct from well defined curve Nov. 4 to Nov. 24; Interpolate Nov. 24 to Feb. 5 to Mar. 19; Direct from well defined curve Mar. 19 to Nov. 14.

Monthly discharge of Chicorico Creek near Raton, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	3.3	0.3	0.50	30.5
November .....	0.5	0.3	0.31	17.8
December .....	0.4	0.3	0.31	19.0
January .....	0.4	0.4	0.40	24.6
February .....	0.5	0.4	0.47	26.4
March .....	20	0.5	1.4	88.2
April .....	23	0.5	2.53	150
May .....	2.4	0.5	1.23	75.8
June .....	308	2.4	32.1	191
July .....	308	0.5	15.9	980
August .....	509	1.0	64.3	3,950
September .....	509	1.0	50.6	3,010
The year .....	509	0.3	11.8	8,560
1924				
October .....	527	3.0	134	8,250
November .....	15.0	1.0	3.45	205
December .....	2.8	2.0	2.41	148
January .....	2.0	1.2	1.62	99.8
February .....	5.5	1.1	2.98	172
March .....	452	3.0	57.0	3,500
April .....	148	1.0	95.0	5,650
May .....	103	0.8	9.68	596
June .....	212	0.7	9.50	565
July .....	292	0.4	24.1	1,480
August .....	1.0	0.4	0.55	341
September .....	0.8	0.4	0.55	32.9
The year .....	527	0.4	28.6	20,700

# VERMEJO RIVER NEAR DAWSON, N. MEX.

Location—Two and one-quarter miles above Dawson and one-quarter mile above Loretta in section 10, township 28 north, range 20 east.

Records available—October 26, 1915, to May 31, 1923.

Drainage area—270 square miles.

Gage—Automatic recording. Installed September 17, 1921. No relation to former datum.

Channel—Nearly straight for two hundred feet above and below the station. Probably shifting during high water.

Discharge measurements—Made by wading or from a bridge one-quarter mile below the station.

Winter conditions—Gage heights affected by ice during November, December, January and February.

Diversions—There is an appropriation of eight and one-half feet at Vermejo Park, 25 miles above the station, and the water supply for the town of Dawson, and the coal mines of Phelps, Dodge & Co., amounting to about one and one-half second feet, is diverted a few feet below the station. Water for the irrigation of the Dawson Farm is diverted a mile below the station through a ditch having a capacity of about four second feet. All the normal flow and part of the flood water is diverted for irrigation 9 miles below the station by the Maxwell Irrigated Lands Company.

Co-operation—Maintained in co-operation with Phelps, Dodge & Co., Dawson, New Mexico.

Note—On August 8, 1921, flood destroyed staff gage. Discharge estimated at peak of flood, 24,600 second feet. On September 17, 1921, an automatic gage was installed about one-fourth mile above old location of staff gage. No relation to former datum.



## Discharge measurements of Vermejo River near Dawson, N. Mex., for climatic year 1923.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 22.....	Lambert-Griffin .....	0.60	2.8
Jan. 11.....	Mark Lambert .....	i 0.28	8.7
Mar. 31.....	..... do .....	0.17	3.4
June 1.....	Lambert-Archer .....	0.28	1.6

i=Ice.

## Daily discharge in second-feet of Vermejo River near Dawson, N. Mex., for climatic year 1923.

[William Willson, observer.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
1923								
1.....	2.3	2.8	8.8	9.5	6.6	3.0	3.5	3.6
2.....	2.0	2.8	7.0	9.4	6.5	3.0	3.4	3.6
3.....	1.7	6.1	8.8	9.3	6.4	3.1	3.4	3.6
4.....	1.4	6.1	11	9.3	6.3	3.2	3.4	3.6
5.....	1.5	6.1	10	9.2	6.2	3.1	3.5	3.6
6.....	1.7	6.1	6.1	9.1	6.1	3.0	3.5	3.6
7.....	1.8	5.2	7.0	9.0	6.0	3.0	3.6	3.6
8.....	1.8	4.7	6.6	8.9	5.9	2.9	3.6	3.5
9.....	1.8	6.6	5.2	8.9	5.8	2.9	3.6	3.5
10.....	2.2	8.2	3.7	8.8	5.7	2.9	3.7	3.4
11.....	2.5	7.5	3.7	8.7	5.6	2.9	3.6	3.4
12.....	3.3	8.8	4.2	8.6	5.5	2.9	3.7	3.5
13.....	2.8	6.1	4.7	8.5	5.4	2.9	3.6	3.5
14.....	3.3	6.6	10	8.4	5.3	2.9	3.6	3.6
15.....	3.7	7.5	12	8.3	5.2	2.9	3.6	3.6
16.....	3.7	6.1	5.2	8.2	5.0	2.9	3.5	3.6
17.....	3.3	7.0	5.2	8.1	4.6	3.0	3.4	3.5
18.....	2.8	6.1	2.6	8.0	3.8	2.9	3.4	3.5
19.....	2.8	5.2	2.3	7.9	3.6	3.0	3.5	3.4
20.....	2.8	3.7	2.5	7.8	3.5	3.2	3.6	3.5
21.....	2.6	6.6	2.5	7.7	3.7	3.5	3.6	3.6
22.....	2.8	8.2	2.8	7.6	3.6	3.2	3.5	3.5
23.....	3.7	9.4	4.2	7.5	3.4	3.3	3.6	3.6
24.....	4.2	7.5	5.6	7.4	3.1	3.2	3.6	3.7
25.....	3.3	8.8	8.2	7.3	3.0	3.3	3.9	3.9
26.....	3.3	6.6	10	7.2	2.9	3.3	4.0	3.9
27.....	2.6	6.6	9.9	7.1	2.8	3.4	3.9	3.9
28.....	2.6	10	9.8	7.0	2.9	3.4	3.6	3.9
29.....	2.8	11	9.7	6.9	....	3.5	3.6	3.7
30.....	3.3	14	9.7	6.8	....	3.6	3.5	3.4
31.....	3.7	....	9.6	6.7	....	3.6	....	3.2

Daily discharge for 1923 determined as follows: Direct from fairly well defined curve Oct. 22 to Dec. 26; Interpolate Dec. 26 to Feb. 16; Direct from well defined curve Feb. 16 to May 31.

## Monthly discharge of Vermejo River near Dawson, N. Mex., for climatic year 1923.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October.....	4.2	1.4	2.71	167
November.....	14	2.8	6.93	412
December.....	12	2.3	6.72	414
January.....	9.5	6.7	8.16	502
February.....	6.6	2.9	4.80	267
March.....	3.6	2.9	3.13	192
April.....	4.0	3.4	3.58	213
May.....	3.9	3.2	3.58	220

## CIMARRON RIVER AT UTE PARK, N. MEX.

Location.—At a highway bridge at Ute Park, half a mile below the mouth of Ute Creek, in section 19, township 27 north, range 18 east.

Records available—July 14, 1907 to September 30, 1924.

Drainage area—235 square miles (measured on Land Office map).

Gage—Automatic recording.

Channel—Permanent at high stages but subject to occasional shifts at low and medium stages.

Discharge measurements—Made by wading or from the bridge.

Winter conditions—There is generally backwater caused by ice during December, January and February.

Diversions—The Eagle Nest Dam, with approximate capacity of 100,000 acre feet is located above this station.

## Discharge measurements of Cimarron River at Ute Park, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 21.....	Griffin-Lambert .....	0.47	6.4
Jan. 10.....	Mark Lambert .....	0.58	5.9
Mar. 30.....	..... do .....	0.50	5.0
June 1.....	Lambert-Archer .....	1.39	97.5
July 20.....	..... do .....	0.84	42.0
Aug. 31.....	Mark Lambert .....	0.52	11.0
1924			
Nov. 4.....	Mark Lambert .....	0.39	7.1
Feb. 5.....	..... do .....	i 0.71	5.2
Apr. 12.....	..... do .....	0.71	31.2
June 18.....	..... do .....	1.04	72.1
Aug. 20.....	..... do .....	0.79	40.3
Sept. 22.....	..... do .....	0.95	66.4

i=Ice.



Daily discharge in second-feet of Cimarron River at Ute Park, N. Mex., for climatic years 1923-24.

[F. B. Strong, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	13	11	9.7	6.0	5.0	3.5	4.3	26	93	32	42	5.6
2.....	13	9.6	6.4	6.0	5.3	3.7	4.3	27	88	32	45	5.0
3.....	14	8.8	6.4	6.0	5.6	3.8	4.3	27	86	21	48	5.0
4.....	14	12	6.4	6.0	5.8	3.0	4.3	27	86	19	50	4.8
5.....	14	15	5.9	6.0	5.6	3.0	4.3	27	85	20	50	4.2
6.....	13	15	5.5	5.9	5.5	3.0	15	26	85	22	52	3.8
7.....	14	13	5.0	5.9	5.4	3.0	25	26	90	22	70	3.3
8.....	14	13	4.5	5.9	5.2	3.0	26	28	90	23	76	3.6
9.....	14	12	4.1	5.9	5.1	3.0	26	29	88	23	78	3.0
10.....	14	11	3.6	5.9	4.9	3.0	27	32	67	34	79	2.7
11.....	14	10	7.7	5.5	4.8	3.0	27	36	45	36	85	2.7
12.....	17	10	22	5.3	4.4	3.0	29	38	43	36	88	2.7
13.....	19	13	19	5.1	4.0	3.0	30	35	36	39	86	2.8
14.....	20	18	17	4.8	3.6	3.0	32	31	29	49	85	3.3
15.....	20	19	12	4.6	3.2	3.0	32	26	28	52	85	3.4
16.....	20	19	9.5	4.3	2.8	3.0	32	22	29	54	84	3.4
17.....	20	20	4.1	4.1	2.4	3.0	32	19	28	55	79	3.4
18.....	20	19	3.6	3.7	2.0	3.0	32	19	25	47	60	3.5
19.....	4.4	15	7.1	3.5	2.1	3.1	31	22	26	46	61	3.5
20.....	7.3	15	6.8	3.3	2.2	3.3	31	27	28	25	61	3.1
21.....	6.0	13	6.6	3.0	2.3	3.4	31	29	27	23	61	2.8
22.....	6.0	11	6.4	3.1	2.5	3.6	34	34	20	36	40	2.8
23.....	6.0	8.4	6.1	3.3	2.6	3.7	35	78	19	54	13	2.9
24.....	6.0	7.0	6.1	3.4	2.7	3.8	33	88	19	52	11	3.0
25.....	6.0	9.0	6.1	3.6	2.8	4.0	31	90	18	49	9.9	2.9
26.....	5.6	15	6.1	3.7	3.0	4.0	30	88	19	45	8.9	2.8
27.....	5.6	12	6.1	3.8	3.1	4.1	28	93	19	42	8.4	2.7
28.....	5.6	11	6.0	4.0	3.3	4.2	26	96	20	38	7.8	2.6
29.....	5.6	7.0	6.0	4.3	....	4.3	26	96	30	38	6.8	2.6
30.....	5.9	5.4	6.0	4.5	....	4.3	26	94	31	38	6.6	2.6
31.....	9.6	....	6.0	4.8	....	4.3	....	93	....	39	6.3	....
1924												
1.....	2.6	3.1	5.4	26	8.7	14	25	53	50	132	60	34
2.....	2.8	3.1	6.6	30	7.5	14	24	59	49	137	63	34
3.....	3.7	3.4	6.2	34	7.5	14	26	63	47	137	63	32
4.....	3.1	8.7	12	38	10	16	28	74	47	139	61	35
5.....	2.6	8.7	12	42	12	16	30	80	44	146	60	35
6.....	2.8	6.6	12	38	11	22	30	83	45	146	57	42
7.....	2.8	6.2	6.6	34	8.7	15	35	83	47	126	57	65
8.....	2.8	4.2	6.6	30	5.8	13	38	87	47	123	56	63
9.....	2.8	3.4	8.7	26	8.7	13	44	88	45	123	56	63
10.....	4.2	4.2	8.7	22	6.6	13	38	85	44	121	56	65
11.....	3.8	4.2	8.7	18	7.0	12	34	90	45	117	57	68
12.....	3.5	3.8	8.7	14	4.6	12	34	93	45	90	54	66
13.....	3.4	3.4	8.7	14	3.2	12	37	95	50	74	60	66
14.....	3.4	3.0	8.7	14	5.4	12	47	96	71	72	59	70
15.....	3.4	2.8	9.3	14	7.5	12	56	95	71	74	57	70
16.....	3.3	3.2	10	14	10	14	47	92	72	87	54	72
17.....	3.3	2.8	9.9	14	11	14	47	88	82	82	50	72
18.....	3.4	3.2	9.9	14	12	12	42	90	80	80	47	72
19.....	3.5	3.2	9.9	14	15	12	37	92	80	77	45	72
20.....	3.7	3.0	8.7	14	16	12	37	92	80	66	45	70
21.....	3.7	3.2	8.7	14	12	12	39	92	79	75	44	72
22.....	3.5	3.0	8.7	14	8.7	14	45	90	80	74	41	72
23.....	3.9	2.8	8.7	14	13	14	50	92	80	75	42	72
24.....	4.0	3.0	8.7	14	15	15	59	88	80	79	41	72
25.....	3.8	3.2	8.1	14	16	16	59	72	77	83	39	72
26.....	3.5	3.4	9.3	14	16	19	54	60	74	87	38	73
27.....	3.4	5.8	10	16	15	22	50	54	79	82	34	75
28.....	3.4	7.0	10	16	19	23	47	52	85	90	32	69
29.....	3.4	6.2	12	16	16	25	45	54	93	88	32	63
30.....	3.3	7.5	16	14	....	25	50	59	133	88	35	57
31.....	3.1	....	20	14	....	26	....	54	....	75	34	....

Daily discharge for 1923 determined as follows. Indirect method for shifting channel Oct. 21 to Jan. 10; Interpolating for period of ice; Direct from well defined curve, Jan. 10 to June 1; indirect method for shifting channel, June 1 to July 20; Direct from well defined curve July 20 to Nov. 4.  
1924—Direct from 2 well defined curves Nov. 4 to Nov. 14; Interpolating for day of ice.

Monthly discharge of Cimarron River at Ute Park, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	20	4.4	11.8	728
November .....	20	5.4	12.6	748
December .....	22	3.6	7.54	464
January .....	6	3	4.68	288
February .....	5.8	2	3.84	213
March .....	4.3	3	3.42	210
April .....	35	4.3	24.1	1,480
May .....	96	19	46.1	2,830
June .....	93	18	46.6	2,770
July .....	55	19	36.8	2,260
August .....	88	6.3	50.0	3,060
September .....	5.6	2.6	3.33	198
The year.....	96	2.0	21.1	15,261
1924				
October .....	4.2	2.6	3.35	206
November .....	8.7	2.8	4.30	270
December .....	16	6.2	9.58	590
January .....	42	14	19.3	1,190
February .....	19	3.2	10.6	610
March .....	26	12	15.6	960
April .....	59	24	41.1	2,450
May .....	96	52	78.9	4,850
June .....	133	44	66.6	3,960
July .....	146	66	98.3	6,050
August .....	63	32	49.3	3,030
September .....	75	32	52.1	3,700
The year.....	146	2.6	38.4	27,900

#### CIMARRON RIVER AT SPRINGER, N. MEX.

*Location*—At the highway bridge which crosses the Cimarron River about half a mile above the Atchison, Topeka and Santa Fe railway bridge at Springer, New Mexico. Six miles below the mouth of the Rayado and 6 miles above the junction of the Cimarron and the upper Canadian, in section 28, township 25 north, range 22 east.

*Records available*—July 13, 1907 to December 31, 1909, December 20, 1919 to September 30, 1924. Gaging station re-established December 20, 1919, and referred to new datum.

*Drainage area*—About 1,000 square miles.

*Gage*—Chain gage on lower side of bridge.

*Channel*—Probably shifting.

*Discharge measurements*—Made by wading, or from bridge.

*Winter conditions*—Flow is affected by ice during winter months.

*Diversions*—Water is diverted both above and below the station.



Discharge measurements of Cimarron River at Springer, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 21.....	Griffin-Lambert .....	0.24	2.7
Jan. 12.....	Mark Lambert .....	i	4.5
Apr. 1.....	do .....	0.04	2.2
June 2.....	Lambert-Archer .....	0.18	1.6
July 20.....	do .....	0.30	3.4
Sept. 2.....	Mark Lambert .....	0.30	4.8
1924			
Nov. 5.....	Mark Lambert .....	0.47	17.5
Feb. 6.....	do .....	0.56	11.0
Apr. 13.....	do .....	1.97	211
Aug. 21.....	do .....	18.45	4.3
Sept. 24.....	do .....	18.56	2.2
Nov. 30.....	do .....	18.16	14.9

i=Ice.

Daily discharge in second-feet of Cimarron River at Springer, N. Mex., for climatic years 1923-24.  
[Paul Devine, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	2.9	9.4	8.2	5.5	4.0	3.9	3.9	3.9	4.7	30	10	3.9
2.....	2.9	9.4	8.1	5.4	4.0	3.9	3.9	3.9	4.4	30	10	3.9
3.....	2.9	9.4	8.0	5.3	4.0	3.9	3.9	3.9	4.7	30	10	3.9
4.....	2.9	9.4	7.9	5.1	4.0	3.9	3.9	3.9	4.7	30	10	3.9
5.....	2.9	9.4	7.8	5.1	3.9	3.9	3.9	3.9	4.4	79	79	4.4
6.....	2.9	6.9	7.8	5.0	3.9	3.9	3.9	3.9	3.9	58	19	3.9
7.....	2.9	9.4	7.7	4.9	3.9	3.9	3.9	3.9	4.4	10	19	4.4
8.....	2.9	14	7.6	4.9	3.9	3.9	3.9	3.9	184	10	19	4.4
9.....	2.8	18	7.5	4.8	3.9	3.9	3.9	3.9	21	10	19	3.9
10.....	2.8	18	7.4	4.7	3.9	3.9	3.9	3.9	19	19	19	3.9
11.....	2.8	18	7.3	4.6	3.9	3.9	3.9	3.9	15	19	19	4.6
12.....	2.8	18	7.2	4.5	3.9	3.9	10	3.9	10	19	19	4.6
13.....	2.8	18	7.1	4.5	3.9	3.9	10	3.9	12	19	19	4.4
14.....	2.8	18	7.1	4.4	3.9	3.9	15	3.9	10	3.9	19	26
15.....	2.8	18	7.0	4.4	3.9	10	15	3.9	12	10	19	10
16.....	2.8	18	6.9	4.4	3.9	10	3.9	3.9	184	30	19	219
17.....	2.8	9.4	6.8	4.4	3.9	3.9	3.9	3.9	191	19	19	219
18.....	2.7	9.3	6.7	4.3	3.9	3.9	3.9	3.9	198	19	30	219
19.....	2.7	9.2	6.6	4.3	3.9	3.9	3.9	3.9	205	19	114	219
20.....	2.7	9.2	6.5	4.3	3.9	3.9	3.9	3.9	212	79	184	429
21.....	2.7	9.1	6.4	4.2	3.9	3.9	3.9	3.9	219	10	254	359
22.....	3.9	9.0	6.3	4.2	3.9	3.9	3.9	3.9	19	3.9	324	324
23.....	3.9	8.9	6.3	4.2	3.9	3.9	3.9	3.9	15	3.9	58	289
24.....	3.9	8.8	6.2	4.2	3.9	3.9	10	3.9	15	3.9	10	114
25.....	3.9	8.7	6.1	4.2	3.9	3.9	15	3.9	16	3.9	3.9	79
26.....	3.9	8.6	6.0	4.1	3.9	6.2	19	3.9	13	3.9	3.9	79
27.....	3.9	8.5	5.9	4.1	3.9	3.9	3.9	3.9	10	3.9	4.4	79
28.....	3.9	8.5	5.8	4.1	3.9	3.9	3.9	4.4	11	3.9	4.4	58
29.....	3.9	8.4	5.7	4.1	....	3.9	3.9	4.4	114	10	3.9	58
30.....	3.9	8.3	5.6	4.1	....	3.9	3.9	3.9	30	10	3.9	58
31.....	3.9	....	5.6	4.0	....	3.9	....	3.9	....	10	4.4	....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	41	41	26	15	12	18	108	50	12	11	8.1	5.6
2.....	794	19	27	15	11	18	108	37	5.0	11	5.6	5.6
3.....	266	12	26	15	11	19	108	33	3.4	10	5.6	15
4.....	124	12	26	15	11	19	94	37	3.4	10	5.6	5.6
5.....	60	12	26	15	11	26	94	60	3.4	9.6	5.6	5.6
6.....	50	19	26	14	11	30	126	60	3.4	9.3	11	19
7.....	41	19	26	14	11	33	162	50	3.4	9.0	5.6	5.6
8.....	70	19	26	14	12	33	222	60	3.4	8.6	5.6	5.6
9.....	486	19	26	14	12	50	222	60	3.4	8.3	19	5.6
10.....	140	18	60	14	12	50	266	50	3.4	8.0	8.1	3.5
11.....	70	18	81	14	12	108	310	50	3.4	7.6	5.6	3.5
12.....	70	19	81	14	13	108	310	60	3.4	7.3	5.6	3.5
13.....	94	19	108	14	13	190	310	50	3.4	7.0	19	3.5
14.....	19	22	140	14	13	222	266	60	3.4	6.6	8.1	3.5
15.....	19	19	190	13	14	162	354	60	3.4	6.3	5.6	3.5
16.....	41	18	190	13	14	124	266	60	3.4	6.0	5.6	11
17.....	41	16	33	13	14	108	222	50	3.0	5.6	5.6	5.6
18.....	41	16	33	13	15	81	190	81	3.0	5.3	5.6	3.5
19.....	70	14	33	13	15	94	190	81	2.7	5.0	3.5	3.5
20.....	50	12	26	13	15	94	162	81	2.7	4.7	3.5	3.5
21.....	70	12	41	13	15	108	190	71	2.2	4.3	3.5	3.5
22.....	33	12	50	13	16	70	176	70	2.7	5.0	3.5	3.5
23.....	33	12	26	12	16	124	176	94	2.7	5.6	3.5	3.5
24.....	26	12	19	12	16	124	162	94	2.7	5.6	3.5	3.5
25.....	33	12	16	12	17	140	162	50	8.0	5.6	124	3.5
26.....	41	12	16	12	17	162	162	12	12	5.6	11	3.5
27.....	41	16	16	12	18	162	190	12	12	5.6	5.6	3.5
28.....	37	15	16	12	18	124	222	8.0	12	5.6	5.6	3.5
29.....	41	19	15	12	18	124	94	8.0	12	5.6	5.6	3.5
30.....	33	22	15	12	....	124	94	8.0	11	8.1	5.6	3.5
31.....	33	....	15	12	....	124	....	8.0	....	5.6	5.6	....

Daily discharge for 1923 determined as follows: Direct from fairly well defined curve, Oct. 21 to Oct. 1, interpolating for periods of ice.  
1924—Direct from well defined curve Oct. 1 to Oct 1; Interpolating for periods of ice.

Monthly discharge of Cimarron River at Springer, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	3.9	2.7	3.16	195
November .....	18	6.9	11.5	685
December .....	8.2	5.6	6.87	423
January .....	5.5	4.0	4.53	278
February .....	4.0	3.9	3.91	217
March .....	10.0	3.9	4.36	268
April .....	19.0	3.9	6.12	360
May .....	4.4	3.9	3.93	240
June .....	219	3.9	55.3	3,500
July .....	79	3.9	19.7	1,210
August .....	324	3.9	43.5	2,680
September .....	429	3.9	96.4	5,740
The year.....	429	2.7	21.8	15,800
1924				
October .....	794	19	97.0	5,970
November .....	41	12	17.0	1,010
December .....	190	15	47.2	2,900
January .....	15	12	13.3	820
February .....	18	11	13.9	800
March .....	222	18	95.9	5,900
April .....	354	94	191	11,340
May .....	94	8.0	50.5	3,100
June .....	12	2.2	5.11	304
July .....	11	4.3	7.04	433
August .....	124	3.5	10.5	645
September .....	19	3.5	5.21	310
The year .....	354	2.2	46.2	33,500



## PONIL CREEK NEAR CIMARRON, N. MEX.

*Location*—Five miles northwest of Cimarron, on the road to Ponil Park, one mile above the Chase Ranch, section 8, township 27 north, range 19 east.

*Records available*—October 29, 1915, to September 30, 1924.

*Drainage area*—130 square miles.

*Gage*—Automatic recording.

*Channel*—Permanent; clean and straight for 1,000 feet above and below the station. The bottom is rocky and both banks are above high water.

*Discharge measurements*—Made by wading.

*Winter conditions*—Ice may affect the gage heights in December, January and February.

*Diversions*—All the normal flow is diverted for irrigation below the station.

*Note:* On May 8, 1922, the gage was moved up stream about one-half mile owing to very poor control. No relation to former data.

*Discharge measurements of Ponil Creek near Cimarron, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Discharge Sec.-Ft.
1923			
Oct. 22	Griffin-Lambert	1.64	0.7
Jan. 11	Mark Lambert	i	0.9
Mar. 31	do	1.84	2.5
June 1	Lambert-Archer	2.07	13.4
July 21	do	2.31	11.8
Sept. 1	Mark Lambert	2.18	7.6
1924			
Nov. 4	Mark Lambert	2.35	131
Feb. 5	do	i	2.8
Apr. 13	do	2.86	104
June 18	do	2.41	17.8
Aug. 21	do	2.24	1.6
Sept. 22	do	2.29	1.5

i=Ice.

*Daily discharge in second-feet of Ponil Creek near Cimarron, N. Mex., for climatic years 1923-24.*

[Howard Ashbough, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1923												
1	0.4	0.8	1.0	3.0	1.4	1.7	3.4	41	11	15	10	8.6
2	.3	.9	1.3	2.8	1.4	1.7	3.4	41	8.5	14	11	8.8
3	.3	1.1	2.1	2.6	1.4	1.5	3.4	41	13	14	9.1	11
4	.3	1.2	1.4	3.4	1.4	1.2	3.1	41	11	14	7.0	8.8
5	.3	1.0	.9	2.2	1.4	1.2	2.6	38	7.3	12	11	11
6	.3	1.0	.9	2.0	1.5	1.2	3.1	36	5.3	12	155	10
7	.3	1.0	1.2	1.7	1.5	1.2	3.1	36	7.5	4.8	127	9.4
8	.3	1.0	1.6	1.5	1.5	1.2	8.2	36	145	2.4	97	7.5
9	.3	1.0	2.0	1.3	1.5	1.2	12	38	147	4.3	67	6.6
10	.3	1.0	2.5	1.1	1.6	1.3	16	34	73	13	37	6.2
11	.3	1.0	2.5	.9	1.6	1.7	16	39	71	40	7.5	6.0
12	.3	1.0	3.7	.9	1.6	5.8	18	36	63	88	7.0	6.8
13	.4	1.0	3.0	.9	1.6	2.1	16	44	52	105	6.4	16
14	.4	1.0	3.1	.9	1.7	2.3	21	52	36	98	5.6	11
15	.4	1.0	3.2	1.0	1.7	2.4	16	52	19	93	5.1	5.5
16	.4	.7	5.2	1.0	1.7	2.4	11	50	19	30	4.7	6.0
17	.5	.6	4.9	1.0	1.8	2.6	14	49	17	16	4.7	7.9
18	.5	.6	4.7	1.0	1.8	2.6	8.2	46	19	27	20	11
19	.5	.6	4.6	1.0	1.8	2.6	18	46	30	83	21	16
20	.6	.6	4.4	1.1	1.7	2.6	28	44	28	48	36	12
21	.7	.6	4.3	1.1	1.7	2.1	28	42	38	16	36	11
22	.7	.6	4.1	1.1	1.7	1.8	27	41	42	12	17	12
23	.8	.6	4.0	1.1	1.7	1.8	28	39	36	11	17	12
24	.8	.5	3.8	1.2	1.7	2.1	26	30	17	12	12	12
25	.8	1.2	3.7	1.2	1.7	2.4	28	27	17	19	12	11
26	.8	1.8	3.7	1.2	1.6	2.9	17	24	18	17	12	11
27	.8	1.4	3.5	1.2	1.7	3.1	18	22	17	17	12	10
28	.8	1.3	3.5	1.3	1.7	2.9	20	18	15	17	12	10
29	.7	1.2	3.3	1.3	....	2.9	36	16	16	11	12	10
30	.8	1.1	3.3	1.3	....	2.8	41	14	13	9.4	12	9.8
31	.9	....	3.2	1.3	....	3.1	....	13	....	8.6	9.4	....
1924												
1	9.6	16	19	12	3.8	4.7	24	139	80	11	0.4	3.5
2	9.5	14	19	11	3.6	4.7	34	184	65	12	6.3	6.3
3	9.4	12	19	11	3.3	3.0	41	191	59	13	7.7	5.2
4	9.3	12	18	11	3.0	3.0	37	198	56	14	13	6.3
5	9.2	14	18	11	2.8	3.0	43	205	53	15	28	7.0
6	9.1	12	18	10	2.8	3.4	54	212	56	26	11	7.7
7	11	12	18	10	2.8	3.5	94	219	50	28	11	8.4
8	15	12	17	9.8	2.8	3.6	158	226	47	27	7.7	8.4
9	12	12	17	9.6	2.8	3.9	189	233	43	23	7.7	9.2
10	16	12	17	9.3	2.8	4.3	153	240	43	27	7.7	9.9
11	14	13	17	9.0	2.8	6.8	146	254	42	22	8.4	9.9
12	14	12	16	8.8	2.8	8.1	139	272	42	8.4	9.2	9.2
13	21	11	16	8.6	2.8	8.6	139	279	43	8.6	12	7.7
14	20	11	16	8.3	2.8	11	181	286	62	8.8	13	9.2
15	19	10	16	8.0	2.8	23	226	265	71	9.0	9.9	11
16	18	9.8	15	7.8	2.8	25	202	251	65	9.2	6.3	11
17	17	12	15	7.6	2.8	24	160	240	53	9.4	6.3	14
18	17	18	15	7.3	2.8	23	122	244	80	9.6	4.8	13
19	16	21	15	7.0	2.8	22	111	240	36	9.8	4.1	12
20	16	22	14	6.8	2.8	22	108	234	27	10	4.1	11
21	16	21	14	6.6	2.8	22	139	220	20	10	3.5	14
22	16	21	14	6.3	2.8	17	181	206	17	10	0.9	9.2
23	16	22	14	6.0	2.8	16	198	178	14	11	3.5	6.3
24	16	21	13	5.8	2.8	15	220	142	13	11	6.3	7
25	16	21	13	5.6	2.8	17	192	128	11	11	8.4	7
26	16	20	13	5.3	2.8	25	132	122	9.9	11	6.3	6.3
27	16	20	13	5.0	2.8	25	83	108	8.4	8.4	9.2	7.7
28	18	20	12	4.8	2.8	24	77	100	7.7	9.9	8.4	9.3
29	17	20	12	4.6	4.1	24	83	90	8.7	9.2	4.8	11
30	16	19	12	4.3	....	16	100	86	9.7	12	.5	12
31	16	....	12	4.0	....	19	....	90	....	0.3	.5	....

Daily discharge for 1923 determined as follows: Direct from well defined curve Oct. 22 to Dec 31; Interpolate Dec. 31 to Feb 18; Direct from well defined curve Feb. 18 to June 1; Indirect method for shifting channel June 1 to July 21.

1924—Direct from 2 well defined curves July 21 to Nov. 14 interpolating for frozen periods.



Monthly discharge of Ponil Creek near Cimarron, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October . . . . .	0.9	0.3	0.52	31.7
November . . . . .	1.8	0.5	0.95	56.3
December . . . . .	5.2	0.9	3.06	188
January . . . . .	3.4	0.9	1.45	89.2
February . . . . .	1.8	1.4	1.61	89.3
March . . . . .	5.8	1.2	2.20	136
April . . . . .	41	2.6	16.5	980
May . . . . .	52	13	36.3	2,230
June . . . . .	147	5.3	38.6	2,300
July . . . . .	105	2.4	28.5	1,750
August . . . . .	155	4.7	26.2	1,610
September . . . . .	16	5.5	9.8	590
The year . . . . .	147	0.3	13.9	10,050
1924				
October . . . . .	21	9.1	14.9	915
November . . . . .	22	9.8	15.8	938
December . . . . .	19	12	15.4	946
January . . . . .	12	4	7.81	480
February . . . . .	4.1	2.8	2.94	169
March . . . . .	25	3.0	13.8	854
April . . . . .	226	24	126	7,470
May . . . . .	286	86	196	12,060
June . . . . .	80	7.7	39.7	2,360
July . . . . .	28	0.3	13.1	802
August . . . . .	28	0.4	7.44	458
September . . . . .	14	3.5	8.99	535
The year . . . . .	286	0.3	38.8	28,000

# RAYADO RIVER NEAR ABREU'S RANCH NEAR CIMARRON, N. MEX.

*Location.*—Fifteen miles southwest of Cimarron, six miles above the Abreu Ranch and 100 yards above the ranch house of Ramon Abreu, in section 29, township 25 north, range 18 east.

*Records available.*—May 4, 1911, to September 30, 1924.

*Drainage area.*—24 square miles.

*Gage.*—Automatic recording. Datum lowered 0.5 November 5, 1917.

*Channel.*—Permanent.

*Discharge measurements.*—Made by wading.

*Winter conditions.*—Ice causes backwater during the winter months.

*Diversions.*—None above the station. The entire flow is used for irrigation below the station.

Discharge measurements of Rayado River near Abreu's Ranch near Cimarron, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 21	Griffin-Lambert	0.78	3.7
Jan. 10	Mark Lambert	i 0.79	3.9
Mar. 30	do	1.36	8.1
May 31	Lambert-Archer	1.62	18.6
July 20	do	1.30	9.1
Aug. 31	Mark Lambert	1.29	7.3
1924			
Nov. 5	Mark Lambert	1.06	4.3
Feb. 5	do	i	3.9
Apr. 12	do	2.45	108
June 18	do	1.45	16.8
Aug. 21	do	1.13	6.0
Sept. 22	do	0.94	3.2

i=Ice.

Daily discharge in second-feet of Rayado River near Abreu's Ranch near Cimarron, N. Mex., for climatic years 1923-24

[M. R. Harvey, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	3.6	3.7	3.8	3.9	5.3	7.4	8.4	13	22	9.2	6.2	8.8
2	3.6	3.7	3.8	3.9	5.4	7.4	7.4	13	22	9.6	6.6	9.1
3	3.6	3.7	3.8	3.9	5.4	7.5	6.4	14	21	10	7.0	11
4	3.6	3.7	3.8	3.9	5.5	7.6	6.6	14	20	11	7.4	9.1
5	3.6	3.7	3.8	3.9	5.5	7.7	6.9	14	20	10	7.8	6.4
6	3.7	3.7	3.8	3.9	5.6	7.7	7.1	14	19	10	8.2	6.8
7	3.7	3.7	3.8	3.9	5.7	7.8	7.3	15	23	10	8.6	6.4
8	3.7	3.7	3.8	3.9	5.8	7.9	7.6	15	36	9.0	8.6	7.3
9	3.7	3.7	3.8	3.9	5.9	7.9	7.8	15	24	9.4	8.2	5.0
10	3.7	3.7	3.8	3.9	6.0	8.0	7.9	15	19	9.2	6.0	3.7
11	3.7	3.8	3.8	3.9	6.1	8.1	8.1	15	20	9.4	5.6	3.6
12	3.7	3.8	3.8	4.0	6.1	8.1	8.5	16	19	11	5.0	3.3
13	3.7	3.8	3.8	4.0	6.2	8.2	8.7	16	15	13	2.6	3.6
14	3.7	3.8	3.8	4.1	6.3	8.3	8.9	16	12	9.2	1.7	5.6
15	3.7	3.8	3.8	4.2	6.3	8.3	9.2	16	17	9.0	1.8	6.3
16	3.7	3.8	3.8	4.2	6.4	8.4	9.4	17	16	9.2	3.4	11
17	3.7	3.8	3.8	4.3	6.5	8.5	9.6	17	21	8.6	17	12
18	3.7	3.8	3.8	4.4	6.5	8.5	9.9	17	32	7.8	14	16
19	3.7	3.8	3.8	4.4	6.6	8.6	10	17	28	7.6	11	26
20	3.7	3.8	3.8	4.5	6.7	8.7	10	18	25	9.3	12	31
21	3.7	3.8	3.9	4.6	6.7	8.8	11	18	21	7.9	3.6	30
22	3.7	3.8	3.9	4.6	6.8	8.9	11	18	16	7.9	3.4	11
23	3.7	3.8	3.9	4.7	6.9	8.9	11	18	13	6.3	3.2	11
24	3.7	3.8	3.9	4.8	7.0	9.0	11	19	12	5.6	3.0	13
25	3.7	3.8	3.9	4.8	7.1	9.1	11	19	11	6.0	3.1	14
26	3.7	3.8	3.9	4.9	7.2	9.1	12	19	10	6.0	3.0	14
27	3.7	3.8	3.9	5.0	7.2	9.2	12	19	9.4	7.9	2.7	13
28	3.7	3.8	3.9	5.0	7.3	9.3	12	19	9.0	9.1	3.5	8.2
29	3.7	3.8	3.9	5.1	....	9.3	12	20	9.2	8.0	2.6	6.9
30	3.7	3.8	3.9	5.2	....	9.4	13	20	9.2	6.9	2.4	5.6
31	3.7	....	3.9	5.2	....	8.0	13	20	....	5.8	4.5	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	4.4	16	5.0	4.4	3.9	18	14	83	69	21	18	7.6
2	4.4	17	5.0	4.4	3.9	19	24	78	64	19	12	7.3
3	6.6	19	4.9	4.4	3.9	19	34	91	58	20	11	7.3
4	11	17	4.9	4.4	3.9	20	44	97	46	18	12	7.8
5	13	6.1	4.9	4.4	3.9	20	54	103	36	38	11	9.7
6	13	6.8	4.9	4.4	4.4	19	64	109	31	31	7.6	7.8
7	14	6.6	4.9	4.3	4.9	19	74	109	25	23	7.1	7.3
8	13	7.3	4.8	4.3	5.4	19	84	111	20	19	6.4	7.8
9	14	7.9	4.8	4.3	5.9	19	95	104	18	23	6.0	7.6
10	18	7.5	4.8	4.3	6.4	18	106	101	19	36	7.1	7.3
11	18	10	4.8	4.3	6.9	18	117	103	13	25	14	6.9
12	18	8.6	4.8	4.2	7.4	18	128	104	15	25	18	6.6
13	18	9.0	4.8	4.2	8.0	18	137	102	18	22	17	6.3
14	17	8.6	4.7	4.2	8.6	18	167	103	18	21	38	6.0
15	16	6.4	4.7	4.2	9.2	17	174	101	18	21	18	5.7
16	15	7.3	4.7	4.2	9.8	17	122	91	17	25	13	5.4
17	14	5.3	4.7	4.2	10	17	106	81	17	23	10	5.0
18	13	5.2	4.7	4.1	11	17	97	78	17	20	8.4	4.7
19	12	5.2	4.6	4.1	12	17	83	79	17	14	7.1	4.4
20	11	5.2	4.6	4.1	12	16	91	76	16	13	6.2	4.1
21	11	5.1	4.6	4.1	13	16	96	74	15	10	5.8	3.8
22	10	5.1	4.6	4.1	13	16	106	77	14	9.7	5.6	3.5
23	11	5.1	4.6	4.0	14	16	80	76	13	9.7	6.0	3.5
24	12	5.1	4.6	4.0	15	16	78	76	12	11	5.8	3.4
25	13	5.1	4.5	4.0	15	15	78	75	13	17	6.4	3.2
26	12	5.1	4.5	4.0	16	15	79	74	14	20	7.3	3.1
27	12	5.0	4.5	4.0	16	15	80	74	14	14	6.9	3.1
28	14	5.0	4.5	4.0	17	15	81	79	14	14	6.5	3.2
29	14	5.0	4.5	4.0	18	15	81	89	12	12	6.7	3.3
30	14	5.0	4.5	3.9	.....	14	84	79	15	14	6.4	3.3
31	14	.....	4.5	3.9	.....	14	.....	80	.....	16	6.7	.....

Daily discharge for 1923 determined as follows: Interpolate Oct. 21 to Mar. 30; Direct from two well defined curves Mar. 30 to Nov. 17.

1924—Interpolate Nov. 17 to Apr. 1; Apply curve Apr. 1 to Sept. 30.

Monthly discharge of Rayado River near Abreu's Ranch near Cimarron, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	3.7	3.6	3.68	226
November	3.8	3.7	3.77	224
December	3.9	3.8	3.84	236
January	5.2	3.9	4.35	268
February	7.3	5.3	6.28	350
March	9.4	7.4	8.37	515
April	13	6.4	9.50	585
May	20	13	16.6	1,023
June	36	9.0	18.4	1,090
July	13	5.8	8.67	533
August	17	1.7	5.92	364
September	31	3.3	10.6	632
The year	36	1.7	8.35	6,050
1924				
October	18	4.4	12.9	804
November	19	5.0	7.75	461
December	5.0	4.5	4.82	296
January	4.4	3.9	4.17	257
February	18	3.9	9.60	554
March	20	14	17.1	1,050
April	174	14	88.7	5,270
May	111	74	88.9	5,430
June	69	12	22.9	1,360
July	38	12	19.5	1,200
August	38	5.6	10.3	630
September	9.7	3.1	5.53	330
The year	174	3.1	24.3	17,640

## EAST FORK OF OCATE RIVER AT OCATE, N. MEX.

*Location*—About 500 feet above the junction of east and west forks of Ocate River, in the southeast quarter of section 2, township 22 north, range 18 east.

*Records available*—September 28, 1914 to September 30, 1924.

*Drainage area*—35 square miles.

*Gage*—Chain gage up to June 24, 1919. Inclined staff installed June 25, 1919, and referred to new datum.

*Channel*—In clay, and liable to shifts during high water. Banks high, not subject to overflow.

*Discharge measurements*—Made by wading.

*Winter conditions*—Ice forms in channel at this station during winter months.

*Diversions*—See description, West Fork of Ocate River.

*Discharge measurements of East Fork of Ocate River, at Ocate, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 21	Griffin-Lambert	2.94	1.3
Jan. 10	Mark Lambert	i 3.13	3.2
Mar. 30	..... do	3.13	2.3
May 31	Lambert-Archer	2.91	0.7
July 19	..... do	3.03	3.2
Aug. 31	Mark Lambert	3.06	2.6
1924			
Nov. 2	Mark Lambert	3.14	5.4
Feb. 6	..... do	i 3.33	5.4
Apr. 2	..... do	3.33	19.4
June 17	..... do	2.44	0.8
Aug. 21	..... do	2.62	1.9
Sept. 23	..... do	2.61	2.4

i=Ice.



Daily discharge in second-feet of East Fork of Ocate River, at Ocate, N. Mex.,  
for climatic years 1923-24.

[Vidal Mondragon, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	2.0	3.9	5.7	3.0	2.4	1.3	1.5	0.8	0.6	0.6	0.1	1.5
2.....	2.0	5.7	5.7	3.0	2.3	0.4	1.3	0.4	1.6	0.6	0.4	2.5
3.....	2.0	5.2	5.7	3.0	2.3	0.2	1.1	0.8	1.0	1.0	1.8	3.1
4.....	2.0	4.1	5.7	3.0	2.2	0.4	0.9	0.2	0.6	0.6	1.1	3.5
5.....	2.0	5.7	5.7	3.1	2.2	0.2	0.7	0.3	0.6	7.1	1.8	3.1
6.....	2.0	5.7	5.7	3.1	2.2	0.1	0.5	0.9	0.6	2.5	2.0	2.7
7.....	2.0	5.7	3.9	3.1	2.1	0.1	0.5	1.1	9.0	0.6	28	2.3
8.....	2.3	5.7	3.3	3.2	2.1	0.1	0.3	1.1	7.1	0.6	21	1.9
9.....	2.3	5.7	6.5	3.2	2.1	0.1	0.1	1.1	7.1	0.6	5.0	1.5
10.....	2.3	4.1	2.8	3.2	2.0	0.1	0.2	0.5	5.2	0.6	1.9	1.5
11.....	2.3	4.1	5.2	3.2	2.0	0.1	0.1	0.6	2.5	1.4	1.9	1.5
12.....	2.3	5.7	8.8	3.1	1.9	0.4	0.5	0.6	2.5	0.6	3.0	1.5
13.....	2.3	5.4	5.7	3.1	1.9	0.4	0.3	0.6	2.5	0.6	4.4	1.5
14.....	2.4	5.7	5.7	3.0	1.9	0.1	0.1	0.6	2.5	0.6	1.9	3.1
15.....	2.3	7.6	2.8	3.0	1.8	0.1	0.1	0.7	2.5	2.5	1.9	1.5
16.....	2.7	5.2	4.1	3.0	1.8	0.4	0.6	0.6	2.1	2.1	28	1.5
17.....	3.3	5.7	5.7	2.9	1.8	0.4	0.1	0.7	1.0	3.6	43	1.5
18.....	3.6	4.1	5.7	2.9	1.7	0.5	0.1	0.7	1.6	3.0	33	4.4
19.....	3.6	4.1	7.2	2.9	1.7	0.4	0.1	0.7	1.6	7.1	8.9	10
20.....	3.3	4.1	5.7	2.8	1.6	0.1	0.1	0.7	16	13	7.0	3.5
21.....	4.1	5.2	5.2	2.8	1.6	0.4	0.6	0.5	9.6	5.2	7.0	1.5
22.....	3.9	5.7	5.7	2.7	1.6	0.4	0.7	0.6	2.5	2.5	7.0	1.5
23.....	3.9	4.1	5.7	2.7	1.5	1.3	0.4	0.5	2.5	2.5	3.6	1.5
24.....	5.7	5.7	5.7	2.7	1.5	0.5	0.7	0.5	2.1	1.6	5.0	1.5
25.....	5.7	4.1	4.5	2.6	1.5	0.4	0.7	0.6	1.0	1.0	3.6	1.5
26.....	4.5	4.1	2.8	2.6	1.4	1.8	0.7	0.7	1.6	0.6	3.6	1.5
27.....	4.1	5.2	2.8	2.6	1.4	1.7	3.3	0.5	1.6	2.1	3.6	1.5
28.....	4.1	5.7	2.8	2.5	1.3	1.7	1.8	0.5	1.6	7.1	1.5	1.5
29.....	3.3	7.6	2.9	2.5	....	1.7	3.6	0.5	1.6	1.6	23	1.2
30.....	2.8	11	2.9	2.4	....	1.7	0.8	0.5	1.0	0.4	6.5	0.9
31.....	2.8	....	2.9	2.4	....	1.7	....	0.6	....	0.4	3.5	....
1924												
1.....	0.1	3.5	2.0	3.5	5.1	3.6	12	24	8.0	1.7	2.8	2.0
2.....	10	3.5	2.0	3.6	5.2	3.6	14	24	8.0	3.5	2.8	2.0
3.....	10	3.5	2.0	3.6	5.2	3.5	19	24	8.0	1.4	2.8	1.3
4.....	5.6	3.5	2.1	3.6	5.3	0.2	30	24	8.0	4.2	2.8	2.0
5.....	4.4	5.6	2.2	3.7	5.3	9.5	30	24	6.4	2.8	2.8	2.3
6.....	8.3	5.2	2.2	3.8	5.4	4.4	98	24	5.6	3.9	2.6	2.0
7.....	7.8	3.5	2.2	3.8	5.3	2.1	66	19	2.6	2.8	2.8	2.0
8.....	19	3.5	2.3	3.8	5.2	3.5	71	24	2.8	3.5	1.5	2.0
9.....	86	3.5	2.4	3.9	5.1	4.4	57	27	2.3	2.8	1.3	2.2
10.....	37	3.5	2.4	4.0	5.0	0.8	33	23	2.6	14	1.2	2.0
11.....	4.4	22	2.4	4.0	5.0	3.5	29	23	2.8	8.0	2.8	2.0
12.....	7.8	7.8	2.5	4.0	4.9	3.5	23	21	4.2	7.0	3.9	1.3
13.....	8.8	7.8	2.6	4.1	4.8	3.5	25	19	1.3	6.4	8.0	1.3
14.....	7.8	3.5	2.6	4.2	4.8	1.3	40	23	1.2	4.2	9.1	1.3
15.....	7.8	3.5	2.6	4.2	4.7	1.9	41	21	1.1	4.2	4.6	1.0
16.....	7.8	3.5	2.7	4.2	4.6	2.3	31	21	0.8	2.8	2.8	1.0
17.....	5.2	3.5	2.8	4.3	4.6	4.4	21	19	6.4	1.8	2.8	1.2
18.....	1.5	4.4	2.8	4.4	4.5	6.2	24	18	1.0	1.8	2.8	2.0
19.....	3.1	6.5	2.8	4.4	4.4	4.0	19	18	0.8	1.2	2.3	1.9
20.....	3.5	1.5	2.9	4.4	4.3	7.1	19	16	1.3	1.2	2.3	2.0
21.....	2.5	1.5	3.0	4.5	4.3	1.3	21	12	0.8	1.2	2.3	2.0
22.....	2.5	1.5	3.0	4.6	4.2	0.6	27	10	0.8	1.1	2.6	1.3
23.....	3.5	1.5	3.0	4.6	4.1	1.3	25	8.0	0.8	1.0	2.6	2.0
24.....	5.6	1.5	3.1	4.6	4.1	3.5	33	7.0	0.8	1.2	1.9	2.0
25.....	2.5	1.5	3.2	4.7	4.0	21	31	7.0	0.8	2.6	2.0	2.0
26.....	5.2	1.5	3.2	4.8	3.9	38	27	5.1	0.8	1.1	2.0	0.8
27.....	2.5	1.5	3.2	4.8	3.8	24	26	2.8	0.8	2.0	1.7	0.9
28.....	2.5	1.5	3.3	4.9	3.8	44	24	2.3	0.8	3.1	2.6	1.0
29.....	3.5	2.9	3.4	4.9	3.7	12	19	2.8	0.8	2.8	2.6	1.0
30.....	3.5	1.9	3.4	5.0	....	10	24	9.0	1.0	2.8	2.6	1.3
31.....	3.5	....	3.4	5.0	....	17	....	9.0	....	2.8	2.6	....

Daily discharge for 1923 determined as follows: Direct from fairly well defined curve Oct. 21 to Dec. 26; Interpolate Dec. 26 to Mar. 1; Direct from fairly well defined curve Mar. 1 to Mar. 30; Indirect method for shifting channel Mar. 30 to May 31; direct from well defined curve May 31 to July 19; indirect method for shifting channel, July 19 to August 31; Direct from well defined curve Aug. 31 to Nov. 30.

1924—Interpolate Nov. 30 to Mar. 3; Direct from two well defined curves March 3 to August 21; direct from two fairly well defined curves Aug. 21 to Nov. 15.

Monthly discharge of East Fork of Ocate River, at Ocate, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	5.7	2.3	3.02	186
November .....	11	3.9	5.22	320
December .....	8.8	2.8	4.88	300
January .....	3.2	2.4	2.88	177
February .....	2.4	1.3	1.85	103
March .....	1.8	0.1	0.62	38.1
April .....	3.6	0.1	0.75	44.6
May .....	1.1	0.2	0.63	39.1
June .....	16	0.6	3.06	182
July .....	13	0.4	2.40	148
August .....	43	0.1	9.41	580
September .....	10	0.9	2.26	134
The year .....	43	0.1	3.11	2,250
1924				
October .....	86	0.1	9.16	562
November .....	22	1.5	3.97	236
December .....	3.4	2.0	2.70	166
January .....	5.0	3.5	4.26	262
February .....	5.4	3.7	4.64	267
March .....	44	0.2	7.93	487
April .....	98	12	32.0	1,900
May .....	27	2.3	16.4	1,010
June .....	8.0	0.8	3.02	180
July .....	14	1.0	3.75	200
August .....	9.1	1.2	3.01	180
September .....	2.3	0.8	1.63	97.4
The year .....	98	0.1	7.65	5,550

#### WEST FORK OF OCATE RIVER AT OCATE, N. MEX.

*Location*—About 150 feet above the junction of the east and west forks the Ocate River, in the southeast quarter of section 2, township 22 north, range 18 east. Gage at highway bridge on Ocate-Wagon Mound main highway.

*Records available*—September 28, 1914 to September 30, 1924.

*Drainage area*—Not known.

*Gage*—Vertical staff. New gage, established August 2, 1919, 300 feet below gage established June 30, 1916.

*Channel*—Straight below, curved above station. Channel in clay and liable to shifts during high water. Banks high and not subject to overflow.

*Discharge measurements*—Made by wading or from highway bridge at station.

*Winter conditions*—Gage heights may be affected by ice.

*Diversions*—Water is diverted for irrigation above the station. The Lake Charette Irrigation Company diverts water from the Ocate 3 miles below the station.



Discharge measurements of West Fork of Ocate River, at Ocate, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 21	Griffin-Lambert	0.58	e 0.10
Jan. 10	Mark Lambert	i	e 0.20
Mar. 30	do	0.90	1.6
May 31	do	0.79	e .10
July 20	Lambert-Archer	0.51	e 0.30
Aug. 31	Mark Lambert	0.61	e 0.4
1924			
Nov. 2	Mark Lambert	0.11	0.9
Feb. 6	do	i *0.71	0.6
Apr. 12	do	1.06	7.6
June 17	do	0.98	0.3
Aug. 21	do	0.81	0.10
Sept. 23	do	0.74	0.10

e=Estimated.

i=Ice.

\*Denotes new gage.

Daily discharge in second-feet of West Fork of Ocate River, at Ocate, N. Mex., climatic years 1923-24.

[Vidal Mondragon, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	0.1	0.1	0.7	0.4	0.4	0.7	1.6	0.2	0.2	3.6	0.2	1.2
2	0.1	0.1	0.1	0.4	0.4	0.7	1.6	0.9	0.2	3.6	0.2	1.7
3	0.1	0.1	0.1	0.4	0.4	0.7	1.6	1.6	0.2	3.6	0.3	1.7
4	0.1	0.1	0.1	0.3	0.4	0.7	1.6	1.3	0.2	3.6	0.3	2.3
5	0.1	0.1	0.1	0.3	0.5	0.7	1.6	1.6	0.3	6.5	0.2	0.6
6	0.1	0.2	0.2	0.3	0.5	0.8	1.6	1.6	0.3	4.6	3.4	0.4
7	0.1	0.1	0.4	0.3	0.5	0.8	1.6	1.6	0.3	4.3	1.7	0.3
8	0.1	0.1	0.4	0.2	0.5	0.8	1.3	0.9	1.6	3.0	12	0.2
9	0.1	0.1	0.4	0.2	0.5	0.6	0.5	0.9	0.7	2.6	3.8	0.1
10	0.1	0.1	0.4	0.2	0.5	0.7	0.3	0.2	0.9	4.1	0.6	0.1
11	0.1	0.2	0.4	0.2	0.5	1.0	0.5	0.2	0.9	5.2	0.6	0.1
12	0.1	0.1	0.4	0.2	0.5	1.2	7.0	0.2	0.6	5.8	0.6	0.1
13	0.1	0.2	0.4	0.2	0.5	0.8	3.4	0.2	0.6	5.8	0.6	0.1
14	0.1	0.3	0.1	0.2	0.6	0.6	0.5	0.5	0.5	4.1	0.6	0.5
15	0.1	0.4	0.4	0.2	0.6	0.7	0.5	0.3	0.7	6.7	0.6	0.2
16	0.1	0.4	0.4	0.3	0.6	1.4	0.5	0.9	0.7	7.4	2.6	0.2
17	0.1	0.6	0.4	0.3	0.6	0.8	0.2	0.3	0.7	7.4	25	0.3
18	0.1	0.3	0.6	0.3	0.6	1.0	0.3	0.2	0.7	9.7	12	0.4
19	0.1	0.4	0.5	0.3	0.6	0.9	0.5	0.2	0.7	12	10	0.5
20	0.1	0.4	0.7	0.3	0.6	0.8	1.6	0.2	4.7	11	8.6	0.4
21	0.1	0.2	0.6	0.3	0.6	0.8	0.3	0.2	4.1	8.6	7.4	0.4
22	0.1	0.5	0.4	0.3	0.6	0.9	0.2	0.2	2.2	0.6	8.8	0.4
23	0.1	0.4	0.4	0.3	0.6	0.8	0.2	0.2	1.1	0.6	6.5	0.4
24	0.1	0.4	0.5	0.3	0.6	0.8	0.3	0.2	1.1	0.3	6.5	0.4
25	0.1	0.4	0.4	0.4	0.7	0.9	0.2	0.2	2.0	1.3	6.3	0.4
26	0.1	0.4	0.5	0.4	0.7	0.8	0.2	0.2	2.0	0.8	6.2	0.4
27	0.1	0.4	0.4	0.4	0.7	0.8	0.2	0.2	2.0	1.0	6.2	0.4
28	0.1	0.3	0.4	0.4	0.7	0.8	0.2	0.2	2.0	0.2	6.2	0.4
29	0.1	0.3	0.4	0.4	.....	1.2	0.2	0.2	2.0	0.2	61	0.4
30	0.1	0.4	0.4	0.4	.....	1.8	0.2	0.2	3.6	0.2	5.6	0.4
31	0.1	.....	0.4	0.4	.....	1.6	.....	0.2	.....	0.2	1.7	.....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	0.4	0.2	0.4	0.5	0.6	0.3	0.2	22	2.2	0.2	0.2	0.2
2	4.4	0.3	0.4	0.5	0.6	0.2	0.2	24	2.2	6.6	0.2	0.2
3	3.4	0.1	0.4	0.5	0.6	0.2	0.3	21	11	2.2	0.2	0.2
4	1.1	0.1	0.4	0.5	0.6	0.2	2.2	22	6.6	2.2	0.2	0.2
5	1.8	0.1	0.4	0.5	0.6	0.2	6.6	20	6.6	2.2	0.2	0.2
6	2.3	0.1	0.4	0.5	0.6	0.2	69	11	9.2	9.2	0.2	0.2
7	1.1	0.1	0.4	0.5	0.6	0.2	55	11	6.6	11	0.2	0.2
8	18	0.1	0.4	0.5	0.6	0.2	34	11	9.2	2.2	0.2	0.2
9	41	0.1	0.4	0.5	0.6	0.2	31	16	9.2	2.2	0.2	0.2
10	17	0.1	0.4	0.5	0.5	0.2	18	11	5.7	29	0.2	0.2
11	0.4	8.0	0.4	0.5	0.5	0.1	16	11	2.2	11	16	0.2
12	0.3	0.3	0.5	0.5	0.5	0.1	20	11	2.2	2.2	47	0.2
13	0.3	0.1	0.5	0.5	0.5	6.6	16	11	2.2	2.2	33	0.2
14	0.3	0.1	0.5	0.5	0.5	0.3	34	16	2.2	2.2	6.6	0.2
15	0.3	0.2	0.5	0.5	0.4	0.3	22	16	2.2	47	0.2	0.2
16	0.3	0.2	0.5	0.5	0.4	0.7	13	11	2.2	0.3	0.3	0.1
17	0.3	0.3	0.5	0.5	0.4	1.2	16	11	2.2	0.3	0.3	0.1
18	0.1	0.3	0.5	0.6	0.4	6.6	18	11	2.2	0.2	0.3	0.1
19	0.1	0.3	0.5	0.6	0.4	0.7	18	6.6	2.2	0.2	0.2	0.1
20	0.1	0.3	0.5	0.6	0.4	0.3	16	6.6	2.2	0.2	0.2	0.1
21	0.2	0.3	0.5	0.6	0.4	0.2	16	2.2	2.2	0.2	0.2	0.1
22	0.3	0.4	0.5	0.6	0.3	0.2	16	2.2	2.2	0.2	0.2	0.1
23	0.3	0.4	0.5	0.6	0.3	0.3	22	6.6	2.2	0.2	0.2	0.1
24	0.2	0.4	0.5	0.6	0.3	1.2	24	6.6	2.2	0.3	0.3	0.1
25	0.4	0.4	0.5	0.6	0.3	0.3	27	6.6	2.2	0.3	0.2	0.1
26	0.3	0.4	0.5	0.6	0.3	0.3	29	6.6	2.2	1.8	0.2	0.1
27	0.3	0.4	0.5	0.6	0.3	2.2	31	6.6	2.2	0.5	0.2	0.1
28	0.3	0.4	0.5	0.6	0.3	1.2	22	2.2	2.2	0.2	0.2	0.1
29	0.3	0.4	0.5	0.6	.....	1.1	20	24	6.6	0.2	0.2	0.1
30	0.2	0.4	0.5	0.6	.....	0.7	.....	16	.....	0.2	0.2	.....
31	0.1	.....	0.5	0.6	.....	.....	.....	.....	.....	.....	.....	.....

Daily discharge for 1923 determined as follows: Direct from well defined curve Oct. 21 to Jan. 5; Interpolate Jan 5 to Mar. 8; Direct from two well defined curves Mar. 8 to May 31; Indirect method for shifting channel May 31 to Aug. 31; Direct from fairly well defined curve Aug. 31 to Nov. 2.

1924—Direct from well defined curve Nov. 2 to Nov. 22; Interpolate Nov. 22 to Mar. 7; Direct from well defined curve Mar. 7 to Nov. 10.

Monthly discharge of West Fork of Ocate River, at Ocate, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	0.1	0.1	0.10	6.2
November	0.6	0.1	0.26	16.1
December	0.7	0.1	0.38	23.8
January	0.4	0.2	0.30	18.8
February	0.7	0.4	0.55	30.7
March	1.8	0.6	0.89	54.7
April	7.0	0.2	1.02	60.5
May	1.6	0.2	0.52	32.1
June	4.7	0.2	1.30	77.6
July	13.0	0.2	4.14	255
August	25.0	0.2	6.65	410
September	2.3	0.1	0.51	30.5
The year	25.0	0.1	1.40	1,020
1924				
October	41.0	0.1	3.09	190
November	8.0	0.1	0.51	30.3
December	0.5	0.4	0.46	28.6
January	0.6	0.5	0.54	33.3
February	0.6	0.3	0.45	26.2
March	6.6	0.1	8.71	53.5
April	69.0	0.2	21.0	1,250
May	24.0	2.2	12.2	750
June	11.0	2.2	3.90	232
July	47.0	0.2	4.42	272
August	47.0	0.2	3.50	215
September	0.2	0.1	0.15	8.9
The year period	47	0.1	4.26	3,090



## MORA RIVER NEAR CLEVELAND, N. MEX.

*Location*—One-half mile southeast of Cleveland, N. Mex., and five and one-half miles northwest of Mora, N. Mex. At headgate of J. J. Fuss mill ditch and about 100 feet below the junction of the Rio de la Casa and the Mora River, section 3, township 20 north, range 15 east.

*Records available*—March 5, 1920 to September 30, 1924.

*Drainage area*—140 square miles.

*Gage*—Automatic recording.

*Channel*—Permanent at low stages.

*Discharge measurements*—Made by wading or from bridge one-fourth mile below gage during high water.

*Winter conditions*—Ice may form during winter months.

*Diversions*—There are diversions for irrigation both above and below the station.

*Discharge measurements of Mora River near Cleveland, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Discharge Sec.-Ft.
1923			
Oct. 20	Griffin-Lambert	1.57	7.2
Jan. 9	Mark Lambert	1.47	5.1
Mar. 29	do	1.67	8.9
May 30	Lambert-Archer	2.41	58.3
July 19	do	2.35	62.8
Aug. 30	Mark Lambert	2.25	37.6
1924			
Nov. 1	Mark Lambert	2.19	20.1
Feb. 3	do	1.94	10.6
Apr. 11	do	2.56	10.6
June 16	do	2.35	58.8
Aug. 20	do	1.88	11.2
Sept. 23	do	1.68	8.4

*Daily discharge in second-feet of Mora River near Cleveland, N. Mex., for climatic years 1923-24.*

[Frank Labistado, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	16	13	5.3	6.2	2.5	1.1	9.6	35	61	73	66	28
2	16	14	5.3	5.3	1.8	0.8	8.5	38	61	68	60	25
3	17	17	7.6	5.6	1.6	0.7	8.5	41	60	59	66	26
4	17	18	7.9	5.8	2.0	0.6	8.7	43	58	54	73	24
5	17	17	6.0	8.4	2.0	0.6	8.7	37	53	51	73	18
6	18	16	6.6	9.3	2.3	0.4	9.4	37	48	47	73	30
7	18	16	9.1	9.3	2.2	0.8	10	38	74	43	80	26
8	18	15	7.6	7.2	2.1	1.1	9.3	44	93	47	89	25
9	16	14	8.3	5.7	2.3	1.5	8.5	58	61	40	94	26
10	16	13	8.0	5.2	2.5	1.3	8.9	57	58	42	94	26
11	16	13	12	5.4	2.3	1.1	10	60	56	46	94	28
12	15	12	12	4.8	3.6	1.1	12	53	56	55	94	33
13	14	11	15	3.1	3.4	1.8	12	43	59	56	99	26
14	14	10	13	3.9	3.7	2.6	16	41	61	57	112	30
15	14	9.4	11	3.7	5.2	2.2	13	33	60	61	110	41
16	12	8.7	9.3	4.0	4.8	2.4	14	29	61	71	128	46
17	11	7.9	7.1	7.0	4.3	4.0	14	29	59	66	147	50
18	10	7.1	5.1	5.7	4.5	2.5	16	31	61	66	140	61
19	8.7	4.4	4.6	4.5	4.3	4.0	20	33	61	48	142	53
20	7.2	3.7	5.0	7.0	4.2	1.5	24	35	76	26	140	50
21	8.0	5.6	3.8	5.4	4.5	1.0	23	31	87	37	156	50
22	8.0	6.3	5.0	4.2	3.4	1.4	27	25	79	20	154	50
23	8.0	2.5	6.3	3.9	2.4	1.4	23	20	76	14	140	46
24	7.9	2.6	6.9	3.7	1.4	3.8	23	21	74	12	140	44
25	8.0	3.5	5.8	4.0	1.2	6.8	24	27	74	12	140	37
26	8.0	3.7	6.0	3.4	1.2	7.4	26	30	76	9.6	142	30
27	8.0	5.8	7.2	2.2	0.5	8.5	27	36	76	20	140	26
28	8.0	5.8	7.9	1.6	1.0	9.6	28	49	78	87	133	26
29	10	7.3	5.8	2.1	....	10	35	53	79	66	122	48
30	10	7.2	5.0	2.3	....	10	37	64	78	69	76	42
31	12	....	4.7	3.7	....	....	....	65	....	66	52	....
1924												
1	36	28	39	14	12	14	61	140	126	28	46	12
2	30	26	50	13	11	13	83	142	124	55	46	11
3	24	28	39	13	11	13	105	152	123	60	48	10
4	18	30	24	12	11	9.8	127	163	121	37	48	10
5	35	44	23	12	11	10	149	163	119	33	48	10
6	33	50	15	14	11	11	172	142	118	30	46	10
7	41	53	30	17	11	11	221	135	117	27	44	9.9
8	50	56	46	16	11	12	193	140	132	25	28	12
9	92	60	20	15	11	14	164	147	133	23	12	13
10	76	64	12	15	11	16	136	154	147	21	13	13
11	78	85	12	14	11	14	108	186	161	19	12	13
12	71	66	13	14	11	11	122	186	175	19	12	12
13	66	60	14	11	11	12	140	186	189	19	17	12
14	73	56	15	12	12	9.8	165	186	204	23	41	12
15	82	52	16	12	12	9.4	191	174	142	27	29	10
16	99	49	15	12	12	9.0	172	168	76	31	17	9.3
17	89	46	15	10	12	9.6	145	163	48	35	17	9.0
18	78	48	15	10	13	11	128	158	44	39	14	8.8
19	73	48	14	10	13	10	89	153	26	44	12	8.6
20	80	23	13	11	13	14	80	148	24	17	12	8.4
21	70	18	12	12	14	12	140	143	24	17	11	9.2
22	60	18	11	12	14	11	158	138	25	22	12	8.3
23	50	28	13	12	12	9.5	157	133	19	28	12	8.5
24	40	26	15	11	12	11	156	128	48	34	12	8.6
25	30	48	8.3	10	11	16	155	117	44	41	12	8.5
26	30	46	9.4	9.3	9.6	28	154	112	35	48	12	8.6
27	30	45	11	9.8	10	35	140	110	26	48	14	8.7
28	28	44	12	10	11	42	140	112	22	44	12	8.5
29	33	42	13	11	12	50	140	108	19	48	12	8.2
30	35	40	26	11	....	44	140	106	24	48	10	7.9
31	32	....	14	12	....	39	....	128	....	47	12	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two fairly well defined curves Oct. 20 to May 30; indirect method for shifting channel May 30 to July 19; Direct from well defined curve July 19 to Aug. 30.  
1924—Direct from two well defined curves Aug. 30 to Sept. 23; Indirect method for shifting channel Sept. 23 to Nov. 15.



