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WATER BULLETIN NUMBER 39

Flow of the Rio Grande and Related Data

From Elephant Butte Dam, New Mexico to the Gulf of Mexico

1969

STORAGE IN MAJOR RESERVOIRS
SOURCES OF RIVER FLOW
DIVERSIONS
SUSPENDED SILT
CHEMICAL ANALYSES
SANITARY ASPECTS OF WATER QUALITY
CLIMATOLOGICAL DATA
DRAINAGE BASIN AND IRRIGATED AREAS

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FOREWORD

This bulletin presents the thirty-ninth compilation of the stream discharges and related data concerning the international portion of the Rio Grande, prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission. The stream flow data and kindred subjects pertain to the Rio Grande and its important tributaries near their confluence with the main stream from Elephant Butte, New Mexico to the Gulf of Mexico. The first publication in the series was Water Bulletin No. 1 for the year 1931. The present volume contains the information for the year 1969.

International stream gaging on the Rio Grande was initiated in 1889, when the station at El Paso, Texas was established. Several stations on the Rio Grande and its tributaries downstream from El Paso were established in 1900 and operated until 1914. Between 1914 and 1923, except for a few months in 1919 and 1920, all stream-gaging work on the international reach of the river was suspended. In 1923, the work was resumed and carried on independently by the two countries until 1931 when the present joint program of stream measurements was adopted.

During 1969, the United States Section of the Commission operated the stream-gaging stations on the Rio Grande at El Paso, American Dam, Island, County Line, Fort Quitman, Above Río Conchos, Below Río Conchos, Johnson Ranch, Foster Ranch, Langtry, Del Rio, San Antonio Crossing, Fort Ringgold, San Benito, and Brownsville. The Mexican Section operated the stream-gaging stations on the Rio Grande at Below Amistad Dam, Below Maverick Dam near Quemado, Eagle Pass, Palafox, Laredo, Below Anzalduas Dam, and Progreso. The station at Falcon Dam was operated jointly by the two Sections. Each Section operated the gaging stations on tributary streams, floodways, and diversions within its own country.

The total drainage area within the outer rim of the Rio Grande Basin is 335,500 square miles. However, about half of this area yields no runoff to the river, the estimated productive area of the watershed being 176,333 square miles. Reservoirs in the basin have a total storage capacity of approximately 10,641,400 acre-feet, in addition to the international Amistad and Falcon Reservoirs, which have a combined conservation capacity of 6,262,000 acre-feet. In the Rio Grande Basin, a rounded total of 2,368,000 acres is irrigated below Elephant Butte Dam on the Rio Grande and below Girvin on the Pecos River. The flow of the Rio Grande to the Gulf of Mexico below Brownsville prior to construction of Falcon Dam averaged 2,600,000 acre-feet per year for the period 1934-1952. For the period 1954-1969, this flow has averaged 541,400 acre-feet per year.

Acknowledgments

Other agencies which have contributed to some part of the data published herein include: The Agricultural Research Service and the Soil Conservation Service of the U. S. Department of Agriculture; the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the Weather Bureau of the U. S. Department of Commerce; the Texas Board of Health; the Texas Water Development Board; the Sanchez Ditch and Reservoir Company; the Middle Rio Grande Conservancy District; the Red Bluff Water Power Control District; the New Mexico State Engineer Office; the Rio Grande Compact Commission; the Willacy County Water Control and Improvement District No. 1; the Del Rio City Water Department; the Eagle Pass City Water Department; the Laredo City Water Department; the Del Mar Conservation District; Central Power and Light Company; the Special Water Master of the 93rd District Court of Texas; the El Paso Department of Water and Sewerage; the Maverick County Water Control and Improvement District No. 1; the Ministry of Hydraulic Resources of Mexico; the Ministry of Agriculture and Livestock of Mexico; the Meteorological Service of Mexico; Meteorological Service of the State of Chihuahua, Mexico; Federal Power Commission of Mexico; Potable Water Board of Piedras Negras, Coahuila; the Federal Board of Public Improvement Works of Nuevo Laredo, Tamaulipas; and the Water and Drainage Board of Matamoros, Tamaulipas.

Additional contributions have been made by individuals and corporations and specific notation is made for such, as well as for those of the above-named agencies, where the data appear. The courtesy and cooperation of those who made these contributions are acknowledged with appreciation.

Period Averages

In Water Bulletins Nos. 1 through 29, normal or average discharge volumes shown for the various gaging stations were based on a period beginning in 1924, or thereafter when records became available.

Beginning with Water Bulletin No. 30, the periods have been revised to include only the years following completion of major projects below which the flow of the Rio Grande or a major tributary was modified, or later when records became available. The revised periods are based on the completion of Caballo Dam in 1938; the completion in 1947 of irrigation projects on the Río Conchos and its tributaries; and the construction of International Falcon Dam which was completed in 1953.

For purposes of comparison with the average flows in the Rio Grande below Caballo Dam, records of average discharge in the Rio Grande below Elephant Butte Dam have also been revised to include the same period.

Beginning with this issue for 1969, the period averages for gaging stations from the Río Conchos to Falcon Reservoir have been revised to include only records since 1968, the year Amistad Dam and Luis L. León Dam began impounding water thus modifying their flow.

The period of record used to determine the average diversions from the Rio Grande to the United States below Falcon Dam published herein was restricted to begin in 1957, the first complete year of record after United States' waters in Falcon Reservoir were placed under the jurisdiction of the 93rd District Court of Texas.

FOREWORD

Units of Measure

Data collected by the Mexican Section are computed and published in a Spanish version of the water bulletin in metric units. The Mexican data are converted and reported in this bulletin in English units. Conversion factors conform generally to those in the National Bureau of Standards Miscellaneous Publication 286 "Units of Weight and Measure (United States Customary and Metric) - Definitions and Tables of Equivalents". However, for convenience some of the factors have been shortened and modified to facilitate conversion, reconversion to the original units when necessary, and checking of data. Conversion of the mean daily discharges, the monthly average discharge and the monthly volumes from metric to English units is direct. For this reason the monthly average discharge in cubic feet per second and monthly volumes in acre-feet shown for gaging stations operated by the Mexican Section cannot necessarily be obtained in the usual manner from the total monthly flow in second-foot days. For the same reason, evaporation and rainfall data, when totaled, may not be equivalent to the direct conversion from metric to English units. The following factors have been used for data in this bulletin:

METRIC UNITS		ENGLISH UNITS	
	LENGTHS		
1 Centimeter		0.393701	Inches
1 Meter		3.28084	Feet
1 Kilometer		0.621371	Miles
	AREAS		
1 Square Meter		10.76391	Square Feet
1 Hectare		2.471054	Acres
1 Square Kilometer		0.386102	Square Miles
	VOLUME		
1 Cubic Meter		61023.74	Cubic Inches
1 Cubic Meter		35.31467	Cubic Feet
1 Cubic Meter		1.30795	Cubic Yards
1000 Cubic Meters		0.81071	Acre-Foot
1 Liter		0.264172	U. S. Gallon
	WEIGHTS		
1 Kilogram		2.204623	Pounds
1 Metric Ton		2204.623	Pounds
1 Metric Ton		1.102311	Short Tons (2000 lbs.)

GENERAL HYDROLOGIC CONDITIONS FOR 1969

Along and Adjacent to the International Portion of the Rio Grande

During the year 1969, temperatures were about normal on the watershed of the Rio Grande below El Paso, Texas. Evaporation averaged 97% of normal. Precipitation was 82% of normal from El Paso to Amistad Dam, 107% of normal from Amistad Dam to Falcon Dam, 88% of normal from Falcon Dam to Rio Grande City, and 81% of normal in the Lower Rio Grande Valley on the United States side.

The yearly volume of flow of the Rio Grande was below normal from El Paso to the confluence of the Rio Conchos with the Rio Grande, above normal from the confluence of the Rio Conchos to Amistad Reservoir, and below normal from Amistad Dam to the Gulf of Mexico. In the reach between El Paso and the confluence of the Rio Conchos the flow averaged 59% of normal, ranging from 94% of normal at El Paso Station to 3% of normal above the Rio Conchos Station; in the reach between the confluence of the Rio Conchos and Amistad Reservoir, where flows were partly regulated by releases from Luis L. Leon Reservoir (El Granero) on the Rio Conchos, the flow averaged 114% of the 1948-1968 normal; and in the reach between Amistad Dam and Falcon Reservoir, where Rio Grande flows were partly regulated by releases from Amistad Reservoir, the flow averaged 45% of the 1948-1968 normal. Flows passing Rio Grande stations below Falcon Dam were partly regulated by releases from Falcon Reservoir. Such releases in 1969 amounted to 2,091,762 acre-feet, or 96% of the average for the sixteen years of operation, 1954 through 1969. The volume of flow wasted to the Gulf of Mexico was 249,072 acre-feet or 46% of the average for this sixteen year period.

The total annual flow of all measured tributaries below Fort Quitman was 72% of normal. The total flow of these tributaries in the United States was 379,540 acre-feet or 56% of normal. For Mexico, the measured tributary flow excluding Rio Alamo and Rio San Juan was 1,093,880 acre-feet or 103% of normal. The flow of the Rio Alamo and Rio San Juan was 29% of their respective normals.

Return flow to the Rio Grande at Maverick Power Plant near Eagle Pass was 511,814 acre-feet or 88% of the twenty-one year average. Return flow to the Rio Grande through various drains in the Maverick County irrigation district excluding storm inflow amounted to 168,883 acre-feet, or 78% of the eleven year average. There was no return flow through Poniente Drain in 1969.

There were no floods of consequence on the Rio Grande during 1969. The highest peak flow recorded was 43,100 second-feet at the Palafox Gaging Station.

For all reservoirs in the Rio Grande basin having capacity greater than 15,000 acre-feet, excepting Amistad and Falcon International Reservoirs, the average amount of water in storage in 1969 was 4,100,300 acre-feet or 103% of the normal 3,983,800 acre-feet. In the United States, stored water in these reservoirs averaged 59% of normal while in Mexico the average was 122% of normal. In International Amistad Reservoir, which started impounding water on May 31, 1968, there was a net increase in storage during the year of 611,100 acre-feet. Storage ranged from a low of 687,200 acre-feet on January 1 to a high of 1,299,200 acre-feet on December 29. In International Falcon Reservoir there was a net decrease in storage during the year of 1,185,700 acre-feet. The storage varied from a high of 2,715,500 acre-feet on January 1 to a low of 1,135,300 acre-feet on August 26 and averaged 1,720,800 acre-feet during the year or 95% of the average for the sixteen years of operation, 1954 through 1969.

Diversions from the Rio Grande in the United States were, on the average, 103% of normal. Diversions into the American Canal were 105% of normal; into Maverick Canal 91% of normal; and in the United States below Falcon Dam 113% of the average for the thirteen years, 1957-1969. In Mexico, diversions averaged 118% of normal. Diversions into the Acequia Madre were 126% of normal while diversions through the Anzalduas Canal for irrigation in Mexico were 117% of the sixteen year average.

In 1969, the total reported irrigated acreage from the Rio Grande and its tributaries below El Paso, Texas showed an increase of 13% from the previous year. On the United States side, there was an increase of 9% above and no appreciable change below Falcon Dam for an overall average change of 1%. On the Mexican side, there were increases of 15% above and 29% below Falcon Dam for an overall average increase of 23%.

The 1969 investigation of the quality of Rio Grande water extended from El Paso to Brownsville. The annual tonnage of salts carried by the river above Falcon Dam was 48% of the 1935-1969 normal. The volume of suspended silt transported by the Rio Grande in 1969 was 33% of average for sampling stations above Amistad Dam, 7% of average for sampling stations in the reach Amistad Dam to Falcon Reservoir, and 23% of average for sampling stations below Falcon Dam.

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

DESCRIPTION: Cableway, bubbler gage, and water-stage recorders (graphic and digital) located on the left bank 100 feet upstream from the cableway at latitude 33° 08' 45", longitude 107° 12' 20", and river mile 1,383.2; 0.7 river mile downstream from Elephant Butte Dam, 1.5 river miles upstream from Cuchillo Negro River, and 135.1 river miles upstream from the American Dam at El Paso, Texas. The zero of the gage is 4,242.09 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 17 discharge measurements during the year and a continuous record of gage heights. Records were furnished by the United States Geological Survey. Records available: 1915 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Beginning December 1940, hydroelectric power generation facilities for 27,000 kva were placed in operation at Elephant Butte Dam.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet

Daily:	Max.	8,220	May 22, 1942	Min.	0	Occasionally
Monthly:	Max.	7,600	May 1942	Min.	2.6	Nov. 1961 & Nov. 1964
Yearly:	Max.	2,510	1942	Min.	253	1964

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.5	8.5	643	✟ 1,950	1,270	1,860	✟ 2,080	✟ 1,960	1,940	✟ 7.8	2.3	11.0
2	3.5	8.5	642	1,940	1,250	✟ 1,860	2,070	1,970	✟ 1,950	7.6	1.4	✟ 8.5
3	3.5	9.2	1,260	1,960	1,250	1,860	2,060	1,970	1,950	9.0	✟ 1.4	9.0
4	3.1	10.0	1,280	1,980	1,250	1,860	2,040	1,970	1,940	9.2	2.2	11.0
5	3.1	10.0	1,280	2,000	1,250	1,860	2,040	1,970	1,360	8.2	8.0	9.1
6	3.1	127.0	1,280	1,980	1,240	1,870	2,020	1,980	1,330	8.0	32.0	9.3
7	3.1	12.0	1,280	1,970	1,250	1,890	2,010	1,980	1,330	7.9	25.0	11.0
8	✟ 3.1	11.0	1,280	1,970	1,240	1,890	2,000	1,990	1,330	8.0	18.0	11.0
9	4.4	11.0	1,280	1,970	1,250	1,910	2,000	1,990	1,330	8.8	13.0	9.8
10	4.2	11.0	1,280	1,970	1,250	1,920	1,980	2,000	82.0	9.1	11.0	9.5
11	4.2	11.0	1,280	1,970	1,250	1,940	1,960	2,010	13.0	11.0	8.8	9.9
12	4.2	9.8	1,280	1,970	1,260	1,960	1,930	2,150	12.0	9.7	7.2	10.0
13	4.2	9.0	1,280	1,980	1,270	1,980	1,910	2,260	11.0	9.0	29.0	9.0
14	4.8	9.0	1,280	1,980	1,270	2,000	1,900	2,260	11.0	8.8	2.6	8.6
15	4.6	599	1,280	1,980	1,280	2,010	1,890	✟ 2,260	9.4	8.7	1.1	8.3
16	3.4	633	1,280	1,960	✟ 1,280	✟ 2,010	✟ 1,890	2,260	9.5	9.0	1.8	8.4
17	3.4	✟ 636	1,280	1,760	1,280	2,010	1,910	2,250	10.0	9.2	1.8	8.7
18	3.4	636	1,280	1,970	1,290	2,020	1,920	2,250	10.0	10.0	5.2	7.9
19	3.6	635	1,290	1,960	1,290	2,020	1,930	2,230	9.6	10.0	5.2	8.3
20	3.8	636	1,290	1,970	1,280	2,030	1,920	2,220	11.0	9.5	5.0	8.0
21	4.3	638	1,290	1,970	1,280	2,030	1,930	2,210	112	41.0	8.0	7.7
22	5.2	627	1,300	1,370	1,890	2,030	1,930	2,210	10.0	16.0	7.5	7.3
23	5.3	638	1,300	1,330	1,900	2,050	1,920	2,210	9.2	11.0	7.6	7.0
24	4.7	647	1,300	1,330	1,890	2,080	1,920	2,200	9.3	10.0	6.9	9.1
25	4.8	632	1,300	1,320	1,870	2,080	1,920	1,930	9.5	9.8	6.5	9.0
26	5.3	643	1,300	1,310	1,860	2,080	1,920	2,080	8.9	10.0	7.0	9.9
27	5.7	635	1,310	1,300	1,860	2,080	1,920	1,960	8.4	7.5	7.0	9.9
28	6.4	✟ 638	1,350	1,300	1,850	2,090	1,920	1,960	8.5	5.8	7.0	7.5
29	9.1		1,320	1,290	1,840	2,090	1,940	1,950	8.5	3.2	7.0	8.1
30	9.0		1,330	✟ 1,270	1,850	2,080	1,950	1,950	8.5	2.8	7.2	9.4
31	✟ 8.7		1,350		1,850		1,960	1,950		2.6		10.0
Sum	142.7	9,130	38,775	52,980	45,190	59,450	60,690	64,540	14,841.3	298.2	253.7	281.2

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			29	9.1	† 4	3.1	4.6	283	29,460	86,500	200
Feb.			24	647	† 1	8.5	326	18,109	41,424	88,861	188
Mar.			† 28	1,350	2	642	1,250	76,910	68,417	119,000	1,520
Apr.			5	2,000	30	1,270	1,770	105,086	78,690	162,000	24,000
May			23	1,900	† 6	1,240	1,460	89,634	78,700	467,000	512
June			† 28	2,090	† 1	1,860	1,980	117,919	89,466	363,000	16,913
July			1	2,080	† 15	1,890	1,960	120,379	91,732	211,000	41,352
Aug.			† 13	2,260	† 29	1,950	2,080	128,015	76,987	134,000	9,530
Sept.			† 2	1,950	27	8.4	495	29,438	35,441	129,000	163
Oct.			21	41.0	31	2.6	9.6	591	21,160	72,100	166
Nov.			6	32.0	15	1.1	8.5	503	20,908	158,000	152
Dec.			† 1	11.0	23	7.0	9.1	558	21,742	87,300	179
Yearly				2,260		1.1	950	687,425	654,127	1,818,800	183,415

Current Year 1969 — Period 1938-1969

✟ Discharge measurement made on this day Ø Mean daily † And other days

RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank at latitude 32° 53' 05", longitude 107° 17' 30", and river mile 1,355.0; 0.8 river mile downstream from Caballo Dam, about 3 miles northeast of Arrey, New Mexico, 5 miles south of Caballo, New Mexico, and 106.8 river miles upstream from the American Dam at El Paso, Texas. The zero of the gage is 4,140.90 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 54 discharge measurements during the year and a continuous record of gage heights. Records were furnished by the El Paso office of the United States Bureau of Reclamation. Records available: 1938 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 568 acre-feet of water were diverted in 1969 into Bonita Lateral, a small irrigation canal just below Caballo Dam. Prior to 1938, discharge records were kept at Percha Dam, a low diversion dam about 1.5 miles downstream from this station. Small accretions to the river take place between the station and Percha Dam.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet

Daily:	Max.	7,650	May 20, 1942	Min.	0.1	Oct. 31 - Nov. 14, 1954, Nov. 7 - Dec. 31, 1955
Monthly:	Max.	6,710	May 1942	Min.	0.1	Nov. & Dec. 1955
Yearly:	Max.	2,480	1942	Min.	284	1964

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	1.2	1,100	1,770	952	1,460	2,460	2,640	823	✱ 2.2	1.2	1.3
2	✱ 1.6	1.2	954	✱ 1,800	865	1,420	2,460	2,580	684	2.2	1.2	1.3
3	1.6	✱ 1.2	923	1,870	795	1,480	✱ 2,590	2,600	615	2.1	1.3	1.5
4	1.5	1.2	1,270	1,720	801	✱ 1,540	2,780	2,550	✱ 621	2.3	1.3	✱ 1.5
5	1.5	1.2	✱ 1,560	1,460	804	1,550	2,770	2,520	694	2.2	1.4	1.5
6	1.5	1.2	1,560	1,350	✱ 787	1,500	2,680	✱ 2,560	763	✱ 2.2	✱ 1.4	1.3
7	1.5	1.2	1,560	1,370	747	1,440	2,640	2,560	766	2.2	1.4	1.3
8	1.4	1.2	1,550	1,170	746	1,450	2,380	2,560	750	2.0	1.3	1.4
9	1.4	1.2	1,540	994	752	1,450	✱ 2,150	2,570	896	1.9	1.3	1.4
10	✱ 1.4	✱ 1.2	1,540	✱ 1,020	734	1,640	1,890	2,650	✱ 1,140	✱ 1.8	1.2	1.4
11	1.4	1.2	1,700	978	732	✱ 1,890	1,420	2,680	1,280	1.6	1.2	✱ 1.2
12	1.3	1.2	✱ 1,910	941	733	1,960	1,110	2,640	1,280	1.4	1.2	1.2
13	✱ 1.3	1.2	1,920	913	778	1,900	1,120	2,590	1,060	✱ 1.2	✱ 1.2	1.2
14	1.3	1.2	1,910	896	✱ 845	1,820	1,330	✱ 2,580	834	1.2	1.2	1.2
15	1.3	1.2	1,900	880	860	1,800	1,730	2,590	834	1.2	1.2	1.3
16	1.3	1.2	1,890	✱ 836	910	1,740	✱ 1,990	2,530	826	✱ 1.2	1.2	1.4
17	1.3	1.2	1,890	792	995	1,860	1,990	2,470	✱ 810	1.3	1.2	1.4
18	1.3	1.2	✱ 2,130	795	1,030	✱ 2,010	1,840	2,450	908	1.4	1.0	✱ 1.4
19	1.3	✱ 1.2	2,250	741	1,030	2,000	1,710	2,430	990	1.5	✱ 1.0	1.2
20	1.3	1.2	2,260	✱ 712	✱ 1,040	2,180	1,660	✱ 2,400	832	1.7	1.2	1.2
21	1.3	1.2	2,320	729	1,100	2,380	1,640	2,390	512	2.1	1.2	1.2
22	✱ 1.3	1.2	2,400	847	1,140	2,360	1,790	2,230	119	2.0	1.2	1.1
23	1.3	1.2	2,140	935	1,130	2,340	✱ 2,000	2,070	✱ 8.0	✱ 1.7	1.2	1.0
24	1.3	1.2	2,120	1,150	1,220	2,300	2,050	2,010	4.6	1.6	1.0	✱ 1.0
25	1.2	1.2	✱ 2,340	1,030	1,230	✱ 2,280	2,350	1,920	3.9	1.5	1.0	1.0
26	1.2	1.2	2,410	877	1,250	2,360	2,460	1,870	3.5	1.4	1.1	1.0
27	1.2	405	2,380	880	1,400	2,740	2,460	✱ 1,870	3.2	1.2	1.1	1.0
28	✱ 1.2	1,090 ✱	2,220	892	✱ 1,520	2,930	2,460	1,840	3.0	1.1	✱ 1.1	1.0
29	1.2		1,980	922	1,530	2,720	2,460	1,630	2.9	1.1	1.2	1.0
30	1.2		1,820	✱ 957	1,530	2,460	✱ 2,460	1,410	2.6	✱ 1.0	1.3	1.0
31	1.2		1,810		1,520		2,590	1,090		1.1		1.0
Sum	41.6	1,526.2	57,257	32,227	31,506	58,960	65,420	71,480	18,068.7	50.6	36.0	37.9