## Monthly discharge of Mora River near Cleveland, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	18	7.2	12.5	757
November	18	2.5	9.68	576
December	15	3.8	7.42	456
January	9.3	1.6	4.95	304
February	5.2	0.5	2.76	153
March	10	0.4	2.99	184
April	37	8.5	17.1	1,019
May	65	20	39.9	2,450
June	93	48	67.1	4,000
July	87	9.6	48.0	2,950
August	156	52	109	6,680
September	64	18	35.8	2,130
The year	156	0.4	29.9	21,700
1924				
October	99	18	55.4	3,300
November	85	18	44.2	2,630
December	50	8.3	18.9	1,160
January	17	9.3	12.2	748
February	14	9.6	11.6	667
March	50	9	17.1	1,050
April	221	61	141	8,390
May	186	106	146	8,960
June	204	19	87.5	5,200
July	60	17	33.5	2,060
August	48	10	22.4	1,370
September	13	7.9	9.97	593
The year	221	7.9	49.8	36,100

## MORA RIVER NEAR GOLONDRINAS, N. MEX.

*Location*—Fifteen miles northeast of Watrous and about two miles below Golondrin as on highway bridge on Mora-Watrous road in section 9, township 19 north, range 17 east.

*Records available*—March 10, 1915, to September 30, 1924.

*Drainage area*—About 230 square miles.

*Gage*—Automatic recording.

*Channel*—Permanent. The channel is straight for about 200 feet above the gage and about 100 feet below the gage and both banks reach above ordinary high water.

*Discharge measurements*—Made by wading, or from bridge.

*Winter conditions*—Gage heights are not likely to be affected by ice.

*Diversions*—Water is diverted above and below the station for irrigation.

*Note:* On May 29, 1921, the station above Golondrin as was destroyed by high water. On July 6, 1921, the new station was established. The results from the two stations should be the same except for a small amount of irrigation.

## Discharge measurements of Mora River near Golondrin as, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 20	Griffin-Lambert	0.17	3.7
Jan. 9	Mark Lambert	0.44	14.2
Mar. 29	do	0.10	2.2
May 31	Lambert-Archer	0.74	32.9
July 19	do	0.41	12.2
Aug. 30	Mark Lambert	1.04	58.6
1924			
Nov. 1	Mark Lambert	0.80	43.2
Feb. 4	do	i	4.8
Apr. 11	do	1.59	149
June 16	do	0.68	38.2
Aug. 19	do	0.14	4.9
Sept. 23	do	0.14	4.4

i=Ice.

## Daily discharge in second-feet of Mora River near Golondrin as, N. Mex., for climatic years 1923-24.

[E. S. Weathers, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	5.0	3.0	13	14	17	9.8	3.2	3.4	3.6	2.0	17	42
2	5.0	1.8	13	14	16	9.6	3.2	3.4	3.5	2.0	17	42
3	4.4	5.0	13	14	16	9.3	3.2	3.4	3.4	2.0	12	42
4	4.4	2.0	13	14	16	9.1	3.2	3.4	3.4	2.0	52	32
5	4.4	1.6	13	14	16	8.8	3.2	3.4	3.4	0.2	32	24
6	4.4	1.5	13	14	15	8.6	3.2	3.4	3.3	2.0	24	24
7	4.4	3.2	13	14	15	8.3	3.2	3.4	3.2	2.0	52	52
8	4.4	2.3	13	14	15	8.1	3.3	3.5	3.2	2.0	91	32
9	4.5	1.8	13	14	15	7.9	3.3	3.5	3.1	2.0	107	24
10	4.5	1.8	13	16	14	7.6	3.3	3.5	3.0	2.0	91	24
11	4.5	7.1	13	11	14	7.4	3.3	3.5	3.0	12	91	24
12	4.5	12	13	14	14	7.1	3.3	3.5	3.0	52	125	24
13	4.5	12	13	13	14	6.9	3.3	3.5	2.9	17	125	17
14	4.5	13	14	21	13	6.6	3.3	3.5	2.8	8.0	91	17
15	4.5	14	14	21	13	6.4	3.3	3.5	2.8	8.0	125	17
16	4.6	13	14	21	13	6.2	3.3	3.5	2.8	12	63	24
17	4.6	13	14	20	13	5.9	3.3	3.5	2.7	32	175	24
18	4.6	13	14	20	13	5.7	3.3	3.5	2.6	17	175	32
19	4.6	13	14	20	12	5.4	3.3	3.5	2.6	12	175	52
20	4.6	13	14	20	12	5.2	3.3	3.5	2.6	42	175	32
21	4.0	13	14	19	12	4.9	3.3	3.5	2.5	125	107	24
22	3.8	13	14	19	12	4.7	3.3	3.5	2.4	52	1,042	24
23	4.0	13	14	19	11	4.5	3.4	3.6	2.4	32	245	24
24	4.6	13	14	19	11	4.2	3.4	3.6	2.4	24	175	17
25	3.8	13	14	18	11	4.0	3.4	3.6	2.3	17	175	17
26	4.0	13	14	18	11	3.7	3.4	3.6	2.2	12	125	17
27	3.4	13	14	18	10	3.5	3.4	3.6	2.2	17	107	17
28	2.0	13	14	18	10	3.2	3.4	3.6	2.2	292	91	17
29	4.0	13	14	17	....	3.0	3.4	3.6	2.1	52	76	17
30	4.0	13	14	17	....	3.2	3.4	3.6	2.0	42	63	17
31	3.8	....	14	17	....	3.0	....	3.6	....	24	52	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	17	42	24	22	6.3	20	60	153	107	2.0	2.0	58
2.....	17	42	24	21	5.8	20	60	137	107	12	2.0	7.0
3.....	24	32	24	21	5.3	20	60	137	107	60	2.0	3.2
4.....	24	32	24	20	4.8	20	60	137	107	30	2.0	2.0
5.....	24	32	24	20	5.1	20	117	137	107	48	2.0	2.0
6.....	42	32	32	19	5.4	20	117	172	93	207	2.0	2.0
7.....	24	32	32	19	5.9	16	152	172	81	48	2.0	2.0
8.....	24	32	32	18	6.4	20	244	172	69	48	2.0	2.0
9.....	63	32	32	18	6.9	20	305	172	58	38	2.0	2.0
10.....	107	32	32	17	7.4	20	172	172	48	38	2.0	2.0
11.....	42	245	32	17	7.9	20	172	172	48	38	2.0	2.0
12.....	42	116	31	16	8.4	20	153	188	48	38	2.0	2.0
13.....	52	42	31	16	8.9	20	153	188	38	23	2.0	2.0
14.....	52	32	31	15	9.4	20	188	172	23	23	2.0	2.0
15.....	63	32	30	15	9.9	20	228	172	30	23	2.0	2.0
16.....	76	32	30	14	10	20	207	172	38	23	2.0	93
17.....	52	24	29	14	11	20	153	172	30	23	2.0	2.0
18.....	52	24	29	13	11	20	153	153	23	23	2.0	2.0
19.....	42	24	28	13	12	30	153	137	17	23	2.0	2.0
20.....	42	24	28	12	12	30	137	122	17	17	2.0	2.0
21.....	42	24	27	12	13	30	137	122	17	17	2.0	2.0
22.....	42	24	27	11	13	30	172	122	17	12	2.0	2.0
23.....	42	24	26	11	14	20	172	107	17	2.0	2.0	2.0
24.....	42	24	26	10	14	50	188	107	17	2.0	2.0	2.0
25.....	32	24	25	9.7	15	72	188	107	17	2.0	2.0	2.0
26.....	32	24	25	9.2	15	72	172	107	12	2.0	2.0	2.0
27.....	32	24	24	8.7	16	72	153	107	7.0	2.0	2.0	2.0
28.....	32	24	24	8.2	16	116	153	93	2.0	2.0	2.0	2.0
29.....	32	32	23	7.7	17	72	122	81	2.0	2.0	2.0	82
30.....	32	32	23	7.2	....	40	122	107	2.0	2.0	2.0	82
31.....	32	....	22	6.8	....	40	....	123	....	2.0	2.0	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve Oct. 20 to Nov. 1.

1924—Direct from well defined curve Nov. 1 to Dec. 9; Interpolate Dec. 9 to Feb. 29; Direct from two well defined curves Feb. 29 to Nov. 15.

Monthly discharge of Mora River near Golondrinas, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October.....	5	2	4.27	262
November.....	14	1.5	9.24	549
December.....	14	13	13.6	835
January.....	21	13	16.8	1,040
February.....	17	10	13.4	742
March.....	9.8	3	6.19	380
April.....	3.4	3.2	3.30	197
May.....	3.6	3.4	3.51	216
June.....	3.6	2	2.79	166
July.....	292	0.2	29.7	1,820
August.....	1,042	12	131	8,080
September.....	52	17	26.4	1,570
The year.....	1,042	0.2	21.9	15,900
1924				
October.....	107	17	41.1	2,520
November.....	245	24	39.7	2,360
December.....	32	22	27.4	1,690
January.....	22	6.8	14.2	870
February.....	17	4.8	10.1	580
March.....	116	16	33.2	2,040
April.....	305	60	154	9,170
May.....	188	81	142	8,710
June.....	107	2.0	43.5	2,590
July.....	207	2.0	27.1	1,670
August.....	2.0	2.0	2.00	123
September.....	93	2.0	12.4	740
The year.....	305	2.0	45.6	33,100

## MORA RIVER NEAR SHOEMAKER, N. MEX.

Location—At head of a box canon, 8 miles east of Shoemaker, 20 miles above the mouth of the river and below all important tributaries, section 5, township 18 north, range 21 east.

Records available—October 1, 1914, to September 30, 1924.

Drainage area—930 square miles.

Gage—Automatic recording. Datum lowered 0.08 November 2, 1917.

Channel—Permanent at low stages.

Discharge measurements—Made by wading or from a cable.

Winter conditions—Ice may form in the channel at the station during the winter months.

Discharge measurements of Mora River near Shoemaker, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-ft.
1923			
Oct. 23.....	E. Griffin.....	0.83	1.9
Jan. 1.....	Mark Lambert.....	1.04	12.4
Apr. 1.....	do.....	0.74	1.9
June 2.....	Lambert-Archer.....	0.82	7.8
July 21.....	do.....	1.31	26.4
Sept. 2.....	Mark Lambert.....	1.47	76.2
1924			
Nov. 5.....	Mark Lambert.....	1.40	50.9
Feb. 6.....	do.....	1.12	24.3
Apr. 14.....	do.....	2.26	305
June 19.....	do.....	0.79	6.1
Aug. 22.....	do.....	1.10	12.9
Sept. 23.....	do.....	0.86	4.2

Daily Discharge in second-feet of Mora River near Shoemaker, N. Mex., for climatic years 1923-24.

[Martin Rolf, Observer]

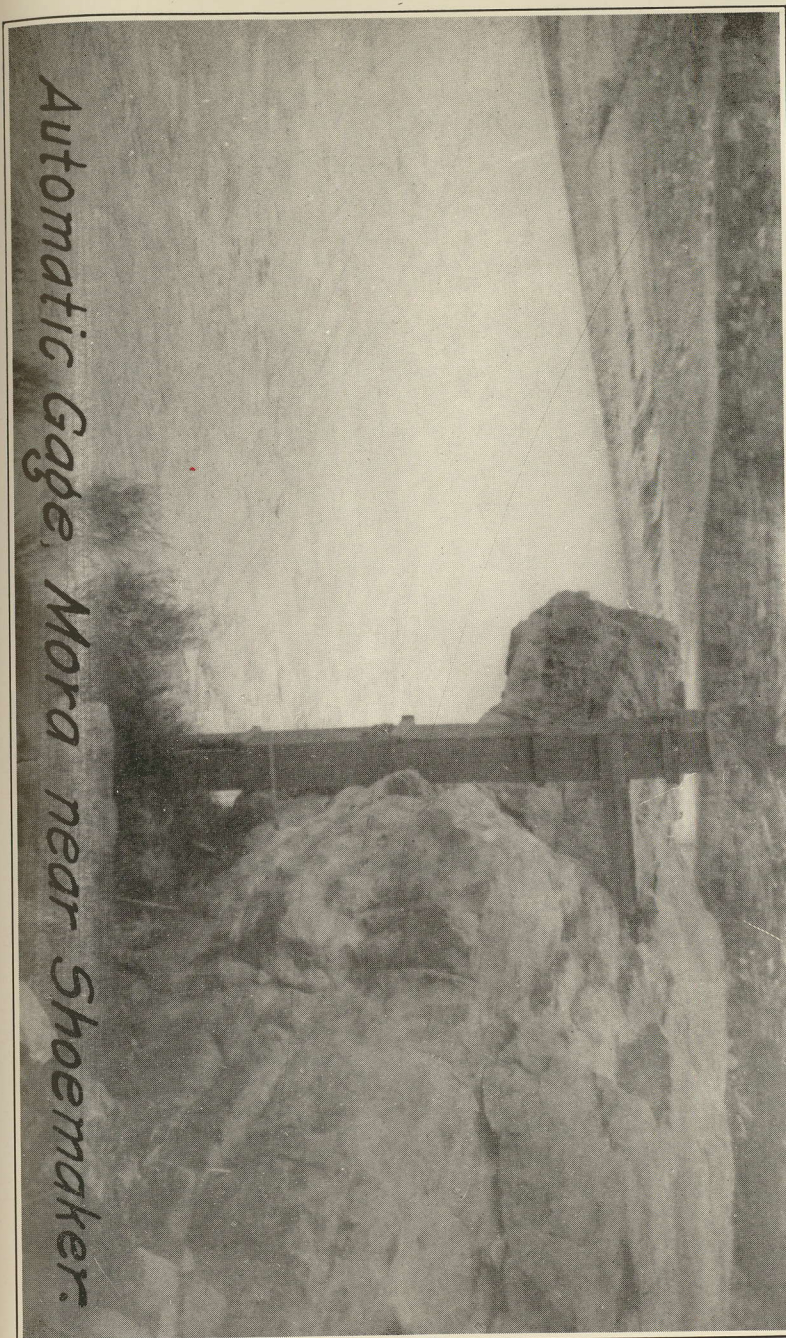
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	2.0	2.9	3.4	2.0	2.1	2.9	1.7	13	7.4	12	20	89
2.....	2.0	2.1	2.5	3.6	2.9	3.8	1.6	11	7.7	10	394	73
3.....	2.0	2.1	2.1	8.0	5.8	2.1	2.1	8.0	7.5	9.4	761	73
4.....	2.0	2.1	2.1	7.0	9.0	6.4	1.7	14	7.4	11	758	73
5.....	2.0	2.1	3.4	6.4	12	4.2	1.9	56	7.6	8.2	337	73
6.....	2.0	2.9	3.4	5.8	17	2.0	2.1	49	7.5	8.2	8.8	73
7.....	2.0	2.9	3.4	9.7	16	1.5	3.1	63	7.6	8.1	8.8	73
8.....	2.0	3.4	3.8	13	15	1.4	4.8	61	13	8.0	8.8	73
9.....	2.0	4.8	3.4	12	15	1.5	4.8	52	148	7.8	8.8	70
10.....	2.0	3.8	2.0	12	13	1.6	6.6	54	143	8.6	9.4	70
11.....	2.0	4.2	2.5	12	14	1.7	2.5	72	100	8.7	48	70
12.....	2.0	5.3	2.5	12	16	1.5	1.7	84	81	8.2	29	73
13.....	2.0	4.2	3.8	11	14	2.1	3.0	73	78	7.8	23	75
14.....	2.0	3.4	5.3	12	17	2.1	4.8	73	56	7.4	18	54
15.....	2.1	3.8	7.5	7.0	15	2.9	6.1	67	23	8.0	48	32
16.....	2.1	4.2	7.5	2.1	13	2.1	6.1	62	20	8.0	77	56
17.....	2.1	3.4	9.7	2.1	13	2.0	7.9	47	20	7.5	107	54
18.....	2.2	2.1	9.7	2.9	13	5.3	9.0	36	23	7.5	137	70
19.....	2.2	3.4	7.0	3.8	10	5.8	10	31	23	7.5	166	67
20.....	2.2	3.4	8.0	3.8	1.4	7.0	6.1	18	20	29	196	97
21.....	2.2	5.8	8.0	4.2	1.5	7.0	9.0	16	16	118	226	64
22.....	2.0	5.8	7.5	4.8	1.4	7.5	9.4	21	135	22	256	35
23.....	1.9	5.8	8.6	3.8	1.4	12	9.4	16	100	23	286	23
24.....	1.9	2.5	8.6	2.0	1.5	11	8.2	12	64	46	243	20
25.....	1.9	2.0	8.0	4.8	1.6	8.6	7.4	9.2	40	48	200	17
26.....	2.0	2.5	7.5	7.5	2.9	6.4	3.8	12	20	48	159	15
27.....	2.0	3.4	5.8	9.0	4.8	5.8	6.8	6.9	15	22	137	13
28.....	2.5	4.2	5.3	4.8	2.9	3.4	7.7	11	14	15	267	14
29.....	3.4	4.8	5.3	1.4	....	2.0	9.0	15	16	27	278	15
30.....	3.4	4.2	6.4	1.5	....	1.5	11	11	14	13	237	15
31.....	2.9	....	3.4	2.2	....	1.4	....	8.6	....	11	116	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1924												
1.....	14	70	85	136	41	51	232	221	135	4.6	7.0	25
2.....	23	75	64	138	38	51	252	221	117	4.8	7.2	16
3.....	27	73	67	139	35	51	272	193	117	5.0	7.4	12
4.....	33	56	61	140	32	48	292	190	105	27	7.6	12
5.....	39	54	64	141	28	45	312	208	105	19	24	12
6.....	45	54	59	142	24	42	333	264	108	13	40	12
7.....	51	59	59	144	26	39	355	284	105	11	56	12
8.....	57	61	61	146	28	36	347	287	105	10	72	11
9.....	63	56	64	147	30	34	340	290	32	10	88	9.1
10.....	69	54	80	135	33	32	332	287	17	9.0	104	8.5
11.....	75	54	102	120	36	37	324	299	16	8.0	120	8.2
12.....	81	196	190	105	38	43	317	312	12	8.0	135	7.9
13.....	78	102	184	102	40	49	310	299	10	7.0	120	7.3
14.....	92	77	179	97	42	55	303	299	7.0	7.0	105	6.6
15.....	118	72	174	102	44	61	304	318	111	111	90	5.8
16.....	154	69	169	111	46	67	305	296	9.4	9.4	75	6.0
17.....	116	61	164	99	48	73	307	281	7.3	7.3	60	6.8
18.....	92	59	159	97	51	79	309	279	7.0	7.0	45	6.6
19.....	86	56	155	97	51	85	311	273	4.8	6.8	30	6.4
20.....	78	56	151	80	51	91	313	242	4.6	6.8	16	6.5
21.....	78	56	147	77	51	94	315	221	5.0	6.2	15	6.8
22.....	78	54	143	73	51	97	318	212	4.8	6.6	15	6.6
23.....	75	54	139	69	51	101	327	196	4.2	6.6	14	6.6
24.....	70	56	135	65	51	105	330	190	3.8	6.6	12	6.1
25.....	78	59	129	62	51	120	380	190	3.6	6.6	10	4.9
26.....	81	61	168	59	51	155	370	180	3.4	6.6	21	4.2
27.....	83	64	355	56	51	150	352	150	3.0	6.6	21	4.6
28.....	83	67	683	53	51	165	318	120	3.0	6.6	21	4.1
29.....	67	77	361	50	51	180	293	111	3.4	6.7	21	4.4
30.....	70	88	258	47	....	196	230	111	3.8	6.8	22	4.4
31.....	70	....	135	44	....	212	....	129	....	6.9	23	....

Daily discharge for 1923 determined as follows: Direct from well defined curve Oct. 23 to Apr. 1; indirect method for shifting channel Apr. 1 to June 2; direct from well defined curve June 2 to Nov. 5.

1924—Direct from well defined curve Nov. 5 to Sept. 23; Indirect method for shifting channel Sept. 23 to Nov. 15.





Monthly discharge of Mora River near Shoemaker, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	3.4	1.9	2.16	133
November .....	5.8	2.0	3.58	213
December .....	9.7	2.0	5.40	332
January .....	13	1.4	6.26	385
February .....	17	1.4	9.00	500
March .....	12	1.4	4.10	251
April .....	11	1.6	5.48	336
May .....	84	6.9	34.9	2,150
June .....	148	7.4	41.2	2,450
July .....	118	7.4	18.8	1,160
August .....	761	8.8	180	11,000
September .....	97	13	52.3	3,210
The year .....	761	1.4	30.6	22,120
1924				
October .....	154	14	71.4	4,410
November .....	196	54	68.3	4,070
December .....	683	59	159	9,800
January .....	147	44	99.1	6,100
February .....	51	24	42.1	2,420
March .....	212	32	85.3	5,240
April .....	380	230	313	18,650
May .....	318	111	231	14,190
June .....	135	3.0	39.1	2,330
July .....	111	4.6	11.8	723
August .....	135	7.0	45.3	2,790
September .....	25	4.1	8.34	500
The year .....	683	3.0	98.1	71,200

#### SAPELLO RIVER AT SAPELLO, N. MEX.

*Location*—About 70 yards above the bridge at the crossing of the road from Las Vegas to Mora, three-eighths of a mile below Sapello, and a half a mile below the mouth of Manuelitos Creek, section 21, township 18 north, range 16 east.

*Records available*—May 9, 1915, to September 30, 1924.

*Drainage area*—About 70 square miles.

*Gage*—Vertical staff.

*Channel*—Shifting. The channel is curved for about 300 feet above the gage and straight for 300 feet below. The right bank is sloping, the left bank is steep and high, and the bottom is sandy.

*Discharge measurements*—Made by wading or from the highway bridge below the gage.

*Winter conditions*—Ice may affect the gage heights during the winter months.

*Note:* On June 4, 1921, gage was destroyed by high water, consequently, there is a period June 4th to July 10th, for which there is no record.



Discharge measurements of Sapello River at Sapello, N. Mex., for climatic years 1923-24.

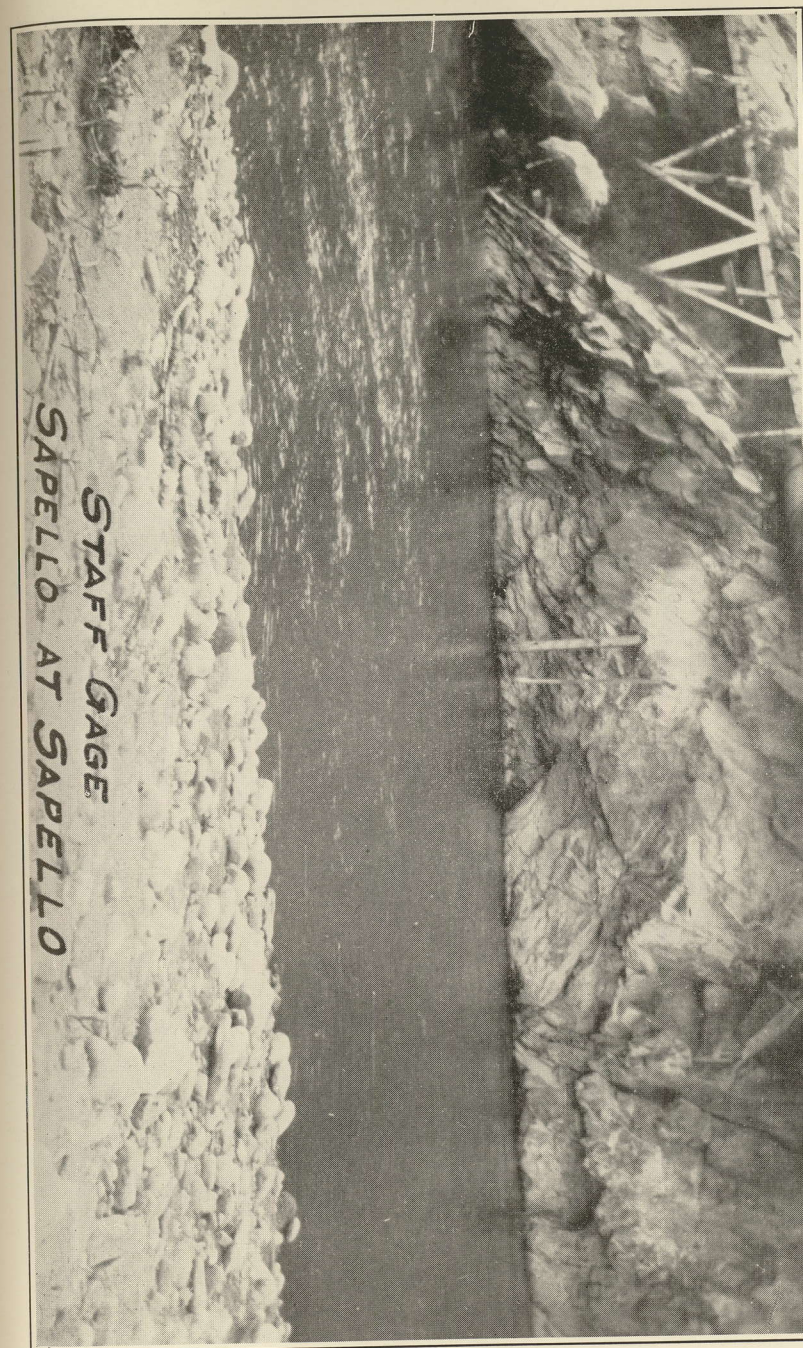
Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 20.....	Griffin-Lambert .....	0.93	0.4
Jan. 9.....	Mark Lambert .....	i 1.05	2.7
Mar. 29.....	do .....	1.18	9.0
May 30.....	Lambert-Archer .....	1.21	11.8
July 19.....	do .....	1.10	5.8
Aug. 30.....	Mark Lambert .....	1.39	22.9
1924			
Nov. 1.....	Mark Lambert .....	1.37	21.1
Feb. 3.....	do .....	i	7.8
Apr. 11.....	do .....	2.10	137
June 16.....	do .....	1.07	15.4
Aug. 20.....	do .....	1.22	6.4
Sept. 23.....	do .....	1.01	1.2

i=Ice.

Daily discharge in second-feet of Sapello River at Sapello, N. Mex., for climatic years 1923-24.

[T. F. Apodaca, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	0.3	0.4	5.2	3.2	2.5	32	8.0	32	6.0	0.2	2.2	24
2.....	.3	.4	5.2	3.2	2.5	32	6.8	32	32	.2	2.2	22
3.....	.3	.4	5.1	3.1	2.5	32	6.0	32	13	.2	2.2	16
4.....	.3	.4	5.0	3.0	2.4	13	6.0	30	2.2	.2	2.2	16
5.....	.3	.4	5.0	3.0	2.4	24	6.0	28	2.2	.2	2.2	16
6.....	.3	.4	4.9	2.9	2.4	24	6.0	24	2.2	.2	2.2	16
7.....	.3	1.7	4.8	2.8	2.4	32	6.0	24	2.2	.2	13	16
8.....	.3	1.7	4.8	2.8	2.4	32	6.0	24	32	.2	16	7.6
9.....	.3	1.7	4.7	2.7	2.4	32	6.0	24	16	.2	16	10
10.....	.3	1.7	4.6	2.7	2.4	32	6.0	24	10	.2	8.0	10
11.....	.3	1.7	4.6	2.7	2.4	32	6.0	24	8.0	10	6.0	10
12.....	.3	1.7	4.5	2.7	2.4	32	13	24	2.2	2.2	6.0	10
13.....	.3	1.7	4.5	2.7	2.4	32	20	24	2.2	2.2	6.0	10
14.....	.3	1.7	4.4	2.7	2.4	32	20	26	2.2	2.2	6.0	10
15.....	.3	1.7	4.3	2.6	2.3	32	20	32	2.2	2.2	6.0	10
16.....	.3	1.7	4.3	2.6	2.3	32	20	32	2.2	2.2	6.0	10
17.....	.3	1.7	4.2	2.6	2.3	32	20	32	2.2	2.2	6.0	10
18.....	.3	1.7	4.1	2.6	2.3	32	20	32	4.1	2.2	6.0	10
19.....	.3	1.7	4.1	2.6	2.3	32	32	32	6.0	50	32	10
20.....	.4	1.7	4.0	2.6	2.3	32	32	32	6.0	32	58	10
21.....	.4	1.7	3.9	2.6	2.3	32	32	32	4.1	2.2	58	9.2
22.....	.4	5.3	3.9	2.6	2.3	38	32	28	4.1	2.2	43	8.0
23.....	.4	5.3	3.8	2.6	2.3	38	32	16	3.0	2.2	43	8.0
24.....	.4	5.3	3.7	2.6	2.2	38	32	16	2.2	1.8	32	8.0
25.....	.4	5.3	3.7	2.6	2.2	316	32	15	2.2	.2	32	8.0
26.....	.4	5.3	3.6	2.5	2.2	24	32	13	2.2	.2	28	8.0
27.....	.4	5.3	3.5	2.5	2.2	20	32	10	2.0	8.0	24	8.0
28.....	.4	5.3	3.5	2.5	2.2	20	32	10	1.8	10	24	8.0
29.....	.4	5.3	3.4	2.5	....	16	32	10	1.8	6.0	24	8.0
30.....	.4	5.3	3.4	2.5	....	16	32	9.2	1.8	6.0	24	8.0
31.....	.4	....	3.3	2.5	....	10	....	6.0	....	16	24	....





Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	6.0	24	15	12	8.0	15	108	86	49	11	15	8.6
2.....	6.0	24	15	12	7.9	15	108	86	40	11	14	8.6
3.....	6.0	24	15	12	7.8	16	86	86	40	11	14	8.6
4.....	6.0	22	15	11	8.1	16	86	86	36	19	12	6.1
5.....	8.0	20	15	11	8.3	16	86	86	36	23	12	6.1
6.....	10	16	15	11	8.6	16	68	86	33	23	12	6.1
7.....	10	16	15	11	8.9	17	68	86	30	36	11	6.1
8.....	78	16	15	11	9.2	17	61	86	30	20	9.0	6.1
9.....	32	16	15	11	9.4	17	54	86	30	20	44	5.4
10.....	24	16	14	11	9.7	17	42	86	27	83	21	4.0
11.....	16	342	14	11	10	17	49	86	27	31	18	4.0
12.....	10	95	14	10	10	17	54	86	27	20	18	4.0
13.....	43	73	14	10	11	17	60	86	24	16	14	4.0
14.....	103	43	14	10	11	17	60	86	21	16	14	4.0
15.....	103	43	14	10	11	17	60	86	19	14	13	2.8
16.....	103	32	14	10	11	32	79	86	16	12	13	2.8
17.....	58	32	14	9.8	12	42	86	86	16	12	11	29
18.....	32	28	13	9.7	12	54	86	86	14	12	11	29
19.....	24	24	13	9.6	12	86	86	84	13	10	11	29
20.....	24	24	13	9.5	12	86	86	79	13	7.1	11	8.6
21.....	24	20	13	9.4	13	86	97	79	13	7.1	11	1.1
22.....	24	20	13	9.2	13	86	108	74	13	7.1	11	1.1
23.....	24	20	13	9.1	13	108	108	74	13	7.1	11	1.1
24.....	24	18	13	9.0	14	188	108	74	13	10	11	1.1
25.....	24	16	13	8.9	14	188	108	66	12	13	11	1.1
26.....	24	16	12	8.8	14	188	108	62	11	13	11	1.1
27.....	24	16	12	8.6	14	188	108	60	9.6	13	10	1.1
28.....	24	16	12	8.5	15	188	86	60	8.2	13	8.6	1.1
29.....	24	16	12	8.4	15	108	86	60	8.2	13	8.6	1.1
30.....	24	16	12	8.3	....	108	86	60	8.2	11	8.6	1.1
31.....	24	....	12	8.2	....	108	....	60	....	11	8.6	....

NOTE—Daily discharge for 1923 determined as follows: Direct from fairly well defined curve Oct. 20 to Nov. 30; Interpolate Nov. 30 to Jan. 9 to Feb 28; Direct from well defined curve Feb. 28 to Nov. 1.

1924—Direct from well defined curve Nov. 1 to Nov. 27; interpolate Nov. 27 to Feb. 3 to Mar. 8; direct from two well defined curves Mar. 8 to June 16; indirect method for shifting channel June 16 to Aug. 20; direct from well defined curve Aug. 20 to Nov. 20.



## Monthly discharge of Sapello River at Sapello, N. Mex., for climatic years 1923-24

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	.4	.3	0.34	20
November .....	5.3	.4	2.52	150
December .....	5.2	3.3	4.25	262
January .....	3.2	2.5	2.70	166
February .....	2.5	2.2	2.42	130
March .....	316	10	37.8	2,320
April .....	32	6	19.2	1,160
May .....	32	6	23.5	1,440
June .....	32	2.2	6.01	360
July .....	50	.2	5.30	330
August .....	58	2.2	18.1	1,110
September .....	24	7.6	11.2	660
The year.....	316	.2	11.1	8,110
1924				
October .....	103	6	31.2	1,920
November .....	342	16	36.8	2,190
December .....	15	12	13.6	833
January .....	12	8.2	9.96	613
February .....	15	7.9	11.1	640
March .....	188	15	67.4	4,150
April .....	108	42	82.5	4,910
May .....	86	60	81.9	4,840
June .....	49	8.2	21.6	1,290
July .....	83	7.1	16.9	1,040
August .....	44	8.6	13.2	810
September .....	29	1.1	6.46	384
The year.....	342	1.1	32.7	23,600

## COYOTE CREEK AT GUADALUPITA, N. MEX.

*Location*—At Guadalupita, N. Mex., about 150 yards east of postoffice, about 20 miles above the junction of Coyote Creek and Mora River, section 1 township 22 north, range 16 east.

*Records available*—December 16, 1919, to September 30, 1924. None previous to establishment of station, December 16, 1919.

*Drainage area*—50 square miles.

*Gage*—Vertical staff.

*Channel*—Probably shifting.

*Discharge measurements*—Made by wading.

*Winter conditions*—Likely to be affected by ice during winter months.

*Diversions*—Water is diverted for irrigation both above and below the station. The normal flow is all utilized.

*Discharge measurements of Coyote Creek at Guadalupita, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 20	Griffin-Lambert	0.33	2.3
Jan. 9	Mark Lambert	i 0.39	5.0
Mar. 29	do	0.47	8.9
May 30	Lambert-Archer	0.30	4.0
July 19	do	0.31	7.9
Aug. 30	Mark Lambert	0.35	9.0
1924			
Nov. 1	Mark Lambert	0.36	9.0
Feb. 3	do	i	10.1
Apr. 11	do	0.82	59.2
June 16	do	0.24	3.7
Aug. 7	do	0.96	2.9
Sept. 23	do	0.93	2.2

i=Ice.

## Daily discharge in second-feet of Coyote Creek at Guadalupita, N. Mex., for climatic years 1923-24.

[A. D. Pacheco, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	1.4	6.5	6.5	4.3	4.5	4.0	15	20	6.4	6.1	38	7.5
2	1.4	6.5	6.5	4.4	4.5	4.0	15	20	6.1	6.1	38	7.5
3	1.4	6.5	6.5	4.5	4.5	10	10	27	4.1	9.5	38	7.5
4	1.4	3.9	3.9	4.6	4.5	10	10	27	4.1	3.9	38	7.5
5	1.4	2.1	3.9	4.7	4.5	10	10	20	2.4	2.5	5.5	7.5
6	1.4	1.4	3.9	4.8	4.4	10	10	15	1.4	3.6	5.5	7.5
7	1.4	3.9	3.9	4.8	4.4	4.0	10	15	1.6	15	5.5	7.5
8	1.4	3.9	3.9	4.9	4.4	6.5	10	20	28	2.5	38	7.5
9	1.4	3.9	3.9	5.0	4.4	6.5	10	20	1.6	2.5	26	7.5
10	1.4	6.5	3.9	5.0	4.4	6.5	10	15	4.6	4.9	26	7.5
11	2.1	6.5	3.9	5.0	4.3	10	6.5	20	4.6	3.6	18	7.5
12	2.1	1.4	3.9	4.9	4.3	10	6.5	20	2.9	4.5	5.5	7.5
13	2.1	1.4	3.9	4.9	4.3	10	6.5	20	2.9	4.5	38	7.5
14	1.4	1.4	3.9	4.9	4.3	2.6	6.5	20	1.9	4.5	26	7.5
15	1.4	2.1	3.9	4.9	4.3	2.6	6.5	20	1.9	4.5	18	7.5
16	2.1	2.1	3.9	4.9	4.2	2.6	10	15	1.9	4.5	18	5.5
17	2.1	2.1	3.9	4.8	4.2	2.6	10	20	22	28	18	5.5
18	1.4	2.1	3.9	4.8	4.2	2.6	10	20	17	4.5	11	5.5
19	1.4	3.9	3.9	4.8	4.2	2.6	10	20	17	18	18	7.5
20	3.9	3.9	3.9	4.8	4.2	2.6	10	15	1.9	11	11	7.5
21	3.9	2.1	2.1	4.8	4.1	4.0	10	15	2.2	26	26	7.5
22	2.1	3.9	3.9	4.7	4.1	4.0	10	15	32	18	26	5.5
23	2.1	3.9	3.9	4.7	4.1	10	15	10	24	11	18	5.5
24	2.1	2.1	3.9	4.7	4.1	10	15	15	32	11	18	5.5
25	2.1	2.1	3.9	4.7	4.1	10	15	15	24	11	26	5.5
26	3.9	3.9	3.9	4.7	4.0	10	15	15	24	11	18	5.5
27	3.9	3.9	3.9	4.6	4.0	10	20	15	18	7.5	7.5	5.5
28	3.9	3.9	4.0	4.6	4.0	10	27	10	19	11	5.5	5.5
29	3.9	6.5	4.1	4.6	....	10	15	10	2.3	5.5	4.0	5.5
30	3.9	6.5	4.2	4.6	....	15	15	10	34	4.0	4.0	5.5
31	6.5	....	4.2	4.6	....	15	....	10	....	5.5	4.0	....
1924												
1	5.5	18	11	4.0	9.0	5.5	11	54	41	5.9	4.3	0.9
2	7.5	18	11	4.0	10	5.5	26	75	41	7.7	4.3	.9
3	5.5	18	11	4.0	10	11	26	75	41	5.9	4.3	3.6
4	5.5	11	7.5	4.0	9.8	5.5	98	75	33	5.9	4.3	1.9
5	5.5	11	7.5	5.0	9.6	7.5	98	54	13	5.9	4.3	3.6
6	5.5	11	7.5	5.0	9.5	5.5	98	54	13	5.9	4.3	1.9
7	11	11	7.5	5.0	9.3	5.5	98	75	10	5.9	1.9	1.9
8	18	11	7.5	5.0	9.1	7.5	98	98	10	5.9	.9	.9
9	18	7.5	4.0	5.0	9.0	5.5	74	98	10	5.9	3.6	1.9
10	18	7.5	4.0	5.0	8.8	5.5	54	98	10	5.9	1.9	1.9
11	18	7.5	4.0	6.0	8.6	5.5	54	54	10	5.9	54	3.6
12	18	7.5	3.0	6.0	8.4	4.0	54	54	10	5.9	54	1.9
13	18	11	3.0	6.0	8.2	4.0	41	75	10	5.9	57	.9
14	18	11	3.0	6.0	8.0	4.0	41	75	10	5.9	4.7	.9
15	11	11	4.0	6.0	7.8	5.5	33	54	10	5.9	1.9	1.9
16	18	11	4.0	6.0	7.6	4.0	41	54	10	5.9	1.9	.9
17	18	11	4.0	7.0	7.5	4.0	54	75	7.7	10	3.6	.9
18	18	11	4.0	7.0	7.3	5.5	54	54	7.7	7.7	3.6	1.9
19	18	11	4.0	7.0	7.1	5.5	54	54	7.7	7.7	3.6	.9
20	18	11	3.0	7.0	6.9	5.5	41	75	7.7	7.7	3.6	.9
21	18	11	3.0	7.0	6.7	7.5	41	75	7.7	8.2	3.6	.9
22	18	11	3.0	7.0	6.5	7.5	54	41	5.9	7.7	3.6	.9
23	18	11	4.0	8.0	6.4	11	54	41	5.9	7.7	3.6	.9
24	18	11	4.0	8.0	6.2	11	75	41	5.9	7.7	1.9	.9
25	18	7.5	4.0	8.0	6.0	5.5	75	41	5.9	10	1.9	.9
26	18	7.5	4.0	8.0	5.9	7.5	75	33	5.9	10	1.9	1.9
27	18	7.5	4.0	8.0	5.8	5.5	75	33	5.9	7.7	3.6	1.9
28	18	7.5	4.0	8.0	5.7	5.5	75	33	5.2	7.7	1.9	1.9
29	18	7.5	4.0	9.0	5.6	5.5	54	33	5.9	7.7	1.9	1.9
30	18	11	4.0	9.0	....	7.5	41	41	5.9	5.9	1.9	.9
31	18	....	4.0	9.0	....	5.5	....	41	....	5.9	1.9	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve Oct. 20 to Dec. 27; Interpolate Dec. 27 to Mar. 1; Direct from well defined curve Mar. 1 to May 30; indirect method for shifting channel May 30 to July 19.

1924—Direct from two well defined curves July 19 to Nov. 15; Interpolate for period Dec. 29 to Mar. 1.



Monthly discharge of Coyote Creek at Guadalupita, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	6.5	1.4	2.33	143
November	6.5	1.4	3.70	220
December	6.5	2.1	4.12	253
January	5.0	4.3	4.74	292
February	4.5	4.0	4.29	238
March	15	2.6	7.35	452
April	27	6.5	11.7	694
May	27	10	17.1	1,050
June	34	1.4	16.8	1,000
July	49	2.5	12.1	743
August	38	4	19.3	1,180
September	7.5	5.5	6.70	399
The year	49	1.4	9.21	6,660
1924				
October	18	5.5	15.2	934
November	18	7.5	10.6	634
December	11	3	5.05	310
January	9	4	6.42	395
February	10	5.6	7.80	449
March	11	4	6.18	380
April	98	11	62.0	3,880
May	98	33	59.1	3,640
June	41	5.2	12.6	751
July	10	5.9	6.95	427
August	57	0.9	8.05	500
September	3.6	0.9	1.57	93.4
The year	98	0.9	17.1	12,400

#### CANADIAN RIVER AT LOGAN, NEW MEXICO

**Location.**—This station was established June 29, 1904, at the bridge of the Chicago, Rock Island and Pacific Railroad one mile west of the depot at Logan. After the flood of October, 1904, the gage was moved to a temporary highway bridge about 750 feet below the old gage. It was discontinued February 26, 1905, and re-established at the original location December 22, 1908. Automatic recording gage was installed August 5, 1910, at a point three-quarters of a mile above the bridge.

**Records available.**—June 29, 1904, to February 26, 1905; December 22, 1908, to May 20, 1914; November 1, 1922, to September 30, 1924.

**Drainage area.**—About 12,000 square miles.

**References.**—U. S. Geological Survey Water-Supply Papers 131 p. 160, 173 p. 60, 247 p. 118, p. 57, 287 p. 56; State Engineer's Reports on the Surface Water Supply of New Mexico for 1911-12 p. 201, 1913 p. 31, 1914 p. 13.

Discharge measurements of Canadian River at Logan, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 18	Lambert-Griffin	2.35	0.10
Jan. 14	Mark Lambert	2.40	e 0.40
Apr. 3	do	2.31	e 0.10
June 4	do	1.43	e 0.60
July 18	Lambert-Archer	3.96	666
Sept. 4	Mark Lambert	4.08	395
1924			
Jan. 19	Mark Lambert	3.39	118
Apr. 15	do	4.42	774
May 16	Lambert-Neel	4.37	584
Aug. 23	Mark Lambert	3.13	61.3
Sept. 25	do	2.66	e 0.5
Oct. 28	do	2.42	0.2

e=Estimated.

Daily discharge in second feet of Canadian River at Logan, N. Mex., for climatic years 1923-24.

[Joseph Paiz, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept.
1923												
1....		0.1	115	0.3	8.8	220	0.1	...	0.6	70	241	...
2....		0.1	110	0.2	11	215	0.1	...	0.6	156	640	...
3....		0.1	90	0.2	8.8	215	0.1	...	0.6	242	519	...
4....		0.1	80	0.2	8.0	220	0.1	...	0.6	328	513	...
5....		0.1	75	0.2	2.7	190	0.1	...	0.6	414	380	...
6....		0.1	70	0.2	5.0	140	0.1	...	0.6	500	376	...
7....		0.1	62	0.2	5.7	105	0.1	...	0.6	587	164	...
8....		0.2	50	0.1	6.5	75	0.1	...	0.6	675	160	...
9....		0.2	50	0.1	8.0	30	0.1	...	0.6	638	155	...
10....		0.2	50	0.1	4.2	38	0.1	...	0.7	602	137	...
11....		0.1	50	0.1	2.7	42	27	...	0.7	567	71	...
12....		0.1	58	0.3	0.3	15	1,768	...	0.7	532	6.0	...
13....		0.1	62	0.4	0.1	5.0	1,754	...	0.7	497	128	...
14....		0.1	80	0.4	0.1	0.4	1,490	...	0.7	462	213	...
15....		0.1	85	0.4	0.1	0.3	1,160	...	0.7	427	136	...
16....		0.2	75	0.4	0.1	0.3	675	...	0.7	519	404	...
17....		0.2	85	3.4	0.1	0.2	619	...	0.7	611	945	...
18....		0.1	66	9.6	0.1	0.3	536	...	0.7	702	1,154	...
19....		0.1	38	13	0.1	0.3	356	...	0.8	488	1,290	...
20....		0.2	23	14	0.1	0.4	304	...	0.8	534	908	...
21....		0.3	17	12	0.3	0.3	260	...	0.8	341	1,678	...
22....		0.4	13	11	6.5	3.4	245	...	0.8	220	1,153	...
23....		1.9	11	13	26	3.4	185	...	0.8	290	1,009	...
24....		23	11	11	75	0.3	145	...	0.8	50	864	...
25....		15	19	14	210	0.4	85	...	11	24	719	...
26....		9.6	19	13	235	0.2	125	...	21	84	574	...
27....		11	19	10	260	0.2	4,687	...	31	165	555	...
28....		75	16	12	250	0.3	4,113	...	41	203	535	...
29....		100	9.6	15	...	0.3	3,540	...	51	200	515	...
30....		120	3.4	14	...	0.2	2,967	...	61	146	495	...
31....		...	1.2	9.6	...	0.1	...	...	...	197	475	...



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....				534	305	280	505	631	1,217	624	6.2	365
2.....				449	320	271	450	596	380	566	12	335
3.....				364	345	244	340	470	395	588	19	306
4.....				279	464	204	325	457	395	450	109	277
5.....				194	360	190	310	484	405	392	123	248
6.....				109	263	184	330	554	412	334	137	219
7.....				122	268	190	385	519	418	276	151	190
8.....				169	145	225	424	603	418	252	165	160
9.....				175	169	271	470	624	200	301	179	120
10.....				157	390	267	596	617	165	335	193	82
11.....				154	505	233	755	624	132	315	208	56
12.....				139	350	218	778	624	99	276	223	42
13.....				145	267	225	740	596	66	255	238	34
14.....				160	172	225	575	582	33	204	253	16
15.....				160	154	200	610	680	0.1	163	268	17
16.....				154	151	190	666	659	46	244	283	14
17.....				157	160	184	815	624	92	638	297	31
18.....				148	142	267	854	770	138	582	596	23
19.....				136	145	297	794	830	184	424	292	16
20.....				157	263	310	688	967	230	288	208	8.6
21.....				151	229	305	540	967	276	6.4	197	0.6
22.....				163	240	340	491	967	322	7.0	125	0.5
23.....				160	301	325	457	967	368	6.4	68	0.6
24.....				166	267	320	450	967	414	6.4	197	1.2
25.....				175	225	305	526	1,020	460	5.7	92	4.4
26.....				178	225	284	554	1,060	506	0.2	248	0.6
27.....				181	204	305	603	1,167	552	0.2	288	0.6
28.....				169	197	310	589	1,220	598	0.2	233	0.6
29.....				187	255	457	645	1,220	643	0.2	125	0.6
30.....				233	.....	610	688	1,223	680	0.2	40	0.6
31.....				267	.....	732	.....	1,220	.....	0.2	202	.....

Daily discharge for 1923 determined as follows: Indirect method for shifting channel Nov. 1 to Sept. 4.

1924—Direct from fairly well defined curve Jan. 1 to Oct. 28.

Monthly discharge of Canadian River at Logan, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
November .....	120	0.1	12.0	711
December .....	115	1.2	48.8	3,000
January .....	15	0.1	5.75	354
February .....	260	0.1	40.5	2,250
March .....	220	0.1	49.1	3,020
April .....	4,687	0.1	835	49,700
May .....				
June .....	61	0.6	7.75	461
July .....	702	24	370	22,700
August .....	1,678	6	552	33,900
September .....				
1924				
January .....	534	109	197	12,100
February .....	505	142	238	14,800
March .....	732	184	290	17,800
April .....	854	310	553	33,600
May .....	1,223	519	794	48,600
June .....	1,217	0.1	341	20,300
July .....	638	0.2	241	14,800
August .....	596	6.2	186	11,450
September .....	365	0.5	85.7	5,100
The period.....	1,223	0.1	321	187,600

## GILA RIVER BASIN

### GILA RIVER NEAR REDROCK, N. MEX.

*Location.*—About 40 miles west of Silver City, four miles northeast of Redrock postoffice, one-fourth mile above the mouth of a box canon, and near the east side of township 18 south, range 18 west. Mangos Draw, the first large tributary upstream from the station, empties into the Gila about 12 miles above.

*Records available.*—May 14, 1908, to September 30, 1924.

*Drainage area.*—Approximately 3,500 square miles.

*Gage.*—Automatic recording.

*Channel.*—Shifting.

*Discharge measurements.*—Made from cable or by wading.

*Winter conditions.*—The channel is generally free from ice all winter.

*Diversions.*—Some water is diverted for irrigation above the station.

*Discharge measurements of Gila River near Redrock, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 2.....	Mark Lambert	2.84	43.9
Dec. 2.....	do	3.57	128
Feb. 5.....	do	3.12	83.2
Apr. 18.....	do	4.13	196
June 16.....	do	2.77	35.4
Sept. 13.....	do	4.91	381
1924			
Dec. 5.....	Mark Lambert	4.44	146
Mar. 12.....	do	4.31	179
June 6.....	do	3.80	51.2
Aug. 28.....	do	2.57	23.6
Sept. 30.....	do	4.27	49.4



Daily discharge in second-feet of Gila River near Redrock, N. Mex., for climatic years 1923-24.

[A. V. Braun, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	47	52	158	82	84	257	234	155	50	52	117	804
2.....	44	54	134	79	85	276	232	150	48	52	92	807
3.....	42	55	128	78	85	296	220	145	48	52	117	807
4.....	42	57	133	74	85	316	220	140	50	52	172	817
5.....	43	57	186	72	83	336	211	135	48	52	143	910
6.....	43	57	175	70	85	352	203	130	47	52	244	1,296
7.....	43	58	163	71	81	369	207	131	47	84	430	1,306
8.....	43	58	143	71	80	386	220	132	47	112	480	1,000
9.....	44	57	132	72	82	403	244	133	47	86	811	600
10.....	45	57	124	73	87	420	237	134	45	83	1,009	336
11.....	46	57	117	73	91	437	253	135	43	220	646	346
12.....	45	56	111	72	94	454	242	136	41	168	480	360
13.....	44	55	105	71	95	405	228	137	39	150	583	376
14.....	40	52	102	72	91	375	213	138	37	137	630	430
15.....	107	47	94	72	76	336	207	139	36	130	670	455
16.....	74	49	87	74	78	302	213	140	37	130	710	458
17.....	66	50	82	74	75	286	198	141	36	158	750	442
18.....	60	49	73	73	74	260	191	142	35	140	791	465
19.....	58	48	70	72	70	241	189	144	34	147	804	445
20.....	55	48	67	76	56	238	193	93	33	140	844	442
21.....	52	48	67	82	57	235	191	98	33	130	794	444
22.....	52	49	69	81	66	233	184	95	32	735	804	435
23.....	51	49	69	81	87	231	182	93	32	227	824	435
24.....	52	52	71	81	115	229	169	84	31	235	780	440
25.....	52	55	69	77	149	227	160	80	24	238	750	445
26.....	53	57	68	78	184	225	157	78	22	240	720	400
27.....	54	59	69	78	219	234	152	78	22	243	679	350
28.....	55	58	74	77	238	232	146	74	28	245	682	300
29.....	54	63	77	77	....	250	156	66	50	144	807	250
30.....	52	116	78	79	....	256	160	58	52	121	807	200
31.....	52	....	79	84	....	244	....	54	....	186	807	....
1924												
1.....	100	224	156	588	176	230	450	568	178	60	58	36
2.....	85	225	153	576	177	225	500	588	148	50	57	39
3.....	75	200	150	564	177	220	550	588	121	51	56	42
4.....	77	192	148	552	175	224	600	593	135	51	55	46
5.....	80	192	146	540	190	228	650	558	126	52	54	45
6.....	82	160	146	520	180	224	700	528	132	52	53	45
7.....	84	150	146	500	180	215	750	508	132	53	52	44
8.....	86	140	146	480	172	205	800	508	129	54	51	43
9.....	85	130	145	460	150	198	850	503	129	55	51	42
10.....	85	120	145	440	175	198	900	479	132	55	49	42
11.....	83	110	145	420	205	190	940	470	135	56	48	41
12.....	70	95	145	400	215	180	988	431	135	56	47	40
13.....	72	88	149	380	205	181	1,030	422	129	57	46	40
14.....	70	81	153	360	190	211	1,006	422	121	58	45	39
15.....	67	74	157	340	210	211	1,042	413	114	58	44	38
16.....	64	67	160	320	245	208	1,036	396	111	58	43	38
17.....	61	60	163	300	255	214	971	357	102	59	39	37
18.....	58	53	166	300	260	220	886	335	102	59	35	36
19.....	55	44	170	275	260	238	818	313	107	60	31	36
20.....	57	55	180	274	245	245	781	298	102	60	27	35
21.....	60	70	190	260	240	238	696	287	97	60	23	34
22.....	65	90	200	235	260	238	711	273	90	61	19	34
23.....	75	110	210	233	275	241	717	260	88	62	15	33
24.....	100	135	220	233	295	235	727	244	86	62	17	35
25.....	140	155	230	234	300	229	786	238	65	63	19	37
26.....	195	175	250	233	290	236	748	226	60	62	21	39
27.....	200	171	1,490	234	280	247	690	220	58	61	23	41
28.....	207	167	1,200	283	230	339	618	220	58	60	24	43
29.....	210	163	1,000	223	255	370	553	232	58	58	30	49
30.....	220	159	800	215	....	400	548	208	58	58	30	49
31.....	222	....	600	210	....	430	....	208	....	58	33	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve Oct. 2 to Dec. 9; Indirect method for shifting channel Dec. 2 to April 18; Direct from well defined curve April 18 to Sept. 13.  
1924—Indirect method for shifting channel Sept. 13 to Mar. 12; Direct from two fairly well defined curves Mar. 12 to Sept. 30.

Monthly discharge of Gila River near Redrock, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	107	40	51.9	3,190
November .....	116	47	55.9	3,330
December .....	186	67	102	6,290
January .....	84	70	75.7	4,650
February .....	238	56	98.3	5,450
March .....	454	225	301	18,500
April .....	253	146	200	11,900
May .....	155	54	116	7,110
June .....	52	22	39.1	2,330
July .....	735	52	160	9,780
August .....	1,009	92	614	37,700
September .....	1,306	200	553	32,900
The year .....	1,306	22	198	143,100
1924				
October .....	222	55	103	6,330
November .....	225	44	128	7,650
December .....	1,490	145	305	18,760
January .....	588	210	359	22,100
February .....	300	150	223	12,800
March .....	430	180	241	14,800
April .....	1,042	450	767	45,700
May .....	593	208	383	23,600
June .....	178	58	257	6,410
July .....	420	50	248	15,230
August .....	58	15	38.5	2,360
September .....	49	33	39.8	2,370
The year .....	1,490	15	237	178,100



## MIMBRES RIVER BASIN

### MIMBRES RIVER AT MIMBRES, N. MEX.

*Location.*—One and one-half miles above Mimbres and one-quarter mile above the Moore Ranch in SE¼, NW¼, section 33, township 16 south, range 11 west.

*Records available.*—May 12, 1921, to September 30, 1924.

*Drainage area.*—183 square miles.

*Gage.*—Automatic recording.

*Channel.*—Shifting.

*Discharge measurements.*—Made by wading.

*Winter conditions.*—Ice rarely forms at this point.

*Diversion.*—Water is diverted above and below the station.

*Discharge measurements of Mimbres River at Mimbres, N. Mex., for climatic years 1923-24.*

Date		Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923				
Oct.	1.....	Mark Lambert .....	-0.01	1.5
Dec.	5.....	..... do .....	0.11	5.3
Feb.	3.....	..... do .....	0.10	4.6
Apr.	17.....	..... do .....	0.08	4.4
June	15.....	..... do .....	0.12	4.4
Sept.	12.....	..... do .....	0.29	29.9
1924				
Dec.	4.....	Mark Lambert .....	0.13	11.0
Mar.	11.....	..... do .....	1.59	21.5
Apr.	23.....	..... do .....	1.71	84.1
June	25.....	..... do .....	0.88	3.6
Aug.	29.....	..... do .....	-0.12	6.1



Daily discharge in second-feet of Mimbres River at Mimbres, N. Mex., for climatic years 1923-24.

[Walter Moore, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	1.5	9.6	4.4	4.6	4.6	4.5	4.4	3.7	5.3	2.7	12	65
2	1.6	9.6	4.6	4.6	4.6	4.5	4.4	3.7	5.3	4.3	13	65
3	1.7	9.6	4.8	4.6	4.6	4.5	4.4	3.7	5.3	5.9	14	59
4	1.8	10	5.1	4.6	4.6	4.5	4.4	3.6	5.3	7.5	14	54
5	1.9	10	5.3	4.6	4.6	4.5	4.4	3.6	5.3	9.1	17	48
6	2.0	9.0	5.1	4.6	4.6	4.5	4.4	3.6	5.3	11	19	42
7	2.0	8.0	4.8	4.6	4.6	4.5	4.4	3.8	5.3	12	22	36
8	2.1	7.0	4.6	4.6	4.6	4.5	4.4	4.1	5.3	14	24	31
9	2.2	6.5	4.6	4.6	4.6	4.5	4.4	4.3	5.3	13	27	25
10	2.3	6.3	4.6	4.6	4.6	4.5	4.4	4.6	5.3	12	30	27
11	2.4	6.3	4.6	4.6	4.6	4.5	4.4	4.8	5.3	12	33	28
12	2.5	5.9	4.6	4.6	4.6	4.5	4.4	5.0	5.3	11	35	30
13	2.5	5.4	4.6	4.6	4.6	4.5	4.4	5.3	5.3	10	38	30
14	5.6	5.0	4.6	4.6	4.6	4.5	4.4	5.3	5.3	9.5	40	27
15	7.0	4.6	4.6	4.6	4.6	4.5	4.4	5.3	5.3	8.8	43	26
16	5.3	4.1	4.6	4.6	4.6	4.5	4.4	5.3	4.0	9.1	45	24
17	4.6	3.6	4.6	4.6	4.6	4.5	4.4	5.3	2.7	9.4	47	22
18	4.6	3.2	4.6	4.6	4.6	4.5	4.4	5.3	2.7	9.7	50	21
19	6.3	3.2	4.6	4.6	4.6	4.5	4.3	5.3	2.7	10	52	20
20	7.0	3.2	4.6	4.6	4.6	4.5	4.3	5.3	2.7	10	53	18
21	7.6	3.0	4.6	4.6	4.6	4.5	4.2	5.3	2.7	11	54	17
22	8.0	3.0	4.6	4.6	4.6	4.5	4.2	5.3	2.7	11	55	15
23	8.6	3.0	4.6	4.6	4.6	4.5	4.0	5.3	2.7	11	56	14
24	9.0	2.7	4.6	4.6	4.6	4.5	4.0	5.3	2.7	11	57	13
25	9.6	3.0	4.6	4.6	4.6	4.5	4.0	5.3	2.7	11	58	12
26	9.0	3.2	4.6	4.6	4.6	4.5	3.9	5.3	2.7	11	59	11
27	9.0	3.5	4.6	4.6	4.6	4.5	3.9	5.3	2.7	11	60	10
28	9.0	3.7	4.6	4.6	4.6	4.5	3.8	5.3	2.7	11	61	9.8
29	9.6	3.9	4.6	4.6	4.6	4.5	3.8	5.3	2.7	11	62	8.8
30	9.6	4.2	4.6	4.6	4.6	4.5	3.8	5.3	2.7	11	63	7.8
31	9.6	4.6	4.6	4.6	4.6	4.5	3.8	5.3	2.7	12	64	6.4
1924												
1	7.0	11	11	14	16	22	22	40	5.1	3.7	4.6	6.8
2	6.2	12	11	15	18	23	34	62	5.1	7.8	4.6	6.7
3	5.3	13	11	16	23	23	153	83	5.1	7.8	4.7	6.3
4	4.4	14	11	17	17	23	157	83	7.3	7.8	4.8	7.0
5	3.5	14	11	18	15	23	162	73	8.8	7.8	4.8	7.1
6	2.7	14	11	22	15	23	167	76	9.7	7.8	4.9	7.1
7	1.8	14	11	21	17	23	125	55	8.8	8.4	4.9	7.3
8	1.8	14	11	14	23	23	93	21	7.7	11	5.0	7.3
9	1.8	14	11	15	23	55	156	19	8.6	13	5.0	7.3
10	1.8	13	11	16	23	47	188	17	9.0	8.4	5.0	7.3
11	1.8	13	11	17	22	40	179	16	9.7	34	5.1	7.3
12	1.8	13	9.9	21	20	50	170	16	9.9	12	5.2	7.3
13	1.8	13	8.8	23	20	50	161	15	8.4	7.5	5.2	7.4
14	1.8	13	7.7	50	21	40	152	13	6.9	8.8	5.2	7.4
15	1.8	13	6.6	68	22	34	143	12	5.5	9.9	5.3	7.4
16	1.8	13	5.5	60	23	23	134	12	5.6	10	5.4	7.4
17	1.9	13	4.4	60	55	23	125	11	5.7	9.9	5.4	7.4
18	1.9	13	3.3	60	52	23	116	11	5.8	8.8	5.4	7.4
19	1.9	13	3.2	55	50	50	108	13	5.6	7.0	5.5	7.4
20	2.0	12	3.1	23	17	62	100	12	5.3	4.0	5.6	7.4
21	2.0	12	3.1	23	17	113	92	12	4.7	4.0	5.6	7.3
22	2.6	12	3.1	23	19	23	84	11	3.8	4.1	5.7	7.3
23	3.3	12	3.3	20	22	19	76	11	3.8	4.2	5.7	7.3
24	4.0	12	4.4	19	55	19	83	10	3.7	4.2	5.8	7.3
25	4.6	12	5.6	20	49	18	101	9.4	3.6	4.2	5.9	7.3
26	5.3	12	6.8	22	43	17	101	8.8	3.6	4.3	5.9	7.3
27	5.9	12	7.9	23	37	17	98	8.2	3.7	4.4	6.0	7.3
28	6.6	12	9.0	23	32	29	48	7.6	3.8	4.4	6.0	7.3
29	7.6	12	10	18	27	42	34	7.0	3.9	4.4	6.1	7.2
30	8.7	11	11	17	....	55	34	6.4	3.8	4.5	6.2	7.2
31	9.8	....	12	16	....	18	....	5.3	....	4.6	6.4	....

NOTE—Daily discharge for 1923 determined as follows: Direct from a well defined curve, October 1 to June 15; indirect method for shifting channel, June 15 to September 12.

1924: Direct from 2 well defined curves, September 12 to August 29.

Monthly discharge of Mimbres River at Mimbres, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October	9.6	1.5	5.34	328
November	10	2.7	4.84	288
December	5.3	4.4	4.66	287
January	4.6	4.6	4.60	283
February	4.6	4.5	4.59	255
March	4.5	4.5	4.50	277
April	4.4	3.8	4.24	253
May	5.3	3.6	4.81	296
June	5.3	2.7	4.04	241
July	14	2.7	10.1	620
August	64	12	41.2	2,530
September	65	7.9	27.1	1,620
The year	65	1.5	10.0	7,280
1924				
October	9.8	1.8	3.72	228
November	14	11	12.7	756
December	12	3.1	8.05	495
January	68	14	26.7	1,640
February	55	15	27.3	1,570
March	113	17	33.9	2,080
April	188	22	113	6,730
May	83	5.3	24.4	1,500
June	9.9	3.6	6.07	360
July	34	3.7	7.83	481
August	6.4	4.6	5.38	331
September	7.5	6.6	7.29	434
The year	188	1.8	22.9	16,620

#### MIMBRES RIVER NEAR FAYWOOD, N. MEX.

**Location.**—In section 7, township 20 south, range 10 west, about six miles northeast of Faywood Hot Springs and 10 miles from Faywood, a station on the Silver City branch of the Atchison, Topeka and Santa Fe railroad.

**Records available.**—April 8, 1908, to September 30, 1924.

**Drainage area.**—Approximately 450 square miles.

**Gage.**—Automatic recording. The datum from 1916 to September, 1920, is 1.45 feet lower than original datum of automatic gage established in 1909.

**Channel.**—Shifting.

**Discharge measurements.**—Made from cable or by wading.

**Winter conditions.**—Ice rarely forms at this point.

**Diversions.**—Water is diverted for irrigation above and below the station.



Discharge measurements of Mimbres River near Faywood, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
<b>1923</b>			
Oct. 1	Mark Lambert		Dry
Dec. 3	do		Dry
Feb. 3	do	2.95	e 0.3
Apr. 17	do	3.01	1.2
June 15	do	3.00	e 0.4
Sept. 12	do	3.88	42.6
<b>1924</b>			
Dec. 4	Mark Lambert	4.01	20.1
Mar. 11	do	4.16	17.2
Apr. 23	do	4.02	66.4
June 25	do	3.52	2.7
Aug. 29	do	2.87	1.4
Oct. 1	do	2.90	0.9

e=Estimated.