Current Year 1969 — Period 1938-1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.			† 2	1.6	† 25	1.2	1.3	82.5	535	4,850	19.2
Feb.			28	1,090	† 1	1.2	54.5	3,027	8,100	64,300	13.0
Mar.			26	2,410	3	923	1,850	113,569	82,756	135,000	24,900
Apr.			3	1,870	20	712	1,070	63,922	83,908	212,000	25,470
May			† 29	1,530	11	732	1,020	62,492	76,651	412,000	75.2
June			28	2,930	2	1,420	1,970	116,947	107,166	354,000	36,268
July			4	2,780	12	1,110	2,110	129,761	114,320	234,000	28,200
Aug.			11	2,680	31	1,090	2,310	141,781	108,772	179,000	20,500
Sept.			† 11	1,280	30	2.6	602	35,839	50,165	181,000	7,730
Oct.			4	2.3	30	1.0	1.6	100	5,224	35,400	15.5
Nov.			† 5	1.4	† 18	1.0	1.2	71.4	2,794	14,400	7.0
Dec.			† 3	1.5	† 23	1.0	1.2	75.2	2,897	19,100	6.0
Yearly				2,930		1.0	922	667,667.1	643,288	1,795,670	206,084.6

✱ Discharge measurement made on this day ∅ Mean daily † And other days

RIO GRANDE AT EL PASO, TEXAS

DESCRIPTION: Gravity well and water-stage recorder located on the downstream side of the first pier from the left abutment of the Courchesne Bridge at latitude 31° 48' 10", longitude 106° 32' 25", and river mile 1,249.9; 5.6 river miles upstream from the Santa Fe Street-Juárez Avenue Bridge between El Paso, Texas and Cd. Juárez, Chihuahua and 1.7 miles upstream from the American Dam at El Paso, Texas. The zero of the gage is 3,722.30 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily discharges in 1969 were computed by adding the flows in the American Canal and the flows at the river station below the American Dam. Because the mean daily discharges are rounded, the monthly sum for this station may not equal the sum of the monthly sums of the other two stations. Extreme discharges are those passing the El Paso station, where measurements are made only during high flows. Records available: 1889 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 24,000 second-feet on June 12, 1905. Min. occasionally no flow. Since Elephant Butte Dam was closed in 1915, the largest peak flow to pass this station was 13,500 second-feet on September 3, 1925.

Average Flow in Second-Feet

Daily:	Max.	23,680	June 12, 1905	Min.	0	Occasionally
Monthly:	Max.	14,300	June 1905	Min.	0	Occasionally
Yearly:	Max.	2,780	1905	Min.	70.1	1902

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	76.1	64.3	34.8	553	576	779	1,180	1,000	1,410	256	126	112
2	78.3	60.5	32.5	563	525	825	1,010	1,200	1,200	241	102	117
3	79.4	55.8	275	604	455	860	939	1,140	1,060	217	143	133
4	79.5	69.0	459	592	470	794	935	1,160	932	202	132	166
5	78.7	65.8	525	730	439	770	1,140	1,240	700	199	130	140
6	81.9	59.8	770	756	469	754	1,340	1,070	616	191	122	142
7	80.1	56.7	652	762	550	807	1,380	1,080	581	191	117	134
8	80.7	53.6	657	694	516	807	1,380	1,030	642	186	116	130
9	76.2	50.8	647	731	456	762	1,530	1,040	611	180	114	124
10	79.8	51.8	628	763	443	815	1,530	995	582	171	114	120
11	76.4	50.9	722	564	431	813	1,580	1,080	540	165	113	118
12	78.0	48.3	799	542	411	843	1,360	1,180	619	162	111	114
13	76.5	53.3	868	614	406	837	1,190	1,090	685	149	113	112
14	75.1	52.6	949	605	413	850	1,010	1,040	1,170	150	109	114
15	81.4	48.1	878	616	374	857	882	1,010	910	150	106	112
16	83.7	45.5	849	553	394	916	869	1,110	703	144	114	112
17	80.0	30.6	776	513	420	961	856	1,240	591	138	109	112
18	79.4	32.8	742	422	418	858	966	1,250	473	134	185	112
19	76.7	35.0	781	429	442	834	1,030	1,180	402	134	102	108
20	78.0	33.8	773	438	498	840	1,070	1,090	364	136	104	108
21	75.3	23.4	771	457	500	856	1,020	1,060	397	151	109	104
22	76.3	35.4	809	432	487	956	963	1,130	493	234	112	106
23	74.2	44.5	1,080	436	456	1,040	916	1,130	519	212	109	108
24	72.2	36.8	865	421	504	1,080	826	1,110	428	275	106	108
25	71.1	34.3	520	485	491	1,020	868	1,220	379	197	109	106
26	71.1	34.8	788	561	621	916	873	1,020	340	157	119	108
27	72.0	33.8	855	570	623	798	1,050	912	298	143	117	112
28	71.0	34.3	781	532	624	827	1,120	923	280	150	119	110
29	69.7		765	522	663	1,250	1,220	920	268	163	113	108
30	67.1		690	542	777	1,290	1,120	1,660	263	155	110	106
31	67.1		588		750		986	1,600		133		104
Sum	2,363.0	1,296.3	21,329.3	17,002	15,602	26,615	34,139	34,910	18,456	5,466	3,425	3,620

Month	Current Year 1969							Period 1938-1969		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.85	2.80	15	88.4	30	63.8	76.2	4,687	6,456	15,100	220
Feb.	2.80	2.65	4	69.4	19	23.0	46.3	2,571	7,903	52,200	136
Mar.	5.25	2.64	23	1,190	2	32.5	688	42,307	33,613	62,500	1,790
Apr.	4.90	3.83	10	825	18	387	567	33,723	44,013	139,000	6,820
May	4.80	3.79	30	795	15	343	503	30,947	47,371	357,000	522
June	5.95	4.65	29	1,520	1	742	887	52,791	55,323	304,000	6,020
July	6.00	4.53	9	1,700	16	814	1,100	67,715	60,858	198,000	9,652
Aug.	6.24	4.59	30	3,730	27	845	1,130	69,244	59,092	158,000	4,870
Sept.	5.78	3.30	14	2,670	30	248	615	36,607	41,401	171,000	2,430
Oct.	3.44	2.96	24	299	20	126	176	10,842	14,743	57,900	151
Nov.	3.28	2.84	3	217	19	101	114	6,793	8,825	21,300	229
Dec.	3.08	2.88	3	257	31	93.7	117	7,180	8,581	25,600	206
Yearly	6.24	2.64		3,730		23.0	505	365,407	388,179	1,559,200	57,481

DIVERSIONS FROM THE RIO GRANDE
AMERICAN CANAL AT EL PASO, TEXAS

DESCRIPTION: Concrete control consisting of two triangular-shaped wingwalls extending toward the center of the canal about one-fourth of the canal width and downstream at a 30° angle with the canal side walls, bubbler gage, water-stage recorders (graphic and digital), and binary decimal transmitter located on the right bank of the concrete-lined canal at El Paso, Texas, latitude 31° 46' 40", longitude 106° 31' 25", and about 2,400 feet downstream from the headgates of the American Dam which are located at river mile 1,248.2. The zero of the gage is 3,712.09 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 52 discharge measurements during the year, a stable rating curve at medium and high flows, and a continuous record of gage heights. Records available: June 2, 1938 through 1969.

REMARKS: This canal diverts water from the Rio Grande at the American Dam at El Paso, Texas, 2.1 river miles upstream from the International Dam at Juárez, Chihuahua. Water from this canal discharges into the Franklin Canal from which water is frequently returned to the Rio Grande at spillways 2.2, 2.7, and 3.6 river miles downstream from the American Dam. The transmitter relays gage height data upon interrogation by telephone via commercial circuits.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,840 second-feet on March 27, 1944. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	1,510	Aug. 13, 1945	Min.	0	Frequently
Monthly:	Max.	1,210	Aug. 1943	Min.	0	Frequently since 1952
Yearly:	Max.	748	1943	Min.	65.6	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	75.5	63.8	0	⋔ 369	420	638	⋔ 998	793	1,080	255	125	112
2	77.7	60.0	0	378	372	678	830	997	997	240	101	⋔ 116
3	78.9	⋔ 22.8	241	419	305	⋔ 711	743	936	⋔ 853	216	142	132
4	79.0	1.5	⋔ 450	407	316	658	726	955	706	201	⋔ 131	165
5	78.2	1.0	517	542	282	629	926	⋔ 1,030	482	198	129	140
6	81.4	⋔ 0	584	569	⋔ 305	613	1,130	865	406	190	121	141
7	⋔ 79.6	0	575	575	392	667	1,170	876	377	⋔ 190	116	134
8	80.2	0	591	⋔ 501	364	446	⋔ 1,180	832	438	185	115	130
9	75.7	0	588	538	300	614	1,170	828	⋔ 404	179	113	⋔ 123
10	79.3	⋔ 0	579	575	287	⋔ 677	1,180	788	374	170	113	119
11	75.9	0	⋔ 629	388	275	676	1,200	869	332	164	112	117
12	77.5	0	724	370	258	705	1,170	⋔ 973	409	161	110	114
13	76.0	0	765	435	⋔ 253	702	992	886	476	148	⋔ 112	112
14	⋔ 74.6	0	870	423	261	710	814	842	702	⋔ 149	108	113
15	80.9	0	864	⋔ 436	222	715	⋔ 690	809	711	149	105	111
16	83.2	0	842	407	245	777	678	906	⋔ 511	143	113	⋔ 112
17	79.5	⋔ 2.0	772	334	270	821	671	1,050	399	137	109	112
18	78.9	11.6	⋔ 739	242	268	718	767	1,050	273	133	⋔ 104	111
19	76.2	13.9	778	255	294	690	830	⋔ 981	322	133	102	108
20	77.5	15.9	771	264	⋔ 352	698	877	896	360	135	104	107
21	⋔ 74.8	4.0	769	276	357	716	823	867	394	⋔ 150	108	104
22	75.8	22.0	807	⋔ 252	346	817	⋔ 756	921	491	233	111	106
23	73.7	16.1	999	261	313	908	709	910	⋔ 517	211	108	⋔ 107
24	71.7	⋔ 0	860	247	362	⋔ 946	620	896	426	274	105	108
25	70.6	0	⋔ 516	301	347	884	659	1,010	377	196	⋔ 109	105
26	70.6	0	610	381	478	778	673	⋔ 814	339	156	118	107
27	71.5	0	664	386	⋔ 478	660	844	708	297	142	117	111
28	⋔ 70.5	0	597	338	479	691	917	707	279	⋔ 149	118	109
29	69.2		575	⋔ 326	522	1,020	⋔ 1,020	701	267	162	113	108
30	66.6		503	348	638	1,130	916	802	⋔ 262	154	109	⋔ 106
31	66.6		404		603		783	1,020		132		104
Sum	2,347.3	234.6	19,183	11,543	10,964	22,093	27,462	27,518	14,261	5,435	3,401	3,604

Current Year 1969 — Period 1939 - 1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	4.10	3.77	15	87.9	30	63.3	75.7	4,656	1,356	8,110	0
Feb.	7.35		22	628	† 5	0	8.4	465	4,835	19,500	0
Mar.	9.50		23	1,190	† 1	0	619	38,049	29,662	50,100	1,700
Apr.	7.37	4.90	10	636	18	212	385	22,896	33,331	70,900	4,560
May	7.48	4.82	30	657	15	191	354	21,747	27,759	69,000	392
June	9.57		29	1,230	8	0	736	43,821	37,300	65,700	5,990
July	9.88	7.00	9	1,310	23	512	886	54,471	44,394	70,700	8,673
Aug.	9.58	7.34	31	1,220	30	625	888	54,582	44,041	74,600	4,840
Sept.	9.57	4.40	1	1,220	18	168	475	28,287	29,163	63,100	2,230
Oct.	5.45	4.00	24	298	20	125	175	10,780	12,210	39,000	0
Nov.	4.88	3.54	3	216	3	72.9	113	6,746	7,303	21,000	0
Dec.	5.07	4.13	3	257	31	93.2	116	7,149	7,286	25,500	0
Yearly	9.88			1,310		0	406	293,649	278,640	541,610	47,397.4

⋔ Discharge measurement made on this day † And other days

RIO GRANDE BELOW AMERICAN DAM AT EL PASO, TEXAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the retaining wall of the Smelter Pump on the left bank of the river at latitude 31° 46' 35", longitude 106° 31' 20", and river mile 1,247.6; 1.5 river miles upstream from the International Dam, 3.3 river miles upstream from the Santa Fe Street-Juárez Avenue Bridge between El Paso, Texas, and Cd. Juárez, Chihuahua, and 0.6 river mile downstream from the American Dam. The zero of the gage is 3,712.30 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 75 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: June 1938 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The operation of the American Dam began June 2, 1938. At this dam, part of the flow passing the El Paso Gaging Station is diverted into the American Canal and the remainder, including excess flood flows, passes this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 11,300 second-feet on September 14, 1958 with a gage height of 14.50 feet. Min. no flow on March 23, 1955 and for several days in 1956, 1959, 1964, and 1968.

Average Flow in Second-Feet

Daily:	Max.	6,040	May 20, 1942	Min.	0	Frequently
Monthly:	Max.	4,880	May 1942	Min	0.2	Nov. 1958, Dec. 1959, & Nov. 1961
Yearly:	Max.	1,510	1942	Min.	13.8	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.6	0.5	34.8	184	✱ 156	141	184	✱ 208	326	1.3	1.0	0.5
2	.6	.5	32.5	185	153	✱ 147	178	202	198	1.2	1.0	✱ .6
3	.5	33.0	33.6	✱ 185	150	149	✱ 196	202	✱ 211	1.2	1.0	1.0
4	.5	✱ 67.5	✱ 8.8	185	154	136	209	✱ 202	226	1.1	✱ 1.0	.5
5	.5	64.8	7.8	188	✱ 157	141	218	210	218	1.0	1.0	.5
6	.5	59.8	✱ 186	187	164	✱ 141	207	201	210	1.0	1.0	.5
7	✱ .5	56.7	77.4	✱ 187	158	140	209	204	204	✱ 1.0	1.0	.5
8	.5	53.6	65.6	193	✱ 152	361	✱ 202	200	✱ 204	1.0	1.0	.5
9	.5	50.8	58.7	193	156	✱ 148	362	208	207	1.0	1.0	✱ .5
10	.5	51.8	48.9	✱ 188	156	138	✱ 350	207	208	1.0	1.0	.5
11	.5	✱ 50.9	✱ 92.6	176	156	137	375	✱ 216	✱ 208	1.0	1.0	.5
12	.5	48.3	75.0	172	✱ 153	138	186	206	209	1.0	✱ 1.0	.5
13	.5	53.3	103	179	153	135	199	203	209	1.0	1.0	.5
14	✱ .5	52.6	78.8	✱ 182	152	140	✱ 195	✱ 202	471	✱ 1.0	.8	.5
15	.5	48.1	13.6	180	✱ 152	142	192	199	✱ 199	1.0	.6	.5
16	.5	45.5	7.0	146	149	139	191	199	192	1.0	.6	✱ .5
17	.5	28.6	4.1	✱ 179	150	140	✱ 185	193	192	1.0	.5	.5
18	.5	✱ 21.2	✱ 3.4	180	150	140	199	✱ 196	✱ 200	1.0	✱ .5	.5
19	.5	21.1	3.0	174	✱ 148	✱ 144	203	197	80.4	1.0	.5	.5
20	.5	17.9	2.4	174	146	142	197	198	3.8	1.0	.5	.5
21	✱ .5	19.4	2.3	✱ 181	143	140	201	196	2.8	✱ 1.0	.5	.5
22	.5	13.4	2.1	180	✱ 141	139	✱ 207	✱ 209	2.2	1.0	.5	.5
23	.5	28.4	78.7	175	143	✱ 137	207	216	✱ 1.9	1.0	.5	✱ .5
24	.5	36.8	4.7	✱ 174	142	139	206	214	1.8	1.0	.5	.5
25	.5	✱ 34.3	✱ 3.7	184	144	137	✱ 209	✱ 213	1.7	1.0	✱ .5	.5
26	.5	34.8	178	180	✱ 143	✱ 138	200	204	1.4	1.0	.5	.5
27	.5	33.8	✱ 191	184	145	138	206	204	1.3	1.0	.5	.5
28	✱ .5	34.3	184	✱ 194	145	136	203	216	1.3	✱ 1.0	.5	.5
29	.5		✱ 190	196	✱ 141	229	✱ 200	219	1.4	1.0	.5	.5
30	.5		187	194	139	✱ 158	202	856	✱ 1.4	1.0	.5	✱ .5
31	.5		✱ 184		147		203	585		1.0		.5
Sum	15.7	1,061.7	2,142.5	5,459	4,638	4,530	6,681	7,385	4,193.4	31.8	22.0	16.1

Month	Current Year 1969 Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1939-1969 Acre-Feet Average	Maximum	Minimum
Jan.			† 1	Ø 0.6	† 3	Ø 0.5	0.5	31.1	4,963	12,000	31.1
Feb.	3.78		4	383	† 1	Ø .5	37.9	2,160	2,773	32,800	31.3
Mar.	4.40	2.33	6	895	23	2.0	69.1	4,250	3,617	22,801	81.9
Apr.	3.62	3.08	7	296	16	82.2	182	10,828	9,968	74,500	2,230
May	3.51	3.22	21	199	30	122	150	9,199	18,841	300,000	25.2
June	4.82	3.20	8	958	16	127	151	8,985	17,273	250,000	35.5
July	5.30	3.41	9	889	1	159	216	13,252	15,894	155,000	967
Aug.	7.35	3.83	30	3,080	3	194	238	14,648	14,722	114,000	37.5
Sept.	6.15	2.60	14	1,540	† 27	1.3	140	8,318	11,632	124,000	53.8
Oct.	2.60	2.56	1	1.4	† 5	1.0	1.0	63.1	2,128	19,000	18.0
Nov.	2.55	2.49	† 1	1.0	† 17	.5	.7	43.6	1,267	8,700	11.9
Dec.	2.70	2.46	3	2.5	28	.4	.5	31.9	1,070	7,760	13.1
Yearly	7.35			3,080		0.4	99.1	71,755.7	104,148	1,093,553	10,001.1

✱ Discharge measurement made on this day Ø Mean daily † And other days

DIVERSIONS FROM THE RIO GRANDE

ACEQUIA MADRE AT JUAREZ, CHIHUAHUA

DESCRIPTION: Bridge for making discharge measurements, gravity well, and water-stage recorder located on the right bank of the canal at Juárez, Chihuahua, latitude 31° 45' 40", longitude 106° 30' 30", about 260 feet downstream from the canal intake at the International Dam at Juárez, Chihuahua, which is located at river mile 1,246.1 and 2.1 river miles downstream from the American Dam at El Paso, Texas.

RECORDS: Based on 128 discharge measurements during the year, 77 by the Mexican Section and 51 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1969. These records, showing the water actually diverted by Mexico, do not necessarily reflect the quantities of water made available to Mexico in the bed of the river by the United States under terms of the Convention of 1906. Such quantities of water are included in the record of "Rio Grande below American Dam at El Paso, Texas." See page 11 in this Water Bulletin.

REMARKS: In 1969 all of the 59,884 acre-feet tabulated below were distributed to land irrigated in the first unit under the canal.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 480 second-feet on July 21, 1944 with a gage height of 6.00 feet. Min. no flow during several months throughout the year.

Average Flow in Second-Feet

Daily:	Max.	339	May 10, 1942	Min.	0	Several months each year
Monthly:	Max.	283	May 1938	Min.	0	Several months each year
Yearly:	Max.	116	1942	Min.	9.2	1964

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	172	✟ 156	144	176	✟ 193	198	0	0	0
2	0	0	0	✟ 171	✟ 144	✟ 142	✟ 175	191	✟ 190	0	0	0
3	0	0	0	✟ 174	143	149	✟ 186	191	✟ 193	0	0	0
4	0	0	0	178	143	✟ 134	✟ 184	✟ 195	✟ 195	0	0	0
5	0	0	0	✟ 178	✟ 145	133	✟ 187	201	194	0	0	0
6	0	0	0	178	✟ 142	✟ 135	185	✟ 196	✟ 199	0	0	0
7	0	0	0	✟ 177	✟ 141	135	✟ 183	194	202	0	0	0
8	0	0	0	182	✟ 141	136	178	✟ 192	✟ 200	0	0	0
9	0	0	0	✟ 183	✟ 141	✟ 140	✟ 182	193	✟ 204	0	0	0
10	0	0	0	✟ 180	141	133	182	194	195	0	0	0
11	0	0	0	✟ 180	141	✟ 133	✟ 189	✟ 197	✟ 193	0	0	0
12	0	0	0	163	✟ 142	134	✟ 187	201	✟ 189	0	0	0
13	0	0	0	174	141	✟ 133	182	✟ 192	188	0	0	0
14	0	0	0	✟ 171	✟ 141	133	✟ 182	✟ 198	198	0	0	0
15	0	0	0	175	✟ 139	135	✟ 173	✟ 192	✟ 193	0	0	0
16	0	0	0	✟ 175	✟ 141	✟ 132	✟ 175	195	182	0	0	0
17	0	0	0	✟ 177	140	136	✟ 174	191	181	0	0	0
18	0	0	0	✟ 177	139	✟ 133	✟ 187	✟ 198	✟ 185	0	0	0
19	0	0	0	172	✟ 140	✟ 136	193	195	85.1	0	0	0
20	0	0	0	172	141	✟ 136	189	✟ 192	0	0	0	0
21	0	0	0	✟ 175	✟ 140	135	✟ 192	✟ 193	0	0	0	0
22	0	0	0	169	✟ 139	136	✟ 193	✟ 196	0	0	0	0
23	0	0	0	✟ 167	✟ 140	✟ 136	✟ 196	206	0	0	0	0
24	0	0	0	✟ 168	141	135	✟ 200	215	0	0	0	0
25	0	0	0	✟ 173	142	✟ 134	✟ 195	✟ 208	0	0	0	0
26	0	0	✟ 115	171	✟ 141	✟ 136	193	212	0	0	0	0
27	0	0	✟ 179	170	141	✟ 138	192	✟ 204	0	0	0	0
28	0	0	✟ 173	✟ 176	✟ 141	139	✟ 194	✟ 206	0	0	0	0
29	0		✟ 172	179	✟ 140	141	190	✟ 202	0	0	0	0
30	0		172	✟ 183	✟ 140	✟ 151	✟ 192	203	0	0	0	0
31	0		✟ 175		145		✟ 192	198		0		0
Sum	0	0	986	5,240	4,392	4,103	5,778	6,134	3,564.1	0	0	0

Current Year 1969								Period 1938-1969		
Month	Average Rainfall — Inches **		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	1938-1969	1969	Day		Day				Average	Maximum	Minimum
Jan.	0.39	0.05		0		0	0	0	0	0	0
Feb.	.33	.10		0		0	0	0	0	0	0
Mar.	.29	.11	26	199	† 1	0	31.8	1,955	1,167	6,482	0
Apr.	.19	T	11	186	12	150	175	10,391	7,168	12,383	2,020
May	.34	.26	1	183	1	128	142	8,709	9,576	17,380	0
June	.71	.02	29	171	1	125	137	8,139	8,221	15,700	0
July	1.58	1.16	† 21	200	1	159	186	11,459	8,346	15,170	0
Aug.	1.31	.89	† 24	215	13	184	198	12,167	8,139	12,620	0
Sept.	1.01	.37	8	206	† 19	0	119	7,064	4,945	12,380	0
Oct.	.72	.53		0		0	0	0	48.6	328	0
Nov.	.34	.68		0		0	0	0	0	0	0
Dec.	.48	.73		0		0	0	0	0	0	0
Yearly	7.69	4.90		215		0	82.6	59,884	47,610.6	83,930	6,653