Daily discharge in second-feet of Mimbres River near Faywood, N. Mex., for climatic years 1923-24.

[R. Trujillo, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
<b>1923</b>												
1	.0	.0	.0	.0	0.1	0.4	1.1	1.4	0.7	0.2	0.7	37
2	.0	.0	.0	.0	.2	.4	1.1	1.1	.7	.2	2.7	38
3	.0	.0	.0	.0	.2	.7	1.1	1.1	.7	.2	1.8	37
4	.0	.0	.0	.0	.3	1.1	1.1	1.1	1.1	.2	2.7	37
5	.0	.0	.0	.0	.3	1.1	.4	1.1	.7	.3	8.7	74
6	.0	.0	.0	.0	.3	1.1	.7	1.1	.7	.4	15	70
7	.0	.0	.0	.0	.3	1.1	.4	1.1	.4	2.0	21	71
8	.0	.0	.0	.0	.3	1.1	.4	.7	.4	2.7	27	68
9	.0	.0	.0	.0	.3	1.1	.4	.4	.4	1.8	53	47
10	.0	.0	.0	.0	.3	1.1	.4	.4	.4	.3	48	47
11	.0	.0	.0	.0	.3	1.1	.4	.4	.4	24	38	44
12	.0	.0	.0	.0	.3	1.1	.4	.6	.4	20	83	48
13	.0	.0	.0	.0	.3	1.1	.4	.7	.4	16	140	60
14	.0	.0	.0	.0	.3	1.1	.4	.7	.4	4.3	125	60
15	.0	.0	.0	.0	.3	1.1	1.1	1.1	.3	.6	112	65
16	.0	.0	.0	.0	.4	1.1	.7	1.1	.3	.6	105	54
17	.0	.0	.0	.0	.4	1.1	1.8	1.1	.3	.4	93	50
18	.0	.0	.0	.0	.4	1.1	1.8	1.1	.3	.4	85	47
19	.0	.0	.0	.0	.4	1.1	1.4	1.1	.3	.4	77	45
20	.0	.0	.0	.0	.4	1.1	1.4	1.1	.3	.4	68	40
21	.0	.0	.0	.1	.4	1.1	1.8	1.1	.3	.4	55	38
22	.0	.0	.0	.1	.4	1.1	1.8	1.1	.2	2.0	46	124
23	.0	.0	.0	.1	.4	1.1	2.1	1.1	.3	12	53	210
24	.0	.0	.0	.1	.4	1.1	2.4	1.1	.3	7.7	52	187
25	.0	.0	.0	.1	.4	1.1	2.9	1.1	.3	5.0	44	163
26	.0	.0	.0	.1	.4	1.1	2.4	.7	.3	.6	43	139
27	.0	.0	.0	.1	.3	1.4	2.1	.7	.2	2.0	70	115
28	.0	.0	.0	.1	.4	1.1	1.8	.7	.2	.4	77	92
29	.0	.0	.0	.1	....	1.1	1.4	.7	.2	.1	62	69
30	.0	.0	.0	.1	....	1.1	1.1	.7	.2	.1	54	46
31	.0	.0	.0	.1	....	....	....	.7	....	.1	45	....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
<b>1924</b>												
1	43	30	20	67	18	4.0	30	52	33	3.0	23	3.2
2	44	29	20	58	18	2.0	30	55	28	3.0	23	2.1
3	44	27	22	49	18	8.0	35	56	27	7.7	24	3.0
4	41	23	21	49	18	11	41	57	26	2.4	31	3.0
5	40	22	20	43	18	12	62	58	26	4.0	43	3.0
6	40	22	19	40	18	13	62	57	26	3.0	36	4.1
7	34	21	18	39	17	16	67	54	26	3.0	31	7.0
8	32	21	16	35	17	16	80	54	26	2.8	28	7.0
9	32	19	13	32	17	18	81	55	22	3.0	28	7.6
10	30	18	15	30	15	18	82	51	18	3.0	31	7.6
11	26	68	12	31	12	17	77	47	18	38	31	7.0
12	23	44	13	33	10	18	75	48	13	24	31	7.0
13	22	29	13	36	8.0	17	73	45	13	5.4	31	7.6
14	28	26	13	36	8.0	19	72	46	12	.2	40	6.0
15	33	27	13	36	11	20	79	44	12	9.2	40	5.0
16	30	24	13	34	12	22	79	42	14	11	40	5.0
17	28	20	13	33	11	21	77	43	11	40	40	6.3
18	29	26	13	32	11	20	74	42	11	20	40	6.3
19	27	30	13	32	11	19	69	39	11	20	40	6.0
20	27	29	15	30	9.0	18	69	37	11	22	40	5.0
21	26	29	16	28	2.0	17	69	37	11	14	39	3.2
22	26	28	16	25	.1	16	66	29	7.0	14	39	3.2
23	22	27	16	25	1.0	15	68	25	6.4	21	39	5.0
24	21	26	7	22	7.0	16	67	27	6.4	16	46	6.0
25	20	23	0	22	9.0	14	69	27	8.6	20	40	6.3
26	21	23	0	23	9.0	16	70	26	6.9	20	34	7.0
27	20	23	13	26	8.0	18	67	25	6.0	85	28	6.3
28	20	22	23	24	7.0	21	62	26	6.0	48	22	5.0
29	24	22	19	22	6.0	26	59	26	4.3	47	15	3.2
30	26	21	80	21	....	28	55	26	3.0	35	9.3	4.1
31	28	....	77	20	....	31	....	28	....	28	3.2	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two fairly well defined curves Oct. 1 to Sept. 12. 1924—Indirect method for shifting channel Sept. 12 to Dec. 4; Direct from two fairly well defined curves Dec. 4 to Oct. 1.

Monthly discharge of Mimbres River near Faywood, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	0.0	0.0	0.0	0.0
November	0.0	0.0	0.0	0.0
December	0.0	0.0	0.0	0.0
January	0.1	0.1	0.03	2.18
February	0.4	0.1	0.33	18.2
March	1.4	0.4	1.05	62.5
April	2.9	0.4	1.22	72.8
May	1.4	0.4	0.91	55.9
June	1.1	0.2	0.40	24
July	24	0.1	3.41	210
August	140	0.7	55.1	3,390
September	210	37	74.1	4,440
The year	210	0.1	11.4	8,240
1924				
October	44	20	29.3	1,800
November	68	18	26.6	1,580
December	80	0.0	18.6	1,140
January	67	20	33.3	2,050
February	18	0.1	11.2	650
March	31	2.0	16.3	1,010
April	82	30	65.5	3,900
May	58	25	41.4	2,550
June	33	25	15.0	892
July	33	3.0	18.5	1,130
August	46	3.2	31.8	1,950
September	7.6	3.2	5.27	314
The year	82	0.00	26.1	18,960



# PECOS RIVER BASIN

## PECOS RIVER AT IRVIN'S RANCH NEAR COWLES, N. MEX.

*Location.*—At bridge, section 8, township 17 north, range 12 east, N. M. P. M. at Irvin's Ranch, about eleven miles above Pecos, N. M. One mile below Canon Espiritu Santo and 100 feet above mouth of Indian Creek and about 3½ miles below station near Cowles.

*Records available.*—August 27, 1919 to September 30, 1924.

*Drainage area.*—185 square miles.

*Gage.*—Automatic recording.

*Channel.*—Permanent, except during high water, when small shifts might occur.

*Discharge measurements.*—Made by wading or from bridge.

*Winter conditions.*—Gage heights are usually affected by ice during the winter months.

*Diversions.*—There are no diversions of consequence above station.

*Discharge measurements of Pecos River at Irvin's Ranch near Cowles, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Nov. 29.....	Mark Lambert .....	0.93	24.3
Jan. 8.....	..... do .....	11.01	28.8
Mar. 28.....	..... do .....	1.07	33.7
May 29.....	Lambert-Archer .....	2.35	403
July 22.....	..... do .....	1.34	66.2
1924			
Oct. 26.....	Lambert-Archer .....	1.12	37.0
Feb. 7.....	Mark Lambert .....	i	35.2
May 11.....	..... do .....	2.56	422
July 3.....	..... do .....	1.66	122
Aug. 29.....	Homer Neel .....	1.11	35.6

i=Ice.



Daily discharge in second-feet of Pecos River at Irvin's Ranch near Cowles, N. Mex., for climatic years 1923-24.

[Ed Irvin, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1923											
1.....	32	21	22	32	28	20	72	246	382	95	68
2.....	28	22	21	31	28	20	57	258	370	87	65
3.....	27	19	20	31	28	20	43	285	340	84	58
4.....	26	18	22	30	29	20	38	313	330	75	91
5.....	26	19	23	30	28	21	35	313	311	76	56
6.....	22	19	25	30	27	22	48	285	288	86	60
7.....	22	18	27	29	25	23	79	305	298	86	99
8.....	20	18	28	29	24	24	75	325	325	86	122
9.....	21	18	30	28	23	25	91	360	288	86	122
10.....	22	18	32	26	21	27	100	407	275	82	111
11.....	22	17	32	25	20	29	100	474	275	84	118
12.....	22	17	32	23	21	29	91	431	263	91	132
13.....	30	19	32	22	23	29	93	335	251	86	174
14.....	30	21	32	20	24	29	102	345	232	87	143
15.....	26	23	32	20	25	29	85	313	221	76	135
16.....	25	25	32	21	27	29	80	345	214	75	151
17.....	22	28	32	21	28	29	89	425	197	73	157
18.....	24	30	30	22	29	29	120	452	171	72	194
19.....	22	32	28	22	28	30	154	482	168	80	178
20.....	21	30	27	22	27	31	159	482	162	60	181
21.....	19	28	25	23	25	33	129	530	271	59	178
22.....	20	27	23	23	24	34	113	504	194	68	187
23.....	24	25	22	24	23	35	104	425	157	66	168
24.....	21	23	20	24	21	36	113	437	122	62	165
25.....	20	22	22	25	20	38	144	474	113	60	162
26.....	20	20	23	25	20	35	161	521	111	68	168
27.....	19	21	25	25	20	31	164	521	105	118	148
28.....	18	23	27	26	20	33	177	512	97	148	130
29.....	18	24	28	26	....	37	198	442	97	95	122
30.....	20	23	30	27	....	47	246	418	95	87	115
31.....	26	....	32	27	....	59	....	400	....	70	103
1924											
1.....	52	41	38	37	48	35	110	215	319	110	99
2.....	54	56	38	37	48	35	128	209	304	116	80
3.....	54	44	38	37	48	35	146	237	312	116	79
4.....	51	49	38	37	44	36	164	301	339	106	67
5.....	51	49	38	37	41	37	182	339	364	101	64
6.....	55	41	37	37	38	38	200	355	373	101	60
7.....	59	46	37	37	35	39	215	373	373	110	58
8.....	58	47	37	37	37	40	290	391	381	80	55
9.....	62	55	37	37	39	41	312	414	301	75	79
10.....	73	59	37	37	41	42	270	458	294	97	61
11.....	65	51	37	37	40	43	266	572	277	88	55
12.....	76	51	37	37	39	44	263	580	277	75	54
13.....	73	48	37	37	38	44	298	644	277	74	72
14.....	66	40	37	37	37	45	386	686	270	89	84
15.....	60	46	37	37	36	46	452	633	266	101	58
16.....	56	38	37	38	35	47	351	580	270	101	53
17.....	54	31	37	38	35	47	280	622	249	110	48
18.....	52	42	37	38	35	47	237	654	240	93	45
19.....	55	37	37	39	35	47	218	612	218	77	42
20.....	47	41	37	39	35	47	253	622	206	75	40
21.....	44	40	37	40	35	47	263	633	188	65	36
22.....	48	37	37	41	35	47	294	612	161	58	35
23.....	52	38	37	42	35	47	323	558	148	61	35
24.....	49	39	37	43	35	51	335	505	141	67	35
25.....	47	39	37	44	35	55	273	458	130	72	37
26.....	39	45	37	46	35	59	234	437	123	79	34
27.....	42	47	37	48	35	63	218	473	121	75	34
28.....	52	38	37	48	35	67	209	405	130	71	32
29.....	51	38	37	48	35	71	206	364	123	74	30
30.....	48	42	37	48	....	75	215	355	114	82	30
31.....	46	....	37	48	....	92	....	351	....	88	35

NOTE: Daily discharge for 1923 determined as follows: Direct from the well defined curves, November 29 to October 26, interpolating for periods of ice. 1924: Direct from a well defined curve, October 26 to October 9, interpolating for periods of ice.

Monthly discharge of Pecos River at Irvin's Ranch near Cowles, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October.....	32	18	23	1,420
November.....	32	17	22	1,320
December.....	32	20	27	1,660
January.....	32	20	25	1,560
February.....	29	20	24	1,360
March.....	59	20	30	1,850
April.....	246	35	109	6,460
May.....	530	246	77	24,530
June.....	382	95	224	13,300
July.....	148	59	82	5,010
August.....	194	56	131	8,050
September.....	128	54	80	4,800
The year.....	530	17	71.2	51,500
1924				
October.....	76	39	54.5	3,350
November.....	59	31	43.8	2,600
December.....	38	37	37.2	2,280
January.....	48	37	40.1	2,460
February.....	48	37	40.4	2,320
March.....	92	35	48.7	2,990
April.....	452	110	253	15,070
May.....	686	351	406	28,950
June.....	373	114	241	14,360
July.....	110	58	86.7	5,330
August.....	99	30	52.4	3,220
September.....	35	12	24.4	1,450
The year.....	686	12	116	84,380

#### PECOS RIVER AT ANTON CHICO, N. MEX.

**Location.**—On highway bridge on Santa Rosa-Las Vegas state highway, one-half mile east of Anton Chico postoffice, about 4 miles below station near Anton Chico, section 9, township 11 north, range 17 east.

**Records available.**—October 26, 1919, to September 30, 1924.

**Drainage area.**—950 square miles.

**Gage.**—Automatic recording.

**Channel.**—Straight for several hundred feet above and below station. Banks high and not subject to overflows. Sandy, shifting bottom.

**Discharge measurements.**—Made by wading or from bridge.

**Winter conditions.**—Ice may cause backwater during winter months.

**Diversions.**—Water is diverted for irrigation at several points above station.

Discharge measurements of Pecos River at Anton Chico, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 14.....	Griffin-Lambert	1.28	12.4
Jan. 13.....	Mark Lambert	1.24	15.2
Apr. 2.....	do	1.39	23.9
June 3.....	Lambert-Archer	2.96	315
July 17.....	do	2.14	43.2
Sept. 3.....	Mark Lambert	2.13	64.6
1924			
Nov. 6.....	Mark Lambert	1.87	56.7
Jan. 20.....	Lambert-Neel	1.88	65.1
Apr. 14.....	Mark Lambert	3.22	695
June 12.....	do	2.99	333
Aug. 22.....	do	1.63	1.7
Sept. 24.....	do	1.68	1.1



Daily discharge in second-feet of Pecos River at Anton Chico, N. Mex., for climatic years 1923-24.

[A. A. Abercrombie, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	10	10	11	13	10	12	13	203	299	95	425	87
2.....	10	10	13	13	10	11	14	210	305	79	435	95
3.....	10	10	13	12	10	12	14	221	299	92	425	92
4.....	10	10	12	13	14	12	15	218	278	66	425	78
5.....	10	10	12	13	13	12	15	245	258	59	365	158
6.....	10	10	13	13	10	12	14	281	262	50	306	124
7.....	10	10	14	13	11	13	13	269	266	66	246	82
8.....	10	10	13	14	10	13	13	260	274	126	186	82
9.....	11	10	13	14	11	13	18	281	290	254	126	132
10.....	11	10	13	14	11	14	22	299	286	262	66	76
11.....	12	10	14	14	10	14	29	318	282	278	6.5	68
12.....	12	10	13	13	10	14	54	317	308	182	8.5	59
13.....	13	10	14	13	10	14	63	323	295	152	10	72
14.....	13	11	14	11	10	13	52	305	286	145	8.5	48
15.....	13	11	13	12	10	12	61	299	250	286	11	59
16.....	12	11	14	13	10	13	64	269	246	208	19	60
17.....	12	11	16	13	10	13	48	290	258	214	81	69
18.....	12	11	15	12	10	12	50	305	355	204	35	68
19.....	12	11	15	12	10	12	72	329	98	204	68	149
20.....	12	12	15	11	10	12	92	347	44	250	100	146
21.....	12	11	14	11	10	12	118	353	76	360	64	110
22.....	10	11	14	11	10	12	143	353	106	262	90	99
23.....	10	11	15	11	10	12	135	359	61	254	76	114
24.....	10	11	15	10	10	12	110	347	38	250	79	112
25.....	10	13	16	10	12	12	115	350	30	250	114	110
26.....	10	16	16	10	12	12	140	347	26	246	85	110
27.....	10	13	16	10	12	12	148	350	26	250	81	110
28.....	11	13	16	10	12	12	153	353	27	374	81	119
29.....	9.9	13	15	10	.....	13	165	335	31	573	81	116
30.....	10	12	14	10	.....	13	183	320	50	490	78	129
31.....	9.8	.....	12	10	.....	13	.....	317	.....	462	83	.....
1924												
1.....	126	84	21	48	35	46	59	6.0	9.0	188	0.8	1.9
2.....	232	83	28	48	24	48	60	6.0	10	185	0.8	4.6
3.....	339	84	32	48	23	46	60	6.0	8.0	161	0.8	31
4.....	446	81	28	46	20	48	61	6.0	6.0	138	0.8	3.2
5.....	543	69	27	46	20	51	94	5.0	4.0	115	0.8	1.8
6.....	660	71	21	48	22	48	140	5.0	3.0	115	0.8	1.0
7.....	526	64	20	53	28	48	188	4.0	2.0	142	0.8	1.0
8.....	495	57	21	46	33	42	288	4.0	46	115	0.8	1.0
9.....	624	59	23	41	28	46	343	3.0	90	115	0.8	1.0
10.....	650	55	22	41	27	42	290	3.0	134	123	0.8	0.9
11.....	564	60	21	46	27	44	265	2.0	179	112	8.2	0.9
12.....	575	176	21	51	27	50	249	2.0	224	179	5.8	0.9
13.....	556	176	22	50	27	51	397	2.0	303	145	6.4	1.0
14.....	556	132	22	46	26	50	546	2.0	298	75	4.0	1.0
15.....	556	117	21	44	27	35	695	3.0	315	364	4.3	1.0
16.....	560	101	22	35	33	1.0	523	3.0	330	331	4.6	32
17.....	528	82	25	27	32	1.0	352	3.0	285	298	6.4	15
18.....	522	66	42	24	33	1.0	181	3.0	249	265	6.4	5.2
19.....	517	50	44	27	33	1.0	10	3.0	237	232	6.4	2.6
20.....	496	39	21	33	32	1.0	10	3.0	240	199	7.0	8.8
21.....	444	33	22	33	32	1.0	9.0	3.0	249	166	7.0	27
22.....	392	32	24	24	32	1.0	9.0	3.0	249	133	7.6	9.4
23.....	340	30	19	24	30	0.7	9.0	3.0	244	100	5.2	2.2
24.....	288	30	24	30	37	1.0	8.0	3.0	219	67	3.8	3.0
25.....	236	30	71	46	42	20	8.0	3.0	210	34	4.0	2.8
26.....	184	33	44	37	41	28	8.0	4.0	208	0.7	12	2.2
27.....	132	41	77	24	37	46	8.0	4.0	208	0.7	4.0	2.2
28.....	81	33	88	25	41	86	8.0	5.0	210	0.7	3.0	2.6
29.....	90	27	73	26	42	121	7.0	6.0	169	0.7	2.2	2.6
30.....	86	25	50	42	.....	73	7.0	7.0	330	0.7	3.2	2.8
31.....	83	.....	48	25	.....	62	.....	8.0	.....	0.7	2.8	.....

NOTE: Daily discharge for 1923 determined as follows: Indirect method for shifting channel, October 14 to January 13; direct from two well defined curves January 13 to September 3; indirect method for shifting channel, September 3 to November 6.

1924: Direct from well defined curve, November 6 to April 4; indirect method for shifting channel, April 4 to June 12; direct from well defined curve June 12 to September 24.

Monthly discharge of Pecos River at Anton Chico, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October .....	13	9.8	10.9	670
November .....	16	10	11.1	658
December .....	16	11	14.0	858
January .....	14	10	11.9	732
February .....	14	10	10.6	591
March .....	14	11	12.5	770
April .....	183	13	71.5	4,240
May .....	359	203	302	18,600
June .....	355	26	190	11,300
July .....	573	50	227	14,000
August .....	435	6.5	138	8,460
September .....	152	48	97.2	5,680
The year .....	573	6.5	92.1	66,600
1924				
October .....	660	81	401	24,600
November .....	176	25	67.3	4,000
December .....	88	19	33.7	2,070
January .....	53	24	38.2	2,340
February .....	42	20	30.7	1,770
March .....	121	1.0	36.8	2,260
April .....	695	7.0	163	9,700
May .....	8.0	2.0	3.96	243
June .....	330	2.0	176	10,450
July .....	364	7.0	146	9,000
August .....	12	0.8	6.27	385
September .....	32	0.9	5.75	342
The year .....	660	0.8	92.6	67,170

### PECOS RIVER AT SANTA ROSA, N. MEX.

**Location.**—On sandstone cliff on west bank of river one-fourth mile above highway bridge at Santa Rosa. One and one-quarter miles above the mouth of Rio Agua Negra Chiquita and six miles above the mouth of Canon Pintada in section 3, township 8 north, range 21 east.

**Records available.**—February 1, 1910, to July 31, 1911; September 21, 1912, to September 30, 1924.

**Drainage area.**—2,780 square miles (from Land Office Maps).

**Gage.**—Automatic recording installed May 5, 1922.

**Channel.**—The stream bed is very flat, having with a depth of two feet a width of 100 feet or more. The bottom is composed of light sand and gravel and shifts continually.

**Discharge measurements.**—Made by wading or from bridge.

**Winter conditions.**—The channel is generally free from ice all winter.

**Diversions.**—There are many diversions for irrigation above the station.



Discharge measurements of Pecos River at Santa Rosa, N. Mex., for climatic years 1923-24

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 14	Griffin-Lambert	0.56	20.2
Jan. 15	Mark Lambert	0.53	16.5
Apr. 4	do	0.57	11.2
June 5	Lambert-Archer	1.38	145
July 17	do	0.91	48.4
Sept. 5	Mark Lambert	0.60	55.4
1924			
Nov. 7	Mark Lambert	0.36	22
Jan. 18	Lambert-Neel	0.32	15.2
Apr. 16	Mark Lambert	1.85	73.3
June 16	do	1.29	145
Aug. 24	do	0.98	29.6
Sept. 26	do	0.72	21.7

Daily discharge in second-feet of Pecos River at Santa Rosa, N. Mex., for climatic years 1923-24.

[Earl Irwin, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	140	32	49	54	13	81	57	88	186	95	97	47
2	133	28	62	51	11	84	31	67	189	90	79	51
3	125	28	70	48	10	81	19	67	189	86	84	52
4	118	14	70	45	28	93	15	71	166	81	83	59
5	108	17	70	42	46	84	17	82	145	76	83	67
6	98	23	75	40	64	98	20	51	160	72	82	98
7	88	19	75	37	82	102	23	39	395	67	76	98
8	78	19	80	34	100	152	16	44	236	62	74	75
9	68	26	99	32	118	200	16	44	281	58	98	55
10	59	26	99	29	138	187	17	57	250	53	87	53
11	49	26	94	26	158	98	51	70	241	48	77	78
12	39	26	89	23	147	109	48	83	232	44	77	100
13	29	32	80	20	161	112	21	96	137	39	54	103
14	19	45	70	18	161	112	38	108	102	34	54	106
15	19	53	70	15	177	122	35	121	82	30	57	122
16	21	70	66	16	180	112	35	134	73	43	62	98
17	19	70	49	16	180	129	38	147	49	49	48	119
18	18	70	53	14	161	147	29	160	32	33	689	132
19	19	70	62	14	152	129	24	173	145	33	868	132
20	19	66	66	14	177	120	38	186	269	29	230	132
21	23	75	66	14	167	134	52	199	150	40	56	75
22	23	84	70	14	129	122	67	211	100	180	51	75
23	24	84	70	14	129	158	59	207	100	154	45	78
24	24	75	66	14	112	152	55	218	105	107	43	95
25	25	62	62	14	95	134	66	229	105	80	42	100
26	25	53	70	14	78	122	129	218	107	58	41	129
27	26	49	67	14	56	120	88	222	110	62	46	132
28	26	45	64	12	69	93	80	214	110	337	45	129
29	32	49	62	12	81	84	204	105	240	45	132	
30	41	49	59	14	98	92	200	100	167	46	129	
31	36	....	56	....	....	84	....	182	....	138	48	....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	132	28	28	98	46	55	121	247	1,246	32	27	33
2	116	24	29	98	46	69	124	226	1,430	30	18	32
3	102	8.1	30	95	47	65	128	205	1,682	30	32	33
4	88	8.8	31	95	48	67	132	205	1,766	33	33	30
5	75	9.5	32	92	49	73	192	252	1,934	71	34	31
6	92	10	33	95	50	73	252	371	1,710	109	47	32
7	52	11	34	98	51	71	312	470	1,598	104	104	32
8	8.0	24	35	95	52	73	372	426	1,654	104	141	31
9	1,188	24	36	78	53	71	432	448	1,710	96	132	30
10	1,079	24	37	53	54	71	492	502	1,710	63	125	30
11	973	25	38	40	55	73	552	726	1,766	50	118	30
12	865	23	39	28	52	78	612	798	1,990	56	111	32
13	758	22	40	26	49	80	672	870	2,102	74	104	32
14	652	100	41	25	46	75	733	1,274	2,214	71	97	32
15	546	82	42	26	44	75	697	1,262	2,270	68	90	33
16	440	65	43	26	42	78	565	1,206	145	66	83	33
17	334	53	43	25	40	78	544	1,150	141	64	76	32
18	228	52	43	24	38	75	522	1,318	85	62	69	33
19	122	37	41	24	45	75	500	1,178	60	60	62	32
20	16	29	45	26	46	78	478	1,150	34	50	56	32
21	33	26	52	33	45	82	457	1,430	34	70	50	33
22	30	25	46	25	50	86	436	1,122	415	100	44	31
23	24	23	78	15	52	89	415	1,094	113	109	38	28
24	21	22	78	14	48	92	394	1,094	34	18	32	27
25	18	22	73	15	46	96	373	822	31	20	33	25
26	23	23	57	15	53	99	352	598	24	12	34	21
27	16	24	80	16	55	103	331	706	24	28	34	22
28	25	25	141	18	55	106	310	814	22	37	34	22
29	25	26	365	21	55	110	289	922	21	40	33	21
30	24	27	140	25	....	114	268	1,030	32	96	33	21
31	26	....	98	30	....	117	....	1,138	....	93	33	....

NOTE: Daily discharge for 1923 determined as follows: Direct from two fairly well defined curves, October 14 to July 17; indirect method for shifting channel, July 17 to September 5; direct from well defined curve, September 5 to November 7.

1924: Direct from well defined curve, September 5 to April 16; direct from fairly well defined curve, April 16 to September 26.

Monthly discharge of Pecos River at Santa Rosa, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	140	18	50.7	3,110
November	84	14	46.2	2,740
December	99	49	71.9	4,280
January	54	12	24.1	1,430
February	180	10	111	6,140
March	200	81	118	7,240
April	129	15	45.3	2,700
May	229	39	108	6,660
June	395	32	155	9,220
July	337	30	86.6	5,320
August	868	41	115	7,070
September	132	47	95	5,660
The year	868	10	84.8	61,600
1924				
October	1,188	0.8	262	16,100
November	100	8.1	30.1	1,790
December	365	28	62.8	3,860
January	98	14	50.0	2,770
February	55	38	48.7	2,800
March	117	55	82.2	5,050
April	733	121	402	23,900
May	1,430	205	808	49,700
June	2,270	21	933	55,530
July	109	12	61.8	3,780
August	141	18	63.1	3,880
September	33	21	29.5	1,750
The year	2,270	0.8	236	171,000



## PECOS RIVER NEAR GUADALUPE, N. MEX.

*Location.*—Seventeen miles northwest of Fort Sumner, 8 miles above Guadalupe postoffice, 500 feet below the mouth of Alamogordo Creek and one-half mile above the Alamo dam site; section 34, township 5 north, range 24 east.

*Records available.*—October 11, 1912, to September 30, 1924.

*Drainage area.*—3,850 square miles.

*Gage.*—Automatic recording.

*Channel.*—Fairly permanent at low and medium stages but liable to shift during floods.

*Discharge measurements.*—Made by wading or from cable.

*Winter conditions.*—Ice may form in the channel during December, January and February.

*Diversions.*—There are many diversions for irrigation above the station.

*Discharge measurements of Pecos River near Guadalupe, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Discharge Sec.-Ft.
1923			
Oct. 19.....	Lambert-Griffin .....	0.96	79.4
Jan. 15.....	Mark Lambert .....	1.05	90.3
Apr. 2.....	do .....	1.07	91.6
June 2.....	Lambert-Archer .....	1.46	241
July 17.....	do .....	1.10	100
Sept. 3.....	Mark Lambert .....	1.28	128
1924			
Oct. 6.....	Mark Lambert .....	2.06	458
Nov. 6.....	do .....	1.14	130
Jan. 20.....	Lambert-Neel .....	1.08	108
June 15.....	Mark Lambert .....	1.20	202
Aug. 24.....	do .....	0.96	91.5
Sept. 26.....	do .....	0.88	78.5

*Daily discharge in second-feet of Pecos River near Guadalupe, N. Mex., for climatic years 1923-24.*

[C. D. Wilburn, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	95	68	87	78	88	98	79	322	266	321	229	244
2.....	90	67	80	77	82	88	78	256	247	280	229	236
3.....	85	66	83	75	80	78	77	190	252	240	185	132
4.....	80	65	86	74	80	66	75	210	275	200	141	114
5.....	75	68	89	73	82	66	74	242	298	160	97	109
6.....	70	71	91	72	84	68	73	274	321	120	94	116
7.....	65	74	94	72	88	68	72	320	344	80	91	187
8.....	70	78	97	72	77	70	84	309	368	82	90	114
9.....	75	82	100	72	71	71	96	286	392	84	86	111
10.....	80	86	97	72	77	74	109	315	383	86	85	106
11.....	85	90	94	72	80	76	121	386	374	88	82	106
12.....	90	91	91	72	96	76	133	455	365	90	85	104
13.....	95	93	89	72	92	65	145	455	357	92	85	104
14.....	100	94	86	81	90	55	157	455	348	94	86	100
15.....	94	96	83	90	88	63	170	424	340	96	88	99
16.....	89	97	80	90	84	72	159	309	332	98	155	99
17.....	84	99	80	89	82	80	147	297	318	100	1,284	99
18.....	79	100	80	89	80	80	135	286	304	106	654	99
19.....	74	104	80	89	80	80	123	274	290	82	586	99
20.....	73	108	80	88	80	80	112	309	276	90	520	99
21.....	72	112	80	88	84	80	100	344	262	81	454	99
22.....	72	116	80	88	114	80	160	344	248	135	388	99
23.....	72	120	80	87	141	80	220	349	234	197	322	96
24.....	72	124	80	87	136	80	280	353	220	146	256	91
25.....	72	128	80	87	122	80	340	358	243	114	190	88
26.....	72	121	80	87	111	80	400	362	266	112	211	85
27.....	72	114	80	86	117	80	460	343	289	126	274	82
28.....	72	107	80	80	106	80	520	323	313	296	253	80
29.....	71	100	80	80	....	80	454	304	337	365	249	76
30.....	70	94	80	88	....	80	388	285	362	253	296	81
31.....	69	....	79	90	....	80	....	....	....	232	257	....
1924												
1.....	97	95	95	170	99	99	622	940	2,000	217	2,075	89
2.....	287	99	99	154	103	96	726	770	1,805	247	1,010	99
3.....	6,800	199	99	139	99	96	831	600	1,655	277	600	97
4.....	17,000	322	99	135	99	94	936	698	1,340	307	525	80
5.....	6,800	322	95	131	106	97	1,040	796	1,160	338	338	76
6.....	420	208	93	127	103	97	1,083	894	1,055	366	170	96
7.....	433	120	95	123	106	99	1,126	992	815	352	114	89
8.....	276	117	92	119	108	97	1,169	1,090	600	525	70	82
9.....	276	115	84	115	117	97	1,212	1,190	555	675	68	80
10.....	277	113	89	111	108	99	1,255	1,208	496	212	83	79
11.....	277	117	109	107	106	99	1,298	1,226	439	282	965	71
12.....	278	103	205	103	104	103	1,340	1,245	382	170	2,630	69
13.....	279	89	168	99	102	117	1,219	1,264	325	139	965	67
14.....	272	89	132	95	101	119	1,297	1,283	268	156	1,250	62
15.....	283	125	95	92	100	117	1,275	1,302	184	152	422	67
16.....	310	125	89	89	99	97	1,253	1,321	130	143	152	68
17.....	272	134	85	86	83	97	1,232	1,340	120	705	103	69
18.....	283	139	90	83	85	99	1,211	1,352	110	495	114	64
19.....	208	139	92	80	87	103	1,190	1,365	101	282	165	83
20.....	134	137	90	99	90	108	1,275	1,378	92	139	600	75
21.....	137	137	93	112	93	103	1,360	1,391	83	125	431	67
22.....	134	137	99	112	96	96	1,445	1,404	99	121	262	69
23.....	134	134	93	110	99	89	1,531	1,417	240	147	94	71
24.....	134	99	93	105	96	85	1,617	1,430	117	750	103	74
25.....	134	82	95	101	97	86	1,703	1,415	99	1,340	152	77
26.....	134	89	95	97	97	86	1,790	1,430	97	1,190	226	80
27.....	113	82	107	99	97	89	1,620	1,355	97	830	296	70
28.....	95	90	134	96	97	199	1,450	1,205	127	770	226	70
29.....	95	93	217	96	97	310	1,280	1,220	157	875	99	70
30.....	95	92	201	97	....	414	1,110	1,250	187	660	80	70
31.....	95	....	186	97	....	518	....	2,045	....	600	70	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two well defined curves Oct. 19 to Oct. 6, 1924. Direct from two well defined curves Oct. 6 to Oct. 29.



Monthly discharge of Pecos River near Guadalupe, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	100	65	78.5	4,830
November .....	128	65	94.4	5,620
December .....	100	79	84.7	5,210
January .....	90	72	81.1	4,990
February .....	141	71	92.5	5,140
March .....	98	60	75.9	4,670
April .....	520	72	185	11,000
May .....	455	190	325	19,300
June .....	392	220	307	18,300
July .....	365	80	150	9,200
August .....	1,284	82	262	16,100
September .....	244	76	112	6,650
The year .....	1,284	60	153	111,000
1924				
October .....	17,000	95	1,179	72,500
November .....	322	82	131	7,820
December .....	205	84	113	6,960
January .....	170	80	109	6,700
February .....	117	83	99.1	5,700
March .....	518	85	132	8,140
April .....	1,790	622	1,250	74,400
May .....	2,045	600	1,217	75,000
June .....	2,000	83	498	29,600
July .....	1,340	217	438	26,900
August .....	2,630	68	434	26,700
September .....	99	62	76.0	4,520
The year .....	17,000	62	475	344,900

### PECOS RIVER NEAR DAYTON, N. MEX.

*Location.*—Three miles east of Dayton, in section 13, township 18 south, range 26 east, half a mile above the mouth of Penasco River.

*Records available.*—March 24, 1905, to September 30, 1924.

*Drainage area.*—20,000 square miles.

*Gage.*—Automatic recording.

*Channel.*—Shifting.

*Discharge measurements.*—Made from cable.

*Winter conditions.*—Ice has little effect on the relation of gage height to discharge.

*Diversions.*—The station is about 10 miles above the outlet of Lake McMillan; one of the reservoirs of the Carlsbad Project of the U. S. Reclamation Service, which irrigates about 20,000 acres in the vicinity of Carlsbad.

*Co-operation.*—Records were furnished by the manager of the Carlsbad Project of the U. S. Reclamation Service.

Discharge measurements of Pecos River near Dayton, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 31	J. R. Yates	6.00	112
Dec. 18	do	6.38	175
Jan. 31	do	6.85	240
Feb. 24	do	7.68	453
Apr. 11	H. H. Robins	5.80	139
Apr. 27	J. R. Yates	6.10	164
May 20	do	6.46	230
June 23	do	6.60	167
July 10	do	5.40	49
July 19	E. E. Teeters	5.70	90
Sept. 1	J. R. Yates	6.95	260
Sept. 16	do	9.00	1,100
1924			
Oct. 2	J. R. Yates	6.43	160
Nov. 24	do	7.30	339
Jan. 3	do	7.88	514
Feb. 8	do	6.85	298
Mar. 15	do	6.40	205
May 15	do	7.40	453
June 21	do	5.90	82
Aug. 16	Foster-Glover	6.84	248
Sept. 24	Yates-Glover	5.60	62

Daily discharge in second-feet of Pecos River near Dayton, N. Mex., for climatic years 1923-24.

[P. R. Ramuz, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	66	104	202	147	231	352	227	307	181	75	210	302
2	60	104	208	147	227	314	225	270	181	75	210	428
3	56	104	197	147	225	314	216	237	119	63	218	322
4	46	104	185	144	221	290	221	203	131	63	186	290
5	39	104	172	142	237	268	218	177	131	75	123	456
6	39	104	158	142	235	257	199	147	115	63	84	352
7	39	108	162	139	218	237	172	147	88	48	68	247
8	41	111	167	139	235	218	164	131	199	48	55	181
9	46	111	162	139	252	208	164	131	425	39	48	101
10	51	111	158	155	270	208	150	139	2,130	48	43	81
11	48	111	158	163	290	204	142	147	1,014	58	39	75
12	44	111	158	163	279	204	152	147	524	288	30	69
13	39	118	158	169	257	204	543	155	524	583	31	66
14	39	126	158	181	243	186	1,232	163	290	375	31	66
15	44	139	158	181	231	155	695	155	268	218	21	64
16	48	142	155	177	231	155	532	208	190	164	20	910
17	53	142	155	176	237	155	478	309	190	149	21	1,080
18	53	142	155	176	231	152	440	290	147	123	20	936
19	58	150	155	176	227	152	416	279	139	94	81	302
20	69	158	155	176	218	155	404	237	108	71	543	172
21	73	162	155	199	212	144	372	208	268	73	1,763	415
22	75	165	155	221	221	144	380	147	456	98	1,359	302
23	79	167	155	231	380	147	326	128	172	139	803	233
24	79	181	155	253	440	142	257	123	543	155	603	172
25	85	190	155	257	380	139	227	123	366	108	352	155
26	91	197	160	257	380	142	199	233	227	81	285	194
27	91	201	163	262	355	142	177	352	155	68	283	190
28	91	218	163	262	361	147	257	218	123	79	208	139
29	94	223	158	247	....	181	395	172	108	326	208	115
30	97	223	158	247	....	199	440	172	88	803	863	89
31	101	....	158	237	....	212	....	181	....	352	339	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	37	456	332	863	366	295	120	517	1,610	76	326	58
2	172	476	339	747	347	286	112	437	2,220	69	227	94
3	120	587	386	603	312	268	102	407	1,390	290	190	118
4	2,080	1,082	419	506	302	257	94	386	803	237	381	101
5	3,300	935	410	440	286	251	150	339	582	195	378	87
6	7,000	887	389	395	292	231	127	295	489	139	253	75
7	3,200	634	366	416	302	208	237	241	410	120	199	66
8	2,053	524	352	375	302	186	218	212	319	101	172	60
9	1,624	463	319	372	302	181	195	212	279	90	155	55
10	3,000	440	314	434	307	185	185	241	243	1,615	115	45
11	3,500	410	458	463	319	186	172	366	253	1,365	90	43
12	3,000	386	285	456	324	190	217	386	239	603	70	251
13	3,330	401	786	419	324	199	616	386	199	389	55	77
14	2,655	419	466	380	322	212	647	437	190	290	43	69
15	1,590	440	416	366	322	216	489	469	172	247	260	67
16	1,391	410	472	372	307	219	472	543	172	227	285	67
17	1,139	372	472	375	295	212	410	543	144	227	440	66
18	984	366	395	352	290	212	425	721	112	203	218	63
19	833	352	366	358	290	212	603	899	104	199	147	61
20	721	361	456	358	279	221	764	695	94	190	115	58
21	603	389	603	352	262	227	685	612	87	181	101	55
22	524	361	726	352	253	219	524	595	77	284	101	55
23	472	347	984	352	253	204	425	603	85	254	58	58
24	466	334	747	352	247	194	378	582	75	218	53	63
25	800	319	500	366	259	186	372	657	56	208	35	61
26	1,980	297	472	361	277	179	425	695	51	686	41	61
27	1,424	279	479	366	285	169	489	513	53	2,240	55	61
28	803	295	638	375	285	152	591	479	53	1,390	50	63
29	603	304	881	358	297	147	721	447	45	815	43	63
30	554	326	747	355	....	158	671	434	76	562	43	63
31	472	....	625	352	....	133	....	440	....	425	46	....

Monthly discharge of Pecos River near Dayton, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October	101	39	62	3,830
November	223	104	144	8,590
December	208	155	164	10,050
January	262	139	189	11,600
February	440	212	269	14,920
March	352	139	198	12,150
April	1,232	142	334	19,870
May	352	123	195	11,970
June	2,130	88	320	19,040
July	803	39	162	9,940
August	1,763	20	295	18,140
September	1,080	63	283	16,850
The year	2,130	20	217	156,950
1924				
October	7,000	37	1,627	100,000
November	1,082	279	455	27,080
December	984	285	503	30,940
January	863	352	419	25,750
February	366	247	297	17,070
March	295	133	206	12,680
April	764	94	391	23,270
May	899	212	477	29,340
June	2,220	45	356	21,180
July	2,240	69	456	28,040
August	440	35	153	9,420
September	251	43	73	4,330
The year	2,240	35	453	329,100

## PECOS RIVER AT CARLSBAD, N. MEX.

*Location.*—At the Green street bridge in Carlsbad. There are no important tributaries within several miles.

*Records available.*—May 20, 1903, to March 31, 1908; May 18, 1914, to September 30, 1923.

*Drainage area.*—22,000 square miles.

*Gage.*—Automatic recording.

*Channel.*—Permanent except at flood stages.

*Discharge measurements.*—Made by wading or from the bridge.

*Winter conditions.*—The channel is free from ice all winter.

*Diversions.*—The station is located below all important diversions in New Mexico.

*Co-operation.*—Records were furnished by the District Engineer, U. S. G. S., Austin, Texas.

*Discharge measurements of Pecos River at Carlsbad, N. Mex., for climatic year 1923.*

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 13	Slack and West	0.65	75.1
Nov. 18	J. R. Yates	0.62	77.0
Jan. 22	do	0.62	77.4
Mar. 9	do	0.90	175
June 16	do	0.62	71.8
July 30	do	0.66	87.0
Sept. 28	do	0.64	87.9

Daily discharge in second-feet of Pecos River at Carlsbad, N. Mex., for climatic year 1923.

[J. R. Yates, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	87	83	80	103	78	137	100	100	97	87	83	87
2	83	83	80	92	75	152	100	100	83	83	85	90
3	87	83	80	87	78	148	92	107	103	87	83	92
4	85	80	80	83	73	160	92	95	103	85	83	92
5	85	78	80	83	75	177	92	100	100	87	84	90
6	83	80	75	83	75	172	92	96	100	85	84	92
7	83	80	73	83	97	177	92	103	184	87	84	90
8	80	80	73	83	119	181	92	97	119	87	84	90
9	87	83	75	83	126	181	95	94	83	87	84	90
10	83	80	75	85	137	190	95	92	83	87	84	92
11	75	80	78	85	145	194	97	97	83	85	85	92
12	83	78	78	85	145	194	95	97	85	85	83	90
13	78	78	78	85	119	194	95	87	83	85	80	90
14	78	78	78	85	110	199	97	97	83	85	80	90
15	80	78	78	85	100	199	100	97	71	80	80	90
16	80	78	78	85	95	203	107	95	73	83	80	155
17	80	78	75	85	97	203	107	97	80	87	78	90
18	83	80	80	85	95	203	103	95	80	90	78	90
19	83	75	78	85	97	203	110	97	78	87	190	87
20	85	78	80	87	90	208	100	92	80	85	87	85
21	90	78	78	80	92	208	103	103	80	124	85	87
22	80	83	78	80	78	203	113	90	71	92	85	87
23	75	80	78	80	160	203	110	97	87	85	85	85
24	75	78	80	80	100	168	113	100	72	85	85	89
25	73	78	78	80	87	145	119	100	78	87	87	85
26	75	78	80	80	90	126	107	90	80	85	87	90
27	78	80	80	80	103	116	110	92	80	87	85	90
28	78	80	83	78	123	110	107	92	83	85	90	87
29	80	83	80	80	....	110	107	95	83	87	85	87
30	83	80	83	78	....	107	103	95	80	87	85	87
31	78	....	87	80	....	103	....	95	....	83	85	....



Monthly discharge of Pecos River at Carlsbad, N. Mex., for climatic year 1923.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	90	73	81.1	4,980
November	83	75	79.6	4,740
December	87	73	78.6	4,830
January	103	78	83.6	5,140
February	160	73	102	5,670
March	208	103	170	10,500
April	119	92	101	6,040
May	107	87	96.3	5,920
June	184	71	88.2	5,250
July	124	80	87.1	5,360
August	190	78	87.2	5,360
September	155	85	91.3	5,430
The year	208	71	95.6	69,200

# PECOS RIVER NEAR MALAGA, N. MEX.

Location.—Three and one-half miles southeast of Malaga, N. Mex., in Sec. 18 or 19, township 24 south, range 29 east.

Records available.—May 1, 1920, to September 30, 1923.

Drainage area.—Not known.

Gage.—Automatic recording. Vertical staff gage reading to 0.01 feet for gage heights 3 to 5 feet and 0.05 feet for gage heights 5 to 16 feet fastened to still well.

Channel.—Stream bed composed of rock covered with shifting sand. The control appears to be a rock ledge located about 500 feet below gage which is at times covered with drift sand. It is presumed that the maximum change of control will not affect the gage height more than 0.10 feet for normal flow.

Discharge measurements.—Made from cable.

Winter conditions.—Not affected by ice.

Diversions.—Water is diverted above and below station for irrigation.

Co-operation.—Records were furnished by the Project Manager, Carlsbad Project, U. S. R. S. Carlsbad, N. M.

Discharge measurements of Pecos River near Malaga, N. Mex., for climatic year 1923.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 13	West and Slack	3.80	151
Nov. 17	J. R. Yates	3.90	162
Jan. 7	do	3.80	133
Mar. 5	do	4.06	247
June 3	Yates and Teeter	3.68	108
July 21	J. K. Yates	3.67	106

Daily discharge in second-feet of Pecos River near Malaga, N. Mex., for climatic year 1923.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	162	228	113	126	136	208	256	101	98	133	110	276
2	117	208	143	169	120	240	228	89	95	120	110	296
3	180	165	143	220	147	256	176	104	123	133	117	288
4	180	150	126	147	158	252	133	80	104	117	104	312
5	180	158	158	162	176	264	123	107	133	126	104	348
6	196	133	158	143	165	280	123	126	133	126	98	280
7	188	161	147	110	147	272	69	113	126	107	107	300
8	180	154	165	130	192	284	69	120	582	110	113	256
9	117	162	140	169	200	276	80	110	280	101	110	288
10	162	154	150	180	212	268	83	120	200	104	101	260
11	173	169	126	158	188	264	80	92	184	123	117	260
12	165	158	158	133	204	248	83	113	208	200	123	268
13	147	158	133	184	216	256	95	173	208	154	120	268
14	154	173	162	224	224	256	95	113	188	130	123	348
15	192	169	143	204	220	264	107	120	173	130	130	425
16	192	173	150	196	228	264	83	120	113	126	113	1,865
17	192	136	147	162	228	268	101	95	104	130	123	615
18	184	133	107	147	224	272	101	101	92	136	117	360
19	169	147	147	143	212	264	98	107	101	140	162	324
20	158	154	154	140	196	272	80	92	113	143	365	316
21	196	165	133	154	244	272	92	89	228	143	212	288
22	232	133	169	120	226	248	69	69	173	252	196	280
23	173	162	101	136	292	248	83	98	176	169	208	272
24	184	147	120	154	248	252	89	89	136	150	196	372
25	165	169	113	143	208	244	184	92	126	130	200	316
26	200	161	140	130	184	280	165	104	113	126	236	272
27	200	120	117	162	192	276	110	126	101	133	192	268
28	154	143	158	154	196	280	95	95	107	120	1,117	256
29	173	176	117	120	....	280	95	110	95	120	402	248
30	204	162	110	126	....	276	101	89	107	117	288	320
31	244	....	117	140	....	256	....	98	....	113	276	....

NOTE.—Daily estimates computed from 1922 Standard Curve: Indirect by corrected gage heights October 1 to December 31, 1922.

Daily estimates computed from 1923 Standard Curve: Indirect by corrected gage heights January 1 to February 14; March 1 to September 30; direct from 1923 curve. February 15 to February 28, 1923.

Daily estimates computed by hourly discharge periods: June 8; August 20 and 28; September 16 and 17.

Monthly discharge of Pecos River near Malaga, N. Mex., for climatic year 1923.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	244	117	178	10,930
November	228	120	159	9,480
December	169	101	137	8,460
January	224	110	154	9,490
February	292	120	201	11,170
March	284	208	263	16,140
April	256	69	112	6,640
May	173	69	105	6,450
June	582	92	157	9,360
July	252	101	134	8,250
August	1,117	98	196	12,080
September	1,865	248	362	21,500
The year	1,865	69	356	130,000



## PENASCO RIVER AT Y. O. CROSSING NEAR HOPE, N. MEX.

*Location.*—About 200 yards above the crossing at Hope-El Paso road with the Penasco River, about 15 miles from Hope, New Mexico.

*Records available.*—October 1, 1923, to September 30, 1924.

*Drainage area.*—730 square miles.

*Gage.*—Automatic recording.

*Channel.*—Slightly curving above station and of fairly good alignment for several hundred feet below station. Bottom of a gravelly composition and liable to shifts.

*Discharge measurements.*—Made by wading or from cable.

*Diversions.*—About 2,260 acres are irrigated above Y. O. Crossing and about 8,000 acres below.

*Discharge measurements of Penasco River at Y. O. Crossing near Hope, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 15	H. A. Hamill	2.02	33.8
Oct. 31	do	2.05	37.4
Dec. 1	do	2.08	41.5
Dec. 7	do	2.10	44.1
Jan. 4	do	2.06	37.3
Jan. 23	do	2.10	38.1
Mar. 17	H. H. Robins	2.06	41.9
Mar. 28	do	1.98	34.2
Apr. 11	do	2.08	48.3
May 8	Robins-Hamill	1.91	29.9
May 10	U. S. R. S.	1.92	27.4
May 31	do	1.71	15.1
June 5	H. A. Hamill	1.90	25.8
June 19	H. H. Robins	1.78	18.2
July 11	U. S. R. S.	2.44	78.1
July 11	Robins-Hamill	2.43	77.6
1924			
Jan. 17	Lambert-Neel	1.86	26.2
Mar. 21	Teeter-Josey	1.88	26.5
Mar. 22	do	1.91	29.2
Apr. 17	Mark Lambert	1.82	21.9
June 20	J. R. Yates	1.30	1.0
Aug. 25	Mark Lambert	1.90	26.8

*Daily discharge in second-feet of Penasco River at Y. O. Crossing near Hope, N. Mex., for climatic years 1923-24.*

[J. D. Josey, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	36	34	41	38	31	34	45	20	14	12	....	68
2	30	33	40	35	32	35	50	14	12	12	....	103
3	28	33	42	35	31	37	50	17	13	10	....	86
4	31	33	49	37	35	35	50	17	14	10	....	66
5	29	34	51	37	29	35	50	20	15	12	....	61
6	29	30	45	36	30	36	53	21	14	13	....	63
7	30	31	44	35	30	35	53	24	13	17	....	72
8	31	32	43	33	30	33	50	23	15	22	....	61
9	32	32	43	34	30	34	50	23	8.0	31	....	57
10	32	32	42	33	30	49	40	20	11	55	....	45
11	31	30	41	32	30	55	46	16	18	90	....	43
12	34	32	40	33	30	44	44	14	13	66	....	43
13	29	33	42	32	32	38	38	17	22	58	....	44
14	36	33	42	32	32	36	41	18	15	50	....	48
15	35	33	42	32	31	38	44	20	14	63	....	52
16	33	33	41	30	34	38	42	16	14	55	....	81
17	31	34	40	28	30	41	41	17	14	58	....	79
18	31	34	41	29	32	41	35	18	15	45	....	77
19	31	35	41	32	36	43	30	11	10	41	....	75
20	29	36	41	31	36	44	30	11	10	42	....	73
21	31	37	40	51	35	51	34	12	12	50	....	71
22	32	40	41	43	35	45	26	9	9.0	46	....	69
23	32	37	41	37	40	45	25	12	7.0	42	....	67
24	33	37	40	36	32	47	25	11	7.0	41	....	65
25	34	36	40	36	34	49	21	18	9.0	38	....	63
26	35	38	40	35	33	46	31	26	7.0	36	112	61
27	35	38	40	36	33	43	30	17	10	35	118	59
28	36	40	40	31	33	37	31	17	11	32	88	58
29	37	40	38	31	....	45	29	14	14	34	97	57
30	36	41	37	31	....	45	30	14	14	32	99	53
31	35	....	36	30	....	49	....	13	....	28	82	....
1924												
1	49	32	32	32	27	32	33	34	16	1.2	31	20
2	45	31	36	31	27	31	32	24	16	0.6	46	19
3	42	31	36	30	27	32	33	21	15	6.5	34	19
4	39	30	36	27	27	33	30	18	13	16	34	18
5	36	30	34	30	27	32	28	18	11	20	34	18
6	33	31	33	28	27	31	28	16	9.5	24	28	17
7	30	33	33	27	27	31	22	10	11	20	24	16
8	27	33	38	20	27	30	23	9.2	11	12	18	10
9	20	34	38	20	28	30	25	8.6	14	11	18	11
10	22	33	38	19	28	30	27	8.6	12	69	20	11
11	10	34	38	19	30	30	29	8.4	7.8	46	38	11
12	8.6	39	38	18	30	29	31	7.8	7.2	34	38	11
13	7.4	38	37	22	28	30	33	7.2	6.8	33	30	12
14	7.4	37	37	27	30	30	34	6.2	6.8	33	24	15
15	27	36	37	27	30	30	33	5.6	5.9	31	19	17
16	27	37	37	26	31	32	28	4.6	6.5	30	22	17
17	27	35	37	25	32	30	30	3.4	5.9	35	18	15
18	27	35	36	24	33	30	31	1.1	6.2	43	19	17
19	27	34	36	24	33	32	30	1.5	4.9	44	17	19
20	27	34	36	23	31	30	27	3.8	3.2	30	13	19
21	27	33	36	21	31	29	24	3.8	1.8	34	13	19
22	29	35	36	20	30	28	22	5.2	0.9	38	12	22
23	30	35	35	19	30	28	22	7.8	2.0	48	12	20
24	30	34	35	19	35	27	21	12	1.8	38	28	20
25	29	31	35	19	34	28	16	1.6	31	21	20	20
26	29	31	35	18	31	28	29	17	1.0	36	17	22
27	29	32	35	27	31	27	34	14	0.8	61	17	21
28	31	32	34	26	32	26	30	12	0.5	63	137	24
29	33	30	34	26	32	27	28	12	0.4	37	34	25
30	33	29	34	27	....	30	27	14	0.4	28	18	24
31	32	....	34	27	....	30	....	13	....	28	37	....



Monthly discharge of Penasco River at Y. O. Crossing near Hope, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	37	28	32.4	2,000
November	41	30	34.7	2,060
December	51	36	41.4	2,550
January	51	28	34.2	2,100
February	40	29	32.4	1,750
March	55	33	41.4	2,540
April	53	21	38.8	2,310
May	26	9.0	16.7	1,030
June	22	7.0	12.5	742
July	90	10	37.9	2,330
August (Aug. 26-31)	118	82	99.3	1,180
September	103	43	70.5	4,200
The year	118	7.0	36.8	24,792
1924				
October	49	7.4	28.0	1,730
November	39	29	33.3	1,980
December	38	32	35.7	2,190
January	32	18	24.1	1,480
February	35	27	29.9	1,720
March	33	26	29.8	1,830
April	34	21	28.2	1,680
May	34	1.1	11.1	680
June	16	0.4	6.70	400
July	69	0.6	31.6	1,940
August	137	12	28.1	1,720
September	25	10	17.6	1,050
The year				18,400

#### GALLINAS RIVER ABOVE HOT SPRINGS NEAR LAS VEGAS, N. MEX.

*Location.*—Two miles and a half above Hot Springs at the end of the Agua Pura ice house spur; section 2, township 16 north, range 15 east.

*Records available.*—March 9, 1915, to September 30, 1924. There are periods during which no observations were made on account of back water from the Agua Pura reservoir No. 9, which reaches the gage.

*Drainage area.*—86 square miles.

*Gage.*—Automatic recording.

*Channel.*—Fairly permanent.

*Discharge measurements.*—Made by wading or from the railroad bridge below the station.

*Diversions.*—There are diversions above and below the station.

Discharge measurements of Gallinas River above Hot Springs near Las Vegas, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Apr. 12	Mark Lambert	0.58	7.2
May 29	Lambert-Archer	1.10	38.1
July 16	do	0.47	4.4
Sept. 5	Mark Lambert	0.76	11.7
1924			
Apr. 14	Mark Lambert	2.35	155
June 11	do	1.17	34.5
Aug. 19	do	0.56	5.5
Sept. 24	do	0.42	2.6

Daily discharge in second-feet of Gallinas River above Hot Springs near Las Vegas, N. Mex., for climatic years 1923-24.

[C. D. Anderson, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	0.6	2.8	5.7	....	....	....	10	101	28	12	5.8	16
2	0.4	2.8	5.7	....	....	....	9.3	94	28	12	5.8	15
3	0.3	3.0	5.7	....	....	....	8.1	104	25	7.2	8.5	16
4	0.2	3.1	5.7	....	....	....	7.5	112	20	4.5	5.4	15
5	0.1	3.2	5.7	....	....	....	7.0	112	16	4.7	5.4	15
6	0	3.3	5.7	....	....	....	8.6	112	13	4.9	5.6	12
7	0	3.4	5.5	....	....	....	16	103	14	5.3	5.4	11
8	0	3.5	5.3	....	....	....	17	112	28	5.4	10	10
9	0	3.6	5.7	....	....	....	18	112	30	5.6	8.8	14
10	0.1	3.7	6.0	....	....	....	20	112	28	5.6	7.6	10
11	0.1	3.7	5.5	....	....	....	18	112	29	13	7.6	9.8
12	0.2	3.5	5.3	....	....	....	30	112	27	8.8	10	9.4
13	0.4	3.7	5.0	....	....	....	42	105	26	6.1	7.6	9.1
14	0.6	4.1	5.0	....	....	....	53	108	25	5.8	6.1	9.8
15	0.7	3.9	5.0	....	....	....	53	99	22	6.7	5.2	11
16	0.8	3.9	5.0	....	....	....	56	94	21	5.8	5.2	10
17	0.7	3.9	5.0	....	....	....	65	112	20	5.4	11	11
18	0.7	3.9	4.8	....	....	....	71	112	20	5.4	37	12
19	0.7	3.5	5.5	....	....	....	87	112	22	6.7	45	17
20	0.6	3.5	5.5	....	....	....	94	112	22	12	27	16
21	1.2	3.2	5.5	....	....	....	81	112	27	13	30	14
22	1.4	3.2	5.5	....	....	....	76	99	21	10	77	14
23	1.5	3.2	5.5	....	....	....	66	70	20	8.5	66	14
24	1.7	3.9	....	....	....	....	60	63	18	7.0	60	14
25	2.1	5.5	....	....	....	....	71	60	18	6.4	50	12
26	2.4	6.4	....	....	....	....	92	54	17	6.1	49	12
27	3.0	5.7	....	....	....	....	79	51	16	9.8	37	11
28	3.5	5.0	....	....	....	....	87	50	15	11	27	10
29	3.5	5.0	....	....	....	....	94	38	14	9.1	23	9.8
30	3.2	6.0	....	....	....	....	104	33	13	7.0	22	9.4
31	3.0	....	....	....	....	....	....	31	....	6.1	18	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	9.4	.....	.....	.....	.....	.....	.....	95	68	18	15	5.3
2.....	11	.....	.....	.....	.....	.....	.....	89	66	18	18	5.0
3.....	11	.....	.....	.....	.....	.....	.....	94	64	18	16	5.9
4.....	11	.....	.....	.....	.....	.....	.....	107	62	18	14	5.6
5.....	14	.....	.....	.....	.....	.....	.....	107	133	60	18	4.8
6.....	14	.....	.....	.....	.....	.....	.....	112	145	59	18	4.5
7.....	14	.....	.....	.....	.....	.....	.....	150	144	56	26	4.2
8.....	15	.....	.....	.....	.....	.....	.....	183	138	53	24	8.3
9.....	16	.....	.....	.....	.....	.....	.....	176	138	50	23	7.4
10.....	17	.....	.....	.....	.....	.....	.....	129	140	47	21	8.0
11.....	18	.....	.....	.....	.....	.....	.....	116	147	43	20	11
12.....	19	.....	.....	.....	.....	.....	.....	117	142	40	18	4.5
13.....	20	.....	.....	.....	.....	.....	.....	133	143	37	18	5.0
14.....	21	.....	.....	.....	.....	.....	.....	160	148	34	19	11
15.....	22	.....	.....	.....	.....	.....	.....	173	150	31	19	6.5
16.....	22	.....	.....	.....	.....	.....	.....	151	133	27	25	7.4
17.....	27	.....	.....	.....	.....	.....	.....	113	129	24	30	8.9
18.....	28	.....	.....	.....	.....	.....	.....	95	125	21	28	7.4
19.....	27	.....	.....	.....	.....	.....	.....	92	121	18	25	6.5
20.....	25	.....	.....	.....	.....	.....	.....	107	117	18	18	5.6
21.....	22	.....	.....	.....	.....	.....	.....	122	113	17	12	5.3
22.....	21	.....	.....	.....	.....	.....	.....	133	109	15	14	5.0
23.....	21	.....	.....	.....	.....	.....	.....	131	105	14	16	5.0
24.....	.....	.....	.....	.....	.....	.....	.....	148	102	13	17	5.3
25.....	.....	.....	.....	.....	.....	.....	.....	133	93	13	19	6.2
26.....	.....	.....	.....	.....	.....	.....	.....	116	80	13	21	6.2
27.....	.....	.....	.....	.....	.....	.....	.....	100	68	12	19	5.3
28.....	.....	.....	.....	.....	.....	.....	.....	92	66	11	18	5.0
29.....	.....	.....	.....	.....	.....	.....	.....	91	62	11	16	5.0
30.....	.....	.....	.....	.....	.....	.....	.....	97	72	18	15	5.3
31.....	.....	.....	.....	.....	.....	.....	.....	70	.....	13	5.3	.....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve for the entire year. 1924—Direct from well defined curve for the entire year.

Monthly discharge of Gallinas River above Hot Springs near Las Vegas, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	3.5	0	1.08	67.8
November .....	6.4	2.8	3.77	232
December .....	6.0	4.8	.....	248
April .....	104	7.0	50.5	3,000
May .....	112	31	90.7	5,600
June .....	30	13	21.4	1,300
July .....	13	4.5	7.64	468
August .....	77	5.4	22.2	1,370
September .....	16	9.1	12.3	732
The period .....	.....	.....	.....	13,020
1924				
October—1-23 .....	.....	.....	.....	844
April—5-30 .....	.....	.....	.....	6,500
May .....	150	62	113	6,980
June .....	68	11	33.8	2,010
July .....	30	12	19.4	1,190
August .....	18	5.0	8.09	498
September .....	5.9	3.2	4.37	260
The period .....	.....	.....	.....	18,280

## GALLINAS RIVER NEAR LAS VEGAS, N. MEX.

*Location.*—At Las Vegas Hot Springs, 6 miles northwest of Las Vegas; section 31, township 17 north, range 16 east. There are no tributaries between the station and Las Vegas and none for several miles above.

*Records available.*—August 13, 1903, to May 31, 1912, and December 1, 1912, to September 30, 1924.

*Drainage area.*—89 square miles.

*Gage.*—Vertical staff.

*Channel.*—Permanent at low stages but shifting during floods.

*Discharge measurements.*—Made by wading or from highway bridge a short distance below the station.

*Winter conditions.*—The channel is kept open by warm water from the springs.

*Diversions.*—The water supply for the town of Las Vegas is diverted about a mile and a half above the station. Beginning a short distance above the gage and extending upstream a distance of about 2 miles is a series of 9 reservoirs belonging to the Agua Pura Co., in which water is stored for the production of ice. These have no effect on the irrigating capacity of the stream, as the water, which is stored only between October and March, is comparatively small in quantity. The intake of the Sanguijuela Reservoir project, the property of the town of Las Vegas, is about one-half mile below the station. There are diversions through small private ditches for the irrigation of about 1,500 acres between the station and the mouth of the Gallinas.

*Discharge measurements of Gallinas River near Las Vegas, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 23.....	E. Griffin .....	1.25	e 0.3
Jan. 16.....	Mark Lambert .....	1.30	1.0
May 4.....	Lambert-Archer .....	2.25	80.6
June 5.....	..... do .....	1.66	9.1
July 16.....	..... do .....	1.33	0.7
Sept. 5.....	Mark Lambert .....	1.59	6.4
1924			
Nov. 7.....	Mark Lambert .....	1.72	12.2
Feb. 7.....	..... do .....	1.66	12.3
Apr. 14.....	..... do .....	2.62	157
June 11.....	..... do .....	1.87	21.5
Aug. 19.....	..... do .....	1.56	6.9
Sept. 24.....	..... do .....	1.29	e 0.8

e=Estimated.



Daily discharge in second-feet of Gallinas River near Las Vegas, N. Mex., for climatic years 1923-24.