✟ Discharge measurement made on this day
† And other days
T Trace
** Average for valley floor in United States and Mexico from El Paso to Island Station

RIO GRANDE – ISLAND STATION NEAR CLINT, TEXAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank of the rectified channel of the Rio Grande at latitude 31° 32' 00", longitude 106° 14' 35", and river mile 1,221.1; 0.6 river mile downstream from the Riverside Canal Wasteway No. 2, about 4 miles south southwest of Clint, Texas, and 27.1 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 3,608.99 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 53 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: August 17, 1938 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 7,050 second-feet on September 14, 1958 with a gage height of 15.80 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	6,140	May 19, 1942	Min.	0	Frequently
Monthly:	Max.	4,880	May 1942	Min.	0	Frequently
Yearly	Max.	1,490	1942	Min.	0.3	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.9	27.3	11.9	5.5	5.9	6.8	* 53.8	23.6	942	↟ 10.4	16.1	8.6
2	↟ 13.3	22.3	11.1	↟ 5.2	6.0	6.8	↟ 24.0	23.8	↟ 565	10.2	15.4	8.3
3	13.7	21.0	10.7	5.2	5.4	6.8	14.9	25.0	280	12.0	15.3	↟ 8.8
4	13.6	42.0	8.8	5.5	6.9	↟ 6.8	13.9	24.7	235	17.5	15.7	22.9
5	13.7	↟ 22.4	↟ 7.0	5.2	6.6	6.2	13.3	26.0	88.5	16.7	↟ 15.7	10.7
6	13.2	21.5	7.6	6.0	6.7	6.8	79.1	↟ 53.5	23.7	16.8	16.2	9.1
7	13.4	16.1	12.5	8.5	↟ 6.5	6.6	118	25.7	18.8	17.2	16.6	9.1
8	↟ 13.5	15.4	7.0	11.6	6.2	6.5	106	25.3	17.1	↟ 17.3	17.0	8.8
9	13.2	15.4	7.1	↟ 5.1	6.9	8.0	↟ 362	24.5	15.6	16.5	17.5	8.6
10	13.6	15.1	6.6	5.2	6.9	6.2	463	25.2	↟ 14.3	15.4	15.9	↟ 8.0
11	13.9	15.0	6.6	5.0	5.1	↟ 5.0	613	25.3	13.9	15.0	14.8	7.6
12	14.3	↟ 15.3	↟ 5.1	5.4	5.7	6.0	471	25.4	13.9	14.6	↟ 15.2	7.6
13	14.6	14.7	3.7	4.6	4.8	6.6	336	↟ 29.1	14.9	14.2	15.8	7.5
14	15.0	14.1	5.6	4.7	↟ 5.0	6.8	108	23.0	824	13.9	16.5	7.4
15	↟ 15.3	14.4	5.8	3.6	6.5	8.2	47.9	22.3	76.0	↟ 13.5	17.1	7.3
16	16.9	13.7	5.8	↟ 3.2	5.5	8.0	↟ 17.9	22.0	53.3	13.5	17.3	7.6
17	24.3	13.1	5.8	4.5	3.9	13.5	20.3	30.8	↟ 19.0	14.0	17.5	↟ 7.5
18	39.9	12.8	5.5	4.0	4.8	↟ 31.2	17.9	146	15.6	14.4	17.4	7.5
19	47.4	↟ 12.5	↟ 5.0	3.2	3.8	11.4	24.9	53.9	14.0	14.8	↟ 16.4	7.5
20	65.6	12.9	4.3	4.7	3.0	11.4	156	↟ 13.3	13.5	15.6	16.5	7.5
21	48.7	12.9	3.4	4.1	↟ 3.4	11.8	234	12.3	14.2	16.5	16.1	7.4
22	↟ 21.0	13.3	4.0	4.4	3.6	12.6	87.8	36.8	18.7	↟ 16.5	15.8	7.4
23	17.5	13.3	43.1	↟ 4.6	2.5	26.1	↟ 26.5	42.0	31.3	16.3	14.8	7.4
24	17.0	13.4	49.6	5.6	6.2	26.8	24.1	15.2	↟ 12.4	16.4	14.1	↟ 7.4
25	19.4	12.8	5.9	5.6	6.3	↟ 71.5	19.4	52.8	11.8	16.6	13.7	7.1
26	28.7	↟ 13.2	↟ 5.9	6.2	6.2	* 70.4	18.9	31.8	11.6	16.1	↟ 13.1	7.5
27	31.8	12.5	5.5	6.8	6.4	* 64.7	37.8	↟ 15.1	11.4	15.6	9.6	7.8
28	26.9	12.3	5.4	6.1	↟ 6.6	* 63.6	33.3	13.7	11.1	15.7	9.6	7.6
29	↟ 22.7		5.2	4.4	5.3	* 171	23.3	15.2	10.8	↟ 16.6	9.1	7.9
30	21.6		5.1	↟ 6.7	5.2	* 161	↟ 31.9	176	11.0	15.9	9.0	7.7
31	25.1		4.6		5.5		24.3	1,630		15.8		↟ 7.4
Sum	681.7	460.7	281.2	160.4	169.3	855.1	3,622.2	2,709.3	3,402.4	471.5	450.8	260.5

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	7.71	6.85	21	87.9	1	12.9	22.0	1,352	4,840	11,900	0
Feb.	7.49	6.87	4	57.9	28	12.0	16.5	914	3,178	37,000	0
Mar.	8.29	6.62	23	208	21	2.3	9.1	558	2,342	21,000	0
Apr.	7.06	6.60	7	20.0	15	.8	5.3	318	3,838	70,500	0
May	6.85	6.60	31	7.6	23	1.4	5.5	336	11,030	299,800	0
June		6.65	29	ø 170	16	5.3	* 28.5	* 1,696	9,587	241,000	0
July	11.80	6.77	9	709	5	11.0	117	7,185	8,750	118,500	0
Aug.	14.00	6.90	31	3,000	20	8.8	87.4	5,374	8,059	99,400	0
Sept.	13.70	6.82	14	2,730	30	8.9	113	6,749	8,963	119,200	0
Oct.	6.98	6.78	8	18.1	2	9.2	15.2	935	4,136	42,800	0
Nov.	6.97	6.74	18	18.6	30	8.7	15.0	894	1,224	7,270	0
Dec.	7.90	6.71	4	78.7	†25	7.1	8.4	517	2,213	12,900	0
Yearly	14.00	6.60		3,000		0.8	37.1	26,828	68,160	1,079,340	238.1

Current Year 1969 — Period 1939-1969

↟ Discharge measurement made on this day * Partly estimated
ø Mean daily † And other days

RIO GRANDE – COUNTY LINE STATION NEAR ACALA, TEXAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank of the rectified channel of the Rio Grande at latitude 31° 22' 50", longitude 105° 59' 10", and river mile 1,200.9; 0.8 river mile downstream from the El Paso-Hudspeth County Line, 5.5 miles northwest of Acala, Texas, about 8 miles southeast of Tornillo, Texas, and 47.3 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 3,547.59 feet *above mean sea level, U. S. C. & G. S. datum.*

RECORDS: Based on 53 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,340 second-feet on May 19, 1942 with a gage height of 8.66 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max.	6,180	May 18, 1942	Min.	0	Frequently
Monthly:	Max.	4,920	May 1942	Min.	0	Frequently
Yearly:	Max.	1,720	1942	Min.	0	1956 & 1964

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34.7	0	0	0	0	0	71.6	0	* 936	⋔ 85.6	31.1	5.1
2	⋔ 31.8	0	0	⋔ 0	0	0	⋔ 25.3	0	⋔ 719	57.1	30.5	0
3	9.9	0	0	0	0	0	5.0	0	397	49.2	28.2	⋔ 0
4	7.5	0	0	0	0	⋔ 0	0	0	217	29.2	23.5	3.8
5	5.1	⋔ 0	⋔ 0	0	0	0	0	0	83.7	20.1	⋔ 16.9	23.4
6	3.4	0	0	0	0	0	0	⋔ 0	23.8	12.9	6.8	21.8
7	1.9	0	4.7	0	⋔ 0	0	11.1	0	17.2	8.1	8.8	9.3
8	⋔ 0	0	.2	0	2.3	0	39.3	0	14.0	⋔ 1.0	8.8	5.6
9	6.9	0	0	⋔ 0	14.8	0	⋔ 222	0	11.8	0	5.6	1.8
10	4.8	0	0	0	2.1	0	342	0	⋔ 8.8	0	8.8	⋔ 0
11	2.8	0	0	0	0	⋔ 0	516	0	6.4	0	8.8	0
12	1.6	⋔ 0	⋔ 0	0	0	0	478	0	7.0	0	⋔ 3.0	0
13	0	0	0	0	0	0	367	⋔ 0	13.1	0	0	0
14	37.8	0	0	0	⋔ 0	0	269	0	431	0	0	0
15	⋔ 49.0	0	0	0	0	0	113	0	107	⋔ 0	7.3	0
16	32.7	0	0	⋔ 0	0	0	⋔ 18.7	0	158	0	0	0
17	6.4	0	0	0	0	0	11.4	0	⋔ 74.6	0	0	⋔ 0
18	3.8	0	0	0	0	⋔ 0	9.6	57.8	20.7	0	0	0
19	2.8	⋔ 0	⋔ 0	0	0	0	9.3	27.7	17.5	0	⋔ 0	0
20	2.2	0	0	0	0	0	34.9	⋔ 1.4	13.6	0	0	0
21	2.4	0	0	0	⋔ 0	0	161	0	6.8	0	0	0
22	⋔ 3.4	0	0	0	0	0	107	0	3.6	⋔ 0	0	0
23	1.5	0	0	⋔ 0	0	0	⋔ 21.6	2.6	46.9	0	0	0
24	1.0	0	15.2	0	0	0	7.3	1.0	⋔ 126	0	5.1	⋔ 0
25	0	0	3.8	0	0	⋔ 0	2.2	28.1	83.4	54.5	0	0
26	0	⋔ 0	⋔ 0	0	0	0	8.0	26.8	49.5	78.4	⋔ 0	0
27	0	0	0	0	0	0	0	⋔ 1.1	21.1	54.1	0	0
28	0	0	0	0	⋔ 0	0	13.1	0	42.5	35.4	5.4	0
29	⋔ 0		0	0	0	0	6.0	0	69.8	⋔ 33.8	24.4	19.5
30	0		0	⋔ 0	0	121	⋔ 0	* 3.4	61.0	38.7	36.2	1.0
31	0		0		0		0	*742		34.1		⋔ 0
Sum	253.4	0	23.9	0	19.2	121	2,869.4	891.9	3,787.8	592.2	259.2	91.3

Month	Current Year 1969 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1938 - 1969 Acre-Feet Average	Maximum	Minimum
Jan.	2.28		14	80.0	† 8	0	8.2	503	6,414	20,000	0
Feb.				0		0	0	0	5,383	47,900	0
Mar.	2.00		24	40.7	† 1	0	.8	47.4	4,700	38,900	0
Apr.				0		0	0	0	7,166	84,200	0
May	1.77		9	20.9	† 1	0	.6	38.1	13,677	303,000	0
June	3.47		30	411	† 1	0	4.0	240	12,243	239,000	0
July	3.91		11	628	† 4	0	92.6	5,691	12,131	140,000	0
Aug.	5.12		31	1,560	† 1	0	* 28.8	* 1,769	11,205	123,000	0
Sept.	4.85	1.28	14	1,310	23	1.6	126	7,513	13,950	140,000	0
Oct.	2.40		25	96.2	† 8	0	19.1	1,175	8,715	61,400	0
Nov.	2.10		†29	52.0	†12	0	8.6	514	5,759	20,400	0
Dec.	2.07		† 5	48.6	† 1	0	2.9	181	6,444	29,700	0
Yearly	5.12			1,560		0	24.4	17,671.5	107,787	1,247,500	0

⋔ Discharge measurement made on this day * Partly estimated † And other days

RIO GRANDE AT FORT QUITMAN, TEXAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank of the rectified channel of the Rio Grande at latitude 31° 05'05", longitude 105° 36'25", and river mile 1,167.1; 1.5 river miles downstream from Old Fort Quitman, 10 miles southeast of Esperanza, Texas, 17.5 miles southeast of McNary, Texas, and 81.1 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 3,450.57 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 53 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS‡: Momentary: Max. 10,600 second-feet October 5, 1946 with a gage height of 10.00 feet. Min. *frequently no flow*.