[C. D. Anderson, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	0.2	0.2	0.3	0.4	0.4	0.4	0.4	58	24	0.8	1.1	1.5
2.....	.2	.2	.3	.4	.4	.4	.4	55	19	.8	1.1	6.5
3.....	.2	.2	.3	.4	.4	.4	1.0	58	17	1.1	1.1	11
4.....	.2	.2	.3	.4	.4	.4	1.5	66	14	1.1	1.1	18
5.....	.2	.2	.3	.4	.3	.4	.4	58	10	1.4	1.2	7.1
6.....	.2	.3	.3	.4	.3	.4	1.1	58	6.8	1.2	1.4	4.6
7.....	.2	.3	.3	.4	1.5	.4	1.5	58	20	1.1	1.4	2.9
8.....	.2	.3	.3	.4	.8	.4	4.0	58	1.2	1.1	1.4	2.2
9.....	.3	.3	.3	.4	.8	.4	8.1	51	10	1.2	1.5	2.9
10.....	.3	.3	.3	.4	.8	.4	7.1	58	11	1.1	1.8	2.6
11.....	.3	.3	.3	.4	.4	.4	7.1	66	10	6.5	1.8	4.0
12.....	.3	.3	.3	.4	.4	.4	26	58	9.6	11	4.6	4.0
13.....	.3	.3	.3	.4	.4	.4	38	51	9.6	5.8	4.6	4.0
14.....	.3	.3	.3	.4	.4	.4	38	58	8.1	3.1	1.8	2.2
15.....	.3	.3	.3	.4	.4	.4	32	51	6.2	.8	1.8	1.8
16.....	.3	.3	.3	.4	.4	.4	32	51	6.2	.8	2.9	1.8
17.....	.3	.3	.3	.4	.4	.4	38	50	4.6	1.1	1.4	1.8
18.....	.3	.3	.3	.4	.5	.4	44	44	4.0	2.2	2.0	4.0
19.....	.3	.3	.3	.4	.5	.4	51	51	4.9	1.1	6.6	4.6
20.....	.3	.3	.3	.4	.5	.4	61	58	4.6	1.1	3.0	11
21.....	.3	.3	.4	.4	.5	.4	47	55	14	10	38	8.6
22.....	.3	.3	.3	.4	.4	.4	38	51	12	6.8	7.3	8.1
23.....	.3	.3	.3	.4	.4	.4	38	44	8.1	2.2	6.1	7.6
24.....	.3	.4	.3	.4	.4	.4	34	42	4.0	6.8	58	7.1
25.....	.3	.4	.4	.4	.4	.4	42	38	1.8	1.2	42	6.8
26.....	.3	.4	.4	.4	.4	.4	58	40	1.5	1.4	38	5.8
27.....	.3	.4	.4	.4	.4	.4	58	42	1.4	5.2	39	5.2
28.....	.3	.3	.4	.4	.4	.4	58	42	1.1	18	22	4.3
29.....	.3	.3	.8	.4	....	.4	58	31	1.1	6.1	19	4.0
30.....	.3	.3	1.2	.4	....	.4	58	27	.8	1.4	5.2	3.7
31.....	.2	....	1.2	.4	....	.4	....	25	....	1.2	4.0	....
1924												
1.....	3.5	14	17	36	12	5.8	65	81	56	5.6	6.4	1.0
2.....	3.5	14	18	26	10	5.8	64	78	56	4.1	21	1.0
3.....	3.7	15	18	18	9.5	7.0	66	79	61	5.6	17	1.0
4.....	4.3	16	18	22	9.5	17	89	96	49	7.4	7.4	1.0
5.....	8.1	18	17	20	10	18	107	129	49	5.8	2.9	1.2
6.....	9.6	16	16	22	11	17	128	152	49	6.1	1.7	1.2
7.....	9.6	14	18	20	12	14	152	142	49	17	1.7	1.2
8.....	9.6	12	27	19	11	6.2	212	142	45	17	2.9	1.2
9.....	72	12	28	18	10	4.6	206	136	36	14	2.9	1.1
10.....	39	11	25	15	9.0	3.4	152	147	33	21	2.7	1.0
11.....	20	230	16	14	8.0	18	166	152	26	21	7.8	1.1
12.....	10	80	13	13	8.0	11	166	152	22	15	10	1.2
13.....	8.6	55	12	11	11	12	180	149	17	5.6	9.0	1.2
14.....	9.1	47	12	9.0	12	16	196	155	16	2.9	17	1.2
15.....	14	42	15	8.0	13	9.5	206	149	25	8.6	13	1.2
16.....	18	34	16	8.5	15	9.0	169	136	24	16	12	1.2
17.....	16	32	14	8.5	15	9.0	152	126	23	15	9.8	1.2
18.....	6.1	28	17	8.0	15	10	131	136	16	15	7.0	1.2
19.....	19	26	16	9.0	22	10	94	124	42	16	6.7	3.3
20.....	5.2	22	14	9.0	20	10	98	116	12	14	3.7	2.0
21.....	5.2	22	12	8.0	11	13	98	107	5.8	7.4	1.0	1.2
22.....	4.6	21	12	8.0	5.8	22	131	102	5.3	3.1	.8	1.0
23.....	6.8	19	11	8.0	4.6	27	126	102	4.7	2.1	1.0	1.0
24.....	4.6	18	12	7.5	4.2	52	166	98	3.7	4.7	1.1	1.0
25.....	22	14	18	7.0	6.2	93	139	94	3.9	26	4.7	1.0
26.....	19	12	28	7.0	4.6	118	102	78	3.5	18	6.4	1.0
27.....	16	12	74	8.0	4.2	89	81	67	2.7	10	5.3	.8
28.....	15	9.5	71	9.5	4.6	133	79	64	2.3	5.3	3.5	.8
29.....	15	10	55	9.5	4.6	86	81	55	2.7	5.6	.9	.8
30.....	17	10	47	10	....	58	85	64	4.1	5.3	1.0	.8
31.....	14	....	31	11	....	86	....	61	....	5.3	1.0	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve for the entire year. 1924—Direct from well defined curve for the entire period.

Monthly discharge of Gallinas River near Las Vegas, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	0.3	0.2	0.27	16.7
November .....	0.4	0.2	0.30	17.6
December .....	1.2	0.3	0.39	24.0
January .....	0.4	0.4	0.40	24.6
February .....	1.5	0.3	0.47	27.2
March .....	0.4	0.4	0.40	24.6
April .....	61	0.4	29.4	1,750
May .....	66	25	50.1	3,080
June .....	24	0.8	8.22	489
July .....	18	0.8	3.37	208
August .....	73	1.1	18.1	1,110
September .....	18	1.5	5.32	317
The year .....	73	0.2	9.79	7,100
1924				
October .....	72	3.5	13.8	850
November .....	230	9.5	29.5	1,759
December .....	74	11	23.2	1,420
January .....	36	7.0	13.1	808
February .....	22	4.6	10.1	581
March .....	133	3.4	31.9	1,960
April .....	206	64	130	7,710
May .....	152	61	112	6,900
June .....	61	2.3	24.8	1,480
July .....	26	2.1	10.5	646
August .....	21	0.8	61.0	375
September .....	3.3	0.8	1.17	70
The year .....	206	0.8	33.7	24,500



## RIO GRANDE BASIN

### RIO GRANDE NEAR DEL NORTE, COLO.

*Location.*—At a highway bridge in about section 30, township 40 north, range 5 east, six miles west of Del Norte, a short distance below the mouth of Wolf Creek. From October 11, 1889, to November 30, 1906, a station was maintained about four miles below the present station, and just above Los Pinos Creek. The flow at the two points is comparable, if a few small ditches are disregarded.

*Records available.*—May 16, 1908, to Septemebr 30, 1924.

*Drainage area.*—1,400 square miles.

*Gage.*—Automatic recording gage. The gage is referred to the same datum as was the gage installed May 16, 1908.

*Channel.*—Slightly shifting at sides from silt deposit at low water.

*Discharge measurements.*—Made from bridge.

*Winter flow.*—River is frozen over during the winter months.

*Reservoirs.*—Daily, monthly and annual discharges modified by storage in Beaver Park, Santa Maria and Rio Grande reservoirs.

*Diversions.*—There are court decrees for diversions of 101 second feet from the Rio Grande between Creede station and Del Norte, for diversions of 162 second feet from intervening tributaries.

*Co-operation.*—Records furnished by the State Engineer of Colorado.

*Discharge measurements of Rio Grande near Del Norte, Colo., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Nov. 25.....	D. S. Jones, Jr. ....	.68	221
Dec. 29.....	do .....	....	232
Jan. 30.....	do .....	....	188
Mar. 6.....	do .....	....	207
Apr. 18.....	D. S. Jones and E. S. C. ....	1.60	841
May 28.....	do .....	3.85	4,350
June 19.....	do .....	3.59	3,630
July 18.....	do .....	2.39	1,850
Aug. 23.....	D. S. Jones, Jr., and C. E. Neff....	1.99	1,290
Oct. 20.....	do .....	1.35	673
1924			
Oct. 20.....	Jones .....	1.35	673
Dec. 3.....	do .....	i 0.97	371
Dec. 27.....	do .....	i ...	346
Jan. 25.....	do .....	...	299
Feb. 27.....	do .....	...	252
Apr. 15.....	do .....	2.52	1,990
May 24.....	do .....	4.04	4,960
July 9.....	do .....	2.60	2,030
Aug. 6.....	do .....	2.07	1,300
Aug. 20.....	Baily and Jones.....	1.59	803
Sept. 25.....	do .....	.79	279

i=Ice.



Daily discharge in second-feet of Rio Grande near Del Norte, Colo., for climatic years 1923-24.

[J. G. Duncan, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923											
1	320	414	....	....	....	360	1,120	3,710	2,770	1,320	694
2	320	388	....	....	....	360	1,320	3,710	2,600	1,460	718
3	320	320	....	....	....	360	1,760	3,320	2,350	1,440	744
4	320	326	....	....	....	360	2,130	3,820	2,230	1,430	727
5	290	314	....	....	....	360	2,350	3,510	2,170	1,550	662
6	279	224	....	....	207	360	2,130	3,320	2,080	1,440	646
7	268	224	....	....	....	360	2,200	3,320	2,080	1,380	670
8	279	256	....	....	....	369	2,510	3,220	2,290	1,480	600
9	290	262	....	....	....	376	2,680	3,130	2,290	1,550	584
10	290	279	....	....	....	414	2,950	2,860	2,260	1,530	554
11	290	308	....	....	....	518	3,130	2,950	2,080	1,480	540
12	279	234	....	....	....	554	3,040	3,320	2,080	1,630	518
13	279	209	....	....	....	584	2,600	3,930	1,870	1,680	540
14	279	209	....	....	....	592	2,430	4,490	1,900	1,690	525
15	279	209	....	....	....	592	2,130	4,610	1,840	1,690	678
16	290	234	....	....	....	607	2,050	4,720	1,760	1,730	694
17	284	234	....	....	....	654	2,200	4,490	1,720	1,790	727
18	279	234	....	....	....	880	2,430	4,260	1,760	1,690	952
19	268	230	....	....	....	1,020	2,860	3,710	1,820	1,630	970
20	268	230	....	....	....	880	3,410	3,710	1,840	1,440	970
21	262	225	....	....	....	925	4,150	3,610	1,820	1,400	970
22	268	225	....	....	....	925	4,150	3,320	1,600	1,310	1,020
23	363	225	....	....	....	794	3,510	3,220	1,450	1,250	1,250
24	428	220	....	....	....	710	3,820	3,220	1,400	1,110	2,110
25	428	220	....	....	....	794	4,610	3,320	1,480	990	1,700
26	428	220	....	....	....	794	5,210	3,410	1,500	898	1,440
27	414	220	....	....	....	880	4,840	3,610	1,550	811	1,380
28	428	220	....	....	....	837	4,840	3,320	1,530	727	1,270
29	441	220	232	....	....	970	4,260	3,320	1,360	727	1,170
30	428	220	....	188	....	1,270	3,820	3,130	1,290	727	1,170
31	428	....	....	....	....	....	3,820	....	1,270	727	....
1924											
1	1,130	584	569	....	....	320	1,070	1,880	2,020	1,340	365
2	1,090	577	592	....	....	320	1,280	2,680	2,100	1,240	350
3	1,080	540	518	....	....	440	1,710	2,360	2,320	1,120	330
4	1,080	540	441	....	....	610	1,760	3,130	2,140	1,100	350
5	1,050	511	448	....	....	930	2,580	3,590	2,040	1,160	340
6	1,060	524	414	....	....	1,040	2,310	3,630	2,250	1,270	340
7	970	540	400	....	....	1,240	2,250	3,950	2,430	1,320	345
8	898	607	406	....	....	1,220	2,600	3,760	2,290	1,230	330
9	934	607	406	....	....	960	3,000	3,430	2,040	1,120	320
10	970	584	390	....	....	1,010	3,280	3,490	2,040	1,110	295
11	889	670	396	....	....	1,220	3,950	3,650	1,960	1,090	330
12	880	584	390	....	....	1,340	4,470	4,350	1,730	1,060	355
13	880	600	300	....	....	1,600	5,080	5,210	1,560	1,080	305
14	889	600	300	....	....	2,040	5,410	5,670	1,460	1,220	290
15	871	600	300	....	....	2,040	5,310	5,720	1,450	1,190	272
16	820	592	300	....	....	1,220	5,040	5,280	1,450	1,040	272
17	794	569	300	....	....	685	5,140	4,980	1,540	1,030	290
18	702	532	300	....	....	640	5,460	4,560	1,440	1,010	305
19	702	462	300	....	....	730	5,510	3,840	1,440	883	280
20	702	455	320	....	....	1,000	5,490	3,080	1,300	811	272
21	686	540	290	....	....	1,490	5,590	2,660	1,270	802	272
22	686	540	280	....	....	1,820	5,510	2,650	1,260	784	272
23	702	670	280	....	....	1,890	4,980	2,580	1,300	730	272
24	710	630	290	....	....	2,190	5,160	2,480	1,300	712	272
25	678	630	350	299	....	1,740	4,740	2,300	1,330	640	276
26	600	554	340	....	....	1,400	3,490	2,320	1,380	598	276
27	592	554	346	....	....	910	3,180	2,210	1,390	570	276
28	638	382	340	....	252	920	2,750	2,240	1,590	556	280
29	630	554	300	....	....	802	2,320	2,130	1,530	549	280
30	562	607	300	....	....	865	2,140	2,060	1,460	528	280
31	622	....	300	....	....	....	1,920	....	1,410	434	....

Monthly discharge of Rio Grande near Del Norte, Colo., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	428	262	325	20,000
November	414	209	252	15,000
December	....	....	226	13,900
January	....	....	208	12,800
February	....	....	190	10,600
March	....	....	260	16,000
April	1,270	360	649	38,600
May	5,210	1,120	3,050	188,000
June	4,720	2,860	3,590	214,000
July	2,770	1,270	1,870	115,000
August	1,790	727	1,350	83,000
September	2,110	518	906	53,900
The year	5,210	209	....	780,800
1924				
October	1,130	562	823	50,600
November	670	382	565	33,600
December	592	280	361	22,200
January	....	....	290	17,800
February	....	....	270	15,500
March	....	....	280	17,200
April	2,190	320	1,150	68,400
May	5,590	1,070	3,690	227,000
June	5,720	1,880	3,400	202,000
July	2,430	1,260	1,680	103,000
August	1,340	434	946	58,200
September	365	272	303	18,000
The year	5,590	272	....	834,000

### RIO GRANDE AT ALAMOSA, COLO.

*Location.*—At concrete road bridge in Alamosa, one-third of a mile above D. & R. G. Railroad bridge, where station was originally established in 1894, discontinued in 1895 and re-established in 1912. The flow at the two points is comparable except for one small ditch diversion. Records initiated by State of Colorado April 19, 1914.

*Records available.*—Discharge measurements and gage heights September 24, 1894 to December 31, 1895. Miscellaneous measurements, 1903 and 1910. Daily discharge May 15, 1912, to September 30, 1924.

*Drainage area.*—Not measured.

*Gage.*—An automatic recording gage.

*Channel.*—Shifting sand.

*Discharge measurements.*—From concrete road bridge at high water and by wading at low water.

*Winter flow.*—Ice cover forms during winter months.

*Diversion.*—Below all but one of the large diversions from the Rio Grande.

*Co-operation.*—Record furnished by State Engineer of Colorado.



## Discharge Measurements of Rio Grande at Alamosa, Colo., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 4	D. S. Jones, Jr.	1.45	145
Dec. 2	do	2.10	187
Dec. 28	do	2.10	195
Feb. 2	do	2.10	235
Mar. 5	do	2.05	341
May 7	do	1.32	141
June 21	do	3.75	1,250
Aug. 22	do	3.75	1,090
Sept. 4	do	2.32	318
Oct. 3	do	3.70	1,200
Oct. 16	do	3.33	907
1924			
Nov. 23	D. S. Jones, Jr.	2.75	528
Dec. 23	do	2.87	279
Jan. 5	do	2.60	269
Jan. 28	do	2.60	230
Feb. 29	do	2.60	319
Apr. 8	do	3.83	1,210
May 6	do	4.20	1,450
May 26	do	5.32	2,410
June 4	do	2.55	207
July 8	D. S. Jones, Jr., and E. S. C.	2.30	214
July 30	do	1.68	52.8
Aug. 11	do	1.35	21.2
Aug. 21	Baily and Jones	1.30	18.6
Sept. 28	Jones	1.28	15.7

## Daily discharge in second-feet of Rio Grande at Alamosa, Colo., for climatic years 1923-24.

[H. P. Malone, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	14	40	256	190	260	306	376	138	394	619	413	329
2	14	50	238	190	238	310	376	132	400	548	354	348
3	14	70	274	190	242	352	413	125	400	482	390	329
4	14	120	329	190	245	318	380	118	410	432	333	310
5	14	140	310	190	285	321	344	112	420	405	351	329
6	15	140	296	200	288	326	308	112	432	344	329	310
7	15	140	296	200	292	326	275	112	420	311	347	348
8	15	160	278	230	296	326	308	112	394	294	155	292
9	15	180	296	230	299	326	344	150	432	326	61	274
10	15	200	299	230	303	326	312	194	432	326	59	256
11	20	220	263	220	306	365	312	220	432	288	43	238
12	20	242	263	220	274	330	312	200	552	272	42	206
13	20	212	263	220	278	295	246	190	552	269	49	165
14	20	249	267	240	281	365	246	180	792	269	120	165
15	20	249	285	240	321	330	246	144	1,070	282	174	178
16	20	235	267	230	325	333	246	130	1,270	266	186	238
17	20	256	267	230	329	333	218	200	1,560	246	440	493
18	20	260	270	240	333	298	218	240	1,480	246	956	388
19	20	228	280	250	337	282	218	270	1,340	243	1,110	620
20	20	232	250	260	344	298	188	300	1,340	243	1,070	904
21	30	270	230	260	348	333	188	432	1,240	272	1,070	857
22	30	274	200	260	352	302	188	432	1,270	240	1,040	928
23	30	274	230	270	396	302	160	470	1,240	253	1,000	940
24	30	274	230	296	360	302	163	470	1,120	237	880	1,080
25	30	278	230	274	329	302	163	470	1,030	250	822	1,660
26	30	263	230	278	333	302	156	394	1,030	443	700	1,580
27	30	285	190	270	337	302	149	432	992	440	660	1,360
28	30	285	195	270	303	305	146	432	1,050	383	562	1,380
29	30	289	200	270	322	143	394	849	362	470	1,320	1,280
30	30	310	200	274	205	140	394	761	380	408	1,280	1,280
31	30	200	282	282	340	394	413	348	413	348	413	348

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	1,260	646	581	....	....	319	300	685	424	82	42	18
2	1,200	612	580	....	....	319	300	650	330	84	42	18
3	1,200	581	576	....	....	295	300	720	244	86	42	18
4	1,200	581	521	....	....	295	350	860	214	109	42	18
5	1,200	581	498	269	....	272	520	1,300	281	124	36	18
6	1,150	550	509	....	....	272	720	1,500	562	114	36	18
7	1,150	550	503	....	....	276	1,030	1,460	741	116	26	18
8	1,120	550	492	....	....	276	1,340	1,300	923	196	26	18
9	1,040	612	490	....	....	276	1,460	1,380	755	252	26	18
10	1,080	646	480	....	....	233	1,340	1,580	550	214	22	18
11	1,040	680	460	....	....	276	1,220	1,700	466	178	20	18
12	1,000	748	450	....	....	214	1,140	2,130	412	162	20	18
13	960	748	430	....	....	256	1,100	2,580	629	132	22	18
14	1,000	680	420	....	....	281	1,420	2,580	1,200	107	20	18
15	960	680	400	....	....	281	1,700	2,920	1,250	86	20	18
16	920	646	380	....	....	182	1,740	3,020	1,810	76	18	18
17	920	646	370	....	....	305	1,180	2,970	1,860	76	18	18
18	890	680	360	....	....	257	930	2,870	1,620	86	18	18
19	816	612	350	....	....	241	895	3,070	1,350	86	18	18
20	782	550	340	....	....	262	860	3,070	1,010	76	18	18
21	748	581	330	....	....	262	1,070	3,070	699	67	18	18
22	748	581	320	....	....	262	1,260	3,070	385	58	18	18
23	748	581	300	....	....	262	1,380	2,870	290	58	18	18
24	748	612	290	....	....	286	1,500	2,670	207	50	18	18
25	748	612	280	....	....	290	1,660	2,580	175	50	18	17
26	748	581	279	....	....	266	1,500	2,440	146	50	18	17
27	748	581	275	....	....	290	1,180	1,610	118	50	18	17
28	714	581	272	230	....	478	895	1,150	98	58	18	17
29	680	581	270	....	319	508	825	881	88	58	18	17
30	680	612	270	....	....	400	790	685	80	58	18	17
31	646	....	270	....	....	325	....	532	....	42	18	....

## Monthly discharge of Rio Grande at Alamosa, Colo., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	30	14	21.8	1,340
November .....	310	40	214	12,700
December .....	329	190	254	15,600
January .....	296	190	239	14,700
February .....	396	238	308	17,100
March .....	365	282	319	19,600
April .....	413	140	249	14,800
May .....	470	112	261	16,000
June .....	1,560	394	837	49,800
July .....	619	237	335	20,600
August .....	1,110	42	482	29,600
September .....	1,660	165	637	37,900
The year .....	1,660	14	373	249,740
1924				
October .....	1,260	646	930	57,200
November .....	748	550	616	36,700
December .....	581	...	398	24,500
January .....	...	...	260	16,000
February .....	...	...	290	16,100
March .....	508	182	291	17,900
April .....	1,740	300	1,060	63,100
May .....	3,070	532	1,930	119,000
June .....	1,860	80	631	37,500
July .....	252	42	98.1	6,030
August .....	42	18	23.5	1,440
September .....	18	17	17.8	1,060
The year .....	3,070	17	....	396,530



## RIO GRANDE NEAR LOBATOS, COLO.

*Location.*—At highway bridge in section 22, township 33 north, range 11 east, ten miles east of Lobatos and a few miles above the Colorado-New Mexico state line; seventeen miles below the mouth of the Conejos River.

*Records available.*—June 28, 1889, to September 30, 1924.

*Drainage area.*—7,700 square miles.

*Gage.*—Automatic recording gage. This gage is referred to the datum of the original gage.

*Channel.*—A gash cut in lava rock; shifting blanket of sand.

*Discharge measurements.*—Made from bridge.

*Winter flow.*—Ice causes backwater varying in amount during the three winter months.

*Diversions.*—There are court decrees for diversions from the Rio Grande of 5,134 second feet between the Del Norte station and this one. There are also decrees for diversions from the following tributaries: Minor tributaries above Alamosa, 464 second feet; Alamosa and tributaries, 2,116 second feet; Conejos and tributaries, 3,464 second feet; Culebra and tributaries, 177 second feet.

*Co-operation.*—Record furnished by the State Engineer of Colorado.

*Discharge measurements of Rio Grande near Lobatos, Colo., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Discharge Sec.-Ft.
1923			
Nov. 28	D. S. Jones, Jr.	1.70	384
Dec. 27	do	2.05	307
Jan. 19	do	2.05	420
Feb. 25	do	1.70	442
May 8	do	3.01	1,790
June 13	do	3.92	2,910
July 11	do	1.78	448
July 27	do	1.34	198
Aug. 25	do	2.87	1,630
1924			
Nov. 19	D. S. Jones, Jr.	2.37	934
Dec. 17	do	2.67	680
Jan. 4	M. Lambert	2.62	409
Jan. 30	D. S. Jones, Jr.	2.99	371
Feb. 28	do	3.17	909
Apr. 10	do	4.25	3,810
May 27	do	4.80	4,820
June 19	do	3.28	2,190
July 8	M. Lambert	1.24	158
July 15	D. S. Jones, Jr.	1.47	288
Aug. 5	do	0.98	102
Aug. 22	Jones and Bailly	0.91	51
Sept. 30	Jones	0.96	89.4

*daily discharge in second-feet of Rio Grande near Lobatos, Colo., for climatic years 1923-24.*

[R. Mondragon, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	91	107	308	305	420	470	414	362	2,800	1,290	119	666
2	91	112	291	305	400	470	456	508	2,780	1,160	105	613
3	91	154	368	305	375	485	456	792	2,700	860	91	613
4	95	240	470	305	350	456	400	1,180	2,550	702	105	596
5	95	325	414	305	370	470	414	1,180	2,500	588	96	596
6	91	280	387	320	370	470	400	1,350	2,280	508	91	596
7	91	280	435	325	370	435	336	1,470	2,020	456	100	596
8	91	280	470	360	400	470	336	1,720	2,500	435	110	596
9	93	291	387	370	370	400	368	1,850	3,010	435	100	563
10	95	314	349	360	400	421	387	2,200	2,800	414	119	500
11	98	325	368	350	370	381	368	2,430	2,610	456	117	428
12	100	325	400	340	350	456	368	2,550	2,680	442	117	414
13	100	368	470	380	370	456	400	2,500	3,090	449	119	374
14	96	400	508	420	400	368	280	2,060	3,330	493	136	349
15	95	368	588	400	450	630	291	1,590	3,760	493	226	580
16	96	368	563	370	460	675	325	1,290	3,950	470	414	374
17	96	336	508	380	460	546	508	1,120	3,970	470	470	449
18	96	400	387	400	460	308	349	1,330	3,920	450	1,110	588
19	96	400	350	420	520	485	349	1,530	3,520	421	1,570	960
20	96	387	370	440	520	485	470	1,850	2,960	387	1,720	1,350
21	96	368	355	410	520	400	470	2,280	2,660	387	1,690	1,520
22	96	414	325	380	520	546	435	2,500	2,500	387	1,670	1,520
23	100	456	355	395	523	470	400	2,580	2,360	421	1,270	1,540
24	100	442	360	410	531	456	400	2,360	2,130	387	1,690	1,720
25	100	435	365	425	456	381	485	2,310	2,020	349	1,550	2,100
26	105	414	370	410	508	387	435	2,800	1,950	291	1,330	2,460
27	105	387	307	390	255	435	421	3,440	1,950	210	1,290	2,360
28	107	400	325	375	400	368	421	3,920	1,950	183	1,120	2,060
29	107	387	340	400	....	368	485	3,890	1,850	154	960	1,920
30	107	400	330	420	....	387	381	3,520	1,530	139	810	1,850
31	107	....	320	440	....	400	....	2,850	....	130	738	....
1924												
1	1,660	1,090	830	....	....	580	943	2,450	1,510	147	100	50
2	1,590	1,090	930	....	....	557	943	2,710	1,320	130	97	50
3	1,590	1,090	880	....	....	620	924	3,060	1,120	123	92	50
4	1,590	1,010	910	409	....	702	924	3,680	1,060	138	97	50
5	1,590	1,030	774	....	450	660	1,020	4,630	1,190	138	104	50
6	1,570	1,020	774	....	....	580	1,250	5,390	1,330	170	104	50
7	1,530	990	801	....	....	677	1,560	5,880	1,710	147	100	46
8	1,520	990	756	....	....	660	1,910	5,240	2,000	152	97	46
9	1,460	1,020	774	....	....	542	3,680	5,200	1,970	184	94	61
10	1,410	1,090	750	....	....	660	3,680	5,350	1,700	319	92	63
11	1,430	1,140	750	....	....	660	3,460	5,740	1,420	313	86	68
12	1,370	1,150	750	....	....	660	3,200	5,980	1,270	371	86	72
13	1,290	1,190	670	....	600	504	3,250	6,480	1,350	358	83	72
14	1,340	1,130	680	....	....	580	3,580	6,620	1,880	313	86	80
15	1,360	1,120	680	....	....	580	4,310	7,000	2,480	258	80	78
16	1,360	1,040	680	....	....	660	4,760	7,190	2,940	223	78	78
17	1,290	990	680	....	....	660	3,720	7,190	3,000	190	72	83
18	1,240	1,000	640	....	....	702	2,890	6,900	2,720	179	68	83
19	1,210	990	600	....	....	660	2,420	6,900	2,340	147	65	75
20	1,140	970	560	....	900	580	2,290	6,980	1,730	127	59	72
21	1,110	950	520	....	....	744	2,500	7,380	1,500	108	54	72
22	1,080	940	500	....	....	702	3,030	7,230	924	97	52	78
23	1,120	920	500	....	....	660	3,790	6,830	685	69	52	75
24	1,130	900	500	....	....	702	4,310	6,340	504	70	52	83
25	1,120	920	500	....	500	677	4,710	5,920	378	68	50	92
26	1,120	930	550	....	900	702	4,760	5,540	294	70	50	97
27	1,120	890	540	....	900	788	4,220	4,950	240	72	50	94
28	1,120	870	520	....	909	878	3,370	3,830	195	83	52	92
29	1,080	860	480	....	700	1,150	2,790	3,010	164	83	52	89
30	1,090	801	440	....	....	1,250	2,500	2,270	138	92	54	89
31	1,120	....	400	371	....	1,210	....	1,830	....	104	54	....



Monthly discharge of Rio Grande near Lobatos, Colo., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	107	91	92.5	6,000
November .....	456	107	339	20,200
December .....	588	291	392	24,100
January .....	440	305	375	23,100
February .....	531	350	425	23,600
March .....	675	308	450	27,700
April .....	508	280	400	23,800
May .....	3,920	362	2,040	125,000
June .....	3,970	1,530	2,690	160,000
July .....	1,290	130	465	28,600
August .....	1,770	91	699	43,000
September .....	2,460	349	1,030	61,300
The year.....	3,970	91	783	566,400
1924				
October .....	1,660	1,080	1,310	80,600
November .....	1,190	801	1,000	59,500
December .....	930	400	655	40,300
January .....	....	....	390	24,000
February .....	....	....	670	38,500
March .....	1,250	504	1,708	43,500
April .....	4,760	924	2,890	172,000
May .....	7,380	1,830	5,350	329,000
June .....	3,000	138	1,370	81,500
July .....	371	68	163	10,000
August .....	104	50	746	4,590
September .....	97	46	713	4,240
The year.....	7,380	46	....	888,000

#### RIO GRANDE AT EMBUDO, N. MEX.

*Location.*—At the mouth of the box canon at the entrance to Espanola Valley about 300 feet below the Denver & Rio Grande Railroad eating house at Embudo and 100 feet below the Santa Barbara Tie & Pole Company's bridge, near section 27, township 23 north, range 9 east. Embudo Creek empties into the Rio Grande about two miles above the station.

*Records available.*—January 1, 1889, to December 31, 1903; September 8, 1912, to September 30, 1924.

*Drainage area.*—Approximately 10,000 square miles.

*Gage.*—Automatic recording.

*Channel.*—Subject to change during flood stages, but fairly permanent during low stages.

*Discharge measurements.*—Made by wading or from cable.

*Winter conditions.*—The flow is seldom affected by ice.

*Diversions.*—A comparatively small amount of water is diverted for irrigation between Lobatos and Embudo stations.

Discharge measurements of Rio Grande at Embudo, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 12	Mark Lambert	2.30	293
Jan. 5	do	2.86	513
Apr. 27	do	3.35	743
May 25	Archer-Lambert	5.80	3,289
July 27	do	2.79	549
Sept. 19	do	3.66	1,044
1924			
Nov. 24	Mark Lambert	3.84	1,140
Jan. 23	Lambert-Neel	2.98	652
Mar. 17	Mark Lambert	3.36	735
May 12	Lambert-Neel	3.36	6,714
July 2	Mark Lambert	3.11	579
July 10	Lambert-Neel	3.12	576

Daily discharge in second-feet of Rio Grande at Embudo, N. Mex., for climatic years 1923-24.

[H. W. Wallace, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	281	312	530	484	570	440	670	900	3,986	1,602	376	1,007
2	281	312	444	460	552	566	681	1,005	3,895	1,335	358	930
3	278	312	432	468	525	561	681	1,160	3,817	1,112	355	876
4	278	315	476	476	498	566	708	1,420	3,648	935	349	858
5	278	321	548	507	480	543	708	1,877	3,388	804	352	864
6	281	365	538	512	464	548	686	2,374	3,245	714	366	858
7	281	448	521	534	507	530	660	2,608	3,063	660	390	840
8	281	476	494	543	489	512	625	2,452	3,206	701	468	816
9	281	480	489	543	516	516	590	2,764	3,570	742	575	810
10	281	480	512	543	507	516	610	3,089	3,817	708	460	792
11	287	484	480	556	498	507	650	3,362	3,570	692	428	740
12	300	498	468	561	494	502	640	3,544	3,323	698	460	700
13	300	512	489	552	476	507	620	3,557	3,453	736	496	660
14	300	498	635	548	484	484	625	3,102	3,765	670	472	635
15	300	502	600	543	502	472	575	2,712	4,012	665	442	650
16	300	516	605	538	525	444	543	2,413	4,300	660	468	685
17	300	512	580	543	525	441	566	2,270	4,482	640	705	1,215
18	297	464	570	552	521	438	580	2,030	4,454	620	798	918
19	297	502	476	552	516	435	645	2,254	4,230	655	1,354	1,028
20	297	548	424	552	516	432	692	2,634	3,830	645	1,910	1,245
21	297	543	428	556	548	429	725	3,050	3,388	590	2,066	1,664
22	297	516	460	538	548	426	786	3,505	3,063	516	2,102	1,740
23	297	507	472	530	556	423	670	3,583	2,881	480	2,020	1,790
24	300	595	494	525	570	420	670	3,544	2,660	484	2,030	2,010
25	300	585	512	552	585	758	692	3,310	2,426	480	1,930	2,010
26	303	580	516	590	590	736	640	3,544	2,273	456	1,780	2,400
27	303	595	498	561	570	731	725	4,012	2,215	505	1,682	2,660
28	306	595	502	502	476	703	747	4,538	2,176	625	1,500	2,465
29	309	552	502	502	.....	655	753	4,622	2,102	488	1,338	2,283
30	315	507	489	512	.....	655	840	4,636	1,877	436	1,268	2,174
31	312	.....	480	525	.....	655	.....	4,398	.....	397	1,126	.....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	2,066	1,387	698	446	605	870	1,316	3,042	3,761	692	446	358
2.....	2,054	1,346	710	426	610	912	1,268	3,042	3,163	655	442	358
3.....	2,020	1,252	764	883	620	926	1,416	3,254	2,790	605	418	360
4.....	1,960	1,362	794	872	600	933	1,470	3,735	2,484	605	450	362
5.....	2,030	1,370	782	389	600	954	1,713	4,338	2,352	590	407	362
6.....	2,066	1,338	722	395	620	926	1,940	5,250	2,418	870	398	364
7.....	1,970	1,268	692	502	635	870	2,240	5,835	2,550	722	386	362
8.....	2,078	1,230	670	645	635	905	2,622	5,970	2,766	665	380	360
9.....	2,030	1,238	710	675	630	898	3,553	6,000	3,030	610	376	360
10.....	1,870	1,230	635	675	655	740	4,256	6,045	3,078	630	376	362
11.....	1,800	1,387	502	650	640	870	4,480	6,280	2,922	710	370	364
12.....	1,810	1,464	340	660	630	926	4,074	6,680	2,682	740	372	382
13.....	1,870	1,446	2,706	640	670	849	3,956	7,112	2,484	722	442	395
14.....	1,740	1,438	1,636	630	716	842	4,256	7,594	2,440	807	535	395
15.....	1,750	1,412	565	625	863	940	4,860	7,934	2,694	746	458	395
16.....	1,760	1,387	555	630	856	933	5,250	8,274	3,202	680	418	395
17.....	1,750	1,362	510	605	849	788	5,130	8,529	3,631	650	404	392
18.....	1,740	1,322	560	590	814	692	4,158	8,563	3,696	630	392	392
19.....	1,664	1,290	585	600	814	926	3,410	8,427	3,553	570	380	395
20.....	1,635	1,282	545	590	821	926	3,030	8,529	3,254	535	374	392
21.....	1,554	1,260	538	580	842	989	3,102	8,563	2,898	498	364	389
22.....	1,518	1,192	530	585	870	975	3,553	8,767	2,451	470	360	386
23.....	1,536	1,140	490	595	877	989	4,130	8,580	2,080	430	358	386
24.....	1,545	1,087	482	595	863	996	4,890	8,223	1,704	438	356	386
25.....	1,527	1,031	474	580	842	947	5,580	7,866	1,407	458	356	389
26.....	1,572	947	458	580	828	996	5,340	7,432	1,192	498	356	386
27.....	1,581	905	486	580	870	1,045	5,130	7,096	1,031	494	356	386
28.....	1,536	821	555	580	856	1,199	4,536	6,728	898	518	356	389
29.....	1,482	670	518	585	807	1,252	3,748	6,200	794	605	354	389
30.....	1,430	686	518	585	....	1,380	3,254	5,355	734	518	352	386
31.....	1,387	....	502	595	....	1,443	....	4,620	....	482	358	....

NOTE—Daily discharge for 1923 determined as follows: Direct from a well defined curve for the entire year.

1924: Direct from a well defined curve for the entire year.

Monthly discharge of Rio Grande at Embudo, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October .....	315	278	294	18,100
November .....	595	312	483	28,400
December .....	635	424	505	31,100
January .....	590	460	531	32,700
February .....	590	464	522	28,700
March .....	758	420	534	32,800
April .....	840	543	669	39,700
May .....	4,636	900	2,912	179,000
June .....	4,482	1,877	3,337	198,500
July .....	1,602	397	692	42,500
August .....	2,102	349	981	60,300
September .....	2,660	635	1,277	76,000
The year.....	4,636	278	1,062	768,000
1924				
October .....	2,078	1,387	1,753	107,700
November .....	1,464	686	1,218	72,500
December .....	2,706	300	682	41,800
January .....	675	310	560	34,400
February .....	877	600	743	42,700
March .....	1,443	692	962	59,200
April .....	5,580	1,268	3,589	213,500
May .....	8,767	3,042	6,576	404,300
June .....	3,761	734	2,471	147,000
July .....	870	430	608	37,400
August .....	535	352	392	24,100
September .....	395	358	379	22,600
The year.....	8,767	300	1,664	1,207,000

## RIO GRANDE NEAR BUCKMAN, N. MEX.

(In the earlier reports of the Geological Survey this station was designated as "near Rio Grande" and "at Watertank.")

**Location.**—At the Denver & Rio Grande Railroad bridge, four miles above Buckman and two miles below the Indian village of San Ildefonso. The nearest tributaries are Tesuque Creek, which enters three miles above, Rito de Sena, which enters 200 feet below, and Pajarito Canon, which enters four miles below the station.

**Records available.**—February 1, 1895, to December 31, 1905; June 23, 1909, to September 30, 1924.

**Drainage area.**—13,900 square miles.

**Gage.**—Automatic recording.

**Channel.**—Shifting during low water but fairly permanent during medium and high stages.

**Discharge measurements.**—Made from a cable three miles below the station. There are no diversions or important tributaries between the cable and the gage.

**Winter conditions.**—The gage height and discharge relation is influenced by ice.

**Diversions.**—Irrigation is practically continuous between this station and the station at Embudo.

**Discharge measurements of Rio Grande near Buckman, N. Mex., for climatic years 1923-24.**

Date	Hydrographer	Gage height Feet	Discharge Sec.-Ft.
1923			
Nov. 9.....	Griffin-Lambert .....	2.47	532
Dec. 27.....	Lambert-Cantelou .....	2.34	621
Jan. 23.....	Mark Lambert .....	2.37	722
Apr. 7.....	do .....	2.96	934
Apr. 30.....	Lambert-Archer .....	4.56	2,895
June 21.....	do .....	5.79	4,015
July 31.....	do .....	1.87	487
Aug. 22.....	do .....	4.44	2,446
1924			
Oct. 3.....	Mark Lambert .....	5.15	3,470
Dec. 14.....	Lambert-Archer .....	2.86	965
Jan. 9.....	Lambert-Neel .....	2.73	857
Jan. 23.....	do .....	2.53	744
Jan. 31.....	do .....	2.61	801
Apr. 8.....	Mark Lambert .....	7.40	6,337
Apr. 27.....	do .....	7.62	7,590
May 20.....	do .....	9.28	13,791
June 10.....	Lambert-Archer .....	5.20	3,994
July 11.....	Lambert-Neel .....	2.48	1,060
Sept. 6.....	Lambert-Houston .....	1.34	233

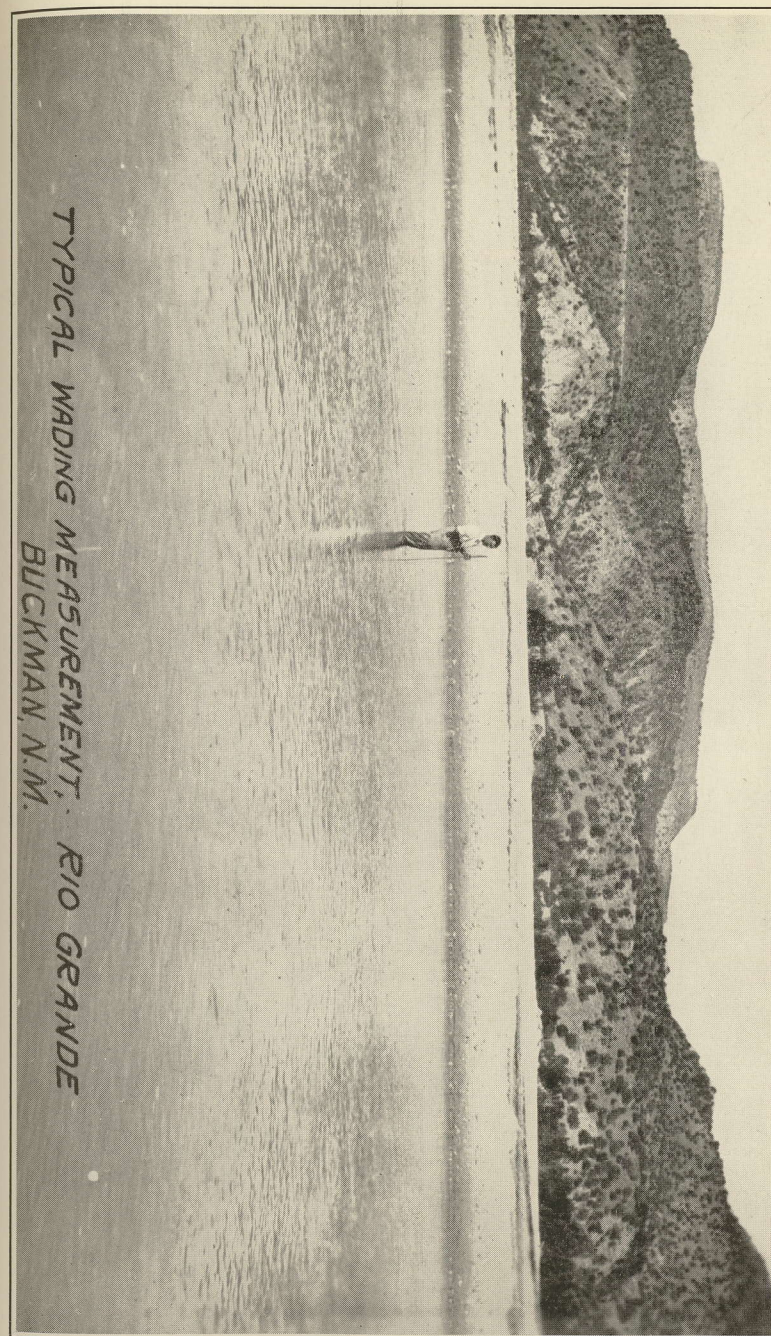


Daily discharge in second-feet of Rio Grande near Buckman, N. Mex., for climatic years 1923-24.  
[E. T. Mallery, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	235	288	800	645	745	765	1,274	3,200	6,539	2,075	500	1,382
2.....	240	290	720	640	755	880	1,281	3,478	5,210	1,835	498	1,310
3.....	235	293	630	640	724	988	1,232	5,370	5,110	1,652	502	1,177
4.....	235	296	660	645	709	1,108	1,183	5,290	4,810	1,475	500	1,107
5.....	230	299	740	665	706	1,036	1,127	6,312	4,522	1,295	645	1,072
6.....	245	302	790	660	679	988	1,036	6,841	4,332	1,155	530	1,058
7.....	245	360	735	695	706	922	1,024	6,864	4,054	1,015	552	1,100
8.....	240	400	705	740	709	855	1,108	6,970	4,674	1,002	574	1,030
9.....	240	550	650	715	709	860	1,141	7,318	5,912	1,095	596	1,024
10.....	245	530	640	705	730	860	1,134	7,744	5,582	950	618	994
11.....	245	550	615	710	712	988	1,330	8,160	4,990	905	641	964
12.....	245	560	625	730	700	1,018	1,394	8,316	4,560	860	665	928
13.....	255	565	630	740	709	934	1,338	7,666	4,560	850	784	904
14.....	255	570	750	730	718	865	1,490	7,318	4,790	890	868	808
15.....	260	575	825	740	718	845	1,607	6,198	5,090	840	862	904
16.....	265	570	810	735	765	850	1,499	5,090	5,350	838	958	910
17.....	270	645	840	765	809	706	1,643	4,750	5,497	836	1,233	1,730
18.....	280	635	780	795	853	727	2,016	5,210	5,455	834	1,820	3,490
19.....	260	590	710	800	897	855	2,335	8,186	5,190	833	2,196	5,630
20.....	260	690	565	805	941	724	2,357	6,496	4,712	832	2,562	2,712
21.....	265	700	515	810	986	840	1,994	6,958	4,250	831	2,625	2,650
22.....	270	730	550	805	1,031	898	1,972	7,102	3,730	830	2,550	2,600
23.....	270	670	610	715	1,076	850	1,890	6,703	3,495	800	2,638	2,638
24.....	272	805	635	703	1,121	625	1,652	6,404	3,270	771	2,484	3,000
25.....	274	825	650	718	1,166	850	1,553	6,335	3,005	742	2,316	2,978
26.....	276	830	680	780	1,211	958	1,742	6,381	2,860	714	2,138	3,058
27.....	278	815	695	735	1,155	1,072	1,823	6,680	2,695	686	1,962	3,314
28.....	280	800	680	697	886	1,120	2,016	6,974	2,510	658	1,810	3,090
29.....	282	760	685	694	.....	1,225	2,236	6,974	2,400	630	1,649	2,800
30.....	284	805	682	682	.....	1,204	2,695	6,749	2,310	580	1,631	2,650
31.....	286	.....	665	721	.....	1,246	.....	6,132	.....	525	1,422	.....
1924												
1.....	2,436	1,841	1,303	895	782	879	1,520	5,520	4,650	1,303	649	252
2.....	2,376	1,907	1,310	850	818	928	1,560	5,670	4,622	1,294	820	228
3.....	3,012	1,841	1,374	805	824	970	1,970	6,100	4,622	1,231	474	246
4.....	2,808	1,830	1,274	760	812	1,010	2,340	7,000	4,636	1,150	439	246
5.....	2,688	1,750	1,382	715	812	978	3,120	8,000	4,622	1,132	318	260
6.....	2,028	1,712	1,334	670	818	949	3,940	9,000	4,622	1,735	306	290
7.....	2,508	1,658	1,268	658	872	886	4,820	10,000	4,622	1,402	210	285
8.....	2,424	1,640	1,247	662	879	865	6,570	11,000	3,836	1,052	180	285
9.....	2,652	1,595	1,296	666	865	907	7,350	12,500	4,090	940	130	248
10.....	2,592	1,613	1,198	666	994	806	7,750	13,000	3,999	1,060	120	260
11.....	2,388	1,962	1,051	666	1,230	745	7,600	13,900	3,570	1,069	222	445
12.....	2,388	1,973	802	666	1,059	879	6,730	14,550	4,622	1,240	390	815
13.....	2,496	1,929	850	670	1,086	886	6,760	14,940	4,468	1,105	868	620
14.....	2,292	1,830	1,072	730	1,149	765	7,650	15,560	4,622	996	1,114	565
15.....	2,260	1,770	1,149	730	1,230	794	9,300	16,910	3,674	1,044	1,240	470
16.....	2,229	1,703	1,121	720	1,510	879	8,900	16,790	4,090	908	1,159	445
17.....	2,198	1,676	1,037	720	1,610	837	7,300	16,200	4,258	884	1,020	455
18.....	2,167	1,595	1,100	675	1,580	662	6,000	15,680	4,230	836	884	449
19.....	2,136	1,568	1,170	670	1,274	720	5,350	15,220	3,934	820	649	443
20.....	2,105	1,534	1,163	634	1,212	865	5,400	14,710	3,544	804	544	437
21.....	2,073	1,502	1,170	658	1,050	928	5,900	14,050	3,082	509	502	431
22.....	2,042	1,478	1,114	685	1,077	907	6,750	13,350	2,687	276	418	425
23.....	2,011	1,470	1,107	794	1,113	956	7,600	12,040	2,291	180	372	419
24.....	1,980	1,470	1,079	765	1,095	1,030	9,000	11,260	1,870	130	360	413
25.....	1,949	1,478	1,121	745	1,050	1,110	9,250	10,300	1,600	210	336	407
26.....	1,918	1,454	1,121	750	970	1,190	8,650	9,160	1,375	516	312	401
27.....	1,929	1,478	1,121	745	928	1,270	7,890	8,140	1,195	324	318	395
28.....	1,907	1,430	1,075	760	970	1,350	7,000	7,340	1,044	593	294	405
29.....	1,841	1,247	1,031	760	900	1,430	6,060	6,480	1,060	1,060	600	430
30.....	1,918	1,240	985	765	.....	1,520	5,660	5,680	1,294	1,348	252	455
31.....	1,800	.....	940	770	.....	1,610	.....	5,115	.....	740	240	.....

NOTE—Daily discharge for 1923 determined as follows: Indirect method for shifting channel, November 9 to January 23; direct from two well defined curves, January 23 to October 3.

1924: Direct from two well defined curves, October 3 to September 5; indirect method for shifting channel, September 5 to October 21.



TYPICAL WADING MEASUREMENT, RIO GRANDE  
BUCKMAN, N.M.



Monthly discharge of Rio Grande near Buckman, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	286	230	259	15,900
November	830	288	577	34,900
December	840	515	686	42,172
January	810	640	721	44,300
February	1,211	679	844	46,900
March	1,246	625	925	56,800
April	2,695	1,024	1,604	95,400
May	8,316	3,200	6,457	396,900
June	6,539	2,310	4,249	260,700
July	2,075	525	962	58,200
August	2,638	498	1,333	82,000
September	5,630	898	1,973	118,000
The year	8,316	230	1,730	1,252,000
1924				
October	3,012	1,800	2,240	138,000
November	1,973	1,240	1,639	97,500
December	1,382	802	1,140	70,000
January	895	634	724	44,600
February	1,610	782	1,053	60,500
March	1,610	662	985	60,500
April	9,300	1,520	6,190	367,800
May	16,910	5,115	11,118	683,700
June	4,650	1,044	3,427	204,000
July	1,735	130	900	55,400
August	1,240	120	508	31,200
September	815	228	398	23,600
The year	16,910	120	2,531	1,837,000

#### RIO GRANDE NEAR SAN MARCIAL, N. MEX.

*Location.*—In section 19, township 7 south, range 1 west, at the Atchison, Topeka and Santa Fe Railway bridge, one mile south of San Marcial. No important tributaries enter in the immediate vicinity of this station.

*Records available.*—January 29, 1895, to September 30, 1924.

*Drainage area.*—30,000 square miles.

*Gage.*—Inclined staff gage established January 29, 1895, and carried out by a flood in 1896. Wire gage established in its place at same datum. This was soon abandoned and gage heights have since been measured with a graduated rod from the bridge deck to the water surface. Gage datum of inclined staff and wire gages still used.

*Channel.*—Sandy and very shifting. A number of bridge piers interfere with the accuracy of discharge measurements but not with gage height fluctuations.

*Discharge measurements.*—Made from down stream side of bridge.

*Diversions.*—Water is diverted above this point for irrigation.

*Co-operation.*—The record was furnished by the manager of the Rio Grande Project, U. S. Reclamation Service.



Discharge measurements of Rio Grande near San Marcial, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
May 10	Alkison	1.33	6,712
May 11	do	1.34	6,746
May 12	do	1.68	8,113
May 12	do	1.88	8,733
May 14	do	1.90	9,448
May 15	do	1.80	6,862
May 15	do	1.60	6,623
May 16	do	1.20	5,670
May 17	do	0.96	5,248
May 18	do	1.40	5,886
May 19	do	1.56	7,034
May 28	do	1.60	7,338
May 29	do	1.68	7,812
May 30	do	1.62	7,810
May 31	do	1.41	6,610
June 1	do	1.10	5,447
June 2	do	1.02	5,365
June 4	do	0.90	4,699
June 5	do	0.76	4,018
June 6	do	0.60	3,805
June 7	do	0.60	3,541
June 8	do	1.06	5,013
June 9	do	1.16	4,650
June 11	do	1.06	3,930
June 12	do	1.00	3,513
June 13	do	0.90	2,762
June 14	do	0.98	3,740
June 15	do	1.08	3,934
June 19	do	1.06	3,592
June 20	do	1.06	3,361
June 21	do	0.90	3,125
June 22	do	0.58	2,249
June 23	do	0.54	2,240
June 25	do	0.54	1,993
June 26	do	0.20	1,728
June 27	do	0.24	1,760
June 28	do	0.46	1,676
June 29	do	0.12	1,291
June 30	do	0.14	1,248
July 1	do	0.02	906
July 3	do	0.10	713
July 5	do	0.30	610
July 6	do	0.34	755
July 7	do	0.24	794
July 9	do	0.34	670
July 10	do	0.10	152
July 11	do	0.10	137
July 18	do	1.20	114
July 19	do	1.00	109
July 20	do	1.20	97
July 21	do	1.40	67
July 23	do	1.50	44
July 24	do	1.50	1,118
July 25	do	1.15	1,082
Oct. 29	Neiswander		
Dec. 28	do		

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1924			
Jan. 1	King	1.28	846
Jan. 7	do	1.30	738
Jan. 14	do	1.16	842
Jan. 14	do	1.16	842
Jan. 14	do	1.32	913
Jan. 29	do	1.50	961
Feb. 7	do	1.74	2,060
Feb. 18	do	1.76	1,709
Feb. 26	do	1.40	1,157
Mar. 1	do	1.40	1,050
Mar. 9	do	1.17	758
Mar. 17	do	1.20	858
Mar. 25	do	1.98	2,020
Apr. 1	do	2.58	4,155
Apr. 8	do	3.45	8,923
Apr. 13	do	3.85	9,855
Apr. 26	do	3.30	6,387
May 1	do	3.20	5,912
May 5	do	4.15	9,959
May 8	do	4.15	10,468
May 10	do	4.60	10,751
May 14	do	4.55	10,286
May 13	do	4.60	11,702
May 22	Grow and Neiswander	3.35	7,090
May 31	King	2.00	2,532
June 7	do	1.40	1,928
June 16	do	2.00	2,595
June 20	do	1.35	1,371
June 25	do	0.60	359
June 30	do	1.78	1,150
July 6	do	1.32	920
July 12	do	0.05	820
July 23	do	0.55	574
July 31	do	0.50	697
Aug. 6	do	0.00	54
Aug. 16	do	2.00	1,986
Sept. 12	do	0.25	18
Sept. 15	do		

Gage one foot lower. 12-29-1923.



Daily discharge in second-feet of Rio Grande near San Marcial, N. Mex., for climatic years 1923-24.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	0	0	0	230	560	740	740	2,958	7,810	1,078	0	4,910
2.....	0	0	0	110	560	940	740	3,360	6,610	1,291	0	4,838
3.....	0	0	0	100	560	1,090	740	3,714	4,280	1,248	0	6,231
4.....	0	0	0	120	560	1,070	740	4,093	5,447	1,730	0	4,886
5.....	0	0	0	90	560	1,030	740	4,472	5,365	906	0	2,058
6.....	0	0	0	100	520	820	136	4,851	4,700	714	0	1,616
7.....	0	0	0	150	520	820	136	5,230	4,018	610	0	1,607
8.....	0	0	0	130	520	820	136	5,609	3,805	592	0	1,729
9.....	0	0	0	130	520	820	136	5,988	3,541	483	0	1,744
10.....	0	0	0	130	520	820	136	6,367	2,580	794	0	1,729
11.....	0	0	0	450	730	900	174	6,746	5,013	670	0	1,729
12.....	0	0	0	450	890	900	174	8,113	4,650	1,200	0	483
13.....	0	0	0	450	1,070	900	174	6,173	3,930	800	654	347
14.....	0	0	0	450	1,000	900	174	8,735	3,513	500	1,210	383
15.....	0	0	0	450	880	900	174	9,448	2,762	400	1,112	408
16.....	0	0	0	960	590	920	174	6,862	3,000	300	2,250	460
17.....	0	0	0	960	590	920	174	6,623	2,756	300	2,204	488
18.....	0	0	677	960	590	920	500	3,670	4,000	152	2,230	538
19.....	0	0	621	960	590	920	500	5,248	3,740	137	2,276	330
20.....	0	0	634	960	590	920	1,070	3,753	3,934	114	1,322	3,142
21.....	0	0	647	1,160	970	930	2,540	4,162	3,592	109	1,521	4,291
22.....	0	0	740	1,160	970	930	2,860	4,114	2,361	118	2,473	4,062
23.....	0	0	792	1,160	970	930	2,380	3,943	3,125	97	3,078	1,218
24.....	0	0	757	1,160	970	930	2,440	6,568	4,454	67	2,548	1,588
25.....	0	0	707	1,160	970	930	2,400	6,960	2,249	44	3,658	1,602
26.....	0	0	667	1,190	760	540	2,250	4,628	2,240	40	2,508	1,878
27.....	0	0	740	1,130	790	540	2,500	4,050	1,993	36	2,810	1,864
28.....	0	0	812	910	890	540	2,620	5,886	1,728	0	1,350	1,814
29.....	0	0	623	1,060	....	540	2,400	7,034	1,760	0	1,320	1,678
30.....	0	0	364	1,060	....	540	2,580	7,338	1,676	0	1,241	1,678
31.....	0	0	105	1,040	....	540	....	7,813	....	0	3,759	....
1924												
1.....	1,620	909	900	1,850	950	1,180	2,020	6,340	5,820	600	500	0
2.....	1,618	909	1,500	1,450	1,090	1,200	1,200	5,420	5,030	550	360	0
3.....	1,784	1,131	1,500	1,070	1,060	970	1,600	5,400	4,200	770	100	0
4.....	1,796	1,131	1,471	1,020	1,060	1,100	1,280	5,570	3,680	1,260	400	0
5.....	1,796	1,131	1,695	970	1,220	1,180	1,600	6,300	3,120	1,190	350	0
6.....	1,695	1,664	1,082	940	1,160	1,200	2,020	7,980	2,700	2,420	970	0
7.....	1,394	1,800	1,082	940	1,270	1,270	2,800	9,050	2,590	1,450	600	0
8.....	1,394	3,110	1,860	940	1,460	1,350	3,940	9,640	2,380	1,280	120	0
9.....	2,614	1,730	1,664	1,060	1,320	1,250	4,750	9,690	2,580	1,130	100	0
10.....	2,519	2,600	804	1,060	1,150	1,230	6,780	9,680	2,500	1,240	70	0
11.....	2,521	1,767	804	920	1,230	1,120	8,100	9,980	2,570	1,390	12	0
12.....	2,562	3,219	996	850	1,200	950	8,400	10,850	2,430	1,480	0	0
13.....	2,176	1,748	3,259	750	1,210	960	7,900	11,250	2,090	1,270	0	1,000
14.....	1,718	1,831	1,851	700	1,550	930	7,600	11,700	1,800	820	0	270
15.....	1,874	3,214	1,823	710	1,700	1,080	8,400	11,490	1,450	570	10	150
16.....	1,874	3,108	1,780	720	1,410	1,200	8,400	11,750	1,440	1,120	50	50
17.....	1,998	3,100	1,663	720	1,500	1,010	9,600	12,200	1,710	820	0	0
18.....	1,025	1,721	223	940	1,760	1,100	10,000	12,400	1,960	760	0	0
19.....	1,025	1,742	247	930	1,580	1,620	9,200	12,090	2,540	540	0	0
20.....	1,025	1,721	271	690	1,680	1,210	7,300	12,000	2,520	280	0	0
21.....	1,025	1,714	250	670	1,760	1,000	6,050	12,000	2,040	160	0	0
22.....	1,495	1,708	437	660	1,470	1,260	5,600	12,000	2,040	120	0	0
23.....	1,495	1,643	402	840	1,450	1,210	6,350	12,000	1,740	80	0	0
24.....	1,493	1,504	499	1,020	1,350	850	8,100	11,980	1,580	80	0	0
25.....	1,493	1,778	390	1,020	1,400	1,440	9,200	11,690	1,380	100	0	0
26.....	1,428	860	461	900	1,450	1,450	10,300	10,900	1,160	100	0	0
27.....	1,428	860	515	900	1,350	1,460	12,200	10,450	930	450	0	0
28.....	1,227	950	1,072	770	1,000	1,450	12,200	10,000	760	880	0	0
29.....	1,227	950	1,072	730	1,120	1,880	11,500	9,200	620	820	0	0
30.....	992	900	1,935	730	....	1,840	10,300	8,180	510	1,060	0	0
31.....	992	....	912	740	....	1,800	....	7,220	....	410	0	....





*Monthly discharge of Rio Grande near San Marcial, N. Mex., for climatic years 1923-24.*

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	0	0	0	0
November .....	0	0	0	0
December .....	812	0	287	17,620
January .....	1,190	90	666	40,919
February .....	1,070	520	722	40,085
March .....	930	540	845	51,947
April .....	2,860	136	1,088	64,737
May .....	9,448	2,958	5,951	346,003
June .....	7,810	1,676	3,721	221,417
July .....	1,291	0	470	28,820
August .....	3,658	0	1,275	78,394
September .....	6,231	347	2,044	121,645
The year .....	9,448	0	1,394	1,011,587
1924				
October .....	2,614	992	1,523	55,665
November .....	3,219	860	1,738	103,444
December .....	3,259	223	1,110	68,271
January .....	1,850	660	910	55,954
February .....	1,760	950	1,390	77,177
March .....	1,880	850	1,250	76,860
April .....	12,200	1,280	6,622	407,187
May .....	12,400	5,400	9,884	607,735
June .....	5,820	510	2,260	134,519
July .....	2,420	80	813	49,984
August .....	970	0	118	7,224
September .....	1,000	0	47	2,916
The year .....	12,400	0	2,321	1,684,936

### RIO GRANDE SEEPAGE INVESTIGATION

January 4-January 14th, 1924

On January 4, 1924, two hydrographers started a seepage gain and loss investigation on the Rio Grande from State Bridge near Lobatos, Colorado, to San Marcial, New Mexico, by a measurement at State Bridge, Colorado. The weather was clear and of an even temperature so that the river maintained a uniform flow throughout. Discharge measurements were taken at close intervals and all visible inflow or outflow was also accounted for by exacting measurements at the confluence with or at the diverting point from the main stream.

A close check on the fluctuations of the Rio Grande was possible by automatic gages at Lobatos, Embudo, Buckman, and San Marcial. The speed of the river was timed as nearly as possible and an attempt was made to keep abreast of the flow at all points.

Very few ditches were diverting at this time, thus expediting the investigation and increasing its degree of accuracy. A similar investigation of the Rio Grande and its tributaries was made in October, 1913, and a comparison of the results is very interesting. The former investigation was prolonged to El Paso.

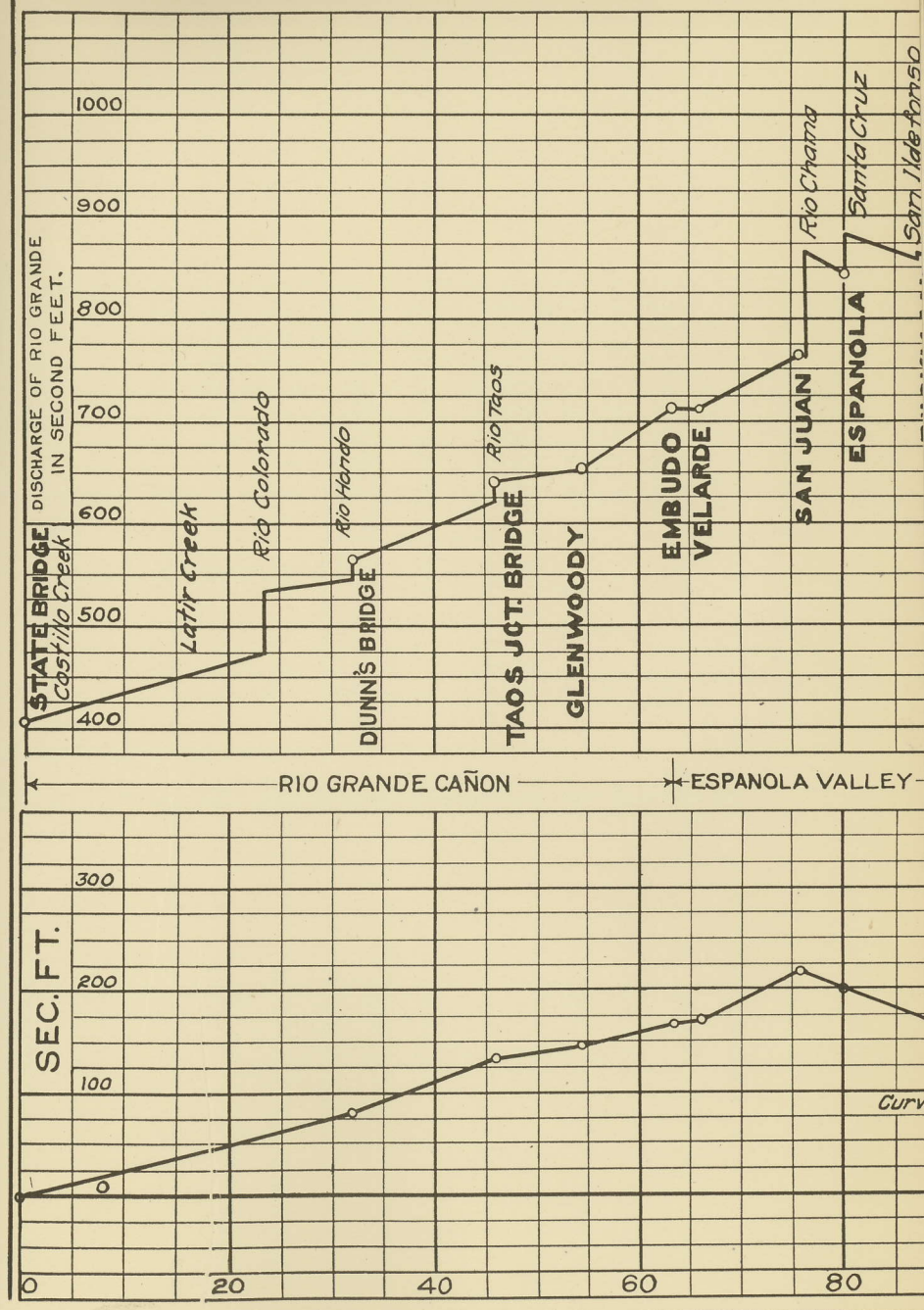


## SEEPAGE STUDY OF THE RIO GRANDE

NEW MEXICO-COLORADO STATE LINE TO SAN MARCIAL  
Jan. 4th to 14th, 1924.OFFICE OF THE STATE ENGINEER  
Santa Fe, N. M.