Average Flow in Second-Feet ‡

Daily:	Max. 5,890	May 19, 1942	Min. 0		Frequently
Monthly:	Max. 5,030	May 1942	Min. 0		Several months since 1951
Yearly:	Max. 1,750	1942	Min. 2.3		1965

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18.9	9.0	0.2	0.5	12.2	4.5	6.4	13.6	921	✟163	110	144
2	✟16.9	9.0	.2	✟ 0	8.5	6.8	✟ 6.4	13.1	✟ 843	149	109	141
3	16.7	8.6	.2	0	6.9	9.0	5.9	12.8	690	134	108	✟145
4	16.0	8.1	1.8	0	5.4	✟ 7.5	5.9	13.9	430	125	118	150
5	24.0	✟ 8.2	✟ 5.4	0	12.0	6.9	5.5	14.3	340	132	✟110	160
6	27.3	8.6	5.3	0	9.0	5.2	5.5	✟ 14.7	182	136	112	141
7	19.2	8.4	5.2	.4	✟ 15.6	5.7	61.7	14.7	143	87.9	124	131
8	✟18.4	7.8	4.9	.2	13.5	5.8	184	14.2	125	✟ 67.5	124	142
9	48.9	7.6	4.9	✟ 0	20.0	8.1	✟ 43.9	14.2	128	61.2	107	145
10	53.7	9.2	4.8	0	27.2	9.1	51.5	17.7	✟ 66.5	83.2	108	✟149
11	33.2	6.4	4.9	0	19.4	✟ 8.4	161	14.2	52.0	85.5	117	150
12	30.4	✟ 6.3	✟ 4.5	0	22.3	5.9	238	13.7	112	68.2	✟ 68.1	133
13	60.4	5.7	4.5	0	12.5	3.4	211	✟ 12.4	129	72.3	46.6	115
14	54.1	5.6	4.6	7.7	✟ 11.4	1.8	✟ 197	9.6	232	62.0	49.1	111
15	✟51.8	4.9	4.3	9.5	9.9	1.4	119	8.8	606	✟ 51.9	47.9	123
16	49.1	4.6	4.3	✟ 7.6	7.4	20.3	✟ 51.2	8.6	423	55.4	88.4	119
17	35.6	5.0	4.3	13.5	8.8	39.5	43.7	7.8	✟ 294	40.9	119	✟113
18	19.7	4.1	4.3	8.0	8.6	✟ 14.2	42.5	7.2	149	52.6	116	116
19	17.8	✟ 5.6	4.2	13.9	7.0	2.0	40.1	7.0	156	45.0	✟110	108
20	22.1	4.5	4.2	13.5	8.3	.8	56.2	✟ 6.8	125	56.0	94.9	103
21	31.8	.2	4.0	17.7	✟ 8.2	.8	47.0	6.7	98.4	110	79.1	115
22	✟19.6	.2	3.8	10.2	6.6	.6	47.0	8.6	112	✟ 59.7	90.9	130
23	13.1	.2	3.7	✟ 12.1	8.8	.6	✟ 36.7	10.7	132	56.5	88.0	107
24	11.3	.2	3.3	11.0	6.4	1.1	26.2	13.6	✟ 148	69.2	89.3	✟ 72.5
25	11.1	.2	3.2	11.2	5.5	✟ 5.0	19.4	13.9	146	91.7	90.6	112
26	10.9	✟ .2	✟ 3.0	9.3	7.6	2.6	22.0	14.8	138	95.0	✟105	124
27	10.7	.2	3.0	7.6	6.8	7.9	32.0	✟ 33.9	93.2	96.4	95.5	126
28	10.6	.2	3.0	6.7	✟ 6.7	8.0	35.0	40.1	68.3	152	113	118
29	✟10.1		2.1	33.3	5.9	7.9	30.3	53.2	117	✟146	127	123
30	9.4		.8	✟ 17.2	6.7	8.7	✟ 15.6	98.4	136	99.8	139	102
31	8.6		.6		4.8		14.1	389		90.8		✟ 98.8
Sum	781.4	138.8	107.5	211.1	319.9	209.5	1,861.7	922.2	7,335.4	2,795.7	3,004.4	3,867.3

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
	Current Year 1969								Period 1938-1969		
Jan.	4.10	3.45	9	68.8	31	8.6	25.2	1,550	6,655	20,900	0
Feb.	3.60		10	12.6	†21	0.2	5.0	275	5,923	50,100	0
Mar.	3.43		7	6.0	† 1	0.2	3.5	213	4,599	38,900	0
Apr.	3.77		29	94.2	† 2	0	7.0	419	5,781	77,000	0
May	3.55	3.22	10	34.6	4	1.7	10.3	635	13,959	309,000	0
June	5.31	3.14	16	274	23	0.4	7.0	416	12,550	240,000	0
July	7.02	3.35	7	1,360	† 2	5.1	60.1	3,963	13,242	140,000	3.8
Aug.	5.73	3.36	31	916	20	5.5	29.7	1,829	12,458	127,000	16.7
Sept.	5.95	3.99	15	1,090	11	50.0	245	14,550	16,547	147,000	0
Oct.	5.06	3.76	21	353	17	30.2	90.2	5,545	12,465	66,500	0
Nov.	4.53	3.88	7	155	13	40.7	100	5,959	7,621	24,500	0
Dec.	4.78	4.05	5	220	24	68.1	125	7,671	7,830	31,000	0
Yearly	7.02			1,360		0	59.4	43,025	119,630	1,270,400	1,662.3

‡ Period 1924-1969 † And other days ✟ Discharge measurement made on this day

RIO GRANDE ABOVE RIO CONCHOS NEAR PRESIDIO, TEXAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank at latitude 29° 37' 15", longitude 104° 28' 50", and river mile 962.5; 6.5 miles northwest of the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua, 7.8 miles upstream from the Río Conchos, and 285.7 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 2,576.66 feet above mean sea level. U. S. C. & G. S. datum.

RECORDS: Based on 85 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 14,000 second-feet on June 14, 1905. Highest flow recorded since 1924 was 5,160 second-feet, with a gage height of 10.57 feet, on May 26, 1942. Min. frequently no flow.

Average Flow in Second-Feet ‡

Daily:	Max:	13,700	June 13 & 14, 1905	Min.	0	Frequently
Monthly:	Max:	10,150	June 1905	Min.	0	Frequently
Yearly:	Max:	1,970	1907	Min.	1.3	1964

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	✟ 0	✟ 0	0	✟ 0	✟ 0.4	0	✟ 0.6	0	✟ 8.0
2	✟ 0	0	0	0	3.2	✟ 89.0	0	.3	✟ 0	.1	0	7.4
3	0	✟ 0	✟ 0	0	.6	✟ 159	0	0	0	0	✟ 0	5.9
4	0	0	0	0	0	.4	0	✟ 0	✟ 0	0	0	✟ 6.6
5	.1	0	0	0	✟ 0	0	0	0	0	0	0	6.5
6	✟ .2	0	✟ 0	✟ 0	0	✟ 0	0	0	0	✟ 0	✟ 0	2.6
7	.1	0	0	0	0	0	✟ 0	0	0	0	0	2.5
8	0	0	0	0	0	0	0	0	✟ 0	0	0	✟ 4.4
9	0	0	0	0	0	✟ 0	8.9	0	0	0	0	12.9
10	0	✟ 0	✟ 0	0	0	0	46.6	0	0	✟ 0	✟ 0	15.1
11	0	0	0	0	0	0	✟ 22.0	✟ 0	0	0	0	✟ 17.3
12	0	0	0	0	✟ 0	0	19.3	0	0	0	0	18.3
13	✟ 0	0	0	0	0	0	16.9	0	9.0	0	✟ 0	18.4
14	0	0	0	✟ 0	0	0	✟ 12.2	0	.8	✟ 0	0	19.4
15	0	0	0	0	0	26.2	7.8	0	✟ .5	0	0	✟ 17.7
16	0	0	0	0	✟ 0	✟ 107	46.6	0	.2	✟ 0	5.0	20.0
17	0	✟ 0	✟ 0	0	0	16.8	48.7	0	0	0	✟ 5.9	23.8
18	0	0	0	0	0	✟ 3.7	✟ 2.7	✟ 0	6.2	0	2.6	✟ 23.8
19	0	0	0	0	✟ 0	1.5	1.5	0	✟ 116	0	.8	24.6
20	✟ 0	0	0	0	0	✟ 3.8	12.0	0	141	✟ 0	✟ .7	23.5
21	0	0	0	✟ 0	0	12.3	17.0	✟ 0	34.8	0	.5	23.3
22	0	0	0	0	0	5.0	✟ 23.1	0	✟ 12.1	0	.4	✟ 27.9
23	0	0	0	0	0	✟ 2.1	7.8	0	11.0	✟ 0	.2	27.2
24	0	✟ 0	✟ 0	✟ 0	0	1.2	7.0	0	10.3	0	.1	25.5
25	0	0	0	0	0	.5	✟ 6.2	✟ 0	✟ 9.9	0	✟ .2	25.3
26	0	0	0	0	✟ 0	0	4.6	8.0	9.6	0	.7	26.2
27	0	0	0	0	0	✟ 0	4.0	✟ 2.7	9.4	✟ 0	1.0	26.0
28	✟ 0	0	0	✟ 0	✟ 0	.4	✟ 68.6	5.0	8.2	0	.8	25.3
29	0		0	0	6.3	0	40.0	✟ .4	✟ 5.3	0	1.8	✟ 24.1
30	0		0	0	0	0	7.3	0	1.8	0	10.4	24.5
31	✟ 0		0		0		3.4	0		✟ 0		23.5
Sum	0.4	0	0		10.1	428.9	434.2	16.8	386.1	0.7	31.1	557.5

Month	Current Year 1969 Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1969 Acre-Feet Average	Maximum	Minimum
Jan.	8.31		† 5	0.9	† 1	0	0	0.8	6,153	24,400	0
Feb.				0		0	0	0	5,190	40,800	0
Mar.				0		0	0	0	3,853	39,100	0
Apr.				0		0	0	0	2,868	41,600	0
May	9.72		29	218	† 1	0	.3	20.0	10,196	240,000	0
June	13.76		2	657	† 1	0	14.3	851	10,739	216,000	0
July	11.28		10	173	† 1	0	14.0	861	14,116	156,000	0
Aug.	10.67		26	116	† 2	0	.5	33.3	13,286	133,000	0
Sept.	10.93		13	225	† 1	0	12.9	766	16,802	151,000	0
Oct.	8.85		1	1.0	† 3	0	0	1.4	14,316	105,000	0
Nov.	9.07		30	15.9	† 1	0	1.0	61.7	5,912	34,500	0
Dec.	9.82	8.69	21	62.1	6	1.4	18.0	1,106	6,256	30,900	0
Yearly	13.76			657		0	5.1	3,701.2	109,687	1,176,700	951.8

‡ Period June 1900 - March 1914; September 1919 - March 1920; and 1924 - 1969
✟ Discharge measurement made on this day † And other days

RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the right bank at latitude 29° 34' 00", longitude 104° 27' 10", 1.5 river miles from the confluence with the Rio Grande, 1.9 miles west of Ojinaga, Chihuahua, and 3.7 miles west of Presidio, Texas. This stream enters the Rio Grande at river mile 954.7, 13.8 river miles upstream from the "Rio Grande below Río Conchos" Gaging Station, and 293.5 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 2,568.04 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 161 discharge measurements during the year, 154 by the Mexican Section and 7 by the United States Section of this Commission, a continuous record of gage heights, and a rating curve which, above 15,000 second-feet, was defined previously by related gage heights and records of discharge at the "Rio Grande below Río Conchos" Gaging Station. Computations by shifting control methods. Records available: 1896 through 1969. Records of stage and measured discharge at this station began April 4, 1954. Prior to this date, flow records were determined from records of the Rio Grande at stations located upstream and downstream from the *Río Conchos* confluence.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. La Boquilla Reservoir with 2,417,500 acre-feet capacity, La Colina Reservoir with 19,500 acre-feet capacity, La Rosetilla Reservoir with 15,400 acre-feet capacity, and *Luis L. Leon Reservoir* with 689,100 acre-feet capacity are located 250, 242, 186, and 112 river miles, respectively, upstream from this station. Francisco I. Madero Reservoir, with capacity of 344,600 acre-feet, is located on the Río San Pedro, a tributary which enters the Río Conchos 174 river miles upstream from this station. Power generation facilities: La Boquilla 14,647 kw., La Colina 3,620 kw., La Rosetilla 5,150 kw., Francisco I. Madero and Luis L. Leon, none.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 162,000 second-feet on September 11, 1904. Min. no flow several days in May, June, and July 1953 and in July 1955.

Average Flow in Second-Feet ‡

Daily:	Max.	148,900	Sept. 11, 1904	Min.	0	Several days 1953 & 1955
Monthly:	Max.	24,540	Sept. 1904	Min.	4.7	April 1955
Yearly:	Max.	3,710	1906	Min.	155	1953

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	# 2,220	1,920	2,330	1,800	480	583	266	# 144	# 742	# 886	590	# 671
2	2,240	1,920	2,290	# 1,760	# 466	# 816	# 271	123	742	830	583	671
3	# 2,250	# 1,920	# 2,260	1,760	459	# 3,050	399	210	# 738	# 766	# 583	# 667
4	2,260	1,920	2,250	# 1,670	459	# 890	# 477	# 805	696	713	600	639
5	2,270	# 1,910	# 2,230	1,670	# 459	756	484	865	# 650	689	# 636	# 625
6	# 2,280	1,900	2,210	1,650	445	# 738	558	# 869	632	# 689	625	625
7	2,270	# 1,890	# 2,190	# 1,620	# 434	791	# 2,950	872	604	724	# 611	636
8	# 2,270	1,880	2,160	1,670	417	929	# 4,700	# 851	# 569	# 646	625	# 636
9	2,250	1,870	2,150	# 2,020	395	# 992	# 3,850	770	530	759	646	636
10	# 2,240	# 1,870	# 2,130	2,140	392	939	# 4,240	717	# 491	# 766	# 657	632
11	2,250	1,860	2,120	# 1,940	424	# 890	# 1,230	# 699	473	763	646	611
12	2,260	# 1,930	# 2,100	1,820	# 519	805	777	622	# 463	756	# 611	# 586
13	# 2,260	2,370	2,070	1,680	526	# 752	773	# 544	456	# 720	607	583
14	2,250	# 2,540	# 2,020	# 1,630	516	752	# 770	484	727	# 706	# 607	583
15	# 2,250	2,570	1,440	1,600	# 509	2,130	788	# 424	# 579	# 706	604	# 579
16	2,240	2,590	1,690	# 1,540	# 509	# 3,880	# 1,250	388	576	710	607	565
17	# 2,220	# 2,570	# 2,380	1,380	498	1,030	1,980	353	# 579	# 724	# 622	# 554
18	2,150	2,560	2,360	# 1,170	480	# 466	# 932	# 333	572	961	618	516
19	2,070	# 2,540	# 2,330	1,030	# 456	371	851	349	# 2,460	939	# 604	# 427
20	# 2,020	2,530	2,300	890	417	# 290	1,080	# 357	975	# 756	604	353
21	2,010	# 2,510	# 2,260	# 780	# 392	246	# 2,110	344	1,090	710	# 622	310
22	# 2,010	2,490	2,210	727	385	204	1,380	# 322	# 844	# 675	629	# 301
23	1,990	2,470	2,170	# 675	# 374	# 171	1,530	317	953	646	632	299
24	# 1,960	# 2,460	# 2,140	629	344	# 141	1,100	# 308	# 968	# 625	# 618	# 296
25	1,960	2,450	2,110	# 586	326	# 119	# 664	# 299	964	611	441	295
26	1,980	# 2,430	2,080	565	# 314	114	406	498	# 957	607	# 277	# 300
27	# 1,980	2,420	2,040	540	351	# 132	530	# 448	943	# 646	224	300
28	1,970	# 2,390	# 2,000	# 523	# 381	191	# 1,850	410	922	1,070	# 185	300
29	# 1,940		1,940	516	357	287	410	# 893	# 901	# 749	388	# 309
30	1,920		1,890	# 509	367	# 287	# 232	674	883	710	667	321
31	1,920		# 1,830		625		190	703		# 703		# 334
Sum	66,160	62,680	65,680	38,490	13,476	23,742	39,028	15,995	23,679	22,961	16,969	15,160

Current Year 1969 — Period 1968-1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	9.45	8.99	6	2,290	31	1,920	2,140	131,293	75,586	131,293	19,879
Feb.	9.78	5.61	16	2,780	†11	1,860	2,240	124,386	63,861	124,386	3,336
Mar.	9.58	7.48	17	2,380	16	953	2,120	130,298	67,235	130,298	4,171
Apr.	9.19	6.56	10	2,140	30	505	1,280	76,357	42,796	76,357	9,235
May	6.96	6.17	31	671	26	309	434	26,730	18,831	26,730	10,932
June	15.32	5.61	3	9,530	†25	109	791	47,101	26,554	47,101	6,008
July	14.63	5.94	10	7,590	31	173	1,260	77,426	85,566	93,705	77,426
Aug.	8.83	5.84	26	2,020	2	117	516	31,728	73,823	115,918	31,728
Sept.	12.27	6.30	19	5,120	14	441	788	46,959	257,820	468,680	46,959
Oct.	7.74	6.53	28	1,550	17	565	742	45,537	117,687	189,837	45,537
Nov.	6.69	5.87	30	675	29	177	565	33,659	79,485	125,311	33,659
Dec.	6.69	6.10	† 1	671	25	293	487	30,071	32,562	35,053	30,071
Yearly	15.32	5.61		9,530		109	1,110	801,545	941,806	1,082,065	801,545

‡ Period June 1900 - March 1914; September 1914 - March 1920; and 1924-1969

Discharge measurement made on this day † And other days

ALAMITO CREEK NEAR PRESIDIO, TEXAS

DESCRIPTION: Gravity well and water-stage recorder located on the left bank 300 feet upstream from the highway bridge on Farm-to-Market Road 170 at latitude 29° 31' 15", longitude 104° 17' 40", about 2,000 feet from the confluence with the Rio Grande, and about 6 miles southeast of Presidio, Texas. This stream enters the Rio Grande near the lower end of the Presidio Valley at river mile 941.3, 9.7 river miles downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua, and 306.9 river miles downstream from the American Dam at El Paso, Texas. Measurements of high flows are made from the highway bridge. The zero of the gage is 2,541.61 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 80 discharge measurements during the year at low and medium flows, a high flow rating curve determined by slope-area calculations, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1969.

REMARKS: A small irrigation reservoir (San Esteban) 10.5 miles south of Marfa, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. Backwater from the Rio Grande begins to affect the station record when the flow at the station on the Rio Grande below Río Conchos reaches about 35,000 second-feet.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 56,400 second-feet, determined by slope-area calculations, on September 2, 1962, with a gage height of 13.54 feet. Min. ø 0.1 second-foot on July 25, 1953 and several days in August 1958.

Average Flow in Second-Feet

Daily:	Max.	6,200	Sept. 2,	1962	Min.	0.1	July 25, 1953 & several days in August 1958
Monthly:	Max.	418	Sept.	1958	Min.	0.6	Oct., Nov., Dec., 1953 & May 1968
Yearly:	Max.	55.9		1941	Min.	4.3	1951

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.1	2.1	1.9	✱ 1.7	✱ 1.2	0.7	✱ 0.6	✱ 1.1	0.8	✱ 1.2	1.1	✱ 1.1
2	✱ 2.0	2.0	1.9	1.7	1.2	✱ 86.0	.7	1.1	✱ .7	1.2	1.1	1.1
3	2.0	✱ 1.8	✱ 1.9	1.6	1.2	2.3	.7	1.1	.7	1.3	✱ 1.1	1.1
4	2.0	1.9	1.9	1.6	1.2	.6	.8	✱ 1.1	✱ .7	1.3	1.1	✱ 1.1
5	2.0	1.9	1.8	1.6	✱ 1.2	.6	.9	1.1	.8	1.3	1.0	1.1
6	✱ 2.0	2.0	1.8	1.5	1.2	.6	.9	1.1	.8	✱ 1.4	✱ 1.0	1.2
7	2.0	2.0	1.7	✱ 1.5	1.2	.6	✱ 145	1.1	.8	105	1.0	1.2
8	1.9	2.1	1.7	1.5	1.2	.6	259	1.0	✱ .9	1.9	1.0	✱ 1.2
9	1.9	2.1	1.6	1.5	1.2	✱ 92.5	168	1.0	.9	1.3	1.0	1.1
10	1.9	✱ 2.2	✱ 1.6	1.5	1.2	1.6	368	6.8	.9	✱ 1.3	✱54.0	1.0
11	1.9	2.2	1.6	1.5	1.2	1.6	✱ 4.0	✱ 1.0	.9	1.2	.9	✱ .9
12	1.8	2.3	1.7	17.1	✱ 1.2	1.6	1.5	1.0	1.0	1.1	.9	.8
13	✱ 1.8	2.3	1.7	2.3	1.2	1.6	1.2	.9	1.0	1.0	✱ .9	.7
14	1.8	2.3	1.7	✱ 1.8	1.2	1.6	✱ 1.5	.8	1.0	✱ .9	1.0	.6
15	1.9	2.4	1.8	1.7	1.2	561	4.0	.8	✱ 1.0	.9	1.1	✱ .5
16	1.9	2.4	1.8	1.6	✱ 1.2	✱ 831	52.0	.7	1.0	✱ .9	1.2	.7
17	2.0	✱ 2.4	✱ 1.8	1.6	1.3	✱ 61.3	6.5	.7	1.0	1.0	✱ 1.3	.9
18	2.0	2.3	1.8	1.5	1.3	✱ 28.2	✱ 1.3	.6	1.2	1.0	1.3	✱ 1.1
19	2.1	2.2	1.7	1.4	✱ 1.3	1.1	69.4	✱ .7	✱ 659	1.0	1.3	1.1
20	✱ 2.1	2.2	1.7	1.4	1.3	1.1	382	.7	2.6	✱ 1.1	✱ 1.3	1.0
21	2.1	2.1	1.6	✱ 1.3	1.2	1.1	161	✱ .8	2.1	1.1	1.3	1.0
22	2.1	2.0	1.6	1.3	1.2	1.1	✱ 14.0	.7	✱ 1.5	1.1	1.2	✱ 1.0
23	2.1	2.0	1.5	1.2	1.2	✱ 1.1	2.0	.6	1.4	✱ 1.1	1.2	1.0
24	2.1	✱ 1.9	✱ 1.5	1.2	1.2	1.0	93.4	.6	1.4	1.1	1.1	1.0
25	2.1	1.9	1.5	1.2	1.1	1.0	✱ 3.7	✱ 40.6	✱ 1.3	1.1	✱ 1.1	1.0
26	2.1	1.9	1.6	1.2	✱ 1.1	.9	2.4	59.1	1.3	1.1	1.1	1.1
27	2.1	1.9	1.6	1.1	1.1	✱ .8	109	✱ 68.0	1.2	✱ 1.1	1.1	1.1
28	✱ 2.1	1.9	1.6	✱ 1.1	1.1	.8	✱ 46.4	12.5	1.2	1.1	1.1	1.1
29	2.2		1.6	1.1	1.8	.7	3.2	✱ 1.0	✱ 1.2	1.1	1.1	✱ 1.1
30	✱ 2.4		1.6	1.2	.8	.6	1.1	.9	1.2	1.1	1.1	1.1
31	2.2		1.7		.8		1.1	.9		✱ 1.1		1.0
Sum	62.7	58.7	52.5	59.5	37.0	1,685.3	1,905.3	210.1	691.5	139.4	86.0	31.0