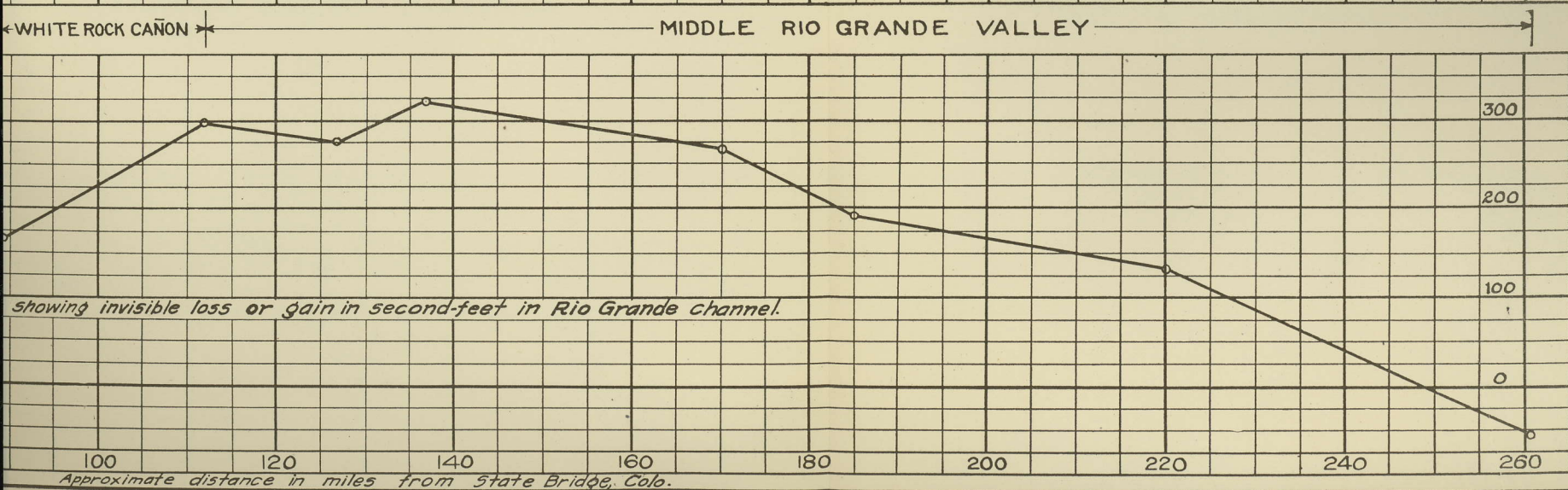
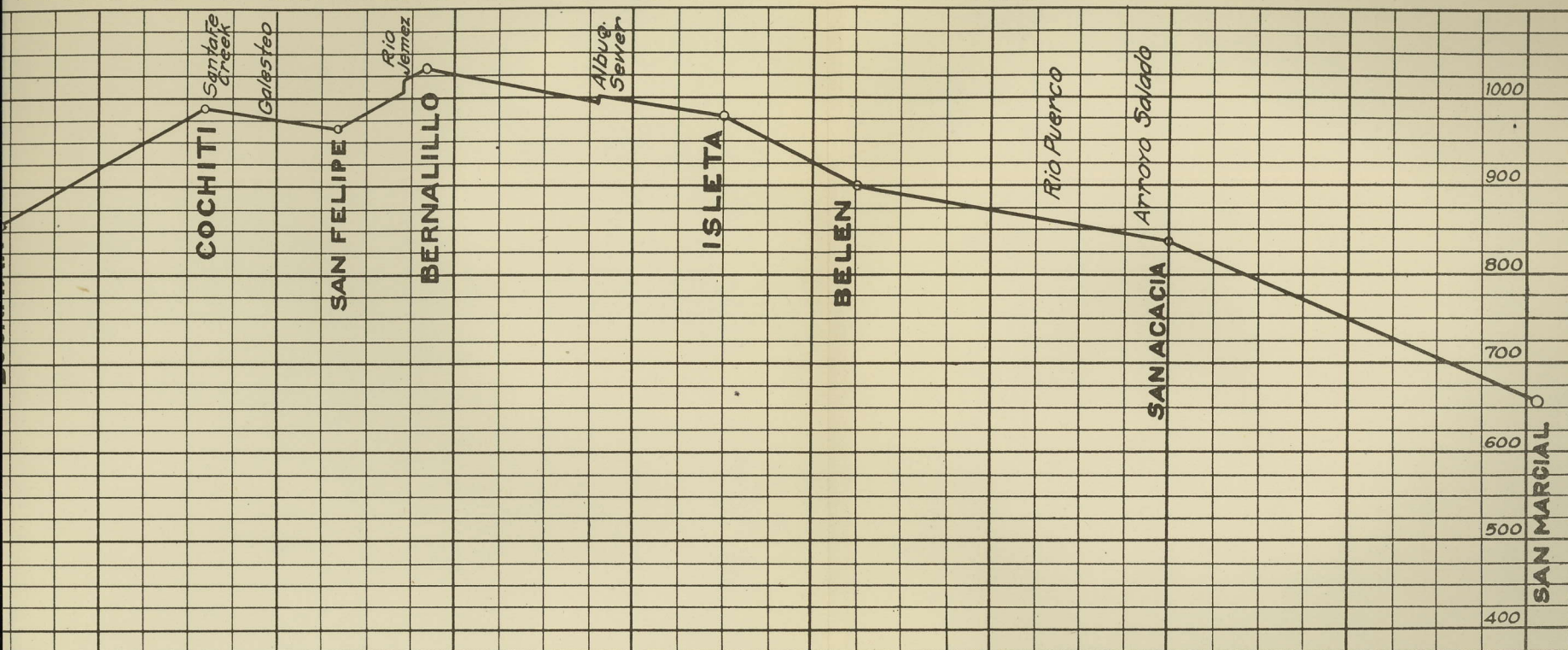
Distance in Miles	STREAM AND PLACE	Date	Inflow	Outflow	Rio Grande	Invisible Loss or Gain	
						Sec.	Total
0	Rio Grande—State Bridge	1-4	.....	.....	409	.....	.....
24	Rio Colorado	1-5	60.8	.....	.....	.....	60.8
32	Rio Grande—Dunn's Bridge	1-6	.....	.....	549	+ 79.2	.....
32	Rio Hondo	1-6	17.2	.....	.....	.....	.....
46	Rio Taos	1-7	18.2	.....	.....	.....	.....
46	Rio Grande—Taos Jct. Bridge	1-7	.....	.....	640	55.6	134.8
54	Rio Grande—Glenwoody	1-7	.....	.....	652	+ 12.0	146.8
60	Embudo Creek at Dixon	1-7	43.6	.....	.....	.....	.....
63	Rio Grande—Embudo	1-7	.....	.....	717	+ 21.4	168.2
66	Rio Grande—Velarde	1-7	.....	.....	719	+ 2.0	170.2
75 1/2	Rio Grande—San Juan	1-8	.....	.....	766	+ 47.0	217.2
76	Rio Chama	1-8	96.9	.....	.....	.....	.....
80	Rio Grande—Espanola	1-8	.....	.....	847	- 15.9	201.3
80	Santa Cruz	1-8	37.3	.....	.....	.....	.....
87	San Ildefonso	1-9	7.6	.....	.....	.....	.....
89	Rio Grande—Buckman	1-9	.....	.....	857	- 34.9	+166.4
112	Rio Grande—Cochiti	1-10	.....	.....	988	+131	+297.4
127	Rio Grande—San Felipe	1-10	.....	.....	966	- 22	+275.4
134	Rio Jemez	1-11	12.0	.....	.....	.....	.....
127	Rio Grande—Bernalillo	1-11	.....	.....	1027	+ 49	+324.4
156	Albuquerque Sewer	1-12	6.5	.....	.....	.....	.....
170	Rio Grande—Isleta	1-12	.....	.....	979	- 54.5	+269.9
185	Rio Grande—Belen	1-12	.....	.....	901	- 78	+191.9
208	Rio Puerco	1-12	0	.....	.....	.....	.....
220	Rio Grande—San Acacia	1-13	.....	.....	838	- 63	+128.9
261	Rio Grande—San Marcial	1-14	.....	.....	655	-183	- 54.1
	Rio Colorado above Questa	1-5	18.1	.....	.....	.....	.....
	Rio Colorado below Questa	1-5	16.1	.....	.....	+ 2.0	.....
	Rio Colorado at mouth	1-5	60.8	.....	.....	+ 44.7	.....
	Rio Taos at Los Cordovas	1-6	35.4	.....	.....	.....	.....
	Rio Taos at mouth	1-7	18.2	.....	.....	- 17.2	.....
	Rio Jemez—San Ysidro	1-28	36.9	.....	.....	.....	.....
	Rio Jemez at mouth	1-28	54.2	.....	.....	+ 17.3	.....
	Rio Grande—Buckman	1-23	74.3	.....	.....	.....	.....
	Rio Grande—Cochiti	1-24	88.6	.....	.....	+143	.....

FROM COLORADO S





DIAGRAMS SHOWING  
**SEEPAGE INVESTIGATION OF RIO GRANDE**  
 STATE LINE TO SAN MARCIAL NEW MEXICO. JANUARY 4, TO 14, 1924.





RIO COLORADO NEAR QUESTA, N. MEX.  
(Locally Called Red River)

*Location.*—Two miles above Questa and one and three-fourths miles above the mouth of Cabresto Creek, one-half mile above Eagle Rock ranger station of the United States Forest Service, near section 33, township 29 north, range 13 east.

*Records available.*—October 6, 1912, to September 30, 1924.

*Drainage area.*—112 square miles.

*Gage.*—Automatic recording installed June 17, 1921. Datum lowered 0.26.

*Channel.*—Shifting during high water. Permanent during medium and low stages.

*Discharge measurements.*—Made by wading.

*Winter conditions.*—Ice generally causes backwater during winter months.

*Diversions.*—There are no diversions of consequence above the station.

*Discharge measurements of Rio Colorado near Questa, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 11.....	Mark Lambert .....	1.06	19.5
Jan. 4.....	..... do .....	1.10	18.3
Apr. 26.....	Lambert-Archer .....	1.38	47.6
May 24.....	..... do .....	2.70	198
July 26.....	..... do .....	2.02	55.7
Sept. 20.....	..... do .....	2.06	55.3
1924			
Nov. 23.....	Lambert-Archer .....	1.72	31.8
Jan. 5.....	Lambert-Neel .....	1.42	18.1
Feb. 29.....	Mark Lambert .....	1.67	25.9
May 7.....	..... do .....	2.70	231
July 26.....	H. Neel .....	.....	71.1
Sept. 26.....	..... do .....	1.60	30.5



Daily discharge in second-feet of Rio Colorado near Questa, N. Mex., for climatic years 1923-24.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	23	21	20	20	28	35	42	78	236	117	47	47
2.....	23	20	20	20	28	35	42	85	225	114	49	47
3.....	23	19	20	20	28	35	43	95	225	111	48	47
4.....	23	19	20	20	28	35	43	113	225	108	47	46
5.....	23	19	20	21	29	35	43	148	214	106	46	46
6.....	23	19	20	21	29	36	43	173	214	104	49	46
7.....	23	20	20	22	29	36	44	181	209	102	49	44
8.....	23	20	20	22	29	36	44	196	204	100	52	43
9.....	23	20	20	22	30	36	44	219	199	98	55	43
10.....	22	20	20	22	30	37	44	223	194	96	51	44
11.....	18	20	20	23	30	37	45	231	189	95	49	44
12.....	19	20	20	23	30	37	45	227	184	94	51	44
13.....	20	20	20	23	31	37	45	231	179	91	51	44
14.....	20	20	20	23	31	38	45	216	174	88	51	45
15.....	20	20	20	24	31	38	46	202	170	85	51	46
16.....	21	20	20	24	31	38	46	194	166	82	52	50
17.....	21	20	20	24	32	38	46	193	162	79	52	62
18.....	22	20	20	24	32	39	46	193	158	76	53	70
19.....	21	20	20	25	32	39	47	197	154	73	53	70
20.....	21	20	20	25	32	39	47	197	150	70	53	59
21.....	21	20	20	25	33	39	48	197	147	67	61	56
22.....	23	20	20	25	33	40	48	198	144	64	65	53
23.....	22	20	20	26	33	40	48	198	141	61	58	56
24.....	23	20	20	26	33	40	48	198	138	59	54	77
25.....	22	20	20	26	34	40	48	214	135	57	53	66
26.....	22	20	20	26	34	41	48	214	132	55	51	62
27.....	22	20	20	27	34	41	51	210	129	69	48	61
28.....	22	20	20	27	34	41	55	214	126	65	47	60
29.....	24	20	20	27	....	41	59	210	123	54	47	59
30.....	22	20	20	27	....	42	69	268	120	50	48	58
31.....	22	....	20	28	....	42	....	264	....	48	48	....
1924												
1.....	52	39	28	48	39	30	132	243	420	230	45	25
2.....	60	39	28	48	39	31	136	243	416	224	41	28
3.....	70	38	28	48	39	31	140	303	410	218	37	25
4.....	65	38	27	48	38	31	144	281	403	211	30	25
5.....	61	38	26	48	38	31	148	247	397	205	34	25
6.....	61	38	27	48	38	33	152	243	390	198	25	25
7.....	60	38	30	47	37	36	156	259	384	192	30	25
8.....	60	38	30	47	37	39	160	263	378	186	30	24
9.....	63	38	31	47	37	42	164	267	371	179	36	24
10.....	69	38	34	46	36	45	168	281	365	173	25	24
11.....	66	38	36	46	36	48	172	312	358	166	25	73
12.....	65	37	37	46	36	52	176	316	352	160	30	37
13.....	61	37	38	45	35	56	180	321	346	154	34	30
14.....	61	37	40	45	35	60	184	340	339	147	51	30
15.....	63	37	44	45	35	64	188	354	333	141	42	30
16.....	58	37	45	44	34	68	192	404	326	134	37	46
17.....	55	37	45	44	34	72	196	458	320	128	30	46
18.....	50	37	47	44	34	76	200	476	314	122	30	37
19.....	43	37	47	43	33	80	204	428	307	115	30	37
20.....	40	37	47	43	33	84	208	382	307	109	30	37
21.....	43	37	47	43	33	88	212	386	294	102	28	30
22.....	39	37	47	42	32	92	216	382	288	96	28	28
23.....	39	37	47	42	32	96	219	420	282	96	28	28
24.....	39	35	47	42	32	100	222	404	275	84	28	25
25.....	39	33	47	41	31	104	225	408	269	77	25	25
26.....	39	31	47	41	31	108	228	412	262	71	25	25
27.....	39	30	47	41	31	112	231	416	256	66	24	25
28.....	39	29	48	40	30	116	234	434	250	61	24	25
29.....	39	28	48	40	30	120	237	427	243	57	28	37
30.....	39	26	48	40	....	124	240	416	237	53	25	30
31.....	39	....	48	39	....	128	....	420	....	49	25	....

NOTE—Daily discharge for 1923 determined as follows: Direct from three fairly well defined curves, October 11 to November 23.

1924: Direct from two well defined curves for the entire year.

Monthly discharge of Rio Colorado near Questa, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	24	18	21.8	1,340
November .....	21	19	19.9	1,180
December .....	20	20	20.0	1,230
January .....	28	20	23.8	1,460
February .....	34	28	31.0	1,720
March .....	42	35	38.2	2,350
April .....	69	42	47.1	2,800
May .....	268	78	193	11,900
June .....	236	120	172	10,200
July .....	117	48	81.9	5,030
August .....	65	46	51.3	3,150
September .....	77	43	53.2	3,160
The year .....	268	18	65.6	45,500
1924				
October .....	70	39	52.1	3,200
November .....	39	26	35.9	2,130
December .....	48	26	39.9	2,450
January .....	48	39	44.2	2,720
February .....	39	30	34.7	1,990
March .....	128	30	70.9	4,360
April .....	240	132	189	11,230
May .....	476	243	353	21,700
June .....	420	237	330	19,620
July .....	230	49	297	18,240
August .....	51	24	31.0	1,900
September .....	73	24	31.0	1,840
The year .....	476	24	126	91,360

# RIO COLORADO BELOW QUESTA, N. MEX. (Locally Known as Red River)

*Location.*—Two miles below Questa, at the head of Lower Canon, near section 1, township 28 north, range 12 east, and below all tributaries.

*Records available.*—April 8, 1910, to September 30, 1924.

*Drainage area.*—166 square miles.

*Gage.*—Vertical staff.

*Channel.*—Shifting during high water.

*Discharge measurements.*—Made by wading or from cable.

*Winter conditions.*—The gage heights may be slightly affected by ice during December and January.

*Diversions.*—Water is diverted for irrigation for several miles above the station. There are no diversions below.



Discharge measurements of Rio Colorado below Questa, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 11.....	Mark Lambert .....	1.43	24.9
Jan. 4.....	do .....	1.38	25.7
Apr. 26.....	Lambert-Archer .....	1.83	59.6
May 24.....	do .....	2.58	230
July 26.....	do .....	1.94	55
Sept. 20.....	do .....	2.07	68
1924			
Nov. 23.....	Lambert-Archer .....	1.85	46.8
Jan. 5.....	Lambert-Neel .....	1.48	16.1
Feb. 29.....	Mark Lambert .....	1.76	38.7
May 7.....	do .....	2.68	31.6
July 26.....	do .....	1.56	73.7
Sept. 26.....	H. Neel .....	1.11	36.6

Daily discharge in second-feet of Rio Colorado below Questa, N. Mex., for climatic years 1923-24.

[Mrs. Nick Vigil, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1923												
1.....	19	26	19	21	30	21	36	40	243	72	63	39
2.....	19	25	20	20	26	24	24	83	264	65	71	39
3.....	19	26	21	18	24	32	28	94	143	83	61	53
4.....	19	25	26	21	21	24	24	94	171	83	61	37
5.....	19	23	23	17	21	23	28	94	264	90	67	47
6.....	20	28	21	21	18	21	32	195	205	142	55	42
7.....	19	25	20	28	24	21	21	228	222	72	61	37
8.....	19	26	20	26	18	28	32	228	222	142	61	37
9.....	19	23	17	17	18	28	28	245	282	114	61	42
10.....	19	23	18	21	21	24	28	245	222	65	55	51
11.....	25	25	18	26	21	21	28	245	222	57	59	42
12.....	26	21	19	26	18	18	28	320	222	57	65	40
13.....	30	18	20	19	18	18	28	245	205	127	73	48
14.....	28	18	25	32	21	21	28	245	222	90	65	48
15.....	26	18	23	21	19	15	36	245	222	83	59	36
16.....	26	19	23	18	18	17	24	245	187	101	65	60
17.....	28	19	19	26	21	21	36	281	90	101	65	60
18.....	26	19	16	28	21	21	36	228	83	65	65	54
19.....	26	21	18	28	19	21	28	245	83	90	62	48
20.....	26	21	23	23	21	21	22	210	83	114	56	54
21.....	26	21	20	24	21	21	24	166	90	101	50	40
22.....	28	19	18	23	24	21	36	195	101	83	50	40
23.....	28	20	20	24	21	18	32	281	90	72	50	35
24.....	30	21	19	24	21	24	28	277	65	90	50	63
25.....	28	20	18	18	21	24	24	156	72	83	56	63
26.....	25	25	17	21	18	28	32	156	72	83	50	49
27.....	25	20	19	24	12	24	28	171	72	83	48	32
28.....	23	28	25	15	18	21	26	171	72	71	48	54
29.....	28	32	21	23	.....	28	36	264	83	71	60	49
30.....	28	26	19	23	.....	28	32	264	83	71	53	40
31.....	26	.....	26	24	.....	32	.....	264	.....	71	60	.....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1924												
1.....	24	41	24	7.0	12	30	16	165	445	213	48	39
2.....	21	37	18	10	10	30	31	21	445	243	56	37
3.....	24	34	14	8.5	14	24	37	30	485	275	70	39
4.....	18	27	18	8.5	12	30	27	230	510	275	56	39
5.....	27	24	18	12	8.5	24	37	90	510	275	48	39
6.....	27	34	18	8.5	10	34	34	165	402	275	70	39
7.....	24	30	14	8.5	10	18	16	275	360	275	75	43
8.....	27	34	14	10	10	14	18	317	445	275	65	48
9.....	24	37	24	8.5	10	18	18	380	445	275	75	30
10.....	30	45	8.5	14	12	27	41	337	445	213	48	37
11.....	21	41	10	10	12	34	21	582	400	213	56	33
12.....	62	41	16	12	14	37	50	600	400	150	65	52
13.....	21	30	14	12	10	41	21	423	400	158	48	43
14.....	31	27	12	12	10	37	62	510	445	142	80	37
15.....	41	27	12	12	8.5	34	70	465	445	142	70	33
16.....	34	21	14	8.5	12	14	50	445	510	142	52	39
17.....	62	24	8.5	7.0	12	14	50	423	400	142	80	30
18.....	37	18	14	8.5	14	37	18	423	400	142	56	33
19.....	41	24	14	12	14	41	18	342	400	150	48	39
20.....	30	18	18	8.5	8.5	18	24	200	400	142	56	48
21.....	24	24	12	10	10	34	62	214	400	167	56	39
22.....	21	34	12	10	21	37	21	317	400	188	65	37
23.....	45	21	18	8.5	12	41	18	317	400	158	43	37
24.....	34	34	18	14	12	34	21	295	445	380	43	37
25.....	45	30	16	7.0	14	41	100	485	445	275	52	48
26.....	45	21	21	10	18	16	21	423	400	227	52	37
27.....	37	24	16	10	12	16	24	317	243	227	52	37
28.....	37	21	30	8.5	24	41	21	340	260	243	48	37
29.....	55	16	21	14	14	34	70	340	380	167	43	33
30.....	41	18	16	12	14	41	120	340	295	213	45	37
31.....	41	18	12	10	.....	41	165	485	243	188	48	33
	41	.....	8.5	12	.....	.....	.....	445	.....	118	39	.....

NOTE—Daily discharge for 1923 determined as follows: Direct from two fairly well defined curves, October 11 to July 26; indirect method for shifting channel, July 26 to September 20.

1924: Direct from two well defined curves for the entire year.

Monthly discharge of Rio Colorado below Questa, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	30	19	24.3	1,490
November .....	32	18	23.0	1,350
December .....	26	16	20.3	1,250
January .....	32	15	22.6	1,390
February .....	30	12	20.5	1,140
March .....	32	15	22.9	1,410
April .....	36	24	30.0	1,770
May .....	320	40	207	12,700
June .....	282	65	155	9,230
July .....	142	65	86.8	5,340
August .....	73	48	58.9	3,620
September .....	63	32	45.8	2,720
The year .....	282	12	60.0	43,440
1924				
October .....	62	18	34.3	2,100
November .....	45	16	28.3	1,680
December .....	30	8.5	15.8	975
January .....	14	7.0	10.1	619
February .....	24	8.5	12.5	719
March .....	41	14	30.6	1,820
April .....	165	16	42.1	2,500
May .....	485	21	333	20,460
June .....	510	243	407	24,200
July .....	380	118	208	12,770
August .....	80	39	57.7	3,550
September .....	52	33	38.4	2,280
The year .....	510	7.0	102	73,680



## RIO HONDO AT VALDEZ, N. MEX.

*Location.*—About three-quarters of a mile east of Valdez and half a mile below the mouth of the main canon, section 28, township 27 north, range 13 east.

*Records available.*—December 20, 1915, to September 30, 1924.

*Drainage area.*—38.5 square miles.

*Gage.*—Chain gage.

*Channel.*—Probably permanent at high stages. The bed of the stream is rocky and both banks are above high water. There is one channel at all stages.

*Discharge measurements.*—Made by wading or from highway bridge an eighth of a mile above the station.

*Winter conditions.*—Ice may cause backwater during the winter months.

*Diversions.*—Four small ditches divert water for irrigation above the station.

*Discharge measurements of Rio Hondo at Valdez, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Discharge Sec.-Ft.
1923			
Oct. 11.....	Mark Lambert	1.21	2.3
Jan. 4.....	do	1.54	11.4
Apr. 26.....	Lambert-Archer	1.85	29.4
May 24.....	do	2.28	92.9
July 26.....	do	1.25	2.7
Sept. 20.....	do	1.72	16.9
1924			
Nov. 23.....	Lambert-Archer	1.74	15.1
Mar. 1.....	Mark Lambert	1.77	12.3
May 8.....	do	2.46	113
July 28.....	Neel-Marek	1.70	20.4
Sept. 25.....	H. Neel	1.55	13

i=Ice.

*daily discharge in second-feet of Rio Hondo at Valdez, N. Mex., for climatic years 1923-24.*

[Mrs. L. V. Prando, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1923												
1.....	1.9	3.2	15	10	9.2	7.4	10	62	130	15	3.8	9.4
2.....	1.9	3.2	6.0	10	9.1	7.4	8.5	65	130	15	7.0	8.5
3.....	1.9	3.2	4.4	11	9.1	7.3	8.5	72	121	12	7.0	8.5
4.....	2.2	3.2	5.1	11	9.0	7.2	8.5	80	116	12	7.0	8.5
5.....	2.2	3.2	5.1	11	8.9	7.2	8.5	80	112	12	7.0	8.5
6.....	2.2	4.0	15	11	8.9	7.1	7.0	88	112	11	7.0	8.5
7.....	2.2	4.0	9.2	11	8.8	7.1	7.0	104	112	10	7.6	8.5
8.....	2.2	4.0	4.4	11	8.8	7.0	7.0	104	109	9.4	8.5	8.5
9.....	2.2	2.8	4.6	11	8.7	7.0	7.0	109	104	8.5	8.5	8.5
10.....	2.2	2.8	4.9	11	8.6	7.0	8.5	112	104	8.5	8.5	10
11.....	2.2	3.2	5.1	11	8.6	7.0	9.4	109	104	7.0	8.5	10
12.....	2.2	3.2	5.4	10	8.5	7.0	10	116	104	7.0	7.6	10
13.....	2.2	6.0	5.6	10	8.4	11	15	112	96	9.4	7.0	10
14.....	2.2	5.1	5.9	10	8.4	11	15	96	96	11	7.0	10
15.....	2.2	5.1	6.1	10	8.3	10	12	80	96	9.4	7.0	10
16.....	2.2	4.0	6.4	10	8.3	10	12	80	96	10	7.0	12
17.....	2.2	4.0	6.6	10	8.2	10	12	80	96	8.5	7.0	12
18.....	2.2	15	6.8	10	8.1	10	23	65	96	8.5	9.5	12
19.....	1.9	9.2	7.1	10	8.1	10	30	83	93	8.5	10	15
20.....	1.9	5.1	7.3	10	8.0	7.0	23	121	80	8.5	12	15
21.....	1.9	3.6	7.6	9.9	7.9	4.8	23	130	65	7.0	12	15
22.....	1.9	3.6	7.8	9.8	7.9	5.9	19	130	50	7.0	15	15
23.....	2.2	3.6	8.1	9.8	7.8	7.0	19	96	50	7.0	15	15
24.....	2.2	3.2	8.3	9.7	7.8	7.6	19	83	50	5.2	15	27
25.....	2.2	3.2	8.5	9.6	7.7	6.6	26	104	43	4.8	15	18
26.....	2.2	3.6	8.8	9.6	7.6	7.0	30	121	36	4.8	12	15
27.....	2.2	3.2	9.0	9.5	7.6	7.0	36	126	33	3.8	15	15
28.....	2.8	4.0	9.3	9.5	7.5	7.0	36	126	30	3.2	15	15
29.....	2.5	4.0	9.5	9.4	.....	7.0	39	130	15	2.6	15	15
30.....	2.8	5.1	9.8	9.3	.....	10	47	112	15	2.4	12	15
31.....	2.8	.....	10	9.3	.....	10	.....	121	.....	2.0	11	.....
1924												
1.....	15	15	16	14	12	10	14	35	122	80	26	16
2.....	15	15	14	14	12	9.6	14	48	122	80	21	16
3.....	21	15	14	14	12	9.6	14	124	122	72	20	16
4.....	21	15	14	14	12	9.6	14	124	131	72	20	16
5.....	21	15	16	14	12	9.6	24	134	131	72	20	14
6.....	21	15	20	14	11	9.6	35	124	140	80	21	14
7.....	21	15	14	13	11	9.6	35	101	158	80	25	14
8.....	21	15	16	13	11	14	35	122	158	80	20	14
9.....	21	15	21	13	11	16	48	122	194	72	20	14
10.....	21	15	24	13	11	14	42	140	176	72	20	12
11.....	21	15	21	13	11	14	42	158	176	64	25	12
12.....	21	15	16	13	11	9.6	56	176	176	57	26	33
13.....	21	18	16	13	11	9.6	42	176	176	57	20	33
14.....	21	21	14	13	11	9.6	64	185	194	50	20	30
15.....	21	18	14	13	11	14	56	194	194	44	20	21
16.....	21	18	21	13	11	14	42	194	194	44	21	20
17.....	21	21	14	13	11	14	42	212	194	44	20	20
18.....	21	21	14	13	11	9.6	48	212	176	44	20	20
19.....	21	15	14	13	11	9.6	35	212	176	44	20	20
20.....	21	15	14	12	11	9.6	42	203	149	44	19	21
21.....	21	15	14	12	11	9.6	42	194	113	38	20	20
22.....	21	15	14	12	10	9.6	64	194	113	33	18	20
23.....	15	14	14	12	10	14	72	194	96	30	17	20
24.....	15	14	14	12	10	9.6	72	176	88	26	18	20
25.....	15	11	14	12	10	9.6	64	176	88	23	18	20
26.....	15	14	14	12	10	9.6	64	176	88	21	17	20
27.....	15	14	14	12	10	9.6	35	158	88	20	16	20
28.....	15	16	14	12	10	9.6	35	149	88	24	16	18
29.....	15	31	14	12	10	14	35	140	88	32	16	18
30.....	15	16	14	12	.....	14	48	122	88	26	16	18
31.....	15	.....	14	12	.....	14	.....	122	.....	26	16	.....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve, October 11 to December 20; interpolate for ice, December 20 to March 8; direct from well defined curve, March 8 to September 20.

1924: Direct from two fairly well defined curves, September 20 to December 30; interpolate for ice, December 30 to March 1; direct from two well defined curves, March 1 to September 25.



Monthly discharge of Rio Hondo at Valdez, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	2.8	1.9	2.20	135
November .....	15	2.8	3.88	231
December .....	15	4.4	6.34	390
January .....	11	9.3	10.1	623
February .....	9.2	7.5	8.35	464
March .....	11	4.8	7.89	485
April .....	47	7.0	17.9	1,063
May .....	130	62	99.9	6,140
June .....	130	15	83.1	4,950
July .....	15	2.0	8.08	497
August .....	15	3.8	9.85	606
September .....	27	8.5	12.3	731
The year .....	130	1.9	22.5	16,315
1924				
October .....	21	15	18.9	1,160
November .....	31	11	16.2	970
December .....	24	14	15.5	950
January .....	14	12	12.8	790
February .....	12	10	10.9	630
March .....	16	9.6	12.4	690
April .....	72	14	42.5	2,530
May .....	212	35	154	9,450
June .....	194	88	140	8,320
July .....	80	20	50.0	3,070
August .....	26	16	19.7	1,210
September .....	33	12	19.0	1,130
The year .....	212	9.6	42.6	30,900

## RIO HONDO NEAR ARROYO HONDO, N. MEX.

*Location.*—At the highway bridge at Dunn's Ranch, 200 yards above the mouth of the stream, 1 mile west of Arroyo Hondo post office, near section 31, township 27 north, range 12 east, and below all tributaries.

*Records available.*—April 8, 1910, to September 30, 1924.

*Drainage area.*—73 square miles.

*Gage.*—Vertical staff.

*Channel.*—Shifting.

*Discharge measurements.*—Made by wading or from the bridge on the Ser-villeta road.

*Winter conditions.*—Ice causes backwater during a part of the winter.

*Diversions.*—There are several diversions for irrigation above the station, but none below.

Discharge measurements of Rio Hondo near Arroyo Hondo, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 11	Mark Lambert	1.75	7.2
Jan. 4	do	2.15	9.5
Apr. 26	Lambert-Archer	2.23	32.2
May 24	do	2.60	88.9
July 26	do	1.14	7.5
Sept. 20	do	1.96	35.1
1924			
Nov. 23	Lambert-Archer	1.78	19.8
Jan. 6	Lambert-Neel	i	17.2
Feb. 29	Mark Lambert	1.84	30.5
May 7	do	2.60	102
July 28	Neel-Marck	2.50	27.9
Sept. 25	Homer Neel	2.22	13.3

i=Ice.

Daily discharge in second-feet of Rio Hondo near Arroyo Hondo, N. Mex., for climatic years 1923-24.

[Juan C. Rael, Observer.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1923												
1	4.9	6.3	6.3	9.1	10	16	22	55	172	15	15	37
2	4.9	6.3	7.3	9.2	10	16	22	70	172	15	15	37
3	4.9	6.3	6.3	9.3	10	16	22	70	172	15	15	40
4	4.9	6.3	6.3	9.4	10	16	22	88	146	20	10	37
5	4.9	6.3	7.3	9.4	11	16	22	88	124	15	10	37
6	4.9	6.3	7.3	9.5	11	16	22	79	105	15	10	40
7	4.9	6.3	7.3	9.5	11	16	22	70	146	15	56	37
8	4.9	6.3	7.3	9.5	11	16	22	70	202	15	37	37
9	4.9	6.3	7.3	9.6	11	16	22	108	172	18	15	37
10	4.9	6.3	7.3	9.6	11	16	26	128	172	20	15	37
11	4.9	6.3	7.3	9.6	11	16	30	173	124	20	15	37
12	4.9	6.3	7.3	9.7	11	16	30	150	84	25	15	37
13	4.9	6.3	7.4	9.7	11	16	30	128	84	31	10	25
14	5.5	6.3	7.5	9.8	11	16	22	128	78	37	6.0	15
15	6.3	6.3	7.6	9.8	11	16	30	98	64	37	6.0	20
16	6.3	6.3	7.7	9.8	11	11	30	62	60	37	6.0	15
17	6.3	6.3	7.8	9.9	11	16	30	62	60	22	6.0	25
18	6.3	6.3	7.8	9.9	11	16	41	62	60	64	10	52
19	6.3	6.3	7.9	9.9	11	11	41	79	52	37	22	37
20	6.3	6.3	8.0	10	16	11	41	173	90	31	78	37
21	6.3	6.3	8.0	10	16	16	36	173	52	20	37	37
22	6.3	6.3	8.2	10	16	14	30	173	52	15	37	31
23	6.3	6.3	8.3	10	16	14	30	173	44	15	37	25
24	6.3	6.3	8.4	10	16	14	26	90	37	12	37	37
25	6.3	6.3	8.5	10	16	14	22	90	37	10	37	37
26	6.3	6.3	8.6	10	16	16	30	172	37	10	37	37
27	6.3	6.3	8.7	10	16	16	41	202	31	8.0	37	37
28	6.3	6.3	8.8	10	16	16	41	202	25	22	37	37
29	6.3	6.3	8.8	10	....	16	41	187	15	10	37	37
30	6.3	6.3	8.9	10	....	16	48	124	15	12	37	37
31	8.8	....	9.0	10	....	16	....	124	....	15	37	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	37	37	25	19	15	18	21	56	89	38	11	9.0
2.....	37	37	26	18	15	21	24	56	89	38	9.8	9.0
3.....	37	37	26	18	15	21	24	89	89	46	9.0	9.0
4.....	37	37	27	18	15	24	24	95	89	42	9.0	9.0
5.....	37	37	28	17	15	24	24	158	109	38	9.0	9.0
6.....	37	37	29	17	15	21	30	158	158	77	9.0	9.0
7.....	37	37	30	17	15	24	46	128	158	74	9.0	9.0
8.....	37	37	30	17	15	24	38	158	158	72	9.0	9.0
9.....	37	37	31	17	15	24	89	158	158	69	9.0	9.0
10.....	37	37	31	17	15	14	66	158	158	67	9.0	9.0
11.....	37	37	25	17	15	21	66	172	158	64	9.0	21
12.....	37	37	25	17	15	24	38	172	158	62	9.0	21
13.....	37	37	25	17	15	24	30	188	158	59	9.0	21
14.....	37	37	24	17	15	14	38	196	158	57	9.0	21
15.....	37	37	24	16	15	14	66	204	172	54	9.0	19
16.....	37	37	24	16	15	14	66	204	172	51	9.0	16
17.....	37	37	23	16	14	21	51	212	188	49	9.0	16
18.....	37	37	23	16	14	24	38	235	158	46	9.0	16
19.....	37	37	23	16	14	24	38	227	158	44	9.0	16
20.....	37	37	22	16	14	21	38	212	143	41	9.0	16
21.....	37	37	22	16	14	21	38	212	115	39	9.0	16
22.....	37	31	22	16	14	21	56	212	96	36	9.0	16
23.....	37	31	21	16	14	21	77	212	77	34	9.0	16
24.....	37	25	21	16	14	21	89	212	66	31	9.0	16
25.....	37	25	21	16	14	21	77	212	66	29	9.0	16
26.....	37	25	20	16	14	21	77	204	56	26	9.0	16
27.....	37	25	20	16	14	18	56	165	46	24	9.0	16
28.....	37	25	20	16	24	18	38	158	42	21	9.0	16
29.....	37	25	20	16	24	18	38	158	38	16	9.0	16
30.....	37	25	19	16	....	18	46	128	38	16	9.0	16
31.....	37	....	19	16	....	21	....	102	....	16	9.0	....

NOTE—Daily discharge for 1923 determined as follows: Direct from a well defined curve, October 11 to December 12; interpolate December 12 to February 19; direct from two well defined curves, February 19 to September 20, 1924: Direct from two well defined curves for the entire year.

Monthly discharge of Rio Hondo near Arroyo Hondo, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October.....	8.8	4.9	5.76	355
November.....	6.3	6.3	6.30	375
December.....	9.0	6.3	7.75	479
January.....	10	9.1	9.71	599
February.....	16	10	12.5	692
March.....	16	11	15.3	938
April.....	48	22	30.0	1,800
May.....	202	55	118	7,200
June.....	202	15	89.5	5,300
July.....	64	8.0	21.0	1,300
August.....	78	6.0	25.0	1,500
September.....	52	15	34.3	2,040
The year.....	202	4.9	31.3	22,600
1924				
October.....	37	37	37.0	2,270
November.....	37	25	33.8	2,010
December.....	31	19	24.0	1,480
January.....	19	16	16.6	1,020
February.....	24	14	15.2	877
March.....	21	14	20.5	1,260
April.....	89	21	48.2	2,870
May.....	235	56	168	10,340
June.....	172	38	117	6,980
July.....	77	16	44.4	2,730
August.....	11	9.0	9.12	560
September.....	21	9.0	14.4	860
The year.....	235	9.0	45.8	33,250

## RIO FERNANDO DE TAOS NEAR TAOS, N. MEX.

Location.—At the mouth of the canon, 2 miles northeast of Taos, 200 yards above the headgate of B. C. Randall's intake ditch, in section 21, township 25 north, range 13 east.

Records available.—Partial records from April 6, 1910, to October 4, 1912, and continuous records from October 5, 1912, to September 30, 1924.

Drainage area.—64 square miles.

Gage.—Vertical staff.

Channel.—Shifting during high water.

Discharge measurements.—Made by wading.

Winter conditions.—Springs a short distance above the gage keep the channel open during most of the winter.

Diversions.—There are no diversions of consequence above the station.

NOTE—On July 21, 1921, gage was destroyed. A new gage was established August 23rd and destroyed August 28th. On October 7th a new gage was established. Refers to new datum.

Discharge measurements of Rio Fernando de Taos near Taos, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 12.....	Mark Lambert	0.92	0.3
Jan. 4.....	..... do	0.66	1.0
Apr. 26.....	Lambert-Archer	1.07	9.6
May 23.....	..... do	1.09	11.2
July 27.....	..... do	0.71	0.7
Sept. 21.....	..... do	1.62	0.9
1924			
Nov. 23.....	Lambert-Archer	1.61	0.85
Mar. 1.....	Mark Lambert	1.72	4.8
May 8.....	..... do	2.18	57.9
Aug. 14.....	H. Marck	1.62	5.5
Sept. 19.....	H. Neel	1.68	0.7
Sept. 27.....	..... do	1.62	0.8



Daily discharge in second-feet of Rio Fernando de Taos near Taos, N. Mex.,  
for climatic years 1923-24.

[W. B. Dooley, Observer.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	0.3	0.5	0.8	1.1	1.2	4.4	5.9	17	5.2	2.2	0.6	0.7
2.....	0.3	0.5	0.8	1.1	1.2	4.4	5.9	17	5.2	2.2	0.6	0.7
3.....	0.3	0.5	0.8	1.2	1.2	4.4	5.9	17	5.2	2.1	0.6	0.7
4.....	0.3	0.5	0.8	1.2	1.3	5.9	5.9	17	5.2	2.0	0.6	0.7
5.....	0.3	0.5	0.8	1.2	1.2	5.9	7.5	17	5.2	2.0	0.6	0.7
6.....	0.3	0.6	0.8	1.2	1.3	5.9	7.5	17	3.9	1.9	0.6	0.7
7.....	0.3	0.6	0.9	1.2	1.5	5.9	7.5	17	3.9	1.9	0.6	0.7
8.....	0.3	0.6	0.9	1.2	1.5	5.9	7.5	17	3.9	1.8	0.6	0.7
9.....	0.3	0.6	0.9	0.8	1.5	5.9	7.5	28	3.9	1.7	0.6	0.7
10.....	0.3	0.6	0.9	0.8	1.5	4.4	4.5	12	3.9	1.7	0.6	0.7
11.....	0.3	0.6	0.9	1.0	1.5	4.4	11	17	3.9	1.6	0.6	0.7
12.....	0.3	0.6	0.9	1.0	1.8	4.4	11	17	3.9	1.5	0.6	0.7
13.....	0.3	0.6	0.9	1.0	1.8	4.4	11	6.4	3.9	1.5	0.6	0.7
14.....	0.3	0.6	0.9	1.0	1.8	4.4	11	17	3.9	1.4	0.6	0.7
15.....	0.3	0.6	1.0	1.2	1.5	4.4	11	17	3.6	1.4	0.6	0.7
16.....	0.3	0.6	1.0	1.0	1.5	4.4	11	22	3.1	1.3	0.6	0.7
17.....	0.4	0.7	1.0	0.6	1.8	4.4	14	22	3.1	1.3	0.6	0.7
18.....	0.4	0.7	1.0	0.8	1.5	5.9	28	22	3.0	1.2	0.6	0.7
19.....	0.4	0.7	1.0	1.2	1.5	5.9	28	22	2.9	1.1	0.6	0.7
20.....	0.4	0.7	1.0	1.2	2.1	5.9	28	22	2.9	1.1	0.6	0.7
21.....	0.4	0.7	1.0	0.8	2.3	5.9	28	22	2.8	1.0	0.6	0.7
22.....	0.4	0.7	1.0	1.0	3.1	5.9	28	22	2.8	1.0	0.6	0.7
23.....	0.4	0.7	1.0	1.0	3.9	5.9	28	22	2.7	0.9	0.6	3.2
24.....	0.4	0.7	1.0	1.0	3.9	4.4	28	12	2.6	0.8	0.6	1.4
25.....	0.4	0.7	1.0	1.0	3.9	5.9	17	12	2.6	0.8	0.6	0.7
26.....	0.4	0.8	1.0	1.2	4.4	5.9	17	12	2.5	0.7	0.6	0.7
27.....	0.4	0.8	1.1	1.2	4.4	5.2	17	12	2.5	0.7	0.6	0.7
28.....	0.5	0.8	1.1	1.2	4.4	5.9	17	12	2.4	0.6	0.7	0.5
29.....	0.5	0.8	1.1	1.5	....	7.5	17	12	2.3	0.6	0.7	0.5
30.....	0.5	0.8	1.1	1.5	....	7.5	17	12	2.3	0.6	0.7	0.5
31.....	0.5	....	1.1	1.5	....	7.5	....	12	....	0.6	0.7	....
1.....	93	17	0.6	0.9	0.9	4.6	0.9	9.8	14	1.3	1.3	0.6
2.....	4.6	9.8	0.6	0.9	0.9	4.6	0.9	9.8	14	9.0	1.3	0.6
3.....	9.8	9.8	0.6	0.9	0.9	4.6	4.6	9.8	14	4.8	1.3	0.6
4.....	4.6	4.6	0.6	0.9	0.9	4.6	4.6	9.8	14	4.8	1.3	0.6
5.....	4.6	4.6	0.6	0.9	0.9	4.6	27	17	14	4.8	1.3	0.6
6.....	4.6	4.6	0.6	0.9	0.9	0.9	149	9.8	14	14	1.3	0.6
7.....	0.9	4.6	0.6	0.9	0.9	0.9	177	9.8	9.0	4.8	1.3	0.6
8.....	0.9	4.6	0.6	0.9	0.9	0.9	177	14	9.0	4.8	1.3	0.6
9.....	0.9	4.6	0.6	0.9	0.9	0.9	177	14	4.8	4.8	1.3	0.6
10.....	9.8	4.6	0.6	0.9	0.9	0.9	149	14	4.8	4.8	1.3	4.8
11.....	0.9	27	0.6	0.9	0.9	0.9	65	14	4.8	4.8	4.8	0.6
12.....	0.9	17	0.6	0.9	0.9	0.9	17	14	4.8	4.8	4.8	0.6
13.....	9.8	9.8	0.6	0.9	0.9	0.9	9.8	14	4.8	4.8	4.8	0.6
14.....	4.6	9.8	0.6	0.9	4.6	0.9	9.8	14	4.8	4.8	4.8	0.6
15.....	0.9	4.6	0.6	0.9	4.6	0.9	9.8	14	4.8	4.8	4.8	0.6
16.....	0.9	4.6	0.6	0.9	4.6	0.9	9.8	14	4.8	4.8	4.8	0.6
17.....	0.9	4.6	0.6	4.6	4.6	0.9	9.8	14	4.8	4.8	1.3	0.6
18.....	0.9	4.6	0.6	0.9	9.8	0.9	9.8	14	4.8	14	1.3	0.6
19.....	0.9	0.9	0.6	0.9	4.6	0.9	9.8	9.0	4.8	4.8	1.3	0.6
20.....	4.6	0.9	0.6	0.9	4.6	0.9	9.8	9.0	4.8	4.8	1.3	0.6
21.....	4.6	0.9	0.6	0.9	4.6	0.9	9.8	9.0	1.3	4.8	1.3	0.6
22.....	4.6	0.9	0.6	0.9	4.6	0.9	9.8	9.0	1.3	4.8	1.3	0.6
23.....	9.8	0.9	0.6	0.9	4.6	0.9	9.8	4.8	1.3	4.8	1.3	0.6
24.....	17	0.9	0.6	0.9	4.6	0.9	9.8	14	1.3	4.8	1.3	0.6
25.....	17	0.9	0.6	0.9	4.6	0.9	17	14	1.3	4.8	1.3	0.6
26.....	17	4.6	0.9	0.9	4.6	4.6	17	14	1.3	4.8	1.3	0.6
27.....	17	0.9	0.9	0.9	4.6	4.6	9.8	14	1.3	1.3	0.6	0.6
28.....	9.8	0.6	0.9	0.9	4.6	4.6	9.8	14	1.3	1.3	0.6	0.6
29.....	9.8	0.6	0.9	0.9	4.6	0.9	9.8	14	1.3	4.8	0.6	0.6
30.....	9.8	0.6	0.9	0.9	....	0.9	9.8	14	1.3	1.3	0.6	0.6
31.....	17	....	0.9	0.9	....	0.6	....	14	1.3	1.3	0.6	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two well defined curves, October 12 to September 21.

1924: Direct from well defined curve for the entire year.

Monthly discharge of Rio Fernando de Taos near Taos, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	0.5	0.3	0.36	22.2
November .....	0.8	0.5	0.64	38.5
December .....	1.1	0.8	0.94	58.3
January .....	1.5	0.6	1.09	67.2
February .....	4.4	1.2	2.16	120
March .....	7.5	4.4	5.45	330
April .....	28	5.9	14.90	880
May .....	28	6.4	16.80	1,030
June .....	5.2	2.3	3.50	190
July .....	2.2	0.6	1.32	81.7
August .....	0.7	0.6	0.61	37.7
September .....	3.2	0.5	0.78	46.8
The year .....	28	0.3	4.05	2,900
1924				
October .....	93	0.9	9.43	580
November .....	27	0.6	5.48	326
December .....	0.9	0.6	0.66	40.5
January .....	4.6	0.9	1.02	62.7
February .....	9.8	0.9	3.12	180
March .....	4.6	0.6	1.84	113
April .....	177	0.9	38.0	2,260
May .....	17	4.8	12.2	749
June .....	14	1.3	5.75	342
July .....	14	1.3	4.96	305
August .....	14	0.6	2.27	140
September .....	4.8	0.6	0.74	44.0
The year .....	177	0.6	7.08	5,140

# RIO RANCHOS DE TAOS NEAR RANCHES OF TAOS, N. MEX.

Location.—At the highway bridge one-fourth mile south of Ranches of Taos in township 25 north, range 13 east.

Records available.—March 14, 1920, to September 30, 1924.

Drainage area.—149 square miles.

Gage.—Vertical staff.

Channel.—Fairly permanent, but liable to shifts during high water.

Discharge measurements.—Made by wading or from bridge.

Winter flow.—Ice affects flow during winter months.

Diversions.—There are several diversions above the station.

Discharge measurements of Rio Ranchos de Taos near Ranches of Taos, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft
1923			
Oct. 12.....	Mark Lambert .....	0.36	0.6
Jan. 5.....	..... do .....	0.71	5.4
Apr. 27.....	Lambert-Archer .....	0.83	4.8
May 25.....	..... do .....	1.43	52.6
July 25.....	..... do .....	0.58	0.8
Sept. 21.....	..... do .....	0.78	3.4
1924			
Nov. 24.....	Lambert-Archer .....	0.72	2.6
Mar. 1.....	Mark Lambert .....	1.01	11.9
May 8.....	..... do .....	1.75	82.2
July 31.....	Neel-Marck .....	0.70	1.9
Aug. 1.....	H. Neel .....	0.70	1.5
Sept. 27.....	..... do .....	0.40	0.6



Daily discharge in second-feet of Rio Ranchos de Taos near Ranches of Taos, N. Mex., for climatic years 1923-24.

[Luis Mondragon, Observer.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	0.2	0.3	1.0	1.1	1.2	7.2	1.3	18	50	12	1.4	1.4
2.....	0.2	0.3	1.0	1.1	1.2	6.7	1.3	28	50	12	1.4	1.4
3.....	0.2	0.3	1.0	1.1	1.2	6.7	1.3	39	50	2.0	1.4	1.4
4.....	0.2	0.3	1.0	1.1	1.2	6.7	1.3	39	50	2.0	1.4	5.5
5.....	0.2	0.5	1.0	1.1	1.2	6.7	1.3	39	50	2.0	1.4	9.5
6.....	0.2	0.5	1.0	1.1	1.2	6.7	1.3	39	39	2.0	1.4	7.0
7.....	0.2	0.5	1.0	1.1	1.2	6.7	1.3	39	39	12	1.4	4.0
8.....	0.2	0.5	1.0	1.1	1.2	6.7	1.3	50	39	12	1.4	2.0
9.....	0.2	0.5	1.0	1.1	1.2	6.7	1.3	50	39	1.4	1.4	2.0
10.....	0.2	0.5	1.0	1.1	1.2	6.7	1.3	50	28	1.4	1.4	2.0
11.....	0.2	0.5	1.0	1.1	2.2	1.7	1.3	50	28	1.4	1.4	2.0
12.....	0.2	0.5	1.0	1.1	2.2	1.7	1.3	50	18	1.4	115	2.0
13.....	0.2	0.5	1.0	1.1	2.2	1.7	1.1	50	18	2.0	39	2.0
14.....	0.2	0.5	1.0	1.1	5.3	1.7	1.1	50	12	1.4	7.0	7.0
15.....	0.2	0.5	1.0	1.1	5.3	1.7	1.1	50	12	2.0	23	9.5
16.....	0.2	0.5	1.0	1.1	5.0	1.5	1.1	50	7.0	1.4	61	7.0
17.....	0.2	0.5	1.1	1.2	5.0	1.5	1.1	50	7.0	3.0	7.0	7.0
18.....	0.2	0.5	1.1	1.2	5.0	1.5	1.1	50	7.0	2.0	4.0	7.0
19.....	0.2	0.5	1.1	1.2	5.0	1.5	1.3	50	4.0	1.4	93	4.0
20.....	0.2	0.5	1.1	1.2	5.0	1.5	1.3	56	4.0	1.4	12	4.0
21.....	0.2	0.5	1.1	1.2	7.2	1.5	1.3	56	4.0	1.4	7.0	4.0
22.....	0.3	0.5	1.1	1.2	7.2	1.5	6.1	56	4.0	1.4	7.0	4.0
23.....	0.3	0.5	1.1	1.2	7.2	1.5	1.3	61	4.0	1.4	5.5	4.0
24.....	0.3	0.5	1.1	1.2	7.2	1.5	1.3	61	2.0	1.4	2.0	4.0
25.....	0.3	0.5	1.1	1.2	7.2	1.5	1.3	61	2.0	1.4	2.0	4.0
26.....	0.3	1.0	1.1	1.2	7.2	1.5	1.3	61	2.0	1.4	2.0	4.0
27.....	0.3	1.0	1.1	1.2	7.2	1.5	1.2	61	2.0	109	2.0	4.0
28.....	0.3	1.0	1.1	1.2	7.2	1.5	1.2	61	2.0	15	2.0	4.0
29.....	0.3	1.0	1.1	1.2	....	1.5	15	61	2.0	2.0	2.0	4.0
30.....	0.3	1.0	1.1	1.2	....	1.3	15	61	2.0	1.4	1.4	4.0
31.....	0.3	....	1.1	1.2	....	1.3	....	50	....	1.4	1.4	....
1924												
1.....	4.0	4.0	5.6	5.6	9.6	9.6	15	65	65	4.0	1.4	0.3
2.....	9.5	4.0	5.6	5.6	9.6	9.6	22	65	76	4.0	1.4	0.2
3.....	9.5	4.0	5.6	5.6	9.6	9.6	27	65	76	9.6	92	0.2
4.....	4.0	4.0	5.6	9.6	9.6	9.6	45	65	76	4.0	32	1.0
5.....	4.0	4.0	5.6	9.6	9.6	9.6	50	76	76	7.1	7.1	0.8
6.....	4.0	4.0	5.6	9.6	9.6	9.6	50	87	76	4.0	1.4	0.2
7.....	4.0	4.0	5.6	9.6	9.6	9.6	54	87	76	4.0	1.0	0.2
8.....	4.0	4.0	5.6	9.6	9.6	9.6	65	87	65	4.0	1.0	0.2
9.....	4.0	4.0	5.6	9.6	9.6	9.6	76	87	65	4.0	1.0	0.2
10.....	4.0	4.0	5.6	9.6	9.6	9.6	70	87	65	2.1	1.0	0.2
11.....	4.0	4.0	5.6	9.6	9.6	9.6	70	87	54	2.1	1.0	3.0
12.....	4.0	4.0	5.6	9.6	9.6	9.6	54	93	54	2.1	1.0	0.8
13.....	4.0	4.0	5.6	9.6	9.6	9.6	65	104	45	2.1	40	0.2
14.....	4.0	4.0	5.6	9.6	12	9.6	76	104	36	2.1	36	0.2
15.....	4.0	4.0	5.6	9.6	12	9.6	93	110	36	12	4.0	0.2
16.....	4.0	4.0	5.6	9.6	12	9.6	82	110	27	15	1.4	0.2
17.....	4.0	4.0	5.6	9.6	12	9.6	70	110	27	2.1	1.4	0.2
18.....	7.0	4.0	5.6	9.6	12	9.6	50	110	18	2.1	1.0	0.2
19.....	7.0	4.0	5.6	9.6	9.6	9.6	54	110	12	2.1	1.0	0.2
20.....	7.0	4.0	5.6	9.6	9.6	9.6	54	110	7.1	2.1	1.0	0.2
21.....	7.0	4.0	5.6	9.6	9.6	9.6	60	110	7.1	2.1	1.0	0.2
22.....	7.0	5.5	5.6	9.6	9.6	9.6	65	110	7.1	2.1	0.6	0.2
23.....	7.0	5.5	5.6	9.6	9.6	9.6	70	104	4.0	2.1	0.6	0.2
24.....	7.0	5.6	5.6	9.6	9.6	15	87	104	4.0	2.1	0.6	0.2
25.....	7.0	5.6	5.6	9.6	9.6	15	87	99	4.0	2.1	0.6	0.2
26.....	7.0	5.6	5.6	9.6	9.6	15	76	99	4.0	1.4	0.3	0.2
27.....	7.0	5.6	9.6	9.6	9.6	9.6	65	99	4.0	1.4	0.3	0.2
28.....	7.0	5.6	9.6	9.6	9.6	9.6	60	93	4.0	3.0	0.3	0.2
29.....	7.0	5.6	9.6	9.6	9.6	9.6	65	82	4.0	1.4	0.3	0.2
30.....	7.0	5.6	7.1	9.6	....	9.6	65	70	4.0	1.4	0.3	0.2
31.....	7.0	....	7.1	9.6	....	12	....	65	....	1.4	0.3	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve, September 2 to October 12; indirect method for shifting channel October 12 to April 27; direct from a well defined curve, April 27 to November 24. 1924: Direct from a well defined curve throughout the entire year.

Monthly discharge of Rio Ranchos de Taos near Ranches of Taos, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October .....	0.3	0.2	0.23	14.3
November .....	1.0	0.3	0.56	33.1
December .....	1.1	1.0	1.05	64.4
January .....	1.2	1.1	1.15	70.6
February .....	7.2	1.2	3.99	222
March .....	7.2	1.3	3.21	198
April .....	15	1.1	5.78	344
May .....	61	18	49.9	3,070
June .....	50	2.0	19.2	1,140
July .....	109	1.4	6.88	423
August .....	115	1.4	13.2	814
September .....	9.5	1.4	4.26	253
The year .....	109	0.2	9.18	6,650
1924				
October .....	9.5	4.0	5.70	351
November .....	5.6	4.0	4.47	266
December .....	9.6	5.6	9.31	572
January .....	9.6	5.6	9.21	566
February .....	12	9.6	10.0	576
March .....	15	9.6	10.2	627
April .....	93	15	61.4	3,650
May .....	110	65	92.0	5,660
June .....	76	4.0	35.9	2,130
July .....	15	1.4	3.58	220
August .....	92	0.3	7.49	461
September .....	3.0	0.2	0.36	21.6
The year .....	110	0.2	20.8	15,110

### RIO TAOS AT LOS CORDOVAS, N. MEX.

Location.—At Los Cordovas, 100 feet below the mouth of the Little Rio Grande and Arroyo Seco, and near section 22, township 25 north, range 12 east.

Records available.—April 6, 1910, to September 30, 1924.

Drainage area.—360 square miles.

Gage.—Automatic recording. Installed October 4, 1921.

Channel.—Fairly permanent.

Discharge measurements.—Made by wading or from cable.

Winter conditions.—Ice causes backwater at times during the winter months.

Diversions.—There are several diversions for irrigation above the station.

Discharge measurements of Rio Taos at Los Cordovas, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 10 .....	Mark Lambert .....	1.46	8.4
Jan. 5 .....	..... do .....	1.76	35.5
Apr. 25 .....	Lambert-Archer .....	1.70	25.5
May 23 .....	..... do .....	2.22	107
July 25 .....	..... do .....	1.40	3.1
Sept. 21 .....	..... do .....	1.67	20.0
1924			
Nov. 22 .....	Lambert-Archer .....	1.83	33.5
Jan. 6 .....	Lambert-Neel .....	1.81	35.4
Mar. 1 .....	Mark Lambert .....	1.85	40.8
May 8 .....	..... do .....	2.85	266
Aug. 1 .....	Neel-Marck .....	1.52	12.3
Sept. 27 .....	H. Neel .....	1.59	11.9



Daily discharge in second-feet of Rio Taos at Los Cordovas, N. Mex., for climatic years 1923-24.

[A. Anderson, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	6.8	17	18	33	44	29	27	51	102	11	7.9	14
2.....	7.3	18	22	34	42	27	28	50	98	11	9.3	12
3.....	9.7	18	22	34	45	29	27	58	85	13	10	9.3
4.....	9.7	17	23	35	45	29	25	71	81	10	9.3	7.9
5.....	11	20	22	36	44	28	25	94	72	8.6	10	10
6.....	11	18	22	41	42	29	24	81	63	10	12	11
7.....	9.7	20	24	41	44	29	23	74	54	12	11	8.6
8.....	8.7	18	26	42	44	29	25	87	72	14	14	5.1
9.....	7.9	18	30	45	38	28	25	102	74	12	23	3.0
10.....	7.9	17	25	40	37	27	25	127	78	11	18	8.6
11.....	8.1	16	29	33	33	27	25	138	72	10	16	9.3
12.....	7.3	13	30	31	32	27	26	138	66	8.6	20	8.6
13.....	7.3	15	35	28	30	27	25	155	58	7.9	18	8.6
14.....	7.3	15	42	29	29	27	24	155	44	5.8	11	10
15.....	7.3	17	34	29	29	29	24	122	32	3.7	21	17
16.....	7.3	22	33	28	29	29	24	98	26	8.6	25	17
17.....	9.5	26	32	31	31	27	25	104	23	7.9	23	37
18.....	10	27	25	29	30	26	25	96	20	7.2	46	33
19.....	9.5	28	25	30	31	26	27	98	19	7.9	58	32
20.....	11	26	24	28	33	26	28	124	22	9.3	38	24
21.....	8.1	26	26	28	32	25	35	144	25	10	32	24
22.....	12	26	25	27	33	26	33	149	21	10	26	25
23.....	13	26	25	27	31	28	31	117	18	7.9	25	26
24.....	12	27	26	28	33	26	29	110	18	5.1	23	41
25.....	12	27	24	30	31	28	28	112	18	3.7	20	32
26.....	13	27	23	31	31	29	33	124	16	3.0	20	41
27.....	13	27	26	29	31	28	31	147	14	3.5	20	46
28.....	13	27	27	35	31	27	33	149	13	3.1	16	47
29.....	15	15	26	44	....	27	41	138	12	1.8	16	50
30.....	17	16	35	42	....	25	50	124	11	1.0	15	44
31.....	18	....	32	42	....	25	....	112	....	7.9	14	....
1924												
1.....	33	41	35	40	50	42	39	180	213	14	11	10
2.....	41	41	35	40	49	46	44	182	203	15	11	9.7
3.....	60	40	35	40	48	44	67	197	193	14	155	9.7
4.....	41	40	33	39	45	44	64	247	183	16	29	9.7
5.....	51	40	27	39	42	44	88	285	173	18	15	9.7
6.....	54	49	25	39	40	44	110	289	163	72	15	9.7
7.....	56	46	15	44	38	43	155	278	174	53	12	11
8.....	41	49	43	45	40	38	200	270	197	32	12	11
9.....	30	50	47	46	41	37	247	289	171	38	10	11
10.....	33	51	53	45	41	41	206	293	142	31	9.7	13
11.....	44	52	43	43	42	44	185	358	112	27	9.7	17
12.....	49	53	57	42	42	45	188	396	92	22	11	13
13.....	60	54	44	43	43	44	206	419	87	14	38	13
14.....	47	51	33	44	42	44	266	428	87	12	28	12
15.....	54	54	36	44	42	44	326	457	85	11	19	12
16.....	53	56	37	44	50	44	285	405	82	9.3	18	12
17.....	38	47	38	43	57	44	235	377	73	11	16	13
18.....	36	53	39	44	64	44	188	396	52	9.3	13	14
19.....	31	38	40	45	65	44	177	396	45	10	13	13
20.....	32	46	41	44	66	44	188	372	44	10	11	13
21.....	29	40	41	43	65	44	215	377	40	9.3	10	15
22.....	24	39	41	42	63	44	240	363	36	8.6	9.7	13
23.....	33	39	41	43	60	39	297	348	34	9.3	8.5	13
24.....	56	39	41	44	57	40	345	317	28	10	9.2	13
25.....	51	39	41	44	38	42	315	301	22	10	8.5	12
26.....	38	39	41	44	40	42	285	285	19	10	6.0	11
27.....	36	41	41	45	42	44	255	270	16	11	5.4	12
28.....	39	34	41	46	57	57	228	281	14	14	4.8	12
29.....	43	34	41	45	39	43	201	247	14	16	3.5	12
30.....	42	34	41	45	....	37	174	225	14	14	4.1	12
31.....	41	....	41	47	....	38	....	224	....	13	8.5	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two well defined curves, October 10 to September 21.

1924: Direct from a well defined curve, September 21 to September 27.

Monthly discharge of Rio Taos at Los Cordovas, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	18	6.8	10.3	635
November .....	28	13	21.0	1,250
December .....	42	18	27.0	1,660
January .....	45	27	33.5	2,060
February .....	45	29	35.2	1,950
March .....	29	25	27.4	1,680
April .....	50	23	28.4	1,680
May .....	155	50	111	6,840
June .....	102	11	44.5	2,640
July .....	14	1.0	79.5	488
August .....	58	7.9	20.2	1,240
September .....	37	3.0	22.1	1,310
The year .....	155	1.0	32.4	23,400
1924				
October .....	60	24	42.4	2,510
November .....	56	34	44.3	2,630
December .....	57	15	38.9	2,390
January .....	47	39	43.2	2,660
February .....	66	38	49.4	2,840
March .....	57	37	43.0	2,640
April .....	345	39	191	11,400
May .....	457	180	315	19,300
June .....	213	14	93.6	5,570
July .....	76	8.6	18.2	1,120
August .....	155	3.5	17.2	1,060
September .....	15	9.7	12.1	717
The year .....	457	3.5	75.7	55,000

#### CHAMA RIVER AT EL VADO, N. MEX.

*Location.*—Fifteen miles southwest of Tierra Amarilla, one mile southeast of El Vado, at the mouth of box canon below El Vado Valley. Nutrias Creek, which is the south line of the Tierra Amarilla Land Grant, joins the Chama River from the north four miles below the station. It is located in township 28 north, range 2 east.

*Records available.*—September 28, 1913, to December 31, 1915; February 20, 1920, to September 30, 1924.

*Drainage area.*—650 square miles.

*Gage.*—Automatic recording.

*Channel.*—Permanent.

*Discharge measurements.*—Made by wading and by car and cable.

*Winter conditions.*—Severe ice conditions during winter months.

*Diversions.*—Considerable water is diverted above station for irrigation.



## Discharge Measurements of Chama River at El Vado, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Nov. 1	Mark Lambert	0.16	29.9
Mar. 2	do	0.73	152
May 17	do	5.35	2,077
June 25	do	2.40	567
Aug. 12	do	0.58	121
1924			
Nov. 9	Mark Lambert	0.69	117
Feb. 19	do	0.94	186
June 2	do	3.57	1,152
Aug. 14	do	0.79	157
Aug. 14	do	2.78	130
Sept. 15	do	2.26	31.7

## Daily discharge in second-feet of Chama River at El Vado, N. Mex., for climatic years 1923-24.

[Raymond Sheets, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	52	30	70	108	131	151	316	1,421	1,635	408	93	214
2	51	32	68	109	131	152	333	1,852	1,531	388	91	176
3	51	36	95	109	132	270	349	2,308	1,421	353	104	166
4	52	41	116	110	133	195	366	2,656	1,398	313	98	191
5	52	52	89	111	133	174	383	2,812	1,280	300	152	196
6	52	42	70	112	134	118	399	2,644	1,215	290	132	200
7	51	49	84	112	135	112	416	2,758	1,165	297	146	204
8	52	61	100	113	136	120	432	2,932	1,822	275	161	158
9	51	74	81	114	136	164	450	3,083	1,624	243	174	140
10	52	79	64	115	137	290	466	3,078	1,250	220	220	134
11	52	86	84	115	138	270	480	3,202	1,165	270	140	132
12	52	82	92	116	139	164	499	2,922	1,160	241	152	132
13	54	68	111	117	139	115	515	2,428	1,165	243	224	132
14	52	61	147	118	140	156	532	2,062	1,190	247	323	132
15	52	66	131	118	141	115	549	1,774	1,120	226	302	132
16	54	71	123	119	142	105	697	1,750	1,080	191	302	168
17	55	82	107	120	142	105	910	2,200	1,075	166	736	264
18	55	73	95	120	143	97	1,045	2,608	965	163	428	2,200
19	56	71	90	121	144	95	1,070	2,738	883	146	369	1,442
20	56	74	95	122	145	105	826	3,082	822	146	239	745
21	56	95	100	123	145	166	723	2,746	826	152	206	579
22	56	89	101	123	146	103	674	2,596	715	139	297	542
23	54	94	101	124	147	97	542	2,224	658	117	249	557
24	50	97	102	125	147	115	507	2,338	635	103	196	680
25	44	95	103	126	148	200	575	2,422	594	98	170	528
26	41	84	104	126	149	217	553	2,392	583	98	170	434
27	38	68	104	127	150	233	666	2,326	583	109	284	386
28	36	79	105	128	150	250	796	2,158	528	112	189	382
29	33	94	106	128	.....	266	1,000	2,176	475	114	161	358
30	31	100	107	129	.....	283	1,415	1,679	442	102	174	322
31	30	.....	107	130	.....	300	.....	1,679	.....	95	251	.....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	292	208	117	80	142	185	1,364	1,560	1,232	235	240	22
2	292	221	100	82	144	186	1,418	1,715	1,160	340	125	22
3	382	218	100	84	146	186	1,472	2,292	1,268	310	97	35
4	319	205	104	86	148	187	1,526	3,018	1,346	316	97	18
5	292	195	84	88	150	187	1,580	3,170	1,352	346	98	21
6	305	189	91	90	152	188	1,634	3,246	1,400	260	94	22
7	290	176	96	92	154	188	1,688	3,079	1,376	270	73	22
8	256	178	88	94	156	189	1,742	3,261	1,220	235	72	22
9	239	180	74	96	158	189	1,796	3,474	1,055	206	82	22
10	316	136	74	98	160	190	1,850	3,611	960	349	91	25
11	310	141	74	100	162	243	1,904	3,801	910	382	101	68
12	288	170	73	102	164	296	1,958	3,724	950	245	110	59
13	252	152	73	104	166	349	2,012	3,724	1,075	180	120	48
14	262	150	73	106	168	402	2,446	3,968	1,060	146	130	45
15	264	141	72	108	170	455	2,630	3,694	1,010	122	91	29
16	292	132	72	110	172	508	1,936	3,550	935	115	68	30
17	258	134	72	112	174	561	1,322	3,504	442	129	53	40
18	240	122	71	114	177	614	1,110	3,504	738	112	38	36
19	199	114	71	116	180	667	1,155	3,330	644	92	32	29
20	186	108	71	118	180	720	1,480	3,451	548	72	22	28
21	181	115	70	120	181	773	2,005	3,193	475	70	18	33
22	172	109	70	122	181	826	2,362	2,910	442	58	14	35
23	178	108	70	124	182	879	2,636	2,805	400	48	13	35
24	203	108	71	126	182	932	2,660	2,720	346	45	40	35
25	216	114	72	128	183	986	2,420	2,520	319	52	35	35
26	216	110	73	130	183	1,040	2,590	2,338	285	125	28	36
27	206	104	74	132	184	1,094	1,520	2,238	255	100	20	36
28	192	85	75	134	184	1,148	1,346	2,005	235	436	16	44
29	192	85	76	136	185	1,202	1,140	1,640	215	280	15	30
30	190	85	77	138	.....	1,256	1,292	1,500	210	250	14	29
31	187	.....	78	140	.....	1,310	.....	1,370	.....	325	21	.....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve, June 20 to December 21; interpolate for ice, December 21 to March 2; direct from well defined curve March 2 to November 9.  
1924: Direct from well defined curve for the entire year, interpolating for ice periods.

## Monthly discharge of Chama River at El Vado, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	56	30	49.1	3,020
November .....	100	30	70.8	4,210
December .....	147	64	98.5	6,050
January .....	130	108	119	7,310
February .....	150	131	140	7,800
March .....	300	95	171	10,500
April .....	1,415	316	616	36,700
May .....	3,083	1,421	2,420	148,800
June .....	1,822	442	1,034	61,500
July .....	408	95	205	12,600
August .....	736	91	224	13,700
September .....	2,200	132	401	23,800
The year .....	3,083	30	464	336,000
1924				
October .....	382	172	247	15,210
November .....	221	85	143	8,510
December .....	117	70	79.2	4,870
January .....	140	80	110	6,760
February .....	185	142	168	9,650
March .....	1,310	185	585	35,970
April .....	2,660	1,110	1,766	105,100
May .....	3,968	1,370	2,900	178,300
June .....	1,400	210	795	47,330
July .....	436	48	202	12,400
August .....	240	13	66.7	4,100
September .....	68	18	33.0	1,970
The year .....	3,968	13	593	430,200



## CHAMA RIVER NEAR CHAMITA, N. MEX.

*Location.*—At the Denver & Rio Grande Railroad bridge, four miles above Espanola and half a mile south of Chamita railroad station.

*Records available.*—October 10, 1912, to September 30, 1924.

*Drainage area.*—3,120 square miles.

*Gage.*—Automatic recording. Set to new datum January 27, 1921.

*Channel.*—Shifting.

*Discharge measurements.*—Made by wading or from the railroad bridge.

*Winter conditions.*—Gage heights are affected by ice at times during the winter.

*Diversions.*—Water is diverted for irrigation at several points above the station.

*Discharge measurements of Chama River near Chamita, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
<b>1923</b>			
Oct. 12.....	Mark Lambert	1.91	14.8
Jan. 5.....	..... do	2.68	80.3
Apr. 30.....	Lambert-Archer	4.73	2,447
Aug. 23.....	Lambert-Neel	5.05	727
Sept. 8.....	Lambert-Archer	4.08	148
Sept. 22.....	..... do	4.68	587
<b>1924</b>			
Oct. 30.....	Lambert-Archer	4.10	252
Nov. 22.....	..... do	3.99	187
Dec. 16.....	Mark Lambert	3.81	135
Jan. 8.....	Lambert-Neel	3.40	96.9
Mar. 17.....	Mark Lambert	3.80	217
Apr. 27.....	..... do	5.48	3,981
July 11.....	Lambert-Neel	5.11	345
Sept. 5.....	Mark Lambert	3.82	11.8

*daily discharge in second-feet of Chama River near Chamita, N. Mex., for climatic years 1923-24.*

[H. H. Kramer, Observer.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
<b>1923</b>												
1.....	17	45	179	111	117	350	1,010	2,615	1,560	840	330	400
2.....	19	54	127	107	121	360	1,022	2,615	1,450	850	348	364
3.....	18	53	144	104	126	412	914	2,800	1,475	2,730	366	328
4.....	19	52	121	100	130	742	742	1,905	1,525	1,390	384	292
5.....	16	44	179	96	146	621	632	3,050	1,400	990	402	256
6.....	18	48	186	120	162	577	489	2,950	1,255	865	420	220
7.....	15	53	137	144	178	500	577	2,925	1,160	730	438	184
8.....	15	57	118	141	196	423	896	2,900	1,430	1,315	456	148
9.....	14	62	118	138	213	390	974	2,900	1,580	1,655	474	179
10.....	14	66	103	135	229	412	1,082	3,030	1,000	1,140	492	210
11.....	14	71	98	133	245	786	1,294	3,235	980	890	510	241
12.....	14	76	109	130	186	764	1,307	3,230	1,070	665	528	272
13.....	15	73	121	127	193	566	1,281	3,040	1,130	588	546	303
14.....	25	76	151	124	209	445	1,502	2,935	1,225	511	564	334
15.....	31	76	236	115	236	511	1,593	2,740	1,310	435	582	365
16.....	34	86	263	103	245	423	1,515	2,460	1,400	405	600	396
17.....	34	88	200	124	522	412	1,801	2,425	1,625	335	618	427
18.....	34	94	144	158	926	360	2,139	2,700	1,545	295	636	458
19.....	29	92	98	144	1,022	320	2,320	2,835	1,360	170	654	489
20.....	29	88	86	186	1,046	281	2,165	2,960	1,265	150	672	422
21.....	29	82	86	144	1,154	272	1,866	2,940	1,125	150	690	454
22.....	32	84	88	118	1,106	401	1,736	2,835	1,020	150	708	587
23.....	33	96	96	124	808	456	1,580	2,565	905	168	727	569
24.....	33	144	115	127	731	401	1,320	2,330	845	186	690	551
25.....	34	186	121	144	753	340	1,346	2,320	770	204	652	533
26.....	32	158	98	151	878	500	1,593	2,250	760	222	616	515
27.....	34	124	96	126	753	878	1,684	2,210	670	240	580	497
28.....	37	121	112	100	401	986	1,905	2,105	705	258	544	479
29.....	43	115	80	104	....	1,034	2,126	1,980	715	276	508	462
30.....	43	172	118	109	....	1,034	2,530	1,850	810	294	472	445
31.....	40	....	114	113	....	1,094	....	1,680	....	312	436	....
<b>1924</b>												
1.....	615	243	200	125	134	270	528	3,325	2,506	337	293	8.0
2.....	500	259	228	121	142	275	1,550	3,655	2,424	330	282	7.5
3.....	375	263	221	117	150	301	2,230	4,370	2,342	323	204	8.5
4.....	355	247	207	113	282	357	2,542	5,130	2,260	316	167	12
5.....	345	247	207	109	414	265	2,656	5,330	2,178	310	154	14
6.....	342	239	185	105	546	245	2,770	5,260	2,096	304	154	16
7.....	340	228	176	101	680	235	3,302	5,800	2,014	298	128	18
8.....	325	221	197	97	802	275	3,554	6,520	1,932	292	115	18
9.....	370	214	204	95	935	275	3,986	7,000	1,850	286	107	18
10.....	300	204	162	93	1,075	245	4,130	7,405	1,768	280	115	17
11.....	340	305	168	92	1,178	216	3,986	7,810	1,686	274	128	200
12.....	335	380	142	91	1,282	240	4,058	7,570	1,604	268	107	655
13.....	355	355	154	90	1,386	235	4,130	7,610	1,522	262	168	335
14.....	305	315	154	93	1,490	216	3,950	6,950	1,440	256	180	135
15.....	390	300	154	93	1,594	255	3,770	7,655	1,360	215	148	82
16.....	385	290	152	92	1,697	294	3,590	7,547	1,280	215	148	52
17.....	360	263	152	92	1,800	216	3,410	7,441	1,200	188	148	42
18.....	325	247	150	91	1,433	194	3,158	7,335	1,112	180	141	30
19.....	310	207	154	90	1,066	230	3,158	7,250	1,024	160	128	18
20.....	271	197	168	90	700	245	3,482	6,950	936	141	111	17
21.....	275	194	156	94	650	245	3,554	7,115	848	141	100	17
22.....	221	211	170	98	602	250	3,698	6,835	760	122	74	17
23.....	243	214	164	103	554	245	3,986	6,115	672	103	45	18
24.....	267	214	159	107	506	230	4,418	5,500	584	195	16	18
25.....	275	218	154	111	408	320	4,226	4,210	496	87	15	15
26.....	285	218	149	115	327	790	4,034	3,000	408	79	14	22
27.....	285	228	145	120	308	1,525	3,842	2,916	320	228	14	30
28.....	280	194	141	127	275	1,625	3,600	2,834	320	204	12	30
29.....	251	168	137	129	255	844	3,170	2,752	350	282	10	25
30.....	243	168	133	130	....	620	3,170	2,670	343	282	9.0	22
31.....	235	....	129	132	....	494	....	2,588	....	293	9.0	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve, October 12 to April 30; indirect method for shifting channel, April 30 to October 30.

1924: Direct from three well defined curves, October 30 to October 22.



Monthly discharge of Chama River near Chamita, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	40	14	26.2	1,610
November	186	45	87.9	5,220
December	263	80	134	8,010
January	158	96	126	7,730
February	1,154	117	405	25,900
March	1,094	272	518	31,800
April	2,530	489	1,431	85,200
May	3,235	1,680	2,591	159,000
June	1,625	670	1,169	69,500
July	2,730	150	562	34,500
August	727	330	440	27,000
September	587	179	346	20,600
The year	3,235	14	658	476,000
1924				
October	615	221	326	20,000
November	380	168	242	14,400
December	228	129	167	10,300
January	132	90	105	6,460
February	1,800	134	782	44,960
March	1,675	194	396	24,340
April	4,418	528	3,387	201,550
May	7,810	2,588	5,627	345,900
June	2,506	320	1,279	78,600
July	337	79	231	14,200
August	293	9.0	111	6,830
September	655	7.5	61.9	3,800
The year	7,810	7.5	1,063	771,300

#### EMBUDO CREEK AT DIXON, N. MEX.

*Location.*—About three-eighths of a mile above the confluence of the Rio Grande and about one-fourth mile south of Dixon, New Mexico, in township 22 north, range 10 west, N. M. P. M.

*Records available.*—October 1, 1923 to September 30, 1924.

*Drainage area.*—390 square miles.

*Gage.*—Automatic recording.

*Channel.*—Subject to slight shifts.

*Discharge measurements.*—Made by wading or from highway bridge.

*Winter conditions.*—Ice rarely forms at this station.

*Diversions.*—There are many diversions above the station but none below.

Discharge measurements of Rio Embudo at Dixon, N. Mex., for climatic year 1924.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1924			
Sept. 28	Lambert-Archer	1.16	58.8
Nov. 24	..... do	0.53	36.3
Jan. 7	Lambert-Neel	1.11	43.6
Mar. 17	Mark Lambert	0.92	27.1
Apr. 26	..... do	2.31	444
July 10	Lambert-Neel	1.28	71.3

Daily discharge in second-feet of Rio Embudo at Dixon, N. Mex., for climatic year 1924.

[H. W. Wallace, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	47	44	13	44	53	35	42	288	274	31	2.6	12
2	47	38	9.6	45	60	35	60	290	254	33	2.6	12
3	48	33	10	36	50	39	94	362	325	35	2.6	12
4	49	35	11	37	46	35	110	482	414	33	2.5	12
5	47	37	11	49	45	35	130	523	439	44	2.4	10
6	46	33	12	44	49	33	181	505	497	59	2.3	11
7	53	34	7.8	43	54	34	203	487	447	46	2.2	11
8	60	32	9.6	39	54	38	288	470	417	35	2.1	11
9	74	43	8.4	44	57	34	246	482	388	31	2.0	11
10	98	39	7.0	37	53	36	200	523	268	66	1.9	12
11	122	68	7.0	39	39	40	226	555	181	63	1.9	44
12	120	57	8.0	44	36	40	288	551	172	52	1.9	42
13	130	42	7.6	26	35	39	410	570	172	46	1.9	38
14	122	27	7.6	26	44	50	590	523	163	47	2.0	36
15	135	13	9.6	27	46	53	465	328	166	44	2.0	35
16	127	23	7.8	29	45	50	348	328	135	41	2.0	35
17	127	33	7.8	33	50	33	264	330	110	39	2.0	35
18	120	22	8.4	36	50	43	226	387	96	36	2.0	37
19	120	24	21	45	45	39	209	354	82	33	2.0	37
20	117	19	60	49	45	40	246	320	80	30	2.1	37
21	115	14	76	36	52	40	325	325	71	27	2.1	37
22	117	9.6	54	35	46	37	450	323	62	25	2.1	37
23	166	7.6	38	38	44	27	590	322	53	22	3.2	37
24	146	12	35	40	44	27	668	321	44	19	4.3	38
25	89	15	39	39	42	31	510	320	35	16	5.4	39
26	39	14	45	40	44	33	432	319	27	13	6.5	38
27	37	13	72	44	54	43	387	318	11	11	7.6	38
28	39	12	56	46	53	57	320	309	5.9	8.0	8.7	37
29	40	12	49	46	35	33	290	309	5.2	5.3	10	37
30	37	9.2	49	46	....	33	289	285	12	2.6	11	36
31	43	....	33	49	....	33	....	285	....	2.7	12	....

NOTE—Daily discharge for 1924 determined as follows: Indirect method for shifting channel, September 28 to January 7; direct from well defined curve January 7 to July 10; indirect method for shifting channel, July 10 to October 21.



Monthly discharge of Rio Embudo at Dixon, N. Mex., for climatic year 1924.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1924				
October .....	166	37	86.3	5,310
November .....	68	7.6	27.1	1,610
December .....	76	7.0	25.5	1,570
January .....	49	26	39.7	2,440
February .....	60	35	47.2	2,720
March .....	57	27	37.9	2,330
April .....	668	42	303	18,000
May .....	570	285	390	24,000
June .....	497	5.2	180	10,700
July .....	66	2.6	32.1	1,980
August .....	12	1.9	3.74	230
September .....	44	10	28.8	1,710
The year .....	668	1.9	100	72,600

#### RIO MEDIO ABOVE CUNDIYO, N. MEX.

*Location.*—Three-fourths of a mile above Cundiyo and five miles above Chimo, section 26, township 20 north, range 10 east.

*Records available.*—September 10, 1915, to September 30, 1924.

*Drainage area.*—About 20 square miles. (From Santa Fe sheet U. S. Geological Survey.)

*Gage.*—Vertical staff.

*Channel.*—Permanent at ordinary stages, but likely to shift during floods.

*Discharge measurements.*—Made by wading.

*Winter conditions.*—Ice affects the gage heights during a part of the winter.

*Diversions.*—A small amount of water is diverted for irrigation above the station.

Discharge measurements of Rio Medio above Cundiyo, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Nov. 27 .....	Lambert-Griffin .....	1.19	10.1
Jan. 31 .....	Mark Lambert .....	i	5.1
May 5 .....	do .....	1.60	73.3
July 13 .....	do .....	1.24	16.3
Aug. 28 .....	Lambert-Archer .....	1.07	17.8
1924			
Nov. 26 .....	Lambert-Archer .....	0.93	12.4
Jan. 30 .....	Lambert-Neel .....	i	8.9
Apr. 28 .....	Mark Lambert .....	1.31	52.5
June 9 .....	Lambert-Neel .....	1.57	79.8
Sept. 4 .....	Neel-Marek .....	0.94	6.1

i=Ice.





Daily discharge in second-feet of Rio Medio above Cundiyo, N. Mex., for  
climatic years 1923-24.  
[Marcos Vigil, Observer.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	3.5	5.6	9.7	7.4	5.1	7.0	8.2	86	33	27	19	23
2.....	3.5	5.8	9.6	7.3	5.2	7.0	8.2	116	33	27	19	23
3.....	3.8	5.8	9.5	7.2	5.2	7.1	8.2	116	48	27	18	23
4.....	3.8	5.8	9.4	7.1	5.3	7.2	8.2	130	48	27	17	15
5.....	3.8	5.8	9.4	7.0	5.4	7.3	8.2	148	48	27	17	15
6.....	3.8	5.8	9.3	7.0	5.4	7.4	8.2	86	60	27	16	17
7.....	3.8	5.8	9.2	6.9	5.5	7.4	8.2	86	60	27	15	17
8.....	4.4	6.0	9.2	6.8	5.6	7.5	8.2	101	48	27	15	17
9.....	4.8	6.0	9.1	6.8	5.6	7.6	8.2	116	48	27	14	15
10.....	4.8	6.0	9.0	6.7	5.7	7.6	8.2	116	48	27	14	17
11.....	4.8	6.0	8.9	6.6	5.8	7.7	8.2	116	33	27	18	17
12.....	4.8	7.5	8.8	6.5	5.8	7.8	8.2	116	33	27	20	15
13.....	4.8	7.5	8.8	6.4	5.9	7.8	8.2	72	33	30	26	15
14.....	4.8	7.8	8.7	6.4	6.0	7.9	8.2	86	33	30	20	16
15.....	5.1	7.8	8.6	6.3	6.0	8.0	8.2	86	33	30	20	16
16.....	5.1	7.8	8.6	6.2	6.1	8.0	11	86	33	30	11	16
17.....	5.1	7.8	8.5	6.2	6.2	8.1	16	86	33	30	22	16
18.....	5.1	7.8	8.4	6.1	6.2	8.2	16	86	33	32	22	16
19.....	5.1	7.8	8.3	6.0	6.3	8.2	16	86	33	32	22	16
20.....	5.1	8.1	8.2	5.9	6.4	11	16	48	33	32	22	16
21.....	5.4	8.1	8.2	5.8	6.4	8.2	15	48	33	32	22	16
22.....	5.4	8.1	8.1	5.8	6.5	8.2	20	48	33	32	25	16
23.....	5.4	8.1	8.0	5.7	6.6	8.2	60	40	33	35	25	16
24.....	5.4	8.1	8.0	5.6	6.6	8.2	48	40	27	35	25	16
25.....	5.4	8.1	7.9	5.6	6.7	8.2	48	48	27	35	19	16
26.....	5.4	10	7.8	5.5	6.8	8.2	48	48	27	35	25	15
27.....	5.6	10	7.7	5.4	6.8	8.2	60	48	27	29	25	15
28.....	5.6	9.9	7.6	5.3	6.9	8.2	60	48	27	38	20	16
29.....	5.6	9.8	7.6	5.2	....	8.2	72	40	27	38	20	16
30.....	5.6	9.8	7.5	5.2	....	8.2	86	40	27	32	20	17
31.....	5.6	....	7.4	5.1	....	8.2	....	33	....	20	20	....
1924												
1.....	16	15	50	17	9.5	18	50	50	32	19	19	4.0
2.....	16	27	86	16	9.8	18	50	25	71	27	27	11
3.....	16	15	86	16	10	19	27	46	31	38	11	11
4.....	16	50	86	16	10	19	27	25	31	27	19	2.5
5.....	15	27	122	16	11	19	20	43	31	27	19	4.0
6.....	16	15	27	15	11	20	20	24	31	19	11	4.0
7.....	15	11	20	15	11	20	20	40	30	27	4.0	11
8.....	15	11	20	15	12	20	50	72	30	27	4.0	19
9.....	15	15	27	15	12	20	86	72	87	38	11	19
10.....	16	27	20	14	12	20	86	35	87	27	11	11
11.....	11	11	20	14	12	27	50	23	87	19	11	4.0
12.....	15	20	27	14	13	50	50	33	87	19	19	19
13.....	15	20	27	13	13	27	27	33	87	19	19	27
14.....	11	15	20	13	13	27	50	21	87	27	19	19
15.....	15	11	20	13	14	20	50	31	87	19	11	19
16.....	11	11	27	13	14	20	27	58	87	38	11	27
17.....	8.8	20	27	12	14	20	50	29	87	27	11	19
18.....	15	20	27	12	15	15	86	53	87	27	11	27
19.....	11	27	27	12	15	20	50	28	116	19	4.0	19
20.....	15	27	20	12	15	20	50	20	116	11	4.0	19
21.....	15	20	20	11	15	27	27	28	116	4.0	4.0	19
22.....	11	27	20	11	16	20	50	20	87	4.0	2.5	27
23.....	11	27	19	11	16	20	86	49	87	11	2.5	19
24.....	11	27	19	11	16	27	50	45	87	11	4.0	11
25.....	11	27	19	10	17	27	27	26	87	11	2.5	11
26.....	15	20	18	10	17	15	50	45	87	4.0	2.5	11
27.....	15	20	18	9.7	17	20	20	26	87	11	2.5	11
28.....	11	27	18	9.4	18	20	27	44	87	19	1.7	27
29.....	15	27	18	9.2	18	27	27	25	87	19	2.5	27
30.....	15	20	17	8.9	....	20	26	17	38	11	4.0	11
31.....	15	....	17	9.2	....	27	....	24	....	19	4.0	....

NOTE—Daily discharge for 1923 determined as follows: Indirect method for shifting channel, September 15 to November 27; interpolate for ice, November 27 to March 18; direct from well defined curve, March 18 to July 13; indirect method for shifting channel, July 13 to August 28.

1924: Direct from well defined curve, August 28 to December 20; interpolate December 20 to March 8; direct from well defined curve, March 8 to April 28; indirect method for shifting channel, April 28 to June 9; direct from well defined curve, June 9 to November 2.



Monthly discharge of Rio Medio above Cundiyo, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	5.6	3.5	4.85	298
November .....	10	5.6	7.48	445
December .....	9.7	7.4	8.55	525
January .....	7.4	5.1	6.23	383
February .....	6.9	5.1	6.00	333
March .....	11	7.0	7.94	488
April .....	86	8.2	23.8	1,420
May .....	148	33	79.0	4,860
June .....	60	27	36.4	2,160
July .....	35	20	3.03	1,850
August .....	26	11	19.8	1,220
September .....	23	15	16.7	992
The year .....	148	3.5	20.6	14,370
1924				
October .....	16	8.8	13.8	850
November .....	50	11	21.2	1,260
December .....	122	17	31.9	1,960
January .....	17	8.9	12.7	780
February .....	18	9.5	13.7	786
March .....	50	15	22.2	1,360
April .....	86	20	43.9	2,600
May .....	72	17	35.8	2,200
June .....	116	30	74.6	4,440
July .....	38	4.0	20.2	1,240
August .....	27	1.7	9.31	570
September .....	27	2.5	15.6	930
The year .....	122	1.7	26.2	19,000

#### RIO MEDIO AT CUNDIYO, N. MEX.

*Location.*—At Cundiyo, just below the junction of Rio Frijoles and Rio Medio at the head of a box canon and about four miles above Chimayo, section 28, township 20 north, range 10 east.

*Records available.*—September 10, 1915, to September 30, 1924.

*Drainage area.*—About 38 square miles. (From Santa Fe sheet, U. S. Geological Survey.)

*Gage.*—Vertical staff.

*Channel.*—Probably permanent, except during and after extreme high water.

*Discharge measurements.*—Made by wading.

*Winter conditions.*—Gage heights are affected by ice.

*Diversions.*—A small amount of water is diverted for irrigation above the station.

Discharge measurements of Rio Medio at Cundiyo, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
<b>1923</b>			
Nov. 27	Griffin-Lambert	1.16	16.9
Jan. 31	Mark Lambert	0.96	8.4
May 5	do	1.89	100
July 13	do	1.27	26.7
Aug. 28	do	1.20	23.0
<b>1924</b>			
Nov. 26	Lambert-Archer	1.11	15.7
Jan. 30	Lambert-Neel	i	14.6
Apr. 28	Mark Lambert	1.70	70.6
June 9	Lambert-Neel	1.94	108
Sept. 4	Neel-Marek	1.11	10.5

i=Ice.

Daily discharge in second-feet of Rio Medio at Cundiyo, N. Mex., for climatic years 1923-24.

[Marcos Vigil, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
<b>1923</b>												
1	14	11	14	11	8.5	12	15	55	33	33	38	33
2	14	11	14	11	8.7	13	15	61	33	33	38	38
3	14	11	14	11	8.8	13	15	61	67	33	38	38
4	14	11	14	11	9.0	13	17	61	67	33	38	6.4
5	14	11	14	11	9.1	13	17	80	67	33	38	6.4
6	14	11	14	11	9.2	13	17	88	74	33	28	6.4
7	14	11	14	11	9.4	13	15	95	74	33	38	10
8	14	10	14	11	9.5	13	15	95	74	38	43	10
9	13	10	14	11	9.7	14	15	88	74	38	43	3.6
10	13	10	14	10	9.8	14	15	88	74	38	43	6.4
11	13	10	14	10	9.9	14	15	88	67	38	43	10
12	13	12	13	10	10	14	15	95	67	33	33	6.4
13	13	12	13	10	10	14	15	80	67	33	43	10
14	13	11	13	10	10	14	15	80	67	33	49	10
15	12	11	13	10	10	15	17	80	67	28	55	10
16	12	11	13	9.9	11	15	17	88	67	28	43	10
17	12	11	13	9.8	11	15	20	88	67	28	43	10
18	12	11	13	9.7	11	15	20	88	67	28	43	10
19	12	11	13	9.6	11	15	24	88	67	28	33	10
20	12	11	13	9.5	11	17	20	43	67	28	28	10
21	12	11	12	9.4	11	15	20	43	67	28	33	10
22	12	11	12	9.3	11	15	20	43	67	28	33	10
23	12	11	12	9.2	12	15	33	43	67	28	33	10
24	12	11	12	9.1	12	15	28	43	65	38	33	10
25	12	11	12	9.0	12	15	38	49	65	38	28	10
26	12	15	12	8.9	12	15	43	49	65	28	33	10
27	11	15	12	8.8	12	15	43	43	65	38	28	6.4
28	11	15	12	8.7	12	15	43	43	65	38	33	6.4
29	11	15	12	8.6	....	17	55	43	65	38	28	10
30	11	15	12	8.5	....	15	55	38	65	28	38	10
31	11	....	12	8.4	....	15	....	33	....	38	28	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	11	15	20	17	15	11	6.6	15	28	19	8.8	8.8
2.....	10	28	19	17	15	11	3.7	6.6	38	8.8	8.8	8.8
3.....	10	33	19	17	15	11	10	10	61	7.6	8.8	9.4
4.....	11	20	19	17	15	11	10	15	61	8.8	8.8	8.8
5.....	11	38	19	17	14	11	10	15	102	7.6	9.4	9.4
6.....	12	49	19	17	14	11	2.1	10	87	8.8	9.4	9.4
7.....	11	38	19	17	14	11	3.7	19	102	8.8	8.8	9.4
8.....	11	28	19	17	14	10	6.6	15	118	7.6	7.6	11
9.....	11	28	19	17	14	10	10	15	102	7.6	7.6	11
10.....	11	38	19	17	14	10	15	19	118	8.8	8.8	9.4
11.....	11	20	19	17	14	10	6.6	15	118	9.4	9.4	9.4
12.....	11	28	19	17	14	10	6.6	19	102	9.4	11	19
13.....	11	20	19	16	13	6.6	10	19	87	8.8	19	11
14.....	20	20	19	16	13	6.6	10	15	102	8.8	8.8	19
15.....	15	28	18	16	13	6.6	6.6	19	118	9.4	9.4	19
16.....	20	20	18	16	13	6.6	6.6	19	118	9.4	8.8	11
17.....	15	20	18	16	13	3.7	10	15	102	8.8	8.8	19
18.....	20	20	18	16	13	2.1	3.7	19	118	8.8	7.6	19
19.....	20	28	18	16	13	6.6	6.6	19	118	8.8	7.6	11
20.....	15	28	18	16	13	3.7	3.7	15	102	9.4	6.8	19
21.....	15	20	18	16	12	3.7	3.7	15	118	8.8	6.8	19
22.....	20	20	18	16	12	3.7	6.6	19	118	8.8	7.6	11
23.....	20	28	18	16	12	6.6	10	28	102	8.8	6.8	11
24.....	15	28	18	16	12	6.6	6.6	19	102	7.6	7.6	19
25.....	15	15	18	16	12	3.7	11	10	102	8.8	8.8	11
26.....	20	20	18	15	12	10	10	46	87	7.6	8.8	11
27.....	15	20	18	15	12	10	10	15	102	9.4	7.6	11
28.....	19	20	17	15	12	6.6	6.6	10	87	9.4	6.8	9.4
29.....	20	20	17	15	11	6.6	10	15	102	9.4	7.6	11
30.....	20	20	17	15	....	3.7	10	15	36	8.8	7.6	9.4
31.....	27	20	17	15	....	6.6	....	19	....	8.8	7.6	....

NOTE—Daily discharge for 1923 determined as follows: Indirect method for shifting channel September 15 to November 27; interpolate for ice November 27 to March 11; Direct from well defined curve for the rest of the year.

1924—Direct from two well defined curves for the entire year, interpolating for ice periods.

Monthly discharge of Rio Medio at Cundiyo, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	14	11	12.5	770
November .....	15	10	11.6	690
December .....	14	12	13.0	800
January .....	11	8.4	9.85	606
February .....	12	8.5	10.4	576
March .....	17	12	14.4	880
April .....	55	15	23.7	1,410
May .....	95	33	66.4	4,080
June .....	74	33	65.4	3,890
July .....	38	28	32.8	2,010
August .....	55	28	36.3	2,230
September .....	38	3.6	11.6	680
The year .....	95	3.6	25.7	18,600
1924				
October .....	27	10	15.3	938
November .....	49	15	25.1	1,540
December .....	20	17	18.4	1,060
January .....	17	15	16.2	990
February .....	15	11	13.2	760
March .....	11	2.1	7.65	470
April .....	11	2.1	7.75	460
May .....	46	6.6	16.9	1,040
June .....	118	28	95.3	5,670
July .....	19	7.6	9.05	550
August .....	19	6.8	8.63	530
September .....	19	8.8	12.5	740
The year .....	118	2.1	20.3	14,700

## RIO MEDIO AT CHIMAYO, N. MEX.

Location.—At Chimayo, about 100 feet above the junction of Rio Chiquito and Rio Medio, section 1, township 20 north, range 9 east.

Records available.—September 8, 1915, to September 30, 1924.

Drainage area.—About forty-two square miles. (From Santa Fe sheet, U. S. Geological Survey.)

Gage.—Vertical staff. Gage datum raised 1.72 July 27, 1921.

Channel.—Permanent during ordinary stages. Subject to change during and after floods.

Discharge measurements.—Made by wading.

Winter conditions.—Gage heights not affected by ice.

Diversions.—Some water is diverted for irrigation above the station.

Discharge measurements of Rio Medio at Chimayo, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Nov. 27.....	Lambert-Griffin .....	1.33	12.8
Jan. 31.....	Mark Lambert .....	1.20	5.6
May 5.....	..... do .....	1.85	9.3
July 14.....	..... do .....	1.44	25.3
Aug. 28.....	..... do .....	1.60	9.6
1924			
Nov. 26.....	Lambert-Archer .....	1.79	14.8
Jan. 30.....	Lambert-Neel .....	1.62	10.7
Apr. 28.....	Mark Lambert .....	2.44	65.8
June 9.....	Lambert-Neel .....	2.60	83.3
Sept. 4.....	Neel-Marck .....	1.87	9.2



Daily discharge in second-feet of Rio Medio at Chimayo, N. Mex., for climatic years 1923-24.

[Benjamin Ortega, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	1.5	1.5	11	11	6.0	20	20	82	135	30	1.6	12
2.....	1.5	1.5	11	11	11	20	20	61	135	3.0	5.8	10
3.....	1.5	1.5	11	11	6.0	20	20	61	135	3.0	5.8	10
4.....	1.5	1.5	11	11	11	11	20	82	106	3.0	4.9	8.0
5.....	1.5	1.5	6.0	11	11	6.0	20	106	106	30	4.9	8.0
6.....	1.5	1.5	11	11	11	11	20	106	106	30	1.5	8.0
7.....	1.5	1.5	11	11	6.0	20	20	104	106	44	1.3	8.0
8.....	1.5	2.0	11	11	11	11	20	82	106	44	1.3	10
9.....	1.5	2.0	11	11	11	6.0	20	106	106	3.0	4.2	8.0
10.....	1.5	3.0	6.0	11	11	6.0	20	82	106	3.0	17	8.0
11.....	1.5	2.0	11	11	20	6.0	30	82	106	11	3.8	8.0
12.....	1.5	2.0	11	6.0	11	6.0	30	167	82	44	3.8	8.0
13.....	1.5	2.0	6.0	10	11	6.0	25	135	82	30	2.0	8.0
14.....	1.5	2.0	11	10	11	6.0	20	167	82	21	3.2	8.0
15.....	1.5	3.0	11	11	11	20	30	135	82	21	4.2	10
16.....	1.5	3.0	11	11	11	20	30	135	82	21	2.9	8.0
17.....	1.5	3.0	11	11	20	20	30	135	82	16	3.8	8.0
18.....	1.5	3.0	11	11	20	20	30	135	82	16	2.7	8.0
19.....	1.5	3.0	11	11	20	11	30	167	82	20	4.8	20
20.....	1.5	3.0	11	11	20	11	44	167	44	5.1	26	16
21.....	1.5	3.0	11	11	20	11	44	135	44	18	9.0	16
22.....	1.5	3.0	11	11	20	20	61	200	61	5.1	4.0	16
23.....	1.5	3.0	11	11	11	20	61	200	61	1.7	35	10
24.....	1.5	6.0	11	11	11	20	61	200	30	1.7	35	12
25.....	1.5	6.0	11	11	11	20	82	167	41	1.7	32	12
26.....	1.5	6.0	11	11	11	11	61	167	41	8.0	32	10
27.....	1.5	6.0	11	20	11	20	82	135	41	8.0	1.4	10
28.....	1.5	6.0	11	20	20	20	135	200	30	8.0	4.6	12
29.....	1.5	6.0	11	20	....	20	106	167	30	6.7	4.6	12
30.....	1.5	11	11	11	....	11	82	167	30	1.7	5.3	12
31.....	1.5	....	11	6.0	....	20	....	135	....	1.7	12	....
1924												
1.....	16	24	24	16	8.0	8.2	14	59	85	46	19	19
2.....	16	24	24	16	8.0	6.0	14	59	85	46	19	11
3.....	16	24	24	20	8.2	6.0	14	59	71	46	19	11
4.....	16	24	24	20	8.0	6.2	24	66	70	36	19	11
5.....	16	24	24	20	8.2	6.2	24	65	54	46	19	11
6.....	16	24	24	20	8.2	6.2	106	65	23	19	19	11
7.....	16	24	24	20	8.2	6.2	106	65	23	19	19	11
8.....	16	24	24	20	8.2	6.2	106	65	23	27	19	11
9.....	16	24	20	20	8.2	16	106	65	19	27	19	11
10.....	16	24	20	20	8.2	16	106	65	19	19	19	11
11.....	59	20	20	20	8.2	16	106	154	27	27	19	11
12.....	59	20	20	20	8.2	16	106	154	57	27	19	11
13.....	59	20	20	20	8.2	16	106	154	46	19	19	11
14.....	59	14	20	20	8.2	16	106	154	19	19	19	11
15.....	59	14	20	20	8.2	16	106	154	27	19	19	11
16.....	59	14	20	20	8.2	12	106	154	57	27	19	11
17.....	24	14	20	20	8.0	12	106	153	46	19	19	11
18.....	24	14	20	20	8.0	12	106	153	46	27	19	11
19.....	24	14	20	20	8.0	12	106	153	57	46	19	11
20.....	24	14	20	20	8.2	12	106	153	57	46	19	11
21.....	24	14	20	21	8.2	12	106	153	46	46	19	11
22.....	26	14	20	21	8.2	12	106	153	46	46	19	11
23.....	26	14	20	20	8.2	12	106	152	46	36	19	11
24.....	24	19	20	19	8.2	12	106	152	57	57	19	11
25.....	24	24	21	16	8.2	12	106	152	57	57	19	11
26.....	24	24	21	16	8.2	12	106	152	57	57	19	2.4
27.....	24	24	16	8.0	8.2	12	59	152	46	57	19	4.6
28.....	24	24	16	8.0	8.2	12	59	152	46	46	19	4.6
29.....	24	24	16	8.0	8.2	12	59	151	46	46	19	4.6
30.....	24	24	16	8.0	....	12	59	151	46	46	19	4.6
31.....	24	....	16	8.0	....	12	....	151	....	46	19	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve September 15 to July 14. Indirect method for shifting channel July 14 to August 28.

1924—Direct from a well defined curve August 28 to April 28; Indirect method for shifting channel April 28 to June 9; Direct from well defined curve June 9 to September 4.

Monthly discharge of Rio Medio at Chimayo, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	1.5	1.5	1.50	92.2
November .....	11	1.5	3.31	197
December .....	11	6.0	10.5	646
January .....	20	6.0	11.5	706
February .....	20	6.0	13.0	724
March .....	20	6.0	14.4	892
April .....	135	20	42.5	2,500
May .....	200	61	135	8,300
June .....	135	30	78.7	4,700
July .....	44	1.7	14.8	913
August .....	35	1.3	9.04	556
September .....	20	8.0	10.5	623
The year .....	200	1.3	28.9	20,800
1924				
October .....	59	16	28.3	1,740
November .....	24	14	20.1	1,190
December .....	24	16	20.4	1,260
January .....	20	8.0	17.6	1,080
February .....	8.2	8.0	8.16	470
March .....	16	6.0	11.5	704
April .....	106	14	85.1	5,060
May .....	154	59	124	7,610
June .....	85	19	46.8	2,800
July .....	57	19	37.0	2,300
August .....	19	19	19.0	1,170
September .....	19	2.4	10.1	604
The year .....	154	2.4	35.8	26,000

# RIO FRIJOLES AT CUNDIYO, N. MEX.

Location.—About one mile above Cundiyo and five miles above Chimayo, section 33, township 20 north, range 10 east.

Records available.—September 9, 1915, to September 30, 1924.

Drainage area.—About 13 square miles. (From Santa Fe sheet, U. S. Geological Survey.)

Gage.—Vertical staff.

Channel.—Permanent.

Discharge measurements.—Made by wading.

Winter conditions.—Ice affects the gage heights during a part of the winter.

Diversions.—No water is diverted for irrigation above the station.

Discharge measurements of Rio Frijoles at Cundiyo, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Nov. 27.....	Lambert-Griffin .....	0.60	6.2
Jan. 31.....	Mark Lambert .....	i	2.3
May 5.....	..... do .....	0.96	34.3
July 13.....	..... do .....	0.54	7.8
Aug. 28.....	..... do .....	0.48	5.8
1924			
Nov. 26.....	Lambert-Archer .....	0.50	5.2
Jan. 30.....	Lambert-Neel .....	i	3.3
Apr. 28.....	Mark Lambert .....	0.88	27.5
June 9.....	Lambert-Neel .....	0.97	31.0
Sept. 4.....	Neel-Marek .....	0.42	2.6

i=Ice.



Daily discharge in second-feet of Rio Frijoles at Cundiyo, N. Mex., for climatic years 1923-24.

[Marcos Vigil, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	2.2	2.6	6.0	4.1	2.4	4.2	5.4	56	38	14	14	11
2.....	2.2	2.7	5.9	4.0	2.4	4.3	5.4	70	38	14	14	7.0
3.....	2.2	2.9	5.8	4.0	2.5	4.4	5.4	70	29	14	14	7.0
4.....	2.2	3.0	5.8	3.9	2.5	4.4	7.0	79	29	14	14	11
5.....	2.2	3.1	5.7	3.9	2.6	4.5	7.0	79	29	14	14	11
6.....	2.2	3.3	5.7	3.8	2.7	4.6	7.0	56	29	14	14	11
7.....	2.2	3.4	5.6	3.7	2.7	4.6	7.0	52	26	14	14	11
8.....	2.2	3.6	5.5	3.7	2.8	4.7	7.0	52	26	11	14	7.0
9.....	2.2	3.7	5.5	3.6	2.8	4.8	5.4	52	22	11	16	7.0
10.....	2.2	3.8	5.4	3.6	2.9	4.8	5.4	52	26	11	14	11
11.....	2.2	4.0	5.4	3.5	3.0	4.9	5.4	47	26	11	14	11
12.....	2.2	4.1	5.3	3.4	3.0	5.0	5.4	47	26	11	14	11
13.....	2.2	4.3	5.2	3.4	3.1	5.0	5.4	52	26	11	16	11
14.....	2.2	4.4	5.2	3.3	3.2	5.1	5.4	52	22	11	14	7.0
15.....	2.2	4.5	5.1	3.3	3.2	5.2	11	52	22	11	14	7.0
16.....	2.2	4.7	5.1	3.2	3.3	5.3	11	56	26	11	11	11
17.....	2.2	4.8	5.0	3.1	3.4	5.3	14	56	19	11	11	11
18.....	2.2	5.0	4.9	3.1	3.4	5.4	14	56	19	11	7.0	11
19.....	2.2	5.1	4.9	3.0	3.5	3.8	14	56	19	11	11	7.0
20.....	2.2	5.2	4.8	3.0	3.6	3.8	16	47	19	11	16	7.0
21.....	2.2	5.4	4.8	2.9	3.6	3.8	16	52	19	11	16	11
22.....	2.2	5.5	4.7	2.8	3.7	3.8	19	47	16	11	16	11
23.....	2.2	5.7	4.6	2.8	3.8	3.8	22	47	19	7.0	16	7.0
24.....	2.2	5.8	4.6	2.7	3.9	3.8	16	47	19	11	11	11
25.....	2.2	5.9	4.5	2.7	3.9	5.4	16	52	16	11	16	11
26.....	2.2	6.1	4.5	2.6	4.0	5.4	19	52	16	11	11	16
27.....	2.2	6.2	4.4	2.5	4.1	5.4	22	47	16	11	16	11
28.....	2.2	6.1	4.3	2.5	4.1	3.8	22	47	16	14	16	11
29.....	2.2	6.1	4.3	2.4	....	5.4	38	47	16	11	16	3.4
30.....	2.3	6.0	4.2	2.4	....	5.4	38	38	16	14	16	15
31.....	2.5	....	4.2	2.3	....	5.4	....	38	....	14	16	....
1924												
1.....	10	1.7	9.0	3.0	3.3	2.2	15	10	15	10	10	2.0
2.....	15	3.0	5.3	3.0	3.2	2.2	20	15	20	15	15	2.0
3.....	15	5.1	9.0	3.0	3.2	2.2	20	15	15	15	10	0.6
4.....	10	5.7	9.0	3.0	3.2	2.1	20	20	20	10	10	2.0
5.....	6.2	9.6	9.0	3.0	3.1	2.1	15	20	26	10	6.0	0.7
6.....	6.2	5.7	5.3	3.0	3.1	2.1	6.0	26	26	6.0	10	0.7
7.....	6.2	3.0	9.0	3.1	3.0	2.0	6.0	34	20	10	10	0.7
8.....	3.4	3.0	9.0	3.1	3.0	2.0	10	34	20	10	6.0	0.7
9.....	6.2	3.0	9.0	3.1	3.0	10	15	26	15	6.0	6.0	2.8
10.....	10	5.7	2.8	3.1	2.9	10	20	26	10	6.0	6.0	2.8
11.....	10	3.0	2.2	3.1	2.9	15	20	10	15	6.0	10	6.8
12.....	15	3.0	2.8	3.1	2.8	15	26	15	10	10	15	11
13.....	15	5.7	2.8	3.1	2.8	15	26	10	10	15	11	11
14.....	10	5.7	2.8	3.1	2.8	10	20	34	10	10	15	11
15.....	15	3.0	2.8	3.1	2.7	10	26	34	10	6.0	10	11
16.....	15	3.0	2.8	3.2	2.7	15	42	6.0	15	10	6.8	6.8
17.....	6.2	3.0	2.8	3.2	2.6	15	20	34	6.0	15	6.0	6.8
18.....	3.4	3.0	2.9	3.2	2.6	10	26	26	10	10	6.0	11
19.....	15	5.7	2.9	3.2	2.6	15	20	34	6.0	10	2.0	6.8
20.....	1.8	3.0	2.9	3.2	2.5	10	15	34	2.0	6.0	2.0	11
21.....	1.8	3.0	2.9	3.2	2.5	10	20	26	6.0	6.0	6.0	11
22.....	3.4	5.7	2.9	3.2	2.4	15	20	26	6.0	10	6.0	6.8
23.....	6.2	3.0	2.9	3.2	2.4	10	15	34	10	10	6.0	11
24.....	6.2	3.0	2.9	3.2	2.4	15	20	42	10	6.0	6.0	11
25.....	10	3.0	2.9	3.3	2.4	15	20	20	10	10	2.0	6.8
26.....	10	5.3	2.9	3.3	2.3	20	15	26	6.0	10	6.0	6.8
27.....	10	2.8	3.0	3.3	2.3	20	15	15	10	10	6.0	6.8
28.....	10	2.8	3.0	3.3	2.3	15	10	15	6.0	10	6.0	6.8
29.....	14	5.3	3.0	3.3	2.2	15	6.0	20	10	15	10	6.8
30.....	5.7	5.3	3.0	3.3	....	10	10	26	6.0	15	10	6.8
31.....	1.7	....	3.0	3.3	....	15	....	20	....	10	0	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve September 15 to October 29; Interpolate for ice October 29 to March 18; Direct from well defined curve March 18 to August 28; Indirect method for shifting channel August 28 to November 26.

1924—Direct from fairly well defined curve November 26 to December 12; Interpolate for ice December 12 to March 8. Direct from two well defined curves March 8 to November 3.

Monthly discharge of Rio Frijoles at Cundiyo, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	2.5	2.2	2.21	136
November .....	6.2	2.6	4.56	272
December .....	6.0	4.2	5.06	311
January .....	4.1	2.3	3.20	196
February .....	4.1	2.4	3.21	178
March .....	5.4	3.8	4.69	288
April .....	38	5.4	13.5	776
May .....	79	38	53.0	3,280
June .....	38	16	22.8	1,360
July .....	14	7.0	11.8	728
August .....	16	7.0	14.1	865
September .....	16	3.4	9.85	586
The year .....	79	2.2	12.4	9,000
1924				
October .....	15	1.7	8.82	542
November .....	9.6	1.7	4.09	244
December .....	9.0	2.2	4.40	270
January .....	3.3	3.0	3.15	194
February .....	3.3	2.2	2.73	160
March .....	20	2.0	10.5	650
April .....	26	6.0	16.7	990
May .....	42	10	25.3	1,560
June .....	26	2.0	11.7	700
July .....	15	6.0	9.93	610
August .....	15	2.0	8.06	500
September .....	11	2.0	6.29	374
The year .....	42	1.7	9.35	6,800

### RIO CHIQUITO AT CORDOVA, N. MEX.

*Location.*—About one mile above Cordova and five miles above Chimayo, section 12, township 20 north, range 10 east.

*Records available.*—September 6, 1915, to September 30, 1924.

*Drainage area.*—About 34 square miles. (From Santa Fe sheet, U. S. Geological Survey.)

*Gage.*—Vertical staff.

*Channel.*—Permanent during ordinary stages.

*Discharge measurements.*—Made by wading.

*Winter conditions.*—Ice affects the gage heights during a part of the winter.

*Diversions.*—Several miles above the station water is diverted for irrigation of lands on Truchas Mesa.

*Discharge measurements of Rio Chiquito at Cordova, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Jan. 31.....	Mark Lambert .....	i	2.4
May 5.....	..... do .....	1.79	19.9
July 13.....	..... do .....	1.57	5.2
Aug. 28.....	Lambert-Archer .....	1.59	8.5
Sept. 5.....	Homer Neel .....	1.45	2.4
1924			
Nov. 26.....	Lambert-Archer .....	1.59	5.3
Jan. 30.....	Lambert-Neel .....	i	2.4
Apr. 28.....	Mark Lambert .....	1.70	16.4
June 9.....	Lambert-Neel .....	1.85	26.2
Sept. 4.....	Homer Neel .....	1.45	2.4

i=Ice.



Daily discharge in second-feet of Rio Chiquito at Cordova, N. Mex., for climatic years 1923-24.

[Emilio Cordova, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	2.2	2.0	1.0	2.0	2.5	3.5	3.5	21	44	6.5	21	6.5
2.....	2.2	2.0	1.0	2.0	2.6	3.5	3.5	21	44	6.5	21	6.5
3.....	2.2	2.0	1.6	2.0	2.7	3.5	3.5	21	44	6.5	21	6.5
4.....	2.2	2.0	1.6	2.0	2.8	3.5	3.5	21	57	6.5	21	6.5
5.....	2.2	2.0	1.6	2.0	2.9	3.5	3.5	21	57	6.5	12	6.5
6.....	2.2	2.0	1.6	2.0	3.0	3.5	3.5	21	57	6.5	12	6.5
7.....	2.2	1.8	1.6	2.1	3.1	3.5	6.5	21	57	6.5	6.5	6.5
8.....	2.0	1.6	1.6	2.1	3.2	3.5	6.5	21	57	6.5	6.5	6.5
9.....	2.0	1.6	1.7	2.1	3.3	3.5	6.5	21	44	6.5	6.5	3.5
10.....	2.0	1.6	1.7	2.1	3.4	3.5	6.5	21	33	6.5	6.5	3.5
11.....	2.0	1.6	1.7	2.1	3.5	3.5	6.5	21	33	6.5	6.5	3.5
12.....	2.0	1.6	1.7	2.1	3.5	3.5	6.5	33	33	3.5	44	3.5
13.....	2.0	1.6	1.7	2.1	3.5	3.5	6.5	33	33	3.5	12	3.5
14.....	2.0	1.6	1.7	2.2	3.5	3.5	6.5	33	33	3.5	6.5	3.5
15.....	2.0	1.6	1.7	2.2	3.5	3.5	6.5	33	33	3.5	6.5	3.5
16.....	2.0	1.6	1.8	2.2	3.5	3.5	6.5	33	21	6.5	6.5	3.5
17.....	2.0	1.6	1.8	2.2	3.5	3.5	6.5	33	21	12	6.5	6.5
18.....	2.0	1.6	1.8	2.2	3.5	3.5	6.5	33	21	21	6.5	6.5
19.....	2.0	1.6	1.8	2.2	3.5	3.5	6.5	33	21	21	8.8	4.7
20.....	2.0	1.6	1.8	2.2	3.5	3.5	6.5	33	21	21	8.8	4.7
21.....	2.0	1.6	1.8	2.2	3.5	3.5	6.5	44	21	21	8.8	4.7
22.....	2.0	1.6	1.8	2.3	3.5	3.5	12	44	21	21	8.6	4.7
23.....	2.0	1.6	1.8	2.3	3.5	3.5	12	44	21	21	8.8	4.7
24.....	2.0	1.6	1.9	2.3	3.5	3.5	12	44	21	21	6.5	4.7
25.....	2.0	1.6	1.9	2.3	3.5	3.5	12	44	21	21	6.5	4.7
26.....	1.8	1.3	1.9	2.3	3.5	3.5	12	44	21	21	6.5	4.7
27.....	1.8	1.2	1.9	2.3	3.5	3.5	21	44	21	21	6.5	4.7
28.....	1.8	1.0	1.9	2.3	3.5	3.5	21	44	12	21	6.5	4.7
29.....	1.8	1.0	1.9	2.4	....	3.5	21	44	12	21	6.5	4.7
30.....	1.8	1.0	1.9	2.4	....	3.5	21	44	12	21	6.5	4.7
31.....	1.8	....	2.0	2.4	....	3.5	....	44	....	21	6.5	....
1924												
1.....	6.5	3.5	12	5.9	2.7	7.5	40	53	20	12	18	4.8
2.....	6.5	3.5	12	5.8	2.9	16	40	52	33	13	18	4.8
3.....	6.5	3.5	12	5.7	3.0	16	40	52	33	15	12	4.8
4.....	6.5	3.5	13	5.5	3.2	16	64	52	31	12	12	4.8
5.....	6.5	3.5	13	5.4	3.4	16	40	51	31	12	12	4.8
6.....	12	3.5	12	5.3	3.5	16	40	51	28	12	12	4.8
7.....	3.5	3.5	13	5.2	3.7	16	40	46	29	12	12	9.7
8.....	3.5	3.5	12	5.1	3.8	16	40	45	29	12	12	9.7
9.....	3.5	3.5	12	4.9	4.0	20	16	49	25	14	12	9.7
10.....	3.5	3.5	12	4.8	4.2	20	16	49	25	12	12	9.7
11.....	6.5	3.5	12	4.7	4.3	20	16	54	24	13	15	9.7
12.....	6.5	3.5	13	4.6	4.5	20	16	54	25	12	15	9.7
13.....	3.5	3.5	13	4.5	4.6	20	16	55	25	9.7	15	9.7
14.....	6.5	3.5	13	4.3	4.8	20	16	56	25	9.7	22	7.1
15.....	6.5	3.5	13	4.2	5.0	20	16	56	23	9.7	22	7.1
16.....	6.5	3.5	13	4.1	5.1	16	16	56	22	9.7	22	7.1
17.....	6.5	3.5	7.5	4.0	5.3	16	16	53	21	9.7	9.7	7.1
18.....	6.5	6.5	7.4	3.9	5.5	16	16	53	20	12	9.7	7.1
19.....	6.5	9.0	7.3	3.7	5.6	16	13	53	21	12	9.7	7.1
20.....	6.5	9.0	7.2	3.6	5.8	16	16	51	19	15	9.7	2.5
21.....	1.6	12	7.1	3.5	6.0	16	16	51	18	15	9.7	1.6
22.....	1.6	12	7.0	3.4	6.2	16	16	51	18	15	9.7	1.6
23.....	1.6	12	6.9	3.2	6.3	45	16	45	15	15	9.7	1.6
24.....	1.6	12	6.8	3.1	6.5	45	40	49	15	15	5.7	1.6
25.....	3.5	12	6.7	3.0	6.7	45	40	72	15	18	7.1	1.6
26.....	3.5	12	6.6	2.8	6.8	45	40	70	12	18	7.1	1.6
27.....	3.5	12	6.5	2.7	7.0	45	40	70	12	22	7.1	1.6
28.....	3.5	12	6.4	2.6	7.2	45	40	70	12	22	7.1	1.6
29.....	3.5	12	6.3	2.5	7.3	45	40	68	11	22	7.1	1.6
30.....	3.5	12	6.2	2.4	....	40	40	42	11	18	7.1	1.6
31.....	3.5	....	6.1	2.6	....	40	....	35	....	18	4.8	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve September 15 to December 5; Interpolate for ice December 5 to March 20; Direct from well defined curve March 20 to September 30.

1924—Direct from well defined curve September 30 to December 17; Interpolate for ice December 17 to March 1; Direct from well defined curve March 1 to April 28; Indirect method for shifting channel April 28 to June 9; Direct from well defined curve June 9 to November 3.

Monthly discharge of Rio Chiquito at Cordova, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October .....	2.2	1.8	2.01	123
November .....	2.2	1.0	1.60	95.3
December .....	2.0	1.0	1.72	105
January .....	2.4	2.0	2.18	134
February .....	3.5	2.5	3.30	183
March .....	3.5	3.5	3.50	215
April .....	21	3.5	8.75	521
May .....	44	21	32.6	2,010
June .....	57	12	32.3	1,920
July .....	21	3.5	12.8	789
August .....	44	6.5	10.5	644
September .....	6.5	3.5	4.98	296
The year .....	57	1.0	9.72	7,035
1924				
October .....	12	1.6	4.88	300
November .....	12	3.5	6.80	405
December .....	13	6.1	9.74	599
January .....	5.9	2.4	4.09	252
February .....	7.3	2.7	5.16	297
March .....	45	7.5	24.7	1,520
April .....	64	13	28.7	1,710
May .....	70	35	53.7	3,300
June .....	33	11	21.6	1,290
July .....	22	9.7	19.3	1,190
August .....	22	4.8	11.7	722
September .....	9.7	1.6	5.29	313
The year .....	70	1.6	16.4	11,900

### RIO CHIQUITO AT CHIMAYO, N. MEX.

Location.—At Chimayo, about 40 feet above the junction of Rio Medio and Rio Chiquito, section 1, township 20 north, range 9 east.

Records available.—September 7, 1915, to September 30, 1924.

Drainage area.—About 45 square miles. (From Santa Fe sheet, U. S. Geological Survey.)

Gage.—Vertical staff. Established January 28, 1921. Datum raised 0.22.

Channel.—Shifting.

Discharge measurements.—Made by wading.

Winter conditions.—Gage heights not affected by ice.

Diversions.—Almost the entire flow is diverted for irrigation above this station during the irrigation season.



Discharge measurements of Rio Chiquito at Chimayo, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Nov. 27	Mark Lambert	1.29	1.0
Jan. 31	do	1.28	1.1
May 5	do	1.30	0.2
July 14	do	1.30	0.2
Aug. 28	Lambert-Archer	1.11	0.4
1924			
Nov. 26	Lambert-Archer	1.31	0.5
Jan. 30	Lambert-Neel	....	3.2
Apr. 28	Mark Lambert	1.30	0.4
June 9	Lambert-Neel	1.36	0.6
Sept. 4	Neel-Marck	1.60	2.6

Daily discharge in second-feet of Rio Chiquito at Chimayo, N. Mex., for climatic years 1923-24.

[Benjamin Ortega, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	0.3	0.9	0.9	0.4	0.9	0.9	0.9	0.7	0.9	2.5	0.5	0.5
2	.3	.4	.9	.4	.9	.9	.9	.7	.9	.6	.5	.5
3	.3	.4	.9	.4	.9	.9	1.2	.7	.9	.6	.5	11
4	.3	.4	.9	.4	.9	.9	1.2	.7	.9	.6	.5	2.6
5	.3	.4	.9	.4	.9	.9	1.2	.3	.6	.6	8.2	.5
6	.3	.4	.9	.4	.9	.9	1.2	.6	.6	2.5	8.2	11
7	.4	.4	.9	.4	.9	.9	1.2	.6	.6	2.5	8.2	11
8	.4	.4	.9	.4	.9	.4	1.2	.6	.6	2.5	1.0	11
9	.4	.2	.9	.4	.9	.4	1.2	2.5	.6	.6	1.0	.1
10	.4	.2	.4	.4	.9	.4	1.2	.6	.9	.6	1.0	.2
11	.4	.2	.9	.4	8.5	.4	1.2	.6	.9	.6	1.0	.2
12	.4	.4	.9	.4	.9	.4	1.2	.9	.6	.6	.5	.2
13	.4	.4	.4	.4	.9	.4	1.2	.9	.6	.6	1.0	.2
14	.4	.4	.9	.4	.9	.4	1.2	.9	.6	.3	1.0	.2
15	.4	.9	.9	.4	.9	.9	1.2	2.5	.6	.6	.5	.5
16	.4	.9	.9	.4	.9	.9	.7	2.5	.6	.6	.5	.4
17	.4	.9	.9	.9	.9	.9	.7	2.5	.6	.6	.5	.5
18	.4	.9	.9	.4	.9	.9	.7	2.5	.6	.6	.5	.4
19	.4	.9	.9	.4	.9	.9	.7	2.5	.6	.6	.5	.5
20	.4	.9	.9	.4	.9	.9	1.2	2.5	.9	9.8	.5	.5
21	.4	.9	.9	.4	.9	.9	1.2	2.5	.9	.6	.5	.5
22	.3	.9	.9	.4	.9	.9	3.5	7.6	.6	.6	.5	.5
23	.4	.9	.9	.4	.9	.9	3.5	.9	.6	.6	.5	.4
24	.4	.9	.9	.4	.9	.9	3.5	.9	2.5	.6	.5	.4
25	.4	.9	.9	.4	.9	.8	.7	.9	.6	11	.5	.4
26	.4	.4	.9	.4	.9	.9	.7	.9	.6	11	.5	.5
27	.4	.4	.9	.9	.9	.9	1.2	.9	.6	10	.2	.5
28	.4	.4	.4	.9	.9	.9	.7	2.5	2.5	2.5	.2	.5
29	.9	.4	.4	.9	....	.9	.7	2.5	2.5	.6	.2	.5
30	.9	.9	.4	.4	....	.9	.7	.9	2.5	.6	.5	.5
31	.9	....	.4	....	....	.9	....	2.5	....	.6	....	....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	8.2	1.0	0.5	0.4	3.1	0.3	37	0.5	32	0.5	2.5	0.6
2	8.2	1.0	.5	.4	3.0	.2	37	.5	32	.5	2.5	.6
3	8.2	1.0	.5	.5	2.9	.2	37	.5	.2	.5	2.5	.6
4	8.2	1.0	.5	.6	2.8	.2	60	.5	.2	.5	2.5	2.5
5	8.2	1.0	.5	.7	2.7	.2	60	.5	.2	.5	2.5	.6
6	8.2	.4	.5	.8	2.6	.2	32	.5	.2	.5	2.5	.6
7	8.3	.4	.5	.9	2.5	.2	32	.5	.2	.5	2.5	.6
8	8.2	0.4	0.5	1.0	2.4	0.2	32	0.5	0.2	0.5	2.5	0.6
9	8.2	0.4	0.5	1.1	2.3	0.2	32	0.5	0.2	0.5	2.5	0.6
10	8.3	0.4	0.4	1.2	2.2	0.2	32	0.5	0.2	0.5	2.5	0.6
11	7.5	0.2	0.4	1.3	2.1	0.2	32	22	0.2	0.5	2.5	0.6
12	7.5	0.2	0.4	1.4	2.0	0.2	32	22	0.2	0.5	2.5	0.6
13	7.7	0.2	0.4	1.5	1.9	0.2	32	22	0.2	0.5	2.5	0.6
14	7.5	0.2	0.4	1.6	1.8	0.2	32	22	0.2	0.5	2.5	0.6
15	7.7	0.2	0.4	1.7	1.7	0.2	32	22	0.2	0.5	2.5	0.6
16	7.7	0.2	0.4	1.8	1.6	0.2	32	22	0.2	2.5	2.5	0.6
17	1.0	0.2	0.4	1.9	1.5	0.2	32	22	0.2	2.5	2.5	0.6
18	1.0	0.3	0.4	2.0	1.4	0.2	32	11	0.2	2.5	2.5	0.6
19	1.0	0.3	0.4	2.1	1.3	0.2	32	11	0.5	2.5	2.5	0.6
20	1.0	0.3	0.4	2.2	1.2	0.2	0.5	11	0.5	2.5	2.5	0.6
21	1.0	0.3	0.4	2.3	1.1	0.2	0.5	11	0.5	2.5	2.5	0.6
22	1.0	0.3	0.4	2.4	1.0	0.2	0.5	11	0.4	2.5	2.5	0.6
23	1.0	0.3	0.4	2.5	0.9	0.2	0.5	11	0.4	2.5	2.5	0.6
24	1.3	0.4	0.4	2.6	0.8	0.2	0.5	11	0.4	2.5	2.5	0.6
25	1.3	0.4	0.4	2.7	0.7	0.2	0.5	11	0.4	2.5	2.5	0.6
26	1.3	0.5	0.5	2.8	0.6	0.2	0.5	11	0.5	2.5	2.5	0.6
27	1.3	0.5	0.5	2.9	0.5	0.2	0.5	11	0.5	2.5	2.5	0.6
28	1.0	0.5	0.4	3.0	0.4	0.2	0.5	11	0.5	2.5	0.6	2.5
29	1.0	0.5	0.4	3.1	0.3	0.2	0.5	11	0.5	2.5	0.6	2.5
30	1.0	0.5	0.4	3.2	....	0.2	0.5	11	0.5	2.5	0.6	2.5
31	1.0	....	0.4	3.2	....	0.2	....	11	....	2.5	0.6	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two fairly well defined curves September 15 to July 14; Indirect method for shifting channel July 14 to November 26.

1924—Direct from two fairly well defined curves for the entire year.

Monthly discharge of Rio Chiquito at Chimayo, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	0.9	0.3	0.42	26.2
November	0.9	0.2	0.60	35.5
December	0.9	0.4	0.80	49.4
January	0.9	0.4	0.46	28.6
February	8.5	0.9	1.15	64.1
March	0.9	0.4	0.78	48.3
April	3.5	0.7	1.26	75.0
May	7.6	0.3	1.59	97.8
June	2.5	0.6	0.92	54.9
July	11	0.3	2.16	133
August	8.2	0.2	1.32	80.9
September	11	0.1	1.89	112
The year	11	0.1	1.11	806
1924				
October	8.3	1.0	4.64	286
November	1.0	0.2	0.43	26.8
December	0.5	0.4	0.43	26.8
January	3.2	0.3	1.80	111
February	3.1	0.2	1.70	97.8
March	0.3	0.5	0.20	12.5
April	60	0.5	22.8	1,350
May	22	0.5	10.1	621
June	32	0.2	2.43	145
July	2.5	0.5	1.53	94.2
August	2.5	0.6	2.25	139
September	2.5	0.6	0.85	50.8
The year	60	0.2	4.07	2,961



## SANTA FE CREEK ABOVE RESERVOIR, NEAR SANTA FE, N. MEX.

*Location.*—Five miles east of Santa Fe, one and one-half miles above the storage reservoir and one-fourth mile above the head of the supply ditch of the Santa Fe Water and Light Company, in section 22, township 17 north, range 10 east.

*Records available.*—April 24, 1913, to September 30, 1924.

*Drainage area.*—22.5 square miles.

*Gage.*—Automatic recording.

*Channel.*—Permanent at high stages.

*Winter flow.*—Ice causes backwater during the winter months.

*Diversions.*—No diversions above this station.

*Discharge measurements of Santa Fe Creek above Reservoir near Santa Fe, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Nov. 8.....	Lambert-Griffin .....	0.84	1.05
Dec. 29.....	Lambert-Cantelou .....	i 0.84	1.5
Jan. 30.....	Mark Lambert .....	i	1.8
Apr. 24.....	Lambert-Archer .....	1.33	21.4
May 22.....	do .....	1.47	29.1
May 28.....	Archer-Lambert .....	1.45	29.5
June 11.....	Lambert-Archer .....	1.22	13.2
June 20.....	do .....	1.24	13.0
July 12.....	do .....	1.04	4.7
July 24.....	do .....	0.93	2.5
Aug. 2.....	do .....	0.92	2.4
Aug. 21.....	do .....	1.04	4.0
Sept. 24.....	Mark Lambert .....	1.04	3.2
1924			
Oct. 27.....	Mark Lambert .....	0.99	1.6
Nov. 21.....	Lambert-Archer .....	1.00	2.7
Dec. 28.....	do .....	0.97	2.5
Feb. 9.....	do .....	0.94	2.1
Mar. 8.....	do .....	1.08	2.6
Apr. 15.....	Lambert-Neel .....	1.45	31.4
May 10.....	Neel-Lambert .....	1.50	38.3
June 10.....	Lambert-Archer .....	1.41	27.0
July 1.....	Lambert-Neel .....	1.05	6.4
July 22.....	Mark Lambert .....	0.99	3.9
Sept. 6.....	do .....	0.85	1.3

i=Ice.

*Daily discharge in second-feet of Santa Fe Creek above Reservoir near Santa Fe, N. Mex., for climatic years 1923-24.*  
[Hydrographers, Observers.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	0.7	0.9	1.3	1.5	1.9	3.5	5.4	21	24	3.2	2.2	5.6
2.....	0.7	1.0	1.3	1.5	1.9	3.6	5.5	20	23	3.6	2.0	5.3
3.....	0.7	1.0	1.3	1.5	2.0	3.7	5.5	21	22	5.7	2.2	5.3
4.....	0.7	1.1	1.3	1.6	2.0	3.7	5.6	23	21	4.9	2.4	4.4
5.....	0.7	1.1	1.3	1.6	2.1	3.8	5.6	24	20	3.2	1.8	5.3
6.....	0.7	1.1	1.3	1.6	2.2	3.8	5.7	24	19	5.3	1.8	6.1
7.....	0.7	1.1	1.3	1.6	2.2	3.9	5.8	24	18	3.2	2.2	4.4
8.....	0.7	1.2	1.3	1.6	2.2	4.0	5.8	25	17	2.0	2.7	3.8
9.....	0.7	1.2	1.4	1.6	2.3	4.0	5.9	26	16	2.9	2.7	3.1
10.....	0.7	1.2	1.4	1.6	2.4	4.1	6.0	29	15	2.7	2.4	3.1
11.....	0.7	1.2	1.4	1.6	2.5	4.1	6.1	31	14	4.0	2.2	3.0
12.....	0.7	1.2	1.4	1.6	2.5	4.2	6.6	31	14	4.9	2.0	2.9
13.....	0.7	1.0	1.4	1.6	2.6	4.3	8.0	31	14	3.1	1.9	2.9
14.....	0.7	0.8	1.4	1.6	2.6	4.3	8.5	31	13	2.8	1.9	3.0
15.....	0.8	0.9	1.4	1.7	2.6	4.4	9.6	31	12	2.6	1.8	3.8
16.....	0.8	0.8	1.4	1.7	2.7	4.4	10	31	12	3.1	3.1	3.8
17.....	0.8	0.8	1.4	1.7	2.8	4.5	11	31	12	3.2	4.0	6.1
18.....	0.8	0.8	1.4	1.7	2.8	4.6	14	30	11	2.8	8.5	6.1
19.....	0.8	0.7	1.4	1.7	2.9	4.6	15	30	10	2.9	8.5	5.3
20.....	0.8	0.7	1.4	1.7	3.0	4.7	16	30	12	3.1	7.4	3.8
21.....	0.8	0.8	1.4	1.7	3.1	4.7	17	30	10	3.2	6.3	3.0
22.....	0.8	0.8	1.5	1.7	3.1	4.8	18	30	7.4	2.9	12	2.9
23.....	0.8	0.8	1.5	1.7	3.2	4.9	23	29	7.0	2.7	10	3.0
24.....	0.8	0.8	1.5	1.7	3.2	4.9	23	29	6.6	2.4	11	3.1
25.....	0.7	0.8	1.5	1.8	3.3	5.0	23	33	6.1	2.2	8.8	3.1
26.....	0.7	0.7	1.5	1.8	3.4	5.0	23	36	6.1	2.0	8.4	3.0
27.....	0.7	0.8	1.5	1.8	3.4	5.1	23	31	5.3	6.1	7.7	3.0
28.....	0.8	1.0	1.5	1.8	3.5	5.2	22	29	4.5	5.7	6.8	3.0
29.....	0.8	1.3	1.5	1.8	....	5.2	21	27	3.6	2.9	6.8	3.1
30.....	0.8	1.3	1.5	1.8	....	5.3	21	26	3.2	2.6	7.3	3.0
31.....	0.9	....	1.5	1.8	....	5.3	....	25	....	2.4	6.3	....
1924												
1.....	3.1	2.1	9.4	2.5	2.2	2.5	17	44	40	5.2	7.1	3.8
2.....	3.2	2.3	9.4	2.5	2.2	2.5	17	47	36	5.2	5.6	3.5
3.....	3.2	2.1	3.3	2.5	2.2	2.5	22	60	29	4.9	5.2	3.3
4.....	3.2	2.1	2.9	2.4	2.1	2.5	26	62	40	4.9	5.2	3.1
5.....	3.5	2.1	3.9	2.4	2.1	2.5	32	93	39	4.9	4.6	2.6
6.....	3.1	1.9	5.1	2.4	2.1	2.6	89	86	39	4.6	4.0	1.6
7.....	3.0	2.1	2.2	2.4	2.1	2.6	116	82	39	4.0	3.8	1.5
8.....	2.8	2.1	2.3	2.4	2.1	2.6	120	69	39	4.0	3.8	1.4
9.....	3.0	2.3	2.1	2.4	2.1	3.1	104	47	39	4.3	3.8	1.3
10.....	3.5	2.5	2.1	2.4	2.1	3.6	100	42	32	4.6	3.8	1.4
11.....	3.0	1.6	2.1	2.4	2.1	4.1	96	42	26	4.6	4.6	1.9
12.....	2.5	10	2.2	2.4	2.1	4.6	89	44	24	4.3	4.3	1.7
13.....	2.8	8.9	2.2	2.4	2.1	5.1	96	51	24	4.0	3.8	1.6
14.....	3.0	8.0	2.2	2.4	2.2	5.6	120	60	24	4.6	3.8	1.5
15.....	3.2	7.0	2.2	2.3	2.2	6.1	116	65	20	6.5	3.8	1.5
16.....	2.5	6.0	2.2	2.3	2.2	6.6	93	62	18	7.1	3.5	1.6
17.....	2.2	4.9	2.3	2.3	2.2	7.2	62	62	17	6.2	3.5	2.6
18.....	2.1	4.9	2.3	2.3	2.2	7.8	51	69	15	5.6	3.5	1.6
19.....	2.1	4.9	2.3	2.3	2.2	8.4	47	89	13	4.6	3.5	1.5
20.....	2.1	4.9	2.3	2.3	2.3	9.0	44	89	12	4.3	3.5	1.6
21.....	2.1	2.9	2.3	2.3	2.3	9.6	58	89	12	4.0	3.5	1.4
22.....	2.0	2.5	2.4	2.3	2.3	10	65	86	8.6	3.8	3.5	1.6
23.....	2.1	2.3	2.4	2.3	2.3	11	96	89	7.1	3.5	3.8	1.6
24.....	2.1	2.3	2.4	2.2	2.3	11	108	72	6.5	4.0	3.8	1.6
25.....	2.1	2.5	2.4	2.2	2.4	12	86	65	6.2	4.6	3.5	1.6
26.....	2.1	2.3	2.5	2.2	2.4	16	60	60	4.9	8.1	3.8	1.5
27.....	2.1	5.8	2.5	2.2	2.4	18	51	58	4.3	13	3.8	1.5
28.....	2.0	9.4	2.5	2.2	2.4	19	47	53	4.0	9.6	3.5	1.6
29.....	1.9	9.4	2.5	2.2	2.4	21	40	51	4.0	7.1	3.8	1.5
30.....	2.0	9.4	2.5	2.2	....	18	42	49	4.0	6.8	3.5	1.5
31.....	2.1	....	2.5	2.2	....	17	....	47	....	6.5	3.5	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve, September 25 to November 30; interpolate for ice, November 30 to April 11; direct from two well defined curves, April 11 to October 27.

1924: Direct from well defined curve, October 27 to December 9; interpolate for ice, December 9 to March 25; direct from well defined curve, March 25 to November 24.



Monthly discharge of Santa Fe Creek above Reservoir near Santa Fe, N. Mex.,  
— for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	0.9	0.7	0.75	42.2
November	1.3	0.7	0.95	56.8
December	1.5	1.3	1.41	86.7
January	1.8	1.5	1.67	103
February	3.5	1.9	2.67	148
March	5.3	3.5	4.44	273
April	23	5.4	12.5	741
May	36	20	28.0	1,720
June	24	3.2	14.6	870
July	5.7	2.0	3.36	207
August	12	2.0	5.00	308
September	6.1	2.9	3.91	233
The year	36	0.7	6.62	4,790
1924				
October	3.5	1.9	2.57	158
November	16	1.9	4.86	289
December	9.4	2.1	2.96	182
January	2.5	2.2	2.33	143
February	2.4	2.1	2.22	133
March	21	2.5	8.19	504
April	120	17	70.3	4,185
May	89	42	64.0	3,935
June	40	4.0	20.9	1,243
July	13	3.5	5.46	336
August	7.1	3.5	4.02	247
September	3.8	1.3	1.86	111
The year	120	1.3	15.8	11,460

#### RIO JEMEZ NEAR SAN YSIDRO, N. MEX.

*Location.*—On the White Pine Co. R. R. bridge about three-eighths of a mile south of San Ysidro in section 6, township 15 north, range 2 east, N. M. P. M.

*Records available.*—December 13, 1923, to September 30, 1924.

*Drainage area.*—1158 square miles.

*Gage.*—Automatic recording.

*Channel.*—Shifting.

*Discharge measurements.*—Made by wading or from bridge.

*Winter flow.*—Ice may affect gage heights during winter months.

*Discharge measurements of Rio Jemez near San Ysidro, N. Mex., for climatic year 1924.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
<b>1924</b>			
Dec. 13	Lambert-Archer	1.09	33.5
Jan. 28	Lambert-Neel	1.10	36.9
Mar. 14	Mark Lambert	1.23	72.4
May 3	Lambert-Archer	1.80	492
June 6	do	1.09	68.7
July 14	Mark Lambert	0.90	41.8

Daily discharge in second-feet of Rio Jemez near San Ysidro, N. Mex., for  
climatic year 1924.

[J. M. Miller, Observer.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
<b>1924</b>												
1				44	50	56	115	530	55	32	121	26
2				45	59	73	175	530	58	970	220	25
3				45	53	64	241	530	61	1,080	271	25
4				46	48	64	340	550	64	200	192	25
5				46	42	42	500	590	67	70	113	25
6				47	33	59	502	640	68	70	35	26
7				48	42	48	504	690	80	70	33	26
8				48	35	48	506	680	64	70	32	26
9				49	45	48	508	760	67	70	32	26
10				49	61	73	510	690	67	70	32	26
11				50	56	83	512	640	61	70	32	26
12				50	53	53	514	540	55	70	28	28
13			34	51	61	80	516	382	55	70	28	27
14			35	51	86	67	518	318	58	70	28	27
15			35	52	80	70	520	284	61	77	27	27
16			36	52	83	35	522	245	60	43	27	27
17			36	53	103	67	524	215	56	52	26	27
18			37	54	119	56	527	105	43	42	26	27
19			37	54	107	56	530	91	40	40	25	27
20			38	55	107	73	530	84	40	37	25	27
21			38	55	115	64	530	74	39	36	25	27
22			39	56	131	64	530	70	38	34	25	27
23			39	56	123	68	530	66	38	31	26	26
24			40	57	95	72	530	66	36	31	27	26
25			40	57	42	76	530	62	34	37	27	27
26			41	58	42	79	530	59	32	155	32	27
27			42	58	64	83	530	55	32	258	29	28
28			42	59	33	87	530	44	32	88	27	28
29			43	48	48	91	530	46	32	50	26	27
30			43	45	....	95	530	49	32	52	26	27
31			44	45	....	76	....	52	....	51	26	....

NOTE—Daily discharge for 1924 determined as follows: Direct from two well defined curves, December 13 to October 10.

Monthly discharge of Rio Jemez near San Ysidro, N. Mex., for climatic year 1924.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1924				
December 13-31	44	34	38.9	1,470
January	59	44	51.1	3,140
February	131	33	69.9	4,000
March	95	35	63.6	4,100
April	530	115	480	28,590
May	760	44	314	19,310
June	80	32	50.8	3,020
July	1,080	31	132	8,120
August	271	25	53.2	3,270
September	28	25	26.5	1,580
The period	1,080	25	127	76,600



## RIO PUERCO AT RIO PUERCO, N. MEX.

*Location.*—At the Atchison, Topeka and Santa Fe Railroad bridge at Rio Puerco, N. M., in section 31, township 7 north, range 1 west, 6 miles below the mouth of the San Jose River.

*Records available.*—September 7, 1910, to October 2, 1911; August 19, 1912, to September 30, 1924.

*Drainage area.*—About 4,800 square miles.

*Gage.*—Automatic Recording.

*Channel.*—Shifting.

*Discharge measurements.*—Made by wading or from bridge.

*Winter conditions.*—Ice rarely affects the gage heights.

*Discharge measurements of Rio Puerco at Rio Puerco, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 4.....	Mark Lambert	9.93	e 0.5
Dec. 7.....	do	10.12	4.8
Mar. 16.....	do	10.00	1.0
June 18.....	do	....	Dry
Sept. 30.....	do	....	2.5
1924			
Sept. 30.....	Mark Lambert	....	2.5
Oct. 27.....	do	2.73	2.1
Jan. 25.....	do	i	2.5
Mar. 5.....	do	1.40	8.0
Apr. 4.....	do	1.94	130
May 1.....	Lambert-Archer	1.76	36.2
May 22.....	do	1.47	9.0
July 23.....	Mark Lambert	....	Dry
Sept. 18.....	do	....	Dry

e=Estimated.  
i=Ice.

*Daily discharge, in second-feet of Rio Puerco at Rio Puerco, N. Mex., for climatic years 1923-24.*

[Hydrographers, Observers.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1....	0.5	2.4	4.4	1.0	0.1	0.1	0.2	0	0	0	0.2	74
2....	0.5	2.4	4.5	0.8	0.1	0.1	0.2	0	0	0	0.2	71
3....	0.5	2.5	4.6	0.7	0.1	0.1	0.2	0	0	0	0.2	69
4....	0.5	2.6	4.7	0.6	0.1	0.1	0.2	0	0	0	0.2	66
5....	0.6	2.6	4.7	0.4	0.1	0.1	0.2	0	0	0	0.2	64
6....	0.6	2.7	4.8	0.2	0.1	0.1	0.2	0	0	0	0.2	61
7....	0.7	2.8	4.8	0.1	0.1	0.1	0.2	0	0	0	0.2	59
8....	0.7	2.8	4.6	0.1	0.1	0.1	0.2	0	0	0	0.2	56
9....	0.8	2.9	4.5	0.3	0.1	0.1	0.2	0	0	48	0.5	54
10....	0.9	3.0	4.3	0.2	0.1	0.1	0.2	0	1.2	1.2	0.5	52
11....	0.9	3.0	4.2	0.2	0.1	0.1	0.2	0	1.0	0.3	87	49
12....	1.0	3.1	4.0	0.1	0.1	0.1	0.3	0	1.0	48	128	47
13....	1.0	3.2	3.8	0.1	0.1	0.1	0.3	0	0.2	0.3	350	44
14....	1.1	3.3	3.7	0.1	0.1	0.1	0.2	0	0.2	0.2	19	42
15....	1.2	3.3	3.6	0.1	0.1	0.1	0.2	0	0.2	0.2	83	39
16....	1.2	3.4	3.4	0.1	0.1	1.5	0.2	0	0.2	0.2	63	37
17....	1.3	3.5	3.2	0.1	0.1	0.3	0.2	0	0	0.2	91	34
18....	1.4	3.5	3.1	0.1	0.1	0.3	0.2	0	0	0.2	106	32
19....	1.4	3.6	3.0	0.1	0.1	0.3	0.2	0	0	0.2	83	29
20....	1.5	3.7	2.8	0.1	0.1	1.5	0.2	0	0	0.2	87	27
21....	1.6	3.8	2.6	0.1	0.1	1.5	0.2	0	0	0.2	73	24
22....	1.6	3.8	2.5	0.1	0.1	0.2	0.2	0	0	0.2	58	22
23....	1.7	3.9	2.4	0.1	0.1	0.2	0.2	0	0	0.2	63	20
24....	1.8	4.0	2.2	0.1	0.1	0.2	0.2	0	0	0.2	61	17
25....	1.9	4.0	2.0	0.1	0.1	0.2	0.2	0	0	0.2	24	15
26....	1.9	4.1	1.9	0.1	0.1	0.2	0.2	0	0	0.2	1.4	12
27....	2.0	4.2	1.8	0.1	0.1	0.2	0.2	0	0	0.2	9.5	9.8
28....	2.1	4.2	1.6	0.1	0.1	0.2	0.2	0	0	0.2	5.1	7.4
29....	2.1	4.3	1.4	0.1	....	0.2	0	0	0	0.3	0.7	5.0
30....	2.2	4.4	1.3	0.1	....	0.2	0	0	0	0.2	143	2.5
31....	2.3	....	1.2	0.1	....	0.2	....	0	....	0.2	76	....
1924												
1....	2.5	2.0	3.0	2.7	3.2	7.2	28	37	2.5	25	0	0
2....	2.4	318	3.0	2.7	3.3	7.4	31	31	2.0	40	0	0
3....	2.4	13	3.0	2.7	3.4	7.6	31	40	1.5	34	0	0
4....	2.3	3.4	3.0	2.7	3.5	7.9	142	76	1.1	250	0	0
5....	2.3	2.0	3.0	2.7	3.6	8.2	233	31	0.7	1,158	0	0
6....	2.2	2.4	3.0	2.7	3.8	11	401	52	0.3	250	0	0
7....	2.2	2.0	3.0	2.7	3.9	5.4	385	64	0.2	108	0	0
8....	2.1	2.0	3.0	2.7	4.0	6.0	494	150	0.2	40	0	0
9....	2.1	2.4	3.0	2.6	4.1	8.2	553	166	0.1	7.0	0	0
10....	2.1	2.4	3.0	2.6	4.2	6.0	502	200	0	1.0	0	0
11....	2.0	60	2.9	2.6	4.3	5.4	401	275	0	0	0	2,040
12....	1.9	579	2.9	2.6	4.4	6.0	351	267	0	0	0	983
13....	1.9	26	2.9	2.6	4.5	7.6	250	267	0	0	0	490
14....	1.8	12	2.9	2.6	4.6	5.7	351	259	0	0	0	150
15....	1.8	15	2.9	2.6	4.7	3.9	359	418	0	0	0	70
16....	1.7	11	2.9	2.6	4.8	5.2	250	150	0	0	0	10
17....	1.7	8.8	2.9	2.6	4.9	3.1	309	37	0	0	0	4.0
18....	1.6	8.8	2.9	2.6	5.0	4.3	250	26	0	0	0	3.0
19....	1.6	4.3	2.9	2.6	5.1	8.2	88	25	0	0	0	1.0
20....	1.5	4.3	2.8	2.5	5.2	5.0	100	34	0	0	0	0
21....	1.5	3.1	2.8	2.5	5.4	12	100	30	0	0	0	0
22....	1.4	3.1	2.8	2.5	5.6	7.6	88	15	0	0	0	0
23....	1.4	3.1	2.8	2.5	5.8	6.8	100	7.4	0	0	0	0
24....	1.4	3.1	2.8	2.5	6.0	5.4	242	9.7	0	0	0	0
25....	1.3	3.1	2.8	2.5	6.2	5.0	217	8.2	0	0	0	0
26....	1.3	3.1	2.8	2.6	6.4	12	301	6.5	0	0	0	0
27....	1.2	3.1	2.8	2.7	6.6	108	351	5.0	0	0	0	0
28....	1.2	3.1	2.8	2.8	6.8	183	292	3.0	0	0	0	0
29....	1.0	3.1	2.8	2.9	7.0	233	125	2.0	0	0	0	0
30....	0.8	3.0	2.8	3.0	....	175	38	2.2	0	0	0	0
31....	1.2	....	2.7	3.1	....	164	....	2.8	....	0	0	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two fairly well defined curves for the entire year, interpolating for ice periods.  
1924: Direct from a well defined curve for the entire year, interpolating for ice periods.



Monthly discharge of Rio Puerco at Rio Puerco, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	2.3	0.5	1.27	78.3
November	4.4	2.4	3.37	200
December	4.8	1.2	3.28	201
January	1.0	0.1	0.21	13.0
February	0.1	0.1	0.10	5.6
March	1.5	0.1	0.33	18.0
April	0.2	0	0.19	11.3
May	0	0	0.00	0
June	1.2	0	0.13	7.9
July	48	0	3.27	201
August	350	0.2	52.1	3,200
September	74	2.5	38.0	2,260
The year	350	0	8.57	6,196.1
1924				
October	2.5	0.8	1.73	107
November	579	2.0	37.0	2,200
December	3.0	2.8	2.89	178
January	3.1	2.5	2.65	163
February	7.0	3.2	4.83	278
March	233	3.1	33.5	2,060
April	553	28	245	14,600
May	418	2.0	87.0	5,350
June	2.5	0	0.28	17.0
July	1,158	0	61.5	3,780
August	0	0	0.00	0
September	2,040	0	125	7,440
The year	2,040	0	49.8	36,170

#### BLUEWATER CREEK NEAR BLUEWATER, N. MEX.

**Location.**—About two and one-half miles southwest of Bluewater post office, one-fourth mile from the mouth of Bluewater Creek box canon, 8 miles below the dam site of the Bluewater Development Company, near section 8, township 12 north, range 11 west.

**Records available.**—May 29, 1912, to June 28, 1919; April 6, 1921, to September 30, 1924.

**Drainage area.**—56 square miles.

**Gage.**—Automatic recording.

**Channel.**—Permanent.

**Discharge measurements.**—Made by wading.

**Winter flow.**—Ice affects gage heights during winter months.

**Diversions.**—Most of the water is diverted for irrigation near Bluewater. The Bluewater Project proposes to store the entire flow in a reservoir, the site for which is at the head of Bluewater Canon, about 8 miles above the station.

Discharge measurements of Bluewater Creek near Bluewater, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 3	Mark Lambert	1.01	e 0.50
Dec. 6	do	1.33	2.2
Feb. 11	do	i	1.1
June 19	do	0.93	e 0.3
Sept. 10	do	1.33	2.3
1924			
Dec. 30	Mark Lambert	3.44	96.3
Apr. 4	do	4.20	259
July 24	do	0.78	e 0.4
Sept. 19	do	0.96	0.7

e=Estimated.

i=Ice.

Daily discharge in second-feet of Bluewater Creek near Bluewater, N. Mex., for climatic years 1923-24.

[Wilford Young, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	0.2	0.5	1.7	3.7	1.8	30	91	9.1	1.3	0.3	4.4	8.8
2	0.2	0.5	1.9	3.6	1.7	38	71	11	4.4	0.5	3.8	5.8
3	0.2	0.6	1.9	3.5	1.7	47	77	9.1	4.4	1.0	2.3	6.1
4	0.2	0.6	1.9	3.5	1.6	54	71	6.8	4.3	1.7	1.6	7.9
5	0.2	0.6	2.0	3.4	1.6	62	56	7.0	1.4	1.2	3.2	6.8
6	0.3	0.7	2.0	3.4	1.5	69	56	5.5	1.0	1.2	2.5	8.2
7	0.5	0.7	1.6	3.3	1.4	76	60	7.0	0.5	0.7	2.5	7.4
8	0.6	0.8	1.2	3.2	1.4	84	79	6.8	0.4	0.9	8.2	6.2
9	0.2	0.8	0.8	3.2	1.3	91	76	6.4	0.7	2.3	3.4	3.2
10	0.2	0.9	0.7	3.1	1.2	98	64	5.6	0.5	1.5	1.5	2.6
11	0.2	0.9	1.0	3.1	1.8	86	50	5.3	0.3	0.5	0.9	2.4
12	0.2	1.0	1.1	3.0	3.4	74	53	5.3	0.2	0.7	12	4.1
13	0.2	1.0	2.5	2.9	5.0	62	43	3.9	0.3	1.5	7.4	1.4
14	0.2	1.1	3.5	2.9	7.0	50	32	4.8	0.3	1.0	7.0	0.8
15	1.0	1.1	4.4	2.8	8.0	38	31	5.5	0.4	2.3	5.3	0.9
16	1.8	1.1	4.5	2.8	10	26	32	5.6	0.2	2.8	12	0.7
17	0.3	1.2	4.5	2.7	12	14	32	5.5	0.3	2.6	15	2.6
18	0.2	1.2	4.4	2.6	15	14	34	5.5	0.7	3.2	19	162
19	0.2	1.3	4.4	2.6	19	15	26	4.3	1.1	2.1	29	133
20	0.2	1.3	4.3	2.5	22	16	28	3.8	0.4	2.6	14	104
21	0.5	1.4	4.3	2.5	26	16	29	4.1	0.5	2.1	11	75
22	0.2	1.4	4.2	2.4	29	17	22	4.0	0.1	2.2	9.7	46
23	0.2	1.5	4.2	2.3	33	17	23	4.9	0.3	2.4	9.7	17
24	0.2	1.5	4.1	2.3	36	18	23	4.3	0.1	2.8	6.1	14
25	0.2	1.6	4.1	2.2	20	22	22	4.5	0.8	5.3	5.8	12
26	0.2	1.6	4.0	2.2	4.3	27	17	3.9	0.1	8.4	9.4	0.4
27	0.2	1.7	4.0	2.1	13	40	14	4.2	0.4	10	7.2	6.9
28	0.3	1.7	3.9	2.0	22	52	11	4.1	0.3	20	6.8	4.4
29	0.3	1.7	3.8	2.0	....	71	11	4.2	0.2	10	6.2	1.9
30	0.4	1.8	3.8	1.9	....	71	8.8	3.1	0.1	7.3	3.5	0.5
31	0.4	....	3.7	1.9	....	99	....	2.1	....	5.5	12	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	0.7	5.3	10	54	16	37	18	27	1.2	0.3	0.5	0.5
2.....	.9	18	4.7	54	2.9	24	46	26	1.6	.4	.6	.3
3.....	.8	20	3.5	54	3.8	25	51	27	2.8	.6	1.5	.5
4.....	.9	14	3.0	54	2.2	19	82	24	1.8	.4	8.6	.4
5.....	.8	12	3.0	54	4.7	21	302	23	1.0	.5	3.0	.4
6.....	1.3	10	3.9	54	8.0	22	341	28	1.0	.5	.4	.4
7.....	1.2	9.0	5.6	47	9.8	29	315	21	.6	.6	.4	.2
8.....	1.2	10	3.0	48	24	20	318	19	3	.6	.2	.2
9.....	1.0	11	2.3	40	52	20	195	19	5	.7	.3	.3
10.....	1.4	8.2	4.7	46	77	22	147	18	.5	.7	1.3	.5
11.....	1.9	9.6	7.0	55	53	25	141	9.0	.4	.8	.6	1.8
12.....	2.1	11	9.2	42	56	20	232	6.2	.4	.9	.5	.2
13.....	1.5	12	8.4	38	57	18	252	9.2	.4	.9	.9	.4
14.....	2.4	14	14	33	56	17	191	5.3	.8	.4	.8	.3
15.....	4.3	15	15	28	81	5.4	112	4.3	.9	.4	.6	.4
16.....	5.3	17	11	23	67	3.2	84	6.2	1.0	.4	.8	.3
17.....	4.0	18	14	18	61	2.6	108	4.0	1.1	.8	.4	.3
18.....	2.3	13	18	14	58	4.0	78	1.3	.4	.8	.4	.4
19.....	3.0	13	12	9.4	51	3.9	47	1.7	.4	1.5	.6	1.0
20.....	2.6	12	7.6	5.4	54	4.6	40	4.0	.4	1.4	.6	1.2
21.....	2.1	13	5.6	3.4	58	6.0	35	2.6	.6	1.5	.5	.8
22.....	2.1	11	3.5	3.5	61	4.7	36	2.0	.8	1.8	.6	.6
23.....	1.2	11	13	2.7	53	3.6	35	1.2	.6	1.9	.8	1.1
24.....	.9	11	9.0	2.2	52	3.5	24	1.5	.8	.6	.6	2.1
25.....	.9	12	5.4	2.7	56	9.2	28	1.5	.5	.2	.5	1.6
26.....	.7	5.4	8.8	4.7	64	16	32	2.0	.4	.3	.6	.6
27.....	.8	6.2	9.8	3.0	54	35	57	4.0	.4	.3	.5	.4
28.....	.5	8.2	103	2.6	62	33	54	1.5	.6	.3	.5	.4
29.....	.5	9.2	60	3.8	61	9.0	38	1.6	.5	.4	.4	.4
30.....	.4	12	78	7.8	....	6.2	36	1.0	.3	.4	.4	.4
31.....	1.4	....	54	12	....	8.8	....	1.2	....	.4	.4	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two well defined curves, August 1 to December 16; interpolate for ice, December 16 to March 17; direct from well defined curve, March 17 to September 10.  
1924: Direct from well defined curve for the entire year.

Monthly discharge of Bluewater Creek near Bluewater, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	1.8	0.2	0.33	20.6
November .....	1.8	0.5	1.12	67.0
December .....	4.5	0.7	3.04	180
January .....	3.7	1.9	2.76	170
February .....	36	1.2	11.2	600
March .....	99	14	48.2	2,960
April .....	91	8.8	41.4	2,460
May .....	11	3.8	5.39	332
June .....	4.4	0.1	0.73	43.4
July .....	20	0.3	3.41	210
August .....	29	0.9	7.81	480
September .....	162	0.5	22.1	1,310
The year .....	162	0.1	12.2	8,830
1924				
October .....	5.3	0.5	1.65	101
November .....	20	5.3	11.7	696
December .....	103	2.3	16.5	1,015
January .....	55	2.2	26.4	1,620
February .....	81	2.2	45.3	2,610
March .....	37	2.6	15.4	947
April .....	341	18	116	1,015
May .....	28	1.0	9.78	601
June .....	2.8	0.2	0.75	45.6
July .....	1.9	0.2	0.72	43.0
August .....	8.6	0.2	0.93	57.1
September .....	2.1	0.2	0.58	34.7
The year .....	341	0.2	20.2	14,660

## BLUEWATER CREEK NEAR GRANTS, N. MEX.

Location.—At the Atchison, Topeka and Santa Fe Railroad bridge, about 200 yards west of the depot at Grants, section 25, township 11 north, range 10 west.

Records available.—October 30, 1912, to September 30, 1924.

Drainage area.—383 square miles.

Gage.—Chain gage until December 6, 1917, when it was replaced by a vertical staff gage.

Channel.—Shifting.

Discharge measurements.—Made by wading or from the bridge.

Winter flow.—Ice may affect gage heights during the winter months.

Diversions.—A large part of the water is diverted for the irrigation of lands in the vicinity of Bluewater. Practically the entire normal flow of the San Jose, to which Bluewater Creek is tributary, is diverted by Pueblo Indians below McCarty's.

Discharge measurements of Bluewater Creek near Grants, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 3.....	Mark Lambert .....	....	Dry
Dec. 6.....	..... do .....	0.71	e 0.30
Feb. 11.....	..... do .....	i	e 0.20
June 18.....	..... do .....	0.57	e 0.10
Sept. 11.....	..... do .....	0.74	e 0.30
1924			
Dec. 30.....	Mark Lambert .....	3.10	86.5
Feb. 24.....	..... do .....	0.94	0.8
May 29.....	..... do .....	0.76	0.3
July 23.....	..... do .....	0.64	Dry
Sept. 19.....	..... do .....	0.69	0.1

e=Estimated.

i=Ice.



Daily discharge in second-feet of Bluewater Creek near Grants, N. Mex., for climatic years 1923-24.

[G. S. Woodard, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1923												
1.....		0.2	0.3	0.3	0.2	0.1	60	0.1	0.1	0.1	0.1	352
2.....		.2	.3	.3	.2	.1	28	.1	.1	.1	.1	95
3.....		.2	.4	.3	.2	.1	40	.1	.1	.1	.1	55
4.....		.2	.4	.3	.2	.1	1.0	.1	.1	.1	.1	14
5.....		.2	.4	.3	.2	.1	1.3	.1	.1	.1	.1	12
6.....		.2	.4	.3	.2	.1	.3	.1	.1	.1	.1	9.3
7.....		.2	.4	.3	.2	.1	.1	.1	.1	.1	.1	7.0
8.....		.2	.4	.3	.2	.1	.1	.1	.1	.1	.1	4.8
9.....		.2	.4	.3	.2	.1	.1	.1	.1	.1	.1	2.6
10.....		.2	.4	.3	.2	.1	.1	.1	.1	.1	176	.4
11.....		.2	.4	.3	.2	.1	.1	.1	.1	.1	34	.4
12.....		.2	.4	.3	.1	.1	.1	.1	.1	.1	23	.4
13.....		.2	.4	.3	.1	.1	.1	.1	.1	.1	4.7	.4
14.....		.2	.4	.3	.1	.1	.1	.1	.1	.1	2.8	.4
15.....	.2	.2	.4	.3	.1	.1	.1	.1	.1	.1	139	.4
16.....	.2	.2	.4	.3	.1	.1	.1	.1	.1	.1	198	.4
17.....	.2	.2	.4	.3	.1	.1	.1	.1	.1	13	54	45
18.....	.2	.2	.4	.3	.1	.1	.1	.1	.1	25	5.2	149
19.....	.2	.2	.4	.3	.1	.1	.1	.1	.1	4.7	15	373
20.....	.2	.2	.4	.3	.1	.1	.1	.1	.1	5.8	4.7	242
21.....	.2	.2	.4	.2	.1	.1	.1	.1	.1	.5	86	73
22.....	.2	.2	.4	.2	.1	.1	.1	.1	.1	.1	28	6.8
23.....	.2	.2	.4	.2	.1	.1	.1	.1	.1	.1	10	58
24.....	.2	.2	.4	.2	.1	.1	.1	.1	.1	.1	.1	6.0
25.....	.2	.2	.4	.2	.1	.1	.1	.1	.1	.1	.1	.4
26.....	.2	.3	.4	.2	.1	.2	.1	.1	.1	.1	.2	.4
27.....	.2	.3	.4	.2	.1	4.6	.1	.1	.1	.1	.2	.4
28.....	.2	.3	.4	.2	.1	56	.1	.1	.1	.1	.2	.4
29.....	.2	.3	.3	.2	....	5.2	.1	.1	.1	.1	.2	.4
30.....	.2	.3	.3	.2	....	57	.1	.1	.1	.1	.2	.4
31.....	.2	....	.3	.2	....	55	....	.1	....	.1	417	....
1924												
1.....	0.4	0.6	0.5	32	0.3	0.2	17	17	0.4	0.1	0.5	0.1
2.....	.2	.6	.5	13	.3	.2	50	.5	.5	.1	.5	.1
3.....	.2	.6	.5	2.3	.3	.2	65	.2	.4	.1	.5	.1
4.....	.2	.5	.5	1.2	.2	.2	70	.2	.5	1.1	.5	.1
5.....	.2	5.9	.5	.7	.2	2.4	70	.5	.4	.5	50	.1
6.....	.2	5.1	.5	.5	.2	.5	70	.2	.2	.4	5.6	.1
7.....	.2	5.1	.5	.5	.2	.5	70	.5	.2	.5	1.1	.1
8.....	.5	5.9	.5	.7	.2	.5	70	.5	.5	.2	.5	.1
9.....	.5	4.9	.5	.7	.2	.2	70	.2	.5	.1	.5	.1
10.....	.5	3.9	.5	.7	.2	.2	70	.2	.5	.1	.5	.1
11.....	.5	5.1	.5	.6	.2	.2	70	1.1	.5	3.8	.9	55
12.....	.5	24	.5	.6	.2	.2	65	.2	.4	.5	.9	1.6
13.....	.5	54	.4	.6	.2	.5	65	.2	.2	.1	.9	.1
14.....	.5	4.8	.4	.6	.2	.5	65	.2	.2	.1	.5	.1
15.....	.5	7.0	.4	.6	.2	.5	50	.5	.2	.1	.4	.4
16.....	.5	5.1	.4	.6	.2	.5	50	.2	.2	.1	.2	.1
17.....	.5	4.9	.3	.5	.2	.5	60	.2	.1	.1	.4	.1
18.....	.5	5.2	.3	.5	.2	.5	36	.5	.2	.1	.4	.5
19.....	.5	4.8	.3	.5	1.2	.5	36	.2	.2	.1	.2	.2
20.....	.5	5.1	.3	.5	1.2	.5	32	.4	.1	.1	.2	.2
21.....	.5	.5	.3	.5	1.2	.2	36	.5	.1	.1	.2	.2
22.....	.5	.5	.3	.5	1.2	.2	11	.5	.1	.2	.2	.1
23.....	.5	.5	.3	.4	1.2	.2	3.8	.4	.1	.2	.1	.1
24.....	.5	.5	15	.4	.2	.4	2.4	.4	.1	.4	.1	.2
25.....	.5	.5	30	.4	1.1	.4	1.1	.5	.1	.2	.1	.1
26.....	.5	.5	60	.4	.5	28	11	.4	.2	.2	.1	.2
27.....	.5	.5	81	.4	2.3	55	17	.4	.2	.4	.1	.1
28.....	.5	.5	67	.4	.5	28	11	.4	.2	41	.1	.2
29.....	.5	.5	81	.3	4.8	3.8	17	.2	.1	17	.1	.2
30.....	.5	.5	81	.3	....	7.8	3.8	.4	.2	2.4	.1	.2
31.....	.5	....	50	.3	....	7.8	....	.4	....	.5	.1	....

NOTE—Daily discharge for 1923 determined as follows: Direct from a well defined curve the entire year, interpolating for ice periods.

1924—Direct from a well defined curve for the entire year, interpolating for ice periods.

Monthly discharge of Bluewater Creek near Grants, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	0.2	0.2	0.11	6.7
November .....	0.3	0.2	0.22	12.9
December .....	0.4	0.3	0.38	23.6
January .....	0.3	0.2	0.26	16.3
February .....	0.2	0.1	0.14	7.7
March .....	57	0.1	5.82	358
April .....	60	0.1	4.40	262
May .....	0.1	0.1	0.10	6.1
June .....	0.1	0.1	0.10	5.9
July .....	25	0.1	1.66	102
August .....	417	0.1	43.7	2,690
September .....	373	0.4	50.3	3,000
The year .....	373	0.1	8.95	6,491
1924				
October .....	0.5	0.2	0.44	26.9
November .....	54	0.5	5.27	316
December .....	81	0.3	15.3	941
January .....	32	0.3	2.01	223
February .....	4.8	0.2	0.66	38.3
March .....	55	0.2	4.45	265
April .....	70	1.1	42.2	2,510
May .....	17	0.2	0.91	55.9
June .....	0.5	0.1	0.26	7.7
July .....	41	0.1	22.9	14.1
August .....	50	0.1	2.14	132
September .....	55	0.1	2.03	121
The year .....	81	0.1	6.45	4,660



# SAN FRANCISCO RIVER BASIN

## WHITEWATER CREEK NEAR MOGOLLON, N. MEX.

*Location.*—At the Socorro Mining & Milling Company's plant, 3 miles south of Mogollon, 600 feet below the confluence of the north and south forks of Whitewater Creek, in section 4, township 11 south, range 19 west.

*Records available.*—May 30, 1911, to June 30, 1923.

*Drainage area.*—27 square miles.

*Gage.*—Vertical staff.

*Channel.*—Permanent except at extreme high water.

*Discharge measurements.*—Made by wading or from a foot bridge.

*Winter conditions.*—There is no backwater from ice during the winter.

*Co-operation.*—Gage heights furnished by the Socorro Mining and Milling Company, of Mogollon.

*Discharge measurements of Whitewater Creek near Mogollon, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Apr. 15.....	Mark Lambert .....	1.74	22.1

*Daily discharge in second-feet of Whitewater Creek near Mogollon, N. Mex., for climatic years 1923-24.*

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1923									
1.....	1.9	2.3	5.7	2.8	3.9	6.9	11	23	7.8
2.....	1.9	2.3	4.5	2.3	3.3	7.8	11	20	6.9
3.....	1.9	2.3	7.4	2.3	2.8	13	11	20	6.9
4.....	1.5	3.3	1.3	2.3	2.8	13	11	25	6.0
5.....	1.5	2.3	7.8	2.3	2.3	11	11	25	6.0
6.....	1.5	2.8	5.2	2.3	2.3	9.4	20	34	5.2
7.....	1.5	2.8	4.8	2.3	2.3	9.4	20	34	5.2
8.....	1.5	2.8	5.2	2.3	2.3	9.4	30	34	5.2
9.....	1.5	2.5	5.2	2.3	3.3	20	25	30	5.2
10.....	1.5	2.3	4.5	2.3	3.3	34	25	30	5.2
11.....	1.5	2.3	4.5	2.3	2.3	24	25	25	4.5
12.....	1.5	2.3	3.9	2.3	2.3	21	23	25	4.5
13.....	1.5	2.3	4.3	2.3	3.3	19	23	25	4.5
14.....	1.5	2.3	4.5	2.3	3.3	19	23	25	3.9
15.....	1.5	2.3	4.5	2.3	3.3	14	23	23	3.9
16.....	1.5	2.5	4.5	2.3	3.9	11	25	20	3.9
17.....	1.5	2.5	4.5	2.3	3.9	11	25	20	3.3
18.....	1.5	2.8	3.9	2.3	3.9	9.4	23	23	3.3
19.....	1.5	2.8	3.9	2.3	3.9	11	30	23	3.9
20.....	1.5	2.8	3.3	2.3	5.2	11	30	23	2.3
21.....	1.5	2.8	3.3	3.3	5.2	11	20	23	2.3
22.....	1.9	2.8	3.3	4.5	6.0	13	15	20	2.3
23.....	1.9	2.8	3.3	4.5	7.8	13	18	18	2.3
24.....	1.9	3.3	3.3	4.5	6.9	11	15	15	1.9
25.....	1.9	3.3	3.3	3.9	6.9	11	15	13	1.9
26.....	1.9	3.3	3.3	3.9	6.9	13	15	13	1.9
27.....	1.9	3.3	3.3	3.9	6.9	18	20	15	1.2
28.....	1.9	3.3	3.3	3.9	6.0	15	20	15	1.2
29.....	1.9	3.1	3.3	3.5	6.9	15	23	13	.6
30.....	2.3	4.3	3.3	3.3	....	15	23	13	.6
31.....	2.3	7.4	2.8	3.3	....	13	23	9.4	.6
	....	....	2.8	3.3	....	11	....	9.4	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve October 1 to June 30.



Monthly discharge of Whitewater Creek near Mogollon, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	2.3	1.5	1.72	106
November .....	7.4	2.3	2.91	173
December .....	7.8	2.8	4.11	253
January .....	4.5	2.3	2.90	178
February .....	7.8	2.3	4.27	237
March .....	34	6.9	13.9	857
April .....	30	11	20.1	1,190
May .....	34	9.4	21.3	1,310
June .....	7.8	0.6	3.76	224

## SAN JUAN RIVER BASIN

### SAN JUAN RIVER AT ROSA, N. MEX.

*Location.*—About 300 yards above the highway bridge on highway between Rosa, N. Mex., and Arboles, Colo., and about one-fourth mile below the confluence of the San Juan and Piedra Rivers in township 33 north, range 5 west.

*Records available.*—For San Juan at Arboles, Colo., from 1895 to 1899, and August 21, 1910, to September 5, 1920; for San Juan at Rosa, from September 6, 1920, to September 30, 1924.

*Drainage area.*—2,050 square miles.

*Gage.*—Automatic recording, installed April 11, 1922.

*Channel.*—Likely to shift at high stages.

*Discharge measurements.*—Made from bridge or by wading.

*Winter conditions.*—Ice generally interferes from December to March.

*Diversions.*—There are court decrees for the diversion of 23 second-feet between the station and Pagosa Springs, Colorado, and 61 second-feet from intervening tributaries.

*Floods.*—The highest gage height recorded since the station was established was 17 feet on October 1, 1911, when the discharge was 40,000 second-feet.

*Discharge measurements of San Juan River at Rosa, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 30 .....	Mark Lambert .....	1.52	144
Dec. 17 .....	do .....	1.79	229
Feb. 28 .....	do .....	2.00	317
May 15 .....	do .....	5.34	3,156
June 30 .....	do .....	5.18	2,795
Aug. 11 .....	do .....	3.08	740
1924			
Nov. 13 .....	Mark Lambert .....	3.07	716
Feb. 16 .....	do .....	3.24	767
Apr. 1 .....	do .....	3.13	701
June 1 .....	do .....	4.68	2,130
Aug. 4 .....	do .....	2.56	440
Sept. 14 .....	do .....	1.79	198



Daily discharge in second-feet of San Juan River at Rosa, N. Mex., for climatic years 1923-24.

[Lottie Walker, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	124	126	223	320	379	385	1,448	2,592	4,902	2,287	472	710
2.....	124	122	199	304	387	558	1,294	2,626	4,944	2,122	479	643
3.....	123	128	250	289	395	755	995	2,660	4,958	1,880	479	638
4.....	123	163	247	273	403	678	897	2,695	5,098	1,770	496	607
5.....	122	160	220	257	411	624	755	2,730	4,762	1,690	580	1,375
6.....	123	134	175	242	419	575	932	2,764	4,445	1,560	540	806
7.....	128	132	155	226	429	560	1,493	2,798	4,445	1,580	482	616
8.....	126	155	199	211	436	546	1,740	2,833	4,237	1,650	540	560
9.....	124	172	150	195	444	532	1,710	2,868	4,029	1,610	661	520
10.....	124	178	208	179	453	518	1,830	2,902	3,652	1,432	1,041	490
11.....	126	190	220	164	461	504	1,800	2,936	4,016	1,339	765	465
12.....	128	181	232	147	469	570	1,810	2,971	4,692	1,231	969	462
13.....	126	172	294	133	478	690	2,005	3,006	5,028	1,168	1,057	451
14.....	124	152	418	117	486	666	2,005	3,040	5,140	1,150	942	462
15.....	123	148	326	170	494	710	2,039	3,074	4,916	1,057	1,114	482
16.....	124	155	274	142	503	820	2,074	3,109	4,720	969	1,330	598
17.....	123	163	240	129	511	848	2,108	3,144	4,380	884	1,680	638
18.....	122	202	212	135	520	834	2,143	3,178	4,068	890	1,610	3,920
19.....	122	160	250	149	553	762	2,188	3,212	3,587	866	1,357	2,890
20.....	122	163	244	170	630	807	2,212	3,247	3,587	890	1,132	1,550
21.....	122	211	272	216	690	841	2,246	3,282	3,398	916	1,073	1,580
22.....	123	217	273	275	690	922	2,281	3,316	3,218	948	1,081	1,680
23.....	122	217	274	302	716	1,003	2,316	3,350	3,150	750	948	2,580
24.....	122	223	275	284	748	1,084	2,350	3,938	3,126	675	922	4,625
25.....	122	208	281	264	716	1,165	2,384	4,874	3,242	634	830	3,483
26.....	123	202	286	329	642	1,246	2,419	5,366	3,386	594	794	2,341
27.....	123	172	292	337	460	1,328	2,454	5,765	3,548	584	750	2,100
28.....	135	196	297	316	352	1,016	2,488	5,705	3,207	670	670	1,891
29.....	145	235	303	354	....	1,260	2,522	5,210	2,966	630	625	1,700
30.....	142	265	308	362	....	1,430	2,557	4,622	2,485	536	710	1,510
31.....	134	....	314	371	....	1,430	....	4,580	....	482	735	....
1924												
1.....	1,375	866	424	430	730	810	1,392	2,800	2,116	1,480	515	174
2.....	1,294	878	425	430	740	720	1,176	3,010	2,160	1,329	480	170
3.....	1,394	788	426	430	750	630	1,440	3,220	2,990	1,230	440	168
4.....	1,285	765	428	430	760	540	2,256	3,430	3,760	1,185	474	168
5.....	1,240	735	430	420	770	450	3,000	3,640	4,345	1,122	492	166
6.....	1,267	720	422	415	780	390	3,700	3,850	4,728	1,176	420	166
7.....	1,204	710	416	410	790	390	4,500	4,060	5,262	1,302	380	158
8.....	1,018	680	433	422	800	345	5,300	4,270	4,584	1,212	333	158
9.....	1,049	638	451	434	810	386	6,046	4,488	4,000	1,131	305	150
10.....	1,081	648	418	446	820	396	6,010	5,048	3,865	1,176	293	166
11.....	872	848	406	458	830	380	5,102	5,364	3,985	1,167	275	272
12.....	884	916	428	470	820	690	4,680	5,160	4,520	1,042	281	302
13.....	854	630	426	482	810	386	5,330	5,160	5,313	886	315	212
14.....	842	598	406	496	782	380	6,010	5,636	5,517	767	620	186
15.....	824	570	408	510	754	374	5,806	5,500	5,000	695	575	170
16.....	806	538	410	518	726	386	3,742	5,313	4,760	670	452	166
17.....	745	526	412	532	698	410	2,400	5,194	4,440	712	344	170
18.....	700	494	414	546	670	370	2,280	5,568	4,165	700	319	190
19.....	670	487	416	560	642	384	2,546	5,381	3,592	600	284	168
20.....	666	478	418	574	670	386	3,466	5,500	3,074	550	269	174
21.....	643	481	420	588	610	368	4,210	5,517	2,728	500	257	160
22.....	638	463	422	602	578	378	4,920	5,466	2,650	460	239	156
23.....	695	454	424	616	675	388	4,904	5,347	2,460	480	227	154
24.....	745	445	426	630	816	368	4,952	5,194	2,316	440	215	148
25.....	755	448	428	644	986	340	4,408	4,856	2,256	388	198	148
26.....	750	439	430	658	1,104	406	3,742	4,195	2,172	472	202	142
27.....	725	436	430	672	1,018	900	2,948	4,090	2,017	460	195	140
28.....	700	418	430	686	950	1,392	2,892	3,676	1,940	1,185	188	140
29.....	710	420	430	700	900	1,775	2,400	3,130	1,918	830	184	130
30.....	690	422	430	710	....	1,940	2,600	2,572	1,665	781	184	128
31.....	685	....	430	720	....	2,172	....	2,256	....	570	178	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two well defined curves October 30 to May 15; Indirect method for shifting channel May 15 to June 30; Direct from well defined curve June 30 to November 13.

1924—Direct from two well defined curves for the entire year.

Monthly discharge of San Juan River at Rosa, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	145	122	126	7,720
November .....	265	122	177	10,500
December .....	418	150	255	15,700
January .....	371	117	239	14,700
February .....	748	352	510	28,300
March .....	1,430	385	828	50,900
April .....	2,557	755	1,916	114,000
May .....	5,765	2,592	3,497	215,000
June .....	5,140	2,485	4,045	241,000
July .....	2,287	482	1,143	70,300
August .....	1,680	472	867	53,300
September .....	4,625	451	1,412	84,000
The year .....	5,765	122	1,250	905,000
1924				
October .....	1,394	638	897	55,100
November .....	916	418	598	35,600
December .....	451	406	423	26,000
January .....	720	410	537	33,000
February .....	1,104	578	7,856	45,200
March .....	2,172	340	633	38,900
April .....	6,046	1,176	3,805	226,400
May .....	5,636	2,256	4,448	273,400
June .....	5,517	1,665	3,477	206,800
July .....	1,480	388	861	52,960
August .....	620	178	327	20,100
September .....	302	128	170	10,100
The year .....	6,046	128	1,387	1,024,000

### SAN JUAN RIVER AT FARMINGTON, N. MEX.

**Location.**—One mile southwest of Farmington on north abutment of San Juan bridge, about 1,500 feet below the mouth of the Animas River, in section 17, township 29 north, range 13 west.

**Records available.**—September 21, 1912, to July 28, 1918; November 1, 1921, to September 30, 1924.

**Drainage area.**—6,920 square miles.

**Gage.**—Automatic recording.

**Channel.**—Shifting.

**Discharge measurements.**—Made from bridge.

**Winter conditions.**—The channel generally remains open.

**Diversions.**—Water is diverted for irrigation at several points above the station.

Discharge measurements of San Juan River at Farmington, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 28.....	Mark Lambert .....	0.81	258
Dec. 11.....	do .....	0.93	528
Feb. 23.....	do .....	2.02	1,566
May 11.....	do .....	4.97	8,799
June 29.....	do .....	4.18	6,440
Aug. 9.....	do .....	0.97	1,109
1924			
Nov. 17.....	Mark Lambert .....	2.36	1,441
Feb. 15.....	do .....	2.09	1,428
Apr. 3.....	do .....	2.95	1,821
May 30.....	do .....	3.96	4,674
Aug. 2.....	do .....	2.07	859
Sept. 13.....	Mark Lambert and Ingham .....	1.23	467



Daily discharge in second-feet of San Juan River at Farmington, N. Mex., for climatic years 1923-24.

[L. C. Fix, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	190	422	1,035	585	406	1,634	2,773	4,895	9,688	6,200	1,203	2,150
2.....	185	463	870	590	412	1,608	2,902	4,734	9,878	6,110	1,220	2,095
3.....	175	505	790	594	486	1,322	2,587	5,806	9,992	5,435	1,144	2,035
4.....	170	547	915	599	596	982	2,400	7,090	10,410	4,886	1,101	1,940
5.....	170	589	935	604	652	1,010	2,125	7,960	10,296	4,670	1,101	1,850
6.....	160	631	815	609	692	1,050	1,916	8,293	9,194	4,342	1,118	1,995
7.....	150	675	675	614	708	1,160	2,200	7,260	8,776	4,408	1,026	2,100
8.....	146	745	660	618	772	1,190	3,170	7,816	8,626	5,410	890	1,750
9.....	141	790	760	623	708	1,060	3,310	8,589	7,600	5,360	1,180	1,595
10.....	160	855	675	628	692	1,020	3,508	9,192	6,854	4,868	2,260	1,495
11.....	155	855	572	633	756	1,240	3,784	9,612	7,532	4,362	3,115	1,400
12.....	150	835	604	638	1,040	1,290	3,856	9,422	9,156	3,790	2,710	1,305
13.....	165	855	724	642	1,220	1,080	3,928	8,478	10,334	3,579	4,000	1,265
14.....	205	760	991	647	1,333	901	4,396	8,256	10,720	3,525	4,255	1,335
15.....	225	700	1,160	652	1,470	955	4,474	7,192	10,448	3,435	4,575	1,290
16.....	205	665	1,060	657	1,458	910	4,240	6,260	10,106	3,489	4,405	1,445
17.....	200	700	910	662	1,150	780	4,552	6,260	9,498	3,221	5,755	1,665
18.....	200	685	748	666	1,000	740	5,380	6,623	7,997	2,983	5,990	6,280
19.....	205	735	524	671	1,030	740	5,590	7,430	7,532	2,840	5,000	7,800
20.....	200	715	444	676	1,100	676	5,291	8,952	7,294	2,795	4,795	2,645
21.....	195	885	486	700	1,260	724	4,526	9,498	6,954	3,068	4,000	2,510
22.....	200	1,150	500	732	1,399	780	4,500	8,952	6,029	3,910	3,726	3,060
23.....	210	1,270	508	724	1,366	772	4,120	7,997	6,194	2,825	3,452	4,000
24.....	219	1,385	572	748	1,333	676	3,332	7,498	6,524	2,335	3,178	7,300
25.....	229	1,050	580	716	1,170	668	3,053	9,536	6,988	2,029	2,905	5,695
26.....	239	930	572	684	1,290	740	2,958	11,280	7,260	1,893	2,700	4,400
27.....	248	860	580	740	1,344	1,000	3,072	12,280	7,708	1,668	2,545	3,905
28.....	258	720	572	780	1,518	1,556	3,290	12,520	7,362	2,200	2,300	3,605
29.....	299	860	628	804	.....	2,035	3,310	11,980	6,820	1,616	2,105	3,410
30.....	340	1,050	580	764	.....	2,349	4,120	10,068	6,510	1,415	2,355	2,965
31.....	381	.....	582	540	.....	2,332	.....	9,308	.....	1,256	2,395	.....
1923												
1.....	2,780	1,465	1,065	1,240	694	995	1,285	4,440	2,863	2,298	982	397
2.....	2,595	1,560	1,200	1,070	705	980	1,633	5,000	2,741	2,079	870	398
3.....	2,790	1,681	1,185	900	750	965	1,980	5,672	3,080	1,884	810	398
4.....	2,465	1,802	1,175	730	795	951	3,049	7,794	5,795	1,804	750	399
5.....	2,300	1,923	1,105	560	840	937	4,477	8,976	7,794	1,900	740	399
6.....	2,315	2,045	1,005	649	885	923	5,918	8,784	8,880	1,714	735	400
7.....	2,315	2,167	1,170	738	930	909	7,240	8,264	10,150	1,740	650	402
8.....	2,255	2,289	1,005	827	975	895	9,442	8,311	10,425	1,916	570	405
9.....	2,145	2,411	900	916	1,020	900	9,655	8,928	8,029	1,820	490	410
10.....	2,060	2,533	902	1,005	1,184	865	8,546	9,258	6,862	1,714	498	431
11.....	1,990	2,655	904	1,095	1,348	785	7,156	9,875	7,072	1,900	448	444
12.....	1,855	2,320	906	1,052	1,512	820	6,410	10,040	7,888	2,060	434	439
13.....	1,760	1,845	908	1,010	1,676	805	6,904	9,120	9,600	1,804	431	475
14.....	1,745	1,605	910	968	1,840	760	7,794	9,765	11,470	1,502	498	458
15.....	1,745	1,600	913	926	3,140	850	8,170	10,370	13,600	1,262	690	439
16.....	1,695	1,595	915	884	3,565	820	6,779	10,040	10,580	1,030	650	438
17.....	1,610	1,455	918	842	2,750	900	4,699	10,810	9,304	1,030	582	439
18.....	1,550	1,455	921	800	2,695	895	3,624	12,020	8,123	1,080	490	432
19.....	1,500	1,435	924	758	2,200	855	3,368	12,350	6,862	1,014	458	424
20.....	1,410	1,395	927	718	2,160	885	4,152	11,910	5,631	934	430	428
21.....	1,400	1,370	931	677	2,085	795	5,672	12,405	4,773	780	429	425
22.....	1,395	1,360	935	636	2,070	820	6,820	12,460	4,962	675	400	422
23.....	1,385	1,325	935	595	2,045	815	7,608	11,910	4,588	602	402	426
24.....	1,350	1,370	945	606	1,960	745	7,424	11,085	4,080	502	409	427
25.....	1,405	1,275	945	617	1,955	695	7,562	9,820	3,756	475	409	423
26.....	1,365	1,230	965	628	1,900	1,000	6,492	8,546	3,528	498	407	422
27.....	1,300	1,210	1,895	639	1,815	2,195	5,510	7,700	3,336	626	403	421
28.....	1,210	1,125	2,850	650	1,790	3,440	4,810	7,156	2,894	926	400	420
29.....	1,198	1,095	1,740	661	1,790	1,985	4,368	5,795	2,770	1,346	399	429
30.....	1,195	1,045	1,575	672	.....	1,495	4,080	4,810	2,546	1,274	399	428
31.....	1,200	.....	1,410	683	.....	1,405	.....	3,368	.....	1,190	398	.....

NOTE—Daily discharge for 1923 determined as follows: Indirect method for shifting channel October 28 to December 11; Direct from two well defined curves December 11 to August 9; Indirect method for shifting channel August 9 to November 17.

1924—Indirect method for shifting channel November 17 to April 3. Direct from well defined curve April 3 to end of year.

Monthly discharge of San Juan River at Farmington, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	381	141	205	12,643
November .....	1,385	422	796	47,000
December .....	1,160	444	711	43,700
January .....	804	540	663	41,000
February .....	1,518	412	1,013	56,000
March .....	2,349	668	1,127	63,000
April .....	5,590	1,916	3,621	215,000
May .....	12,520	4,734	8,421	518,000
June .....	10,720	6,029	8,343	500,000
July .....	6,200	1,256	3,514	216,000
August .....	5,990	890	2,855	176,000
September .....	7,800	1,265	2,810	167,000
The year .....	12,520	141	2,850	2,061,000
1924				
October .....	2,790	1,195	1,783	109,600
November .....	2,655	1,045	1,855	98,400
December .....	2,850	900	1,128	69,400
January .....	1,240	560	799	48,900
February .....	3,565	694	1,692	97,900
March .....	3,440	695	1,067	65,600
April .....	9,665	1,285	5,754	342,300
May .....	12,460	3,368	8,928	548,900
June .....	13,600	2,546	6,466	384,700
July .....	2,298	475	1,335	82,050
August .....	982	398	537	33,100
September .....	475	397	423	23,900
The year .....	13,600	397	2,626	1,905,000

### SAN JUAN RIVER AT SHIPROCK, N. MEX.

**Location.**—At highway bridge one-fourth mile south of Shiprock Indian Agency in section 9, township 12 north, range 2 west, Navajo Meridian.

**Records available.**—January 14 to October 6, 1911, and November 17, 1915, to September 30, 1924.

**Drainage area.**—13,070 miles (from Land Office Maps).

**Gage.**—Automatic recording. Established April 7, 1922. Datum raised 6.00 feet.

**Channel.**—Shifting.

**Discharge measurements.**—Made from bridge.

**Winter conditions.**—The flow is rarely affected by ice.

**Diversions.**—Water is diverted at many points above the station.

**Floods.**—During the first week in October, 1911, a flood occurred which reached a gage height of 22 feet and destroyed the bridge at which the gage was located.



Discharge measurements of San Juan River at Shiprock, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 27.....	Mark Lambert .....	0.31	338
Dec. 12.....	do .....	0.77	577
Feb. 23.....	do .....	1.43	1,564
May 10.....	do .....	2.75	8,723
June 28.....	do .....	1.97	6,486
Aug. 8.....	do .....	0.58	896
1924			
Nov. 16.....	Mark Lambert .....	1.86	1,559
Feb. 23.....	do .....	2.09	1,572
Apr. 3.....	do .....	2.19	1,762
May 30.....	do .....	2.49	4,841
Aug. 2.....	Lambert-Ingham .....	1.62	819
Sept. 3.....	Mark Lambert .....	0.90	397

Daily discharge in second-feet of San Juan River at Shiprock, N. Mex., for climatic years 1923-24.

[Harry Claw, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	332	390	355	582	736	1,251	1,120	3,400	10,980	5,155	1,380	920
2.....	331	395	395	468	796	1,243	1,104	3,250	11,110	4,415	1,310	1,045
3.....	330	390	398	468	784	1,232	1,331	3,815	10,800	3,895	1,241	1,171
4.....	329	395	405	456	680	1,221	1,956	5,296	11,020	3,686	1,172	1,197
5.....	325	386	405	474	680	1,210	2,012	6,310	11,050	3,750	1,103	1,423
6.....	320	380	408	504	680	1,200	1,478	7,781	9,190	4,015	1,034	1,549
7.....	321	358	415	504	680	1,190	1,520	5,964	7,770	4,530	965	1,675
8.....	322	350	430	546	680	1,180	1,816	6,450	8,760	5,145	896	1,800
9.....	324	345	455	582	712	1,170	1,900	7,550	7,440	4,945	1,276	1,610
10.....	322	358	445	591	736	1,160	2,232	8,960	6,280	4,945	1,657	1,520
11.....	320	390	460	591	690	1,150	2,200	9,800	6,210	4,660	2,038	1,450
12.....	320	383	564	591	680	1,140	2,072	9,730	8,330	4,215	2,429	1,325
13.....	321	380	573	582	724	1,130	2,136	9,120	10,450	3,750	2,800	1,300
14.....	320	386	620	591	760	1,120	2,136	7,800	12,580	3,405	4,800	1,350
15.....	322	380	862	573	808	1,110	2,264	6,750	12,500	3,260	6,200	1,350
16.....	322	370	848	555	808	1,100	2,104	5,060	11,000	3,405	4,200	1,470
17.....	321	383	834	582	1,385	1,090	2,328	4,650	10,000	3,610	7,720	1,480
18.....	331	386	876	600	1,375	1,080	3,031	4,520	7,670	3,365	7,260	7,000
19.....	341	386	798	650	1,364	1,070	3,600	5,320	6,120	2,845	5,135	9,165
20.....	350	370	640	680	1,353	1,060	3,650	6,780	5,040	2,685	4,545	8,824
21.....	360	360	546	690	1,342	1,050	2,806	9,340	6,370	2,740	2,665	8,483
22.....	370	360	573	680	1,331	1,040	2,468	8,930	3,660	3,360	1,780	8,142
23.....	361	395	528	670	1,320	1,030	2,360	8,440	3,300	3,245	1,645	7,801
24.....	346	395	528	680	1,309	1,020	2,040	6,240	3,750	2,565	1,555	7,460
25.....	338	400	546	690	1,298	1,010	2,296	7,900	5,250	2,190	1,550	7,120
26.....	334	440	564	3,760	1,287	1,000	2,763	11,400	6,310	1,665	1,530	6,780
27.....	350	485	546	3,815	1,276	990	2,648	13,750	7,950	1,450	1,530	6,440
28.....	355	500	546	3,705	1,265	980	2,360	14,200	7,370	1,625	1,495	6,100
29.....	355	495	582	748	.....	970	2,072	13,920	5,640	1,590	1,510	5,920
30.....	370	358	591	650	.....	960	2,328	11,700	5,080	1,520	1,222	5,755
31.....	398	.....	582	670	.....	1,056	.....	10,200	.....	1,450	935	.....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	5,385	2,015	1,285	1,336	1,498	1,400	3,623	4,300	2,260	1,622	777	551
2.....	5,165	2,210	1,445	1,272	1,514	1,400	3,304	3,820	1,712	1,540	800	544
3.....	4,735	2,555	1,595	1,208	1,530	1,400	2,985	4,180	1,645	1,400	722	537
4.....	4,765	2,400	1,590	1,144	1,527	1,400	2,665	5,020	1,645	1,242	761	544
5.....	4,505	2,260	1,555	1,080	1,524	1,400	6,700	6,100	2,550	1,210	852	544
6.....	4,215	2,185	1,495	1,095	1,522	1,400	8,380	9,460	7,780	1,090	774	506
7.....	3,850	2,040	1,450	1,110	1,520	3,475	10,900	12,100	9,940	1,060	696	476
8.....	3,620	1,960	1,420	1,125	1,518	5,550	13,300	11,380	10,900	1,060	670	458
9.....	3,305	2,100	1,505	1,140	1,516	7,625	14,500	10,540	13,060	1,060	628	442
10.....	3,240	2,125	1,465	1,155	1,514	9,700	13,060	10,540	9,700	1,075	593	424
11.....	3,100	2,095	1,460	1,170	1,512	8,946	10,780	10,900	7,060	1,046	586	412
12.....	3,100	3,950	1,500	1,185	1,510	8,192	8,260	11,140	7,780	1,180	586	395
13.....	2,870	3,000	1,560	1,200	1,508	7,437	8,740	11,620	10,660	1,135	586	370
14.....	2,785	2,185	1,605	1,215	1,506	6,682	10,900	11,740	13,900	1,002	593	430
15.....	2,570	1,810	1,609	1,230	1,504	5,927	12,100	11,860	14,620	904	600	524
16.....	2,400	1,605	1,613	1,245	1,502	5,172	13,300	13,420	14,260	891	663	524
17.....	2,215	1,600	1,618	1,260	1,500	4,417	8,620	15,460	11,620	865	670	512
18.....	2,215	1,605	1,622	1,275	1,513	3,362	5,140	17,140	9,460	813	628	488
19.....	2,125	1,605	1,627	1,290	1,526	2,908	3,700	16,540	8,260	826	579	476
20.....	2,125	1,595	1,631	1,306	1,539	2,154	3,585	15,340	6,340	1,046	565	470
21.....	2,035	1,500	1,635	1,322	1,552	1,400	6,100	13,300	4,540	930	565	476
22.....	2,050	1,355	1,650	1,338	1,566	1,900	7,060	13,060	3,700	852	565	482
23.....	2,015	1,300	1,645	1,354	1,580	2,400	8,740	13,300	3,240	516	572	479
24.....	2,085	1,290	1,645	1,370	1,555	2,900	11,380	14,260	3,125	593	572	475
25.....	2,115	1,285	1,645	1,386	1,529	3,400	11,860	14,140	2,665	616	586	472
26.....	2,205	1,280	1,630	1,402	1,503	3,900	12,100	13,420	2,550	639	586	468
27.....	2,175	1,280	2,010	1,418	1,477	4,400	11,140	12,580	2,477	662	579	465
28.....	2,095	1,280	2,305	1,434	1,451	4,900	9,460	10,900	2,115	685	579	461
29.....	1,950	1,285	1,870	1,450	1,425	4,580	6,940	9,460	1,897	708	579	458
30.....	1,920	1,285	1,560	1,466	.....	4,261	4,900	4,540	1,780	731	565	454
31.....	1,885	.....	1,400	1,482	.....	3,942	.....	4,300	.....	754	551	.....

NOTE—Daily discharge for 1923 determined as follows: Direct from two fairly well defined curves October 27 to May 10; Indirect method for shifting channel May 10 to June 28; Direct from well defined curve June 28 to August 8. Indirect method for shifting channel August 8 to November 16.

1924—Indirect method for shifting channel November 16 to February 23; Direct from well defined curve for the rest of the year.



Monthly discharge of San Juan River at Shiprock, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	398	320	334	20,700
November	500	345	392	23,300
December	862	355	559	34,300
January	3,815	456	901	55,400
February	1,385	680	984	54,600
March	1,251	960	781	67,800
April	3,650	1,104	2,204	131,000
May	14,200	3,250	7,881	484,000
June	12,580	3,300	7,967	474,000
July	5,155	1,450	3,325	204,000
August	7,720	896	2,470	152,000
September	9,165	920	3,958	235,000
The year	14,200	320	2,677	1,936,000
1924				
October	5,385	1,885	2,930	180,000
November	3,950	1,280	1,867	111,000
December	2,305	1,285	1,601	98,400
January	1,482	1,080	1,273	78,300
February	1,580	1,425	1,515	87,100
March	9,700	1,400	4,127	254,000
April	14,500	2,665	8,474	504,000
May	17,140	3,820	10,834	666,000
June	14,620	1,645	6,441	383,000
July	1,622	516	960	59,000
August	852	551	633	38,900
September	551	370	477	28,400
The year	17,140	370	3,429	2,488,000

#### NAVAJO RIVER AT EDITH, COLO.

*Location.*—Six miles northeast of Lumberton, N. M., at the highway bridge on the Lumberton-Edith road, one-eighth of a mile east of Edith, a short distance north of the New Mexico-Colorado state line, near the southwest corner of township 33 north, range 1 east, about 5 miles downstream from the confluence of Navajo and Little Navajo Rivers. A small tributary enters from the north about one-fourth mile below the station.

*Records available.*—September 21, 1912, to September 30, 1924.

*Drainage area.*—165 square miles.

*Gage.*—Vertical staff.

*Channel.*—Liable to small shifts.

*Discharge measurements.*—Made from the bridge or by wading.

*Winter conditions.*—Ice forms during the winter months.

*Diversions.*—Water is diverted for irrigation above the station.

Discharge measurements of Navajo River at Edith, Colo., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Nov. 2	Mark Lambert	1.31	25.8
Dec. 20	do	i 1.61	26.3
Mar. 3	do	i	74.0
June 26	do	2.93	382
Aug. 6	do	1.77	63.5
1924			
Nov. 10	Mark Lambert	1.74	68.2
Feb. 17	do	i	66.4
June 2	do	2.88	302
Aug. 4	do	1.90	82.8
Sept. 15	do	1.52	34.0

i=Ice.

Daily discharge in second-feet of Navajo River at Edith, Colo., for climatic years 1923-24.

[Manuel S. Montoya, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	34	26	38	38	68	95	49	484	752	256	65	65
2	34	26	37	39	69	96	49	647	752	256	65	65
3	34	26	37	40	70	96	49	647	752	256	65	65
4	34	26	36	41	71	96	170	647	752	225	65	65
5	34	26	35	42	72	96	170	647	562	225	65	65
6	34	26	35	43	72	96	170	647	562	225	65	65
7	34	26	34	44	73	96	170	647	562	225	75	65
8	34	33	34	45	74	96	170	647	562	225	75	65
9	34	33	33	46	75	96	170	647	562	225	75	65
10	34	33	32	47	76	96	170	647	562	225	85	65
11	34	33	32	48	77	96	170	647	562	225	96	65
12	34	33	31	49	78	96	272	372	562	225	96	65
13	34	33	30	50	79	37	338	390	562	225	143	65
14	34	33	30	50	80	37	355	156	562	225	272	65
15	34	33	29	51	81	33	355	108	562	225	272	65
16	34	33	29	52	82	33	390	108	562	225	305	65
17	34	33	28	53	83	33	390	288	562	225	305	65
18	34	33	27	54	84	33	409	464	445	225	210	65
19	34	41	27	55	85	33	409	523	445	225	210	65
20	34	41	26	56	86	33	256	523	445	225	210	65
21	34	41	27	57	87	33	225	523	338	225	210	65
22	26	41	28	58	88	27	170	562	338	225	156	65
23	26	41	29	59	89	27	170	647	338	75	108	65
24	26	41	30	60	90	27	170	647	338	75	108	240
25	26	41	31	61	91	27	170	647	338	75	108	240
26	26	41	32	62	92	33	240	647	338	65	108	240
27	26	40	33	63	93	338	305	647	305	65	108	240
28	26	40	34	64	94	338	338	647	256	65	65	240
29	26	39	35	65	....	338	338	562	256	65	65	240
30	26	39	36	66	....	338	338	562	256	65	65	240
31	26	....	37	67	....	240	....	752	....	65	65	....



## PIEDRA RIVER AT ARBOLES, COLO.

*Location.*—At the Denver and Rio Grande railroad bridge at Arboles in section 16, township 33 north, range 5 west. The Piedra empties into the San Juan one-half mile below the station.

*Records available.*—June 19, 1895, to September 30, 1899; August 21, 1910, to September 30, 1924.

*Drainage area.*—650 square miles.

*Gage.*—Chain gage.

*Channel.*—Permanent except during high water.

*Discharge measurements.*—Made from the railroad bridge or by wading.

*Diversions.*—There are a number of small diversions for irrigation above the station.

*Discharge measurements of Piedra River at Arboles, Colo., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Discharge Sec.-Ft.
1923			
Oct. 30	Mark Lambert	2.24	54.0
Dec. 17	do	2.26	86.4
Feb. 28	do	2.50	122
May 16	do	5.10	1,337
Aug. 11	do	3.29	276
1924			
Nov. 13	Mark Lambert	3.44	351
Feb. 16	do	2.61	181
Apr. 1	do	2.71	217
June 1	do	3.70	842
Aug. 4	do	2.07	116
Sept. 14	do	1.95	63.2

*Daily discharge in second-feet of Piedra River at Arboles, Colo., for climatic years 1923-24.*

[Lottie Walker, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	48	48	89	200	122	113	678	965	1,694	767	77	233
2	48	48	100	222	122	148	658	1,140	1,566	707	105	240
3	48	48	89	245	122	218	590	1,170	1,590	629	110	187
4	48	48	67	268	122	188	543	938	1,710	575	92	170
5	48	51	89	232	122	188	517	1,810	1,566	545	110	177
6	48	64	89	122	122	195	552	1,958	1,630	485	125	140
7	48	49	94	170	122	160	921	1,958	1,505	585	134	140
8	48	49	100	148	122	130	774	1,790	935	667	164	105
9	40	49	112	160	122	148	899	1,752	1,225	585	285	88
10	40	52	119	130	122	142	866	1,715	1,260	535	445	83
11	40	52	148	152	122	139	965	1,505	1,948	535	285	92
12	40	49	129	166	122	136	899	1,505	1,752	410	695	77
13	40	46	112	130	122	152	938	1,505	1,778	345	612	99
14	40	52	102	136	122	142	965	1,505	1,752	335	475	110
15	40	54	129	136	122	130	866	1,260	1,752	310	525	155
16	40	84	119	136	122	100	899	1,566	1,630	285	545	249
17	40	79	100	142	122	113	1,080	1,260	1,330	262	545	460
18	40	90	100	122	122	111	1,110	1,618	1,225	285	651	707
19	40	70	96	122	122	113	1,110	1,965	1,107	249	785	651
20	40	61	92	122	122	122	976	1,670	1,107	262	923	510
21	40	67	89	122	122	119	965	1,550	1,057	222	845	435
22	40	79	104	122	122	116	921	1,922	1,026	222	815	475
23	40	96	108	122	122	113	738	2,310	1,026	187	640	667
24	40	104	113	122	122	110	723	2,310	983	155	345	831
25	40	110	113	122	122	110	748	1,795	1,026	110	205	995
26	40	78	122	122	122	100	748	2,175	995	99	177	845
27	40	78	130	122	122	113	698	2,405	983	146	177	725
28	40	71	142	122	110	268	832	2,266	947	187	205	640
29	40	78	166	122	....	457	965	1,897	875	134	164	629
30	40	97	170	122	....	548	882	1,795	755	92	205	612
31	45	....	178	122	....	698	....	1,630	....	92	240	....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	131	65	43	53	62	68	62	400	275	178	178	44
2	131	65	44	53	62	68	62	400	275	178	178	44
3	131	65	44	53	62	68	62	450	290	178	178	44
4	131	65	44	54	63	68	573	466	290	178	178	44
5	131	65	44	54	63	69	573	593	482	178	86	44
6	131	65	45	54	63	69	573	593	482	178	86	44
7	131	65	45	54	64	69	536	593	482	178	86	44
8	131	65	45	55	64	69	536	593	482	178	86	44
9	131	65	46	55	64	69	613	633	482	178	86	44
10	131	65	46	55	65	69	573	633	433	178	86	44
11	96	65	46	56	65	69	335	633	433	178	86	44
12	96	65	47	56	65	70	335	633	433	178	86	44
13	96	57	47	56	66	70	653	593	433	178	86	44
14	96	57	47	56	66	70	653	593	433	178	86	44
15	96	57	48	57	66	70	335	633	433	178	44	31
16	75	57	48	57	66	70	653	593	433	178	86	44
17	75	57	48	57	66	70	335	633	433	178	44	31
18	75	57	48	58	66	70	305	633	433	178	44	31
19	75	57	49	58	66	70	305	593	225	178	44	31
20	75	57	49	58	66	70	573	593	225	178	44	31
21	75	43	49	59	67	70	613	593	225	178	44	31
22	75	43	50	59	67	70	613	593	225	178	44	31
23	65	43	51	59	67	70	573	593	225	178	44	31
24	65	43	50	60	67	70	450	593	225	178	44	31
25	65	43	50	60	67	70	450	593	225	178	44	31
26	65	43	51	60	67	70	450	593	225	178	44	31
27	65	43	51	60	67	70	275	536	225	367	44	31
28	65	43	51	61	68	70	275	466	225	613	44	31
29	65	43	52	61	68	70	290	305	225	613	44	31
30	65	43	52	61	....	70	290	275	225	178	44	31
31	65	....	52	62	....	70	....	275	....	137	44	....

NOTE—Daily discharge for 1923 determined as follows: Direct from well defined curve October 1 to November 26; Interpolate for ice November 26 to March 3; Direct from well defined curve March 3 to November 30.

1924—Interpolate for ice November 30 to March 15; Direct from two well defined curves March 15 to November 14.

*Monthly discharge of Navajo River at Edith, Colo., for climatic years 1923-24*

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	34	26	31.4	1,930
November	41	26	34.3	2,040
December	38	26	32.0	1,970
January	67	38	52.4	3,320
February	94	68	80.7	4,480
March	338	27	103	6,320
April	409	49	238	14,200
May	752	108	540	33,200
June	752	256	492	29,200
July	256	65	183	11,200
August	305	65	129	7,900
September	240	65	106	6,300
The year	752	26	169	122,000
1924				
October	131	65	93.5	5,750
November	65	43	55.5	3,300
December	52	43	47.8	2,940
January	62	53	57.1	3,510
February	68	62	65.3	3,760
March	70	68	69.5	4,280
April	653	62	441	26,260
May	633	275	544	33,400
June	482	225	338	20,100
July	613	178	211	12,960
August	178	44	67.7	4,160
September	44	31	37.9	2,260
The year	653	31	167	122,700



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	651	276	108	102	155	160	330	1,342	888	536	130	77
2.....	535	212	84	104	156	158	390	1,315	866	510	125	76
3.....	460	187	90	105	158	140	432	1,490	1,171	510	116	75
4.....	425	170	90	107	160	121	1,052	1,611	1,500	472	120	73
5.....	435	198	69	109	162	154	1,672	1,732	1,575	483	136	72
6.....	385	170	90	110	163	117	2,290	1,854	1,650	492	134	71
7.....	385	198	69	112	165	102	2,510	1,976	1,725	642	139	69
8.....	395	170	136	114	167	88	2,838	2,098	1,800	536	130	68
9.....	375	177	150	116	168	88	2,950	2,220	1,686	500	134	67
10.....	310	205	120	117	170	102	2,620	2,342	1,560	460	125	66
11.....	285	495	96	119	172	88	2,400	2,550	1,660	536	125	64
12.....	295	485	100	121	174	102	2,200	2,420	1,860	452	124	63
13.....	335	335	80	122	176	121	2,180	2,444	2,290	418	123	62
14.....	285	360	62	124	177	136	2,180	2,676	2,128	384	122	61
15.....	222	302	56	126	179	121	2,310	2,520	1,964	350	121	71
16.....	177	244	40	127	181	136	1,660	2,400	1,944	316	120	71
17.....	177	187	43	129	179	140	1,180	2,420	1,176	282	120	61
18.....	177	184	44	131	178	136	1,225	2,600	1,592	248	120	71
19.....	164	178	23	132	176	121	1,135	2,382	1,315	214	105	71
20.....	146	137	32	134	175	132	1,806	2,400	1,099	180	89	61
21.....	146	123	52	136	173	140	1,838	2,480	1,000	156	89	61
22.....	140	129	23	138	172	136	2,096	2,310	980	142	89	61
23.....	146	136	88	139	170	132	2,236	1,540	908	142	88	61
24.....	170	123	48	141	168	230	2,342	1,680	840	142	87	61
25.....	222	147	90	143	167	121	2,126	1,670	806	142	86	61
26.....	233	103	92	145	166	390	3,000	1,520	757	142	84	50
27.....	198	92	93	146	162	564	1,680	1,306	708	142	83	50
28.....	170	112	95	148	161	480	1,620	1,090	659	252	82	55
29.....	177	100	97	150	161	720	1,510	880	610	224	80	60
30.....	170	108	98	151	.....	960	1,342	880	562	180	79	65
31.....	170	.....	100	153	.....	840	.....	880	.....	142	78	.....

NOTE—Daily discharge for 1923 determined as follows: Indirect method for shifting channel October 30 to December 17; Interpolate for ice December 17 to February 27; Direct from two well defined curves February 27 to November 13. 1924—Direct from two well defined curves November 13 to September 14.

Monthly discharge of Piedra River at Arboles, Colo., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October .....	48	40	42.3	2,596
November .....	110	46	66.7	3,968
December .....	178	67	113	6,960
January .....	268	122	148	9,128
February .....	122	110	122	6,750
March .....	698	100	182	11,265
April .....	1,110	517	834	49,600
May .....	2,405	965	1,697	104,000
June .....	1,948	755	1,324	79,000
July .....	767	92	355	22,000
August .....	923	77	378	23,200
September .....	995	77	384	23,000
The year .....	2,405	40	471	341,000
1924				
October .....	651	146	276	17,000
November .....	495	92	201	12,000
December .....	150	23	76.1	4,870
January .....	153	102	127	7,830
February .....	181	155	169	9,710
March .....	960	88	231	14,330
April .....	2,950	330	1,838	109,360
May .....	2,676	880	1,904	117,030
June .....	2,290	562	1,311	78,000
July .....	642	142	333	20,500
August .....	139	78	109	6,710
September .....	77	50	65.2	3,880
The year .....	2,950	23	553	401,200

# LOS PINOS RIVER NEAR IGNACIO, COLO. (Better known as Pine River.)

*Location.*—At the highway bridge at the Southern Ute Indian Agency, near section 8, township 33 north, range 7 west. The nearest tributary is a small stream entering from the west about 2 miles below the station.

*Records available.*—April 22, 1899, to October 31, 1903; September 1, 1910, to November 30, 1912; March 10, 1913, to September 30, 1924.

*Drainage area.*—450 square miles.

*Gage.*—Chain.

*Channel.*—Shifting.

*Discharge measurements.*—Made from the bridge or by wading.

*Winter conditions.*—The gage height and discharge relation may be affected by ice during the winter months.

*Diversions.*—Irrigation is continuous from a point several miles above Bay-field, Colo., to the station.

Discharge measurements of Los Pinos River near Ignacio, Colo., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 30.....	Mark Lambert .....	1.06	11.9
Dec. 16.....	..... do .....	1.76	102
Feb. 27.....	..... do .....	1.91	137
May 14.....	..... do .....	4.13	1,199
June 30.....	..... do .....	3.63	1,054
Aug. 11.....	..... do .....	1.74	89.3
1924			
Nov. 14.....	Mark Lambert .....	2.32	226
Feb. 17.....	..... do .....	2.03	133
Mar. 30.....	Lambert-Jones .....	2.04	157
June 1.....	Mark Lambert .....	2.71	377
Aug. 4.....	..... do .....	1.24	24.8
Sept. 14.....	..... do .....	1.05	9.2



Daily discharge in second-feet of Los Pinos River near Ignacio, Colo., for climatic years 1923-24.

[Albert I. Mills, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	12	34	70	119	100	107	306	515	1,482	745	35	32
2.....	11	46	72	102	100	123	332	579	2,475	693	56	34
3.....	10	54	75	109	88	146	292	705	1,788	547	31	27
4.....	9.6	56	84	97	94	134	225	1,065	1,760	502	20	25
5.....	9.6	61	73	165	95	121	218	1,290	1,600	441	31	19
6.....	8.4	54	70	128	102	105	236	1,072	1,415	374	20	25
7.....	8.8	58	86	150	105	104	343	1,135	1,540	360	10	17
8.....	11	64	75	134	102	112	350	1,194	1,320	471	8.0	10
9.....	9.6	65	65	125	98	114	347	1,290	1,112	644	9.4	8.7
10.....	8.8	44	60	118	97	116	388	1,482	1,168	602	70	7.0
11.....	9.6	44	86	119	85	138	405	1,490	1,515	425	88	5.0
12.....	8.8	35	84	116	100	116	388	1,402	1,780	355	393	6.0
13.....	9.2	34	116	114	97	110	454	1,234	1,840	304	355	5.5
14.....	9.2	29	116	107	94	138	472	1,178	1,790	282	419	5.5
15.....	11	23	109	125	97	114	454	958	1,736	322	775	8.7
16.....	7.2	26	109	107	97	102	490	845	1,622	350	708	10
17.....	8.8	26	97	110	94	110	546	752	1,156	258	534	26
18.....	7.6	19	67	116	105	100	568	920	1,202	274	581	203
19.....	8.4	26	76	98	121	89	579	1,138	1,178	241	534	149
20.....	8.4	29	85	83	123	109	557	1,445	1,150	290	425	127
21.....	8.8	44	79	73	136	114	520	1,338	982	414	331	214
22.....	10	39	91	80	128	100	525	1,356	858	355	258	232
23.....	11	37	91	89	136	85	405	1,140	930	842	203	430
24.....	13	36	82	88	134	109	358	1,435	920	192	159	1,017
25.....	14	56	97	88	121	107	358	1,730	942	142	140	858
26.....	14	68	94	88	121	116	375	2,028	1,160	102	129	708
27.....	12	79	83	89	116	126	383	2,092	1,204	79	91	567
28.....	12	73	91	97	109	155	366	2,076	984	60	64	502
29.....	15	88	95	109	....	203	400	1,700	922	48	52	404
30.....	22	106	83	100	....	249	551	1,495	856	35	43	313
31.....	22	....	82	91	....	282	....	1,520	....	28	36	....
1924												
1.....	278	241	110	140	318	114	210	660	333	276	33	2.8
2.....	250	214	106	152	318	120	285	712	405	248	23	2.0
3.....	250	200	100	156	318	138	360	966	735	214	25	2.0
4.....	223	184	93	118	308	114	435	1,189	1,214	234	30	2.0
5.....	217	182	114	138	329	106	510	1,138	1,447	166	27	5.2
6.....	220	176	148	172	314	96	585	1,189	1,650	136	25	9.2
7.....	212	171	142	234	329	112	838	1,155	1,930	130	19	5.2
8.....	189	171	152	208	322	142	902	1,155	1,700	110	15	5.2
9.....	304	176	122	220	314	102	838	1,312	1,438	91	13	4.4
10.....	313	174	122	227	283	112	822	1,456	1,402	116	11	13
11.....	274	360	138	266	248	120	728	1,600	1,510	150	10	26
12.....	278	266	136	269	224	118	675	1,600	1,700	108	13	19
13.....	282	247	122	244	208	104	728	1,630	1,920	96	17	12
14.....	266	212	106	208	193	110	814	1,770	1,940	88	20	20
15.....	250	205	128	258	178	120	846	1,730	1,920	80	18	29
16.....	238	193	116	280	163	128	668	1,790	1,660	73	11	37
17.....	217	172	124	269	154	104	489	1,930	1,447	66	8.4	58
18.....	203	166	126	294	146	126	410	2,000	1,258	59	6.8	61
19.....	192	166	130	308	138	116	435	1,760	1,030	52	5.2	58
20.....	192	190	136	322	140	110	735	1,780	886	45	3.6	58
21.....	187	166	116	329	140	132	660	1,810	690	30	2.8	57
22.....	171	154	118	365	163	110	705	1,800	735	26	2.8	57
23.....	187	163	96	385	138	132	838	1,720	660	22	2.8	56
24.....	226	140	114	380	136	136	910	1,740	592	15	2.0	56
25.....	187	126	122	370	120	187	982	1,600	592	21	2.0	55
26.....	192	104	122	390	118	272	950	1,240	585	18	2.0	55
27.....	174	106	138	400	142	241	742	1,087	519	18	2.0	51
28.....	174	93	120	420	118	178	615	926	489	33	2.0	44
29.....	189	104	110	395	112	156	525	712	435	47	2.0	45
30.....	161	114	118	361	....	136	555	525	341	44	2.0	54
31.....	179	....	132	361	....	136	....	420	....	35	3.6	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two well defined curves October 30 to May 14, interpolating for periods of ice; indirect method for shifting channel May 14 to June 30; direct from well defined curve June 30 to November 14.

1924—Direct from a well defined curve for the entire year.

Monthly discharge of Los Pinos River near Ignacio, Colo., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	22	7.2	11.0	670
November .....	106	19	48.4	2,880
December .....	116	60	85.2	5,240
January .....	165	73	107	6,610
February .....	136	85	107	5,940
March .....	282	85	128	7,840
April .....	579	218	406	24,200
May .....	2,076	515	1,274	78,300
June .....	2,475	856	1,346	80,100
July .....	745	28	348	21,400
August .....	775	8.0	213	13,100
September .....	1,017	5.0	200	11,900
The year .....	2,475	5.0	357	258,000
1924				
October .....	313	161	222	13,630
November .....	360	93	178	10,580
December .....	152	93	122	7,490
January .....	420	118	280	17,220
February .....	329	112	211	12,160
March .....	272	96	132	8,120
April .....	582	210	660	39,300
May .....	2,000	420	1,358	83,500
June .....	1,940	333	1,105	65,800
July .....	276	15	91.8	5,650
August .....	33	2.0	11.6	714
September .....	61	2.0	32.0	1,900
The year .....	2,000	2.0	367	266,000

## ANIMAS RIVER AT DURANGO, COLO.

**Location.**—At the foot bridge at the foot of Fourteenth street in Durango, near the power plant of the San Juan Water and Power Co. Junction Creek enters about three-fourths of a mile above and Lightner Creek about the same distance below the station.

**Records available.**—June 20, 1895, to December 31, 1905; and January 1, 1910, to September 30, 1924.

**Drainage area.**—694 square miles (from Hayden's Atlas).

**Gage.**—Automatic recording.

**Channel.**—Permanent.

**Discharge measurements.**—Made from cable.

**Winter conditions.**—Ice rarely forms.

**Diversions.**—Water is diverted for irrigation for about 15 miles above the station.

**Floods.**—The maximum observed gage height was 13.6 feet in October, 1911.



Discharge measurements of Animas River at Durango, Colo., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 31.....	Mark Lambert	1.21	199
Dec. 15.....	do	1.28	233
Feb. 25.....	do	1.35	237
May 14.....	do	3.57	207
June 28.....	do	4.62	3,377
Aug. 10.....	do	2.68	1,063
1924			
Nov. 12.....	Mark Lambert	1.76	420
Feb. 15.....	do	1.41	281
Mar. 26.....	Lambert-Jones	1.42	296
June 1.....	Mark Lambert	2.82	1,110
Aug. 4.....	do	1.68	331
Sept. 14.....	do	1.34	273

Daily discharge in second-feet of Animas River at Durango, Colo., for climatic years 1923-24.

[D. S. Harmon, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	246	218	238	139	143	270	480	1,118	3,833	2,400	755	594
2.....	242	210	234	143	135	285	480	1,266	3,918	2,278	798	588
3.....	238	218	242	143	135	285	456	1,685	4,267	1,883	714	570
4.....	238	218	242	159	135	285	456	2,015	4,449	1,784	720	510
5.....	234	218	242	175	139	285	432	2,306	4,213	1,685	702	540
6.....	222	218	230	175	151	285	426	2,051	3,680	1,515	654	534
7.....	210	218	230	167	155	260	426	2,333	3,527	1,685	564	528
8.....	214	218	230	155	155	260	456	2,535	3,527	1,927	540	528
9.....	206	222	234	135	155	260	462	2,965	2,860	2,015	727	492
10.....	206	226	222	135	155	260	522	3,190	2,508	1,750	932	480
11.....	202	226	230	143	155	260	582	3,220	3,393	1,630	1,024	462
12.....	202	226	238	155	155	260	570	2,965	4,054	1,535	1,118	456
13.....	206	226	250	135	159	251	600	2,346	4,437	1,545	1,200	450
14.....	214	226	250	131	183	260	702	1,861	4,418	1,525	1,100	438
15.....	210	218	211	139	215	260	762	1,707	4,361	1,740	1,408	444
16.....	206	218	207	155	211	251	762	1,608	4,323	1,707	1,555	450
17.....	214	226	207	155	183	238	955	1,652	2,995	1,515	1,608	480
18.....	218	226	195	171	183	238	1,145	1,916	2,935	1,418	1,674	552
19.....	214	218	191	171	215	238	1,154	2,306	3,070	1,505	1,601	624
20.....	218	214	187	167	224	238	955	2,950	3,025	1,437	1,408	630
21.....	210	218	187	167	215	251	902	2,980	2,376	1,418	1,294	648
22.....	210	234	183	167	251	270	835	2,745	2,306	1,323	1,127	630
23.....	210	246	183	159	238	270	720	2,187	2,441	1,190	985	672
24.....	202	242	183	159	224	316	660	2,647	2,661	1,083	880	727
25.....	210	234	183	167	238	316	642	3,561	3,010	992	790	748
26.....	210	234	175	167	238	338	684	4,195	3,190	918	734	865
27.....	214	242	175	167	242	392	755	4,532	3,442	865	684	910
28.....	214	255	175	167	256	414	769	4,684	2,935	828	642	970
29.....	214	270	175	167	.....	468	872	4,159	2,647	776	600	955
30.....	214	260	155	143	.....	480	1,228	3,476	2,481	714	612	940
31.....	214	.....	143	151	.....	474	.....	3,731	.....	672	600	.....

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1.....	910	365	260	224	211	233	350	1,682	1,094	1,333	480	215
2.....	880	365	260	215	224	238	395	1,858	1,110	1,154	425	211
3.....	865	343	260	215	220	238	410	1,902	1,540	1,126	380	209
4.....	805	360	265	215	215	238	478	1,946	2,376	1,039	360	205
5.....	828	398	280	215	215	228	590	1,902	2,792	1,022	356	205
6.....	783	432	285	215	199	220	668	1,902	3,016	1,005	346	199
7.....	755	420	270	215	195	220	680	1,902	3,602	989	336	195
8.....	672	528	270	207	195	215	704	2,050	3,060	910	319	195
9.....	612	660	270	207	195	207	775	2,493	2,441	850	301	197
10.....	576	570	260	195	195	207	803	2,722	2,708	973	298	218
11.....	534	450	238	195	195	233	775	2,571	3,060	880	295	220
12.....	516	432	215	195	195	228	817	2,652	3,735	782	316	228
13.....	510	392	215	195	207	220	873	3,210	4,126	712	325	228
14.....	510	360	207	195	242	215	873	3,210	4,126	621	316	230
15.....	510	376	207	195	265	215	1,030	3,120	3,966	586	313	236
16.....	492	365	199	195	260	215	1,130	3,225	3,330	586	313	236
17.....	492	365	195	195	260	220	1,380	3,270	2,960	607	301	232
18.....	480	360	195	175	251	224	1,410	3,458	2,778	579	292	232
19.....	480	343	195	175	251	215	1,410	3,330	2,480	526	283	240
20.....	480	326	199	183	238	211	1,450	3,394	2,110	490	274	240
21.....	450	310	215	175	238	207	1,500	3,394	1,990	485	265	230
22.....	450	305	224	179	238	207	1,490	3,330	1,902	465	256	228
23.....	450	300	211	191	251	207	1,550	3,150	1,902	455	248	225
24.....	438	300	199	195	260	211	1,480	3,105	1,825	430	240	225
25.....	426	300	215	175	246	215	1,410	2,722	1,847	405	240	232
26.....	420	285	215	175	238	214	1,380	2,506	1,803	370	235	240
27.....	420	275	215	175	233	226	1,130	2,350	1,660	380	235	240
28.....	414	275	220	179	233	234	1,206	1,990	1,630	532	228	240
29.....	409	260	224	191	233	246	1,380	1,630	1,490	698	228	240
30.....	392	260	224	195	.....	275	1,580	1,380	1,480	554	220	240
31.....	387	.....	224	199	.....	275	.....	1,122	.....	500	220	.....

NOTE—Daily discharge for 1923 determined as follows: Direct from two well defined curves for the entire year.  
1924—Direct from two well defined curves for the entire year.

Monthly discharge of Animas River at Durango, Colo., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre-feet)
	Maximum	Minimum	Mean	
1923				
October	246	202	216	13,500
November	270	210	228	13,600
December	250	143	207	12,700
January	175	131	155	9,600
February	256	135	187	10,400
March	480	238	297	18,300
April	1,228	426	695	41,300
May	4,684	1,118	267	164,000
June	4,449	2,306	3,396	201,000
July	2,400	672	1,460	89,700
August	1,674	600	960	59,000
September	955	438	613	36,500
The year	4,684	131	925	669,600
1924				
October	910	387	560	34,400
November	660	260	369	21,970
December	285	195	230	14,140
January	224	175	195	12,000
February	265	195	228	13,080
March	275	207	225	13,810
April	1,580	350	1,031	61,360
May	3,458	1,122	2,501	153,800
June	4,126	1,094	2,412	143,500
July	1,333	370	719	44,180
August	480	220	298	18,370
September	240	195	222	13,220
The year	4,126	175	750	543,780



## ANIMAS RIVER AT FARMINGTON, N. MEX.

*Location.*—About three-fourths of a mile south of Farmington and one-fourth mile above the confluence of Animas and San Juan Rivers, in section 15, township 29 north, range 13 west.

*Records available.*—September 17, 1912, to September 30, 1924.

*Drainage area.*—1,220 square miles.

*Gage.*—Automatic recording.

*Channel.*—Shifting.

*Discharge measurements.*—Made from cable or by wading.

*Winter conditions.*—Ice may form during December and January.

*Diversions.*—Water is diverted for irrigation at several points above the station.

*Discharge measurements of Animas River at Farmington, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 28.....	Mark Lambert .....	0.72	225
Dec. 13.....	do .....	1.03	336
Feb. 24.....	do .....	1.24	493
May 11.....	do .....	3.58	3,479
June 29.....	do .....	3.04	2,593
Aug. 9.....	do .....	1.23	430
1924			
Nov. 17.....	Mark Lambert .....	1.35	558
Feb. 13.....	do .....	1.36	560
Apr. 2.....	do .....	1.44	684
May 30.....	do .....	2.39	1,715
Aug. 2.....	do .....	0.99	287
Sept. 13.....	do .....	0.68	193

*Daily discharge in second-feet of Animas River at Farmington, N. Mex., for climatic years 1923-24.*

[L. C. Fix, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	201	210	355	509	302	368	688	1,513	4,145	2,420	745	600
2.....	199	235	330	370	288	376	715	1,404	4,180	2,290	632	645
3.....	197	238	320	421	261	448	670	1,778	4,305	1,970	628	580
4.....	197	275	320	404	275	455	630	2,260	4,431	1,740	550	655
5.....	195	288	320	455	280	429	555	2,687	4,395	1,642	595	610
6.....	195	284	320	396	293	386	576	2,687	3,812	1,505	545	565
7.....	195	275	320	370	298	368	654	2,574	3,708	1,505	475	520
8.....	195	284	320	320	302	358	670	2,901	3,550	1,915	425	475
9.....	195	288	320	306	306	363	688	3,306	3,051	2,055	435	425
10.....	201	288	302	302	311	368	778	3,665	2,802	2,150	735	405
11.....	201	284	302	298	280	396	850	3,690	3,306	1,780	948	370
12.....	199	280	311	298	293	376	832	3,515	4,110	1,615	922	350
13.....	194	275	340	302	302	358	922	3,170	4,557	1,650	1,435	345
14.....	194	275	430	288	288	358	1,040	2,802	4,773	1,555	1,540	365
15.....	199	272	430	298	288	376	1,082	2,320	4,683	1,600	1,790	365
16.....	197	272	387	3 0	316	368	1,061	2,080	4,611	1,815	2,255	435
17.....	197	293	360	288	438	350	1,168	2,065	3,952	1,535	2,350	465
18.....	203	298	320	293	527	345	1,380	2,200	3,187	1,485	2,330	1,040
19.....	209	293	306	302	564	340	1,488	2,510	3,272	1,365	2,180	845
20.....	209	288	306	311	527	332	1,416	3,136	3,306	1,485	1,935	760
21.....	207	316	311	298	527	345	1,272	3,480	2,868	1,395	1,675	735
22.....	209	355	311	288	545	354	1,237	3,340	2,462	1,555	1,455	745
23.....	209	370	306	284	514	340	1,124	2,786	2,510	1,250	1,270	945
24.....	215	404	306	293	514	345	895	2,802	2,735	1,052	1,070	2,010
25.....	215	360	306	311	474	350	868	3,708	3,000	952	895	1,660
26.....	215	330	306	330	348	363	850	4,251	3,190	870	815	1,490
27.....	218	306	288	302	416	376	922	4,611	3,505	815	730	1,265
28.....	220	293	293	272	372	416	980	4,683	3,255	815	680	1,255
29.....	228	320	306	272	....	455	1,010	4,773	2,820	745	645	1,140
30.....	244	446	302	268	....	548	1,320	4,075	2,565	735	645	1,155
31.....	247	....	320	288	....	638	....	3,900	....	735	605	....
1924												
1.....	950	580	401	280	300	305	480	1,288	1,368	1,550	418	174
2.....	890	535	376	230	300	305	525	1,416	1,346	1,416	340	174
3.....	860	485	350	214	290	305	565	1,762	1,538	1,288	305	174
4.....	845	460	358	214	280	305	715	2,205	2,440	1,357	320	173
5.....	800	435	345	250	270	300	858	2,395	3,150	1,199	325	172
6.....	780	425	345	315	280	300	1,001	2,380	3,472	1,177	305	172
7.....	660	415	340	325	310	290	1,357	2,305	3,744	1,122	265	171
8.....	720	425	358	330	435	295	1,750	2,395	3,866	1,177	230	171
9.....	680	435	358	358	401	295	1,800	2,665	3,988	1,067	214	170
10.....	710	450	330	325	507	285	1,712	2,891	4,111	1,023	192	172
11.....	700	2,280	340	290	565	280	1,440	3,200	4,233	1,188	185	179
12.....	672	1,990	345	295	655	270	1,380	3,200	4,356	1,177	182	200
13.....	665	1,699	290	280	655	246	1,404	3,035	4,478	525	178	195
14.....	618	1,408	295	280	735	280	1,675	3,523	4,600	295	210	218
15.....	595	1,117	275	285	765	275	1,912	3,642	3,880	222	200	210
16.....	578	826	290	340	880	281	1,838	3,778	3,035	287	200	234
17.....	570	535	285	238	815	288	1,512	3,898	2,923	351	188	246
18.....	530	545	280	234	750	295	1,322	4,060	2,650	416	182	234
19.....	500	525	285	300	685	302	1,199	4,024	2,094	480	179	202
20.....	480	516	295	275	621	309	1,177	3,863	2,054	444	178	195
21.....	455	471	305	265	556	315	1,428	3,846	2,470	410	177	198
22.....	435	435	310	285	491	335	1,738	3,795	2,275	335	177	198
23.....	475	426	285	320	426	370	1,988	3,659	2,191	280	177	200
24.....	530	426	265	330	410	315	2,094	3,540	2,094	218	177	198
25.....	525	418	238	340	410	345	2,054	3,254	2,081	195	177	198
26.....	512	410	305	350	376	418	1,800	2,815	2,027	185	178	202
27.....	490	376	460	335	376	685	1,588	2,665	1,875	190	177	205
28.....	450	376	516	375	367	665	1,404	2,410	1,725	230	175	230
29.....	445	345	384	320	340	555	1,288	2,014	1,675	635	176	250
30.....	425	350	367	335	....	516	1,265	1,725	1,600	615	175	246
31.....	435	....	350	320	....	498	....	1,538	....	489	174	....

NOTE—Daily discharge for 1923 determined as follows: Direct from two well defined curves October 29 to August 9; Indirect method for shifting channel August 9 to November 17.

1924—Direct from well defined curve November 17 to October 18.



Monthly discharge of Animas River at Farmington, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	247	194	206	12,700
November .....	446	235	301	17,900
December .....	430	288	325	20,000
January .....	509	268	324	20,000
February .....	564	261	373	20,700
March .....	638	332	388	23,900
April .....	1,488	555	944	56,200
May .....	4,773	1,404	3,054	188,000
June .....	4,683	2,462	3,567	212,200
July .....	2,420	735	1,484	91,200
August .....	2,350	425	1,095	67,300
September .....	2,010	345	771	45,900
The year .....	4,773	194	1,072	776,000
1924				
October .....	950	425	615	37,830
November .....	2,280	345	671	39,900
December .....	516	275	333	20,500
January .....	358	214	296	18,210
February .....	880	270	491	28,260
March .....	685	246	348	21,370
April .....	2,094	480	1,409	83,820
May .....	4,060	1,288	2,876	176,810
June .....	4,600	1,346	2,778	165,260
July .....	1,550	185	695	42,720
August .....	418	174	217	13,350
September .....	250	170	199	11,620
The year .....	4,600	170	909	659,700

#### FLORIDA RIVER NEAR DURANGO, COLO.

*Location.*—At wagon bridge on the upper Florida River, about 8 miles from Durango in section 4, township 35 north, range 8 west.

*Records available.*—May 22, 1917, to September 30, 1924.

*Drainage area.*—93 square miles.

*Gage.*—Vertical staff. The gage has no relation to the gage established September 18, 1910.

*Channel.*—Probably shifting.

*Discharge measurements.*—Made from bridge or by wading.

*Winter conditions.*—Ice forms during winter months.

*Co-operation.*—Maintained in co-operation with the State Engineer of Colorado.

Discharge measurements of Florida River near Durango, Colo., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 29	Mark Lambert	0.01	8.8
Dec. 4	do	0.22	13.2
Feb. 25	do	0.27	21.2
May 12	do	1.95	517
June 27	do	1.59	381
Aug. 7	do	0.50	47.8
1924			
Nov. 15	Mark Lambert	0.50	45.4
Feb. 15	do	i 0.41	26.7
Mar. 26	Lambert-Jones	*0.62	26.0
May 31	Mark Lambert	1.69	20.9
Aug. 3	do	0.77	39.7

i=Ice.

\*New gage.

Daily discharge in second-feet of Florida River near Durango, Colo., for climatic years 1923-24.

[J. M. Martin, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	18	6.6	13	15	18	21	70	246	823	....	....	....
2	18	6.6	13	15	18	21	66	284	960	....	....	....
3	18	6.6	13	15	19	21	80	284	964	....	....	....
4	18	6.6	13	15	19	21	96	352	964	....	....	....
5	18	6.6	13	15	19	21	96	352	973	....	....	....
6	14	10	13	16	19	21	96	380	973	....	....	....
7	14	10	13	16	19	21	96	409	982	....	....	....
8	13	11	13	16	19	21	96	444	1,075	....	....	....
9	12	12	13	16	19	21	96	444	1,126	....	....	....
10	12	12	13	16	19	21	105	444	1,170	....	....	....
11	12	12	13	16	19	21	105	444	1,130	....	....	....
12	12	12	13	16	20	21	114	444	1,175	....	....	....
13	12	12	13	16	20	21	114	478	1,132	....	....	....
14	12	12	13	16	20	21	114	484	1,080	....	....	....
15	12	12	13	17	20	21	135	526	1,095	....	....	....
16	12	12	13	17	20	21	158	580	1,095	....	....	....
17	12	12	13	17	20	21	170	670	1,106	....	....	....
18	12	12	13	17	20	21	184	680	1,060	....	....	....
19	11	12	14	17	20	21	198	680	1,070	....	....	....
20	10	12	14	17	20	21	184	724	1,070	....	....	....
21	10	12	14	17	21	21	184	591	850	....	....	....
22	8.0	12	14	17	21	21	214	603	810	....	....	....
23	6.6	12	14	17	21	25	229	828	710	....	....	....
24	6.6	12	14	18	21	21	214	878	760	....	....	....
25	6.6	12	14	18	21	23	198	966	715	....	....	....
26	6.6	12	14	18	21	23	184	927	670	....	....	....
27	6.6	12	14	18	21	23	184	927	433	....	....	....
28	6.6	12	15	18	21	28	198	1,020	475	....	....	....
29	6.6	12	15	18	....	37	229	932	521	....	....	....
30	6.6	12	15	18	....	48	246	898	390	....	....	....
31	6.6	....	15	18	....	60	....	898	....	....	....	....



Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1924												
1.....		50	50	34	29	27	57	275	201	126	54	15
2.....		61	40	34	29	27	66	286	247	119	49	15
3.....		61	40	34	29	27	75	297	383	112	44	15
4.....		74	40	33	29	27	84	308	464	105	40	14
5.....		55	40	33	29	27	93	319	474	98	37	14
6.....	226	55	40	33	28	26	102	330	498	91	34	14
7.....	206	55	40	33	28	26	111	341	416	89	31	14
8.....	190	61	45	33	28	26	120	353	424	88	28	14
9.....	174	83	45	33	28	26	129	364	394	87	25	14
10.....	134	100	45	33	28	26	138	377	397	86	22	14
11.....	124	134	45	32	28	26	147	394	414	85	22	14
12.....	109	93	45	32	27	26	156	373	470	84	21	14
13.....	93	74	45	32	27	26	165	404	500	83	21	14
14.....	93	74	45	32	27	26	165	478	474	78	21	14
15.....	74	74	36	32	27	26	165	504	455	73	20	15
16.....	74	66	36	32	27	26	164	537	391	68	20	15
17.....	74	74	36	32	27	26	164	520	366	63	20	15
18.....	66	66	36	31	27	26	164	504	330	58	20	15
19.....	66	66	36	31	27	26	163	500	290	53	19	15
20.....	61	61	35	31	27	26	163	499	246	49	18	15
21.....	61	61	35	31	27	26	173	498	243	53	17	15
22.....	61	61	35	31	27	26	183	480	273	58	16	15
23.....	61	61	35	31	27	26	193	511	232	63	15	15
24.....	55	55	35	31	27	26	203	542	239	68	15	15
25.....	50	50	35	30	27	26	213	574	219	73	15	14
26.....	50	50	35	30	27	26	223	485	199	78	15	14
27.....	50	50	34	30	27	41	233	420	179	83	15	14
28.....	50	50	34	30	27	44	243	366	159	77	15	14
29.....	50	45	34	30	27	41	253	314	140	71	15	14
30.....	45	45	34	30	.....	41	264	262	133	65	15	14
31.....	45	.....	34	29	.....	49	.....	211	.....	59	15	.....

NOTE—Daily discharge for 1923 determined as follows: Direct from a well defined curve October 29 to November 15; Interpolate for ice November 15 to March 22; Direct from well defined curve March 22 to May 12; Indirect method for shifting channel May 12 to June 27.

1924—Direct from well defined curve October 1 to December 15; Interpolate for ice December 15 to March 26; Direct from well defined curve for the rest of the year.

Monthly discharge of Florida River near Durango, Colo., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October.....	693	6.6	11.3	693
November.....	12	6.6	11.0	676
December.....	15	13	13.6	333
January.....	18	15	16.6	1,023
February.....	21	18	19.5	1,101
March.....	60	21	24.1	1,483
April.....	246	66	148	8,830
May.....	1,020	246	607	37,310
June.....	1,175	390	912	52,250
1924				
October.....	226	45	.....	4,640
November.....	134	45	65.5	3,900
December.....	50	34	38.7	2,380
January.....	34	29	31.7	1,940
February.....	29	27	27.6	1,590
March.....	49	26	28.9	1,780
April.....	264	57	159	9,460
May.....	574	211	407	25,000
June.....	500	133	328	19,500
July.....	126	49	78.8	4,840
August.....	54	15	23.7	1,460
September.....	15	14	14.4	860
The year.....	574	14	.....	77,400

## LA PLATA RIVER AT HESPERUS, COLO.

Location.—At railroad bridge on upper La Plata, about 800 feet northwest of Hesperus railroad station in section 23, township 35 north, range 11 west.

Records available.—May 25, 1917, to September 30, 1924.

Drainage area.—36 square miles.

Gage.—Vertical staff. Automatic recording June 27 to November 18, 1919, and May 1 to September 30, 1924.

Channel.—Probably shifts.

Winter conditions.—Ice forms during winter months.

Co-operation.—Maintained in co-operation with the State Engineer of Colorado.

Discharge measurements of La Plata River at Hesperus, Colo., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-Ft.
1923			
Oct. 29.....	Mark Lambert	0.01	5.1
Nov. 14.....	Colorado	0.01	2.63
Dec. 15.....	Mark Lambert	-0.03	3.2
Feb. 6.....	Colorado	0.11	6.04
Feb. 26.....	Mark Lambert	0.02	5.1
Apr. 4.....	Colorado	0.30	149
May 12.....	Mark Lambert	1.63	317
June 16.....	Colorado	1.30	166
June 22.....	do	0.90	90.8
June 26.....	do	1.01	112
June 27.....	Mark Lambert	1.14	144
July 1.....	Colorado	0.93	94.2
July 17.....	do	0.69	55.1
July 27.....	do	0.57	39.2
Aug. 2.....	do	0.50	35.7
Aug. 8.....	Mark Lambert	0.36	20.5
Aug. 20.....	Colorado	1.07	116
Aug. 24.....	do	0.68	54.1
Sept. 13.....	do	0.21	12.2
1924			
Sept. 24.....	A. W. Ingham	1.74	51.9
Nov. 7.....	D. S. Jones, Jr.	1.36	11.23
Nov. 14.....	Mark Lambert	1.54	17.1
Dec. 11.....	C. E. Feetham	0.20	14.47
Jan. 9.....	D. S. Jones, Jr.	i 1.36	9.54
Feb. 10.....	do	i 1.30	8.75
Feb. 14.....	Mark Lambert	i 1.33	9.30
Mar. 23.....	D. S. Jones, Jr.	1.39	11.67
Apr. 2.....	Lambert-Jones	1.43	13.6
May 9.....	D. S. Jones, Jr.	2.38	317.87
May 31.....	Mark Lambert	1.53	77.0
June 6.....	A. W. Ingham	2.02	165.7
June 14.....	Ingham-Baily	1.88	121.22
June 23.....	A. W. Ingham	1.42	31.5
June 23.....	do	1.70	30.11
July 8.....	do	1.47	12.42
July 16.....	do	1.35	11.97
July 25.....	do	1.40	10.05
Aug. 2.....	Lambert-Ingham	1.52	14.2
Aug. 8.....	A. W. Ingham	1.41	9.45
Aug. 14.....	do	1.32	8.68
Aug. 22.....	do	1.00	5.85
Sept. 11.....	Mark Lambert	1.04	5.6
Sept. 14.....	A. W. Ingham	1.01	5.6
Sept. 20.....	do	1.09	19.83

i=Ice.



Daily discharge in second-feet of La Plata River at Hesperus, Colo., for climatic years 1923-24.

[H. Curtett, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1.....	5.6	5.4	5.4	6.1	5.2	7.2	15	134	422	119	26	24
2.....	5.6	5.4	5.4	6.1	5.4	7.8	15	173	458	110	28	23
3.....	5.5	5.4	5.4	5.4	5.2	7.2	16	240	452	98	30	21
4.....	5.5	5.4	5.4	6.1	5.4	6.1	17	190	476	88	29	19
5.....	5.4	5.4	5.4	6.1	5.4	8.6	17	163	416	77	25	18
6.....	5.5	5.4	5.4	5.4	5.2	9.2	19	149	343	63	23	18
7.....	5.4	5.4	5.4	6.1	5.4	8.9	23	155	277	72	20	18
8.....	5.4	5.4	5.4	5.4	5.4	8.9	26	209	245	85	19	17
9.....	5.4	5.4	5.4	5.4	5.0	8.9	31	293	204	98	33	15
10.....	5.4	5.4	5.4	5.4	4.9	8.2	38	261	272	83	58	14
11.....	5.4	5.4	5.4	5.4	5.4	7.2	38	218	392	85	56	13
12.....	5.4	5.4	5.4	5.4	5.0	10	43	204	404	70	58	13
13.....	5.4	5.4	5.4	5.4	5.0	10	52	183	392	70	54	12
14.....	5.4	5.4	5.4	5.4	5.4	8.6	56	160	322	66	60	13
15.....	5.4	5.4	5.4	5.4	5.5	8.2	67	141	298	64	123	13
16.....	5.4	5.4	5.4	5.4	6.1	13	116	138	200	64	128	12
17.....	5.4	5.4	5.4	5.2	6.1	8.9	149	155	153	56	134	12
18.....	5.4	5.4	5.4	5.2	6.1	10	149	190	148	51	272	15
19.....	5.4	5.4	5.4	5.5	6.0	12	131	200	149	50	162	14
20.....	5.4	5.4	5.4	5.8	6.0	8.9	110	261	138	47	110	16
21.....	5.4	5.4	5.4	5.5	6.0	8.6	96	566	109	49	104	19
22.....	5.4	5.4	5.4	5.4	5.8	12	80	458	117	55	86	23
23.....	5.4	5.4	5.4	5.4	6.0	13	64	333	130	57	64	35
24.....	5.4	5.4	5.4	5.4	6.1	12	63	482	139	54	52	44
25.....	5.4	5.4	5.4	5.4	6.1	8.9	72	644	154	52	45	40
26.....	5.4	5.4	5.4	5.4	6.4	8.9	85	644	177	47	38	37
27.....	5.4	5.4	5.4	6.1	8.6	7.8	94	584	162	40	34	29
28.....	5.4	5.4	5.5	7.8	8.6	8.2	102	572	149	33	28	24
29.....	5.4	5.4	5.6	5.4	....	9.2	129	488	132	23	27	18
30.....	5.4	5.4	5.4	5.4	....	11	158	416	123	18	28	16
31.....	5.4	....	5.6	5.2	....	13	....	452	....	24	26	....
1924												
1.....	21	14	18	11	9.0	9.0	13	136	83	33	14	5.6
2.....	19	14	19	11	9.0	9.0	14	186	117	31	14	5.5
3.....	18	13	19	11	9.0	9.0	16	266	186	26	14	5.5
4.....	18	13	19	11	9.0	9.0	18	491	174	22	13	5.4
5.....	17	13	18	10	9.0	9.0	22	463	224	19	12	5.6
6.....	17	12	19	10	9.0	10	35	491	164	15	11	5.5
7.....	17	12	19	10	9.0	10	68	547	180	22	10	5.5
8.....	18	11	16	10	9.0	10	124	533	133	15	9.0	5.4
9.....	19	12	15	10	9.0	10	160	352	100	13	7.8	5.5
10.....	19	28	15	10	9.0	10	98	380	105	28	8.4	6.4
11.....	19	29	15	10	9.0	10	102	386	142	33	7.7	5.8
12.....	19	19	14	10	9.0	10	186	303	130	18	8.0	5.6
13.....	18	19	14	10	9.0	10	151	320	170	14	8.9	5.4
14.....	18	16	14	10	9.0	10	213	373	170	13	8.6	5.4
15.....	17	18	14	10	9.0	11	183	352	176	10	7.7	5.5
16.....	16	15	14	10	9.0	11	100	292	112	10	6.1	5.5
17.....	16	15	14	10	9.0	11	505	393	89	9.4	6.9	5.5
18.....	16	15	13	10	9.0	11	491	421	78	8.0	6.1	5.6
19.....	16	15	13	10	9.0	11	456	449	55	7.6	6.0	5.8
20.....	16	15	13	10	9.0	11	456	463	45	9.7	5.8	16
21.....	15	15	13	10	9.0	11	460	380	48	8.3	5.7	14
22.....	16	16	13	10	9.0	11	460	320	41	10	5.6	13
23.....	18	17	13	10	9.0	12	450	315	43	11	5.6	11
24.....	16	17	12	10	9.0	12	449	243	43	9.7	5.6	9.5
25.....	16	17	12	9.0	9.0	12	264	184	50	9.8	5.6	8.9
26.....	13	17	12	9.0	9.0	12	145	173	47	8.7	5.7	8.9
27.....	13	17	12	9.0	9.0	12	119	162	49	8.3	5.6	8.6
28.....	13	18	12	9.0	9.0	12	100	140	44	12	5.7	8.6
29.....	13	19	12	9.0	9.0	12	102	113	43	14	5.6	8.0
30.....	12	19	11	9.0	....	12	117	97	36	14	5.5	7.6
31.....	14	....	11	9.0	....	13	....	83	....	15	5.6	....

Monthly discharge of La Plata River at Hesperus, Colo., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October .....	5.6	5.4	5.42	333
November .....	5.4	5.4	5.40	321
December .....	5.6	5.4	5.42	333
January .....	7.8	5.2	5.61	345
February .....	8.6	4.9	5.81	323
March .....	13	6.1	9.37	576
April .....	158	15	69.0	4,110
May .....	644	134	241	14,800
June .....	458	109	218	13,000
July .....	110	18	63.5	3,900
August .....	272	19	63.9	3,930
September .....	44	12	20.2	1,200
The year .....	644	4.9	59.6	43,200
1924				
October .....	21	12	16.6	1,020
November .....	29	11	16.3	969
December .....	19	11	14.4	885
January .....	11	9.0	9.90	608
February .....	9.0	9.0	9.00	518
March .....	12	9.0	10.7	657
April .....	505	13	203	12,100
May .....	547	83	316	19,420
June .....	224	36	103	6,200
July .....	33	7.6	15.4	946
August .....	14	5.5	7.96	489
September .....	16	5.4	7.33	436
The year .....	547	5.4	60.9	44,300

#### LA PLATA RIVER COLORADO—NEW MEXICO LINE

Near Pendleton, New Mexico.

*Location.*—In section 10, township 32 south, range 13 west, 1,000 feet north of state line and three miles from Pendleton, New Mexico. Gage later moved to rear of Hill Ranch which is immediately upon State Line.

*Records available.*—February 19, 1920, to September 30, 1924.

*Gage.*—Automatic and staff gages.

*Channel.*—Slightly shifting.

*Discharge measurements.*—From foot-bridge during high stages and wading at low stages.

*Co-operation.*—Maintained in co-operation with the State Engineer of Colorado.



Discharge measurements of La Plata River near Pendleton, N. Mex., for climatic years 1923-24.

Date	Hydrographer	Gage height Feet	Dis-charge Sec.-Ft.
1923			
Oct. 26	Mark Lambert	0.19	1.2
Nov. 14	D. S. Jones	0.40	6.9
Feb. 10	do	0.57	9.4
Feb. 22	Mark Lambert	0.71	28.1
Apr. 5	D. S. Jones	0.85	48.0
May 9	Mark Lambert	1.98	329
June 17	Ingham-Baily	0.49	17.5
June 28	Mark Lambert	0.21	4.7
July 11	A. W. Ingham	0.24	4.9
Aug. 8	Mark Lambert	-0.05	e 0.4
Aug. 16	A. W. Ingham	1.27	82.8
Aug. 20	do	1.07	59.2
Aug. 23	Ingham-Baily	0.79	27.0
Sept. 14	A. W. Ingham	0.60	14.1
Sept. 22	do	0.70	20.7
1924			
Nov. 7	D. S. Jones	0.55	18.0
Dec. 10	C. E. Feetham	0.72	29.6
Jan. 9	D. S. Jones	0.86	11.4
Feb. 10	do	2.02	67.3
Feb. 13	Mark Lambert	0.92	50.2
Apr. 2	Lambert-Jones	1.03	55.2
May 9	D. S. Jones	1.98	335
May 30	Mark Lambert	0.18	3.4
June 6	A. W. Ingham	0.70	20.7
Aug. 2	Mark Lambert	.....	Dry
Sept. 13	do	0.13	1.3
Oct. 17	do	0.45	8.4

e=Estimated.

Daily discharge in second-feet of La Plata River near Pendleton, N. Mex., for climatic years 1923-24.  
[George Dale, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1923												
1	1.7	4.4	9.0	11	8.4	15	73	54	59	2.3	1.5	16
2	1.7	4.2	9.0	11	6.6	19	55	59	48	2.1	1.5	13
3	1.7	5.0	9.0	12	9.8	20	59	80	59	1.9	1.5	13
4	1.7	6.0	8.1	17	9.4	19	48	96	67	1.7	1.5	13
5	1.7	5.4	6.9	17	11	16	35	116	52	1.6	1.5	14
6	1.7	5.4	6.9	15	12	13	34	82	34	1.6	1.5	14
7	1.8	5.0	7.8	14	13	13	33	108	19	1.6	1.5	14
8	1.7	4.8	7.8	15	14	13	31	140	16	1.6	1.5	14
9	1.6	5.4	7.5	13	17	14	29	120	10	3.7	2.7	13
10	1.6	5.2	6.9	13	15	14	32	233	5.6	4.0	6.0	11
11	1.6	5.4	6.6	14	13	12	27	230	6.0	5.0	7.5	11
12	1.7	5.6	6.9	15	16	11	35	194	11	2.5	9.0	11
13	1.9	4.8	8.1	13	17	9.0	41	143	18	2.3	9.0	12
14	1.7	5.2	8.4	12	8.7	12	36	136	12	1.8	24	13
15	1.7	6.0	8.7	13	43	14	59	77	7.5	1.8	52	13
16	1.8	5.6	9.0	13	106	16	58	75	7.5	1.7	83	13
17	2.1	6.0	7.5	13	118	15	64	42	8.1	1.7	59	16
18	2.0	5.4	6.6	9.0	62	14	62	52	7.2	1.7	154	40
19	2.3	5.0	8.7	9.0	46	13	78	70	6.0	1.7	78	22
20	2.2	4.8	9.0	9.4	42	19	116	126	5.8	2.3	48	16
21	1.8	5.8	10	9.0	41	19	120	106	6.0	1.6	42	16
22	1.9	7.8	11	9.0	32	14	94	78	5.6	1.5	32	15
23	1.8	8.7	11	9.0	24	17	62	48	4.6	1.0	24	15
24	2.0	9.8	11	9.0	21	19	58	62	3.5	1.0	20	15
25	2.1	9.4	9.4	9.0	21	19	56	126	3.2	.5	15	15
26	2.2	8.7	9.0	9.0	19	19	56	158	3.5	.3	13	15
27	2.4	7.5	9.4	13	16	21	49	194	5.4	1.7	13	15
28	2.5	7.2	10	16	15	28	54	136	3.8	1.6	11	15
29	2.8	12	9.4	22	.....	36	55	106	3.8	1.5	12	15
30	3.4	9.4	9.0	22	.....	67	55	70	3.5	1.5	14	15
31	4.2	.....	8.4	36	.....	65	.....	70	.....	1.5	15	.....

[A. A. Hill, Observer]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
1924												
1	15	15	20	.....	26	43	50	224	0	0	0	0
2	15	19	20	.....	28	44	72	224	0	0	0	0
3	12	19	22	.....	30	41	59	257	0	0	17	7.2
4	13	17	20	.....	32	40	80	225	12	0	117	0
5	12	18	19	.....	35	37	193	361	10	0	10	0
6	13	19	18	.....	37	33	230	298	9.2	0	5.6	c
7	18	19	19	.....	40	32	325	318	8.0	0	5.2	0
8	15	20	20	.....	44	35	410	335	0	0	4.0	6.0
9	15	20	18	.....	50	30	446	352	0	0	3.5	24
10	17	27	25	11	67	39	554	393	3.0	3.0	3.1	33
11	18	51	23	.....	60	38	393	376	3.5	3.5	0	23
12	17	20	20	.....	55	33	342	291	2.5	3.0	0	5.6
13	16	27	20	.....	50	30	335	224	5.0	2.5	0	2.8
14	14	37	20	.....	50	35	393	291	5.0	0	0	2.4
15	17	33	21	.....	60	36	428	291	0	0	0	3.0
16	15	30	26	.....	60	33	325	250	0	0	0	3.0
17	15	28	26	.....	66	26	240	158	0	0	0	2.5
18	16	27	28	.....	70	32	240	193	0	0	0	2.0
19	17	26	25	.....	78	26	234	150	0	0	0	2.4
20	15	26	24	.....	90	24	208	124	0	0	0	1.6
21	16	18	21	.....	94	45	267	100	0	0	0	1.6
22	16	19	22	.....	84	46	342	80	0	0	0	4.0
23	16	19	21	.....	57	43	393	43	0	0	0	5.0
24	19	19	28	.....	54	53	393	30	0	0	0	5.6
25	18	19	26	.....	48	65	359	18	0	0	0	6.0
26	19	19	28	.....	46	60	291	12	0	0	0	5.0
27	20	19	31	.....	46	75	224	14	0	0	0	6.0
28	20	17	28	.....	57	70	274	8.8	0	0	0	5.2
29	20	18	26	.....	50	68	257	8.0	0	0	0	6.8
30	19	19	25	.....	53	224	5.2	5.2	0	0	0	4.6
31	19	.....	24	.....	45	.....	5.0	5.0	.....	.....	0	.....

Monthly discharge of La Plata River near Pendleton, N. Mex., for climatic years 1923-24.

Month	Discharge in second-feet			Run-off (total in acre- feet)
	Maximum	Minimum	Mean	
1923				
October	4.2	1.6	2.00	125
November	12.2	4.2	6.37	380
December	11.0	6.6	8.50	527
January	36	9.0	13.7	845
February	118	6.6	27.7	1,541
March	67	9.0	19.8	1,220
April	120	27	55.4	3,300
May	233	42	109.2	6,720
June	67	3.2	16.7	994
July	5.0	0.3	1.8	115
August	154	1.5	24.3	1,500
September	40	11	15.6	926
The year	233	0.3	25.1	18,190
1924				
October	20	12	16.4	1,010
November	51	15	22.8	1,360
December	31	18	22.3	1,370
January			15.0	922
February	94	26	54.3	3,120
March	75	24	41.2	2,530
April	554	50	286	17,000
May	393	5.0	1.81	11,100
June	12	0	1.94	115
July	3.5	0	0.39	24
August	117	0	5.34	328
September	33	0	5.61	334
The year	554	0	52.8	39,210



## LA PLATA RIVER NEAR LA PLATA, N. MEX.

*Location.*—Sixteen miles northwest of Aztec, N. M., one mile south of La Plata at the suspension bridge near Williams' ranch house in section 14, township 31 north, range 13 west. The station is 15 miles above the mouth of the river and below all important tributaries.

*Records available.*—May 25, 1905, to December 31, 1913, and April 19, 1914, to September 30, 1924.

*Drainage area.*—About 340 square miles.

*Gage.*—Chain gage.

*Channel.*—Shifting.

*Discharge measurements.*—Made from bridge or by wading.

*Winter conditions.*—Ice may cause backwater during the winter months.

*Diversions.*—Nearly all the normal flow is diverted for irrigation above the station.

*Discharge measurements of La Plata River near La Plata, N. Mex., for climatic years 1923-24.*

Date	Hydrographer	Gage height Feet	Dis- charge Sec.-ft.
1923			
Oct. 26.....	Mark Lambert .....	1.09	e 0.20
Dec. 13.....	..... do .....	1.26	4.6
Feb. 22.....	..... do .....	1.81	35.7
May 9.....	..... do .....	2.83	25.9
June 28.....	..... do .....	1.23	e 0.70
Aug. 8.....	..... do .....	1.27	e 0.70
1924			
Nov. 16.....	Mark Lambert .....	1.62	12.4
Feb. 22.....	..... do .....	1.21	68.8
Apr. 2.....	..... do .....	0.91	15.4
May 30.....	..... do .....	0.66	3.2
Aug. 2.....	..... do .....	0.52	0.5
Sept. 13.....	..... do .....	0.59	0.6

e=Estimated.