Current Year 1969 — Period 1932 - 1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.			30	ø 2.4	†12	ø 1.8	2.0	124	151	273	46.4
Feb.			†15	ø 2.4	3	ø 1.8	2.1	116	216	3,120	41.5
Mar.			† 1	ø 1.9	†23	ø 1.5	1.7	104	153	270	46.4
Apr.	6.12		12	90.2	†27	ø 1.1	2.0	118	217	1,070	57.9
May	5.75	5.55	29	8.3	†30	.7	1.2	73.4	1,110	8,520	34.7
June	8.03		16	5,040	† 2	ø .6	56.2	3,343	2,157	12,653	49.2
July	7.53		20	4,430	1	ø .6	61.5	3,779	3,399	18,500	46.8
Aug.	7.05		25	988	25	.5	6.8	417	2,967	16,330	56.9
Sept.	7.78		19	4,550	† 2	ø .7	23.0	1,372	3,792	24,900	128
Oct.	6.99		7	489	†14	ø .9	4.5	276	1,611	19,200	36.9
Nov.	6.71		10	339	†11	ø .9	2.9	171	232	2,554	35.7
Dec.			† 6	ø 1.2	15	ø .5	1.0	61.5	157	408	39.3
Yearly	8.03			5,040		0.5	13.8	9,954.9	16,163	40,444	3,109.2

✱ Discharge measurement made on this day ø Mean daily † And other days

RIO GRANDE BELOW RIO CONCHOS NEAR PRESIDIO, TEXAS

DESCRIPTION: Cableway, bubbler gage, concrete control weir, water-stage recorders (graphic and digital), and binary decimal transmitter located on the left bank at latitude 29° 31' 05", longitude 104° 17' 35", and river mile 940.9; 0.4 river mile downstream from Alamito Creek, 10.1 river miles downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua and 307.3 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 2,536.00 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 63 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: 1955 through 1969. Records are also available from 1896 through June 13, 1932 for a station located about 12.1 river miles downstream from the Río Conchos and 1.3 miles upstream from Alamito Creek; and from June 14, 1932 through 1954 for a station about 2.0 river miles downstream from the Río Conchos and 11.4 river miles upstream from Alamito Creek.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The elevation of the zero of the gage prior to placing the concrete control weir in operation was 2,527.99 feet above mean sea level, U. S. C. & C. S. datum. The transmitter, operated in cooperation with the United States Weather Bureau, relays gage height data upon interrogation by telephone via commercial circuits.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 54,300 second-feet on October 1, 1958 with a gage height of 20.37 feet. Min. 0.2 second-foot several days in July 1955, and on June 30, 1958.

Average Flow in Second-Feet

Daily:	Max.	52,200	Oct. 1, 1958	Min.	0.2	Several Days July 1955; June 30, 1958
Monthly:	Max.	17,100	Oct. 1958	Min.	3.6	May 1955
Yearly:	Max	2,590	1958	Min.	283	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,950	1,740	2,090	✱ 1,590	✱ 495	509	✱ 267	✱ 184	680	✱ 824	549	✱ 668
2	✱ 1,970	1,720	2,080	1,550	480	✱ 998	259	156	659	782	558	665
3	2,000	✱ 1,730	✱ 2,020	1,540	639	3,380	266	204	660	714	559	646
4	1,990	1,710	2,010	1,530	523	1,060	372	✱ 682	✱ 652	690	554	✱ 642
5	2,020	1,730	2,000	1,520	✱ 483	729	360	737	599	659	579	632
6	2,020	1,720	1,980	1,500	456	718	473	728	558	✱ 624	✱ 569	610
7	2,000	1,720	1,930	✱ 1,490	442	649	2,210	714	545	801	550	603
8	2,000	1,690	1,920	1,460	407	928	3,790	725	✱ 520	599	551	✱ 606
9	1,980	1,700	1,940	1,730	384	✱ 1,140	3,650	693	475	688	568	598
10	1,960	✱ 1,680	1,950	1,840	398	932	4,240	657	447	✱ 706	677	591
11	1,990	1,640	1,920	1,760	566	895	1,900	✱ 614	428	674	655	✱ 574
12	2,010	1,650	✱ 1,890	1,710	✱ 592	819	1,560	538	414	678	586	577
13	✱ 2,010	2,200	1,860	1,620	540	713	1,460	491	401	674	✱ 567	578
14	2,000	2,270	1,810	1,570	554	666	✱ 1,290	438	835	✱ 647	570	591
15	✱ 1,990	2,310	1,350	1,510	531	2,290	1,330	397	✱ 643	645	577	595
16	1,950	2,340	1,190	1,480	522	4,310	1,300	361	551	✱ 625	590	577
17	1,960	✱ 2,280	✱ 2,100	1,340	515	1,360	3,240	354	543	592	✱ 600	565
18	1,970	2,250	2,120	1,210	560	684	1,810	✱ 328	531	651	585	✱ 577
19	1,930	2,270	2,100	1,070	✱ 476	381	1,440	302	2,950	706	574	522
20	✱ 1,810	2,280	2,070	955	450	282	1,440	316	1,190	✱ 702	✱ 577	419
21	1,790	2,240	2,030	✱ 857	402	233	2,380	292	1,460	668	584	404
22	1,790	2,220	2,020	758	389	209	1,370	290	789	623	585	✱ 388
23	1,770	2,200	1,980	714	380	✱ 175	1,610	275	785	588	594	377
24	1,770	✱ 2,180	✱ 1,930	✱ 649	343	145	1,300	284	875	600	591	370
25	1,770	2,150	1,860	611	331	131	✱ 773	✱ 324	✱ 872	581	✱ 582	364
26	1,770	2,130	1,840	580	✱ 314	115	530	616	839	589	356	372
27	1,790	2,110	1,800	565	336	✱ 137	436	854	832	✱ 577	278	372
28	✱ 1,770	2,070	1,790	✱ 563	355	295	✱ 1,620	400	835	749	256	392
29	1,750		1,730	537	643	302	647	812	✱ 833	675	451	✱ 400
30	1,750		1,700	535	378	282	300	745	833	587	643	406
31	✱ 1,730		1,650		310		255	798		✱ 560		411
Sum	58,960	55,930	58,660	36,344	14,194	25,467	43,878	15,309	23,234	20,478	16,515	16,092

Current Year 1969 — Period 1968-1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	3.71	3.52	6	2,070	31	1,700	1,900	116,947	68,958	116,947	20,968
Feb.	3.85	3.47	† 16	2,380	† 10	1,610	2,000	110,937	57,841	110,937	4,745
Mar.	3.77	2.64	† 17	2,200	16	705	1,890	116,352	60,468	116,352	4,583
Apr.	3.63	2.39	10	1,910	† 29	506	1,210	72,088	41,536	72,088	10,984
May	3.95	1.98	29	2,620	29	264	458	28,154	20,150	28,154	12,147
June	5.66	1.55	16	7,690	26	106	848	50,514	28,220	50,514	5,927
July	5.38	1.80	10	6,620	31	191	1,420	87,032	97,216	107,399	87,032
Aug.	3.64	1.64	26	1,930	2	134	494	30,365	73,785	117,205	30,365
Sept.	4.97	2.01	19	5,280	14	283	774	46,085	257,958	469,832	46,085
Oct.	3.17	2.41	28	1,120	22	508	661	40,618	105,449	170,280	40,618
Nov.	2.78	1.94	10	766	† 28	249	550	32,758	73,082	113,407	32,758
Dec.	2.66	2.11	† 1	678	27	334	519	31,918	32,472	33,027	31,918
Yearly	5.66	1.55		7,690		106	1,050	763,768	917,135	1,070,504	763,768

✱ Discharge measurement made on this day † And other days

TERLINGUA CREEK NEAR TERLINGUA, TEXAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank at latitude 29° 12'00", longitude 103° 36' 15", 2.6 creek miles from the confluence with the Rio Grande, and about 8.5 miles south of Terlingua, Brewster County, Texas. This creek enters the Rio Grande at river mile 876.6, the lower end of Santa Helena Canyon, and 371.6 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 2,200.64 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 75 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1969.

REMARKS: Irrigation diversions modify the flow of this spring-fed creek at this station. On February 1969 the station was moved 458 feet downstream. The zero of the gage was not changed.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 34,900 second-feet on May 24, 1935 with a gage height of 17.59 feet on a gage 0.3 mile downstream. Min. 0.1 several days in June and July 1950.

Average Flow in Second-Feet

Daily:	Max.	17,200	June 1, 1937	Min.	0.1	Several days June & July 1950
Monthly:	Max.	921	June 1937	Min.	0.8	October 1934
Yearly:	Max.	146	1937	Min.	5.5	1943

Mean Daily Discharge in Second-Feet 1969 —— Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.4	2.4	2.4	‡ 2.0	‡ 2.5	6.4	‡ 1.9	‡ 3.6	3.9	‡ 1.9	2.6	‡ 3.0
2	‡ 2.4	2.4	2.4	2.0	2.5	‡ 9.0	1.9	3.1	‡ 3.2	1.9	2.5	3.0
3	2.4	‡ 2.3	‡ 2.4	2.0	‡ 10.1	1,060	1.9	2.7	3.1	1.9	‡ 2.5	3.0
4	2.5	2.3	2.4	2.0	3.8	‡ 99.2	1.9	‡ 2.2	2.9	1.9	2.5	3.1
5	2.6	2.3	2.3	2.0	‡ 3.0	21.6	172	2.2	‡ 2.8	1.9	2.5	‡ 3.1
6	‡ 2.6	2.3	2.3	12.2	3.0	7.9	149	2.2	2.6	‡ 517	2.5	3.1
7	2.6	2.4	2.2	51.6	3.0	6.9	253	2.2	2.4	1,030	2.4	3.2
8	2.6	2.4	2.2	‡ 3.3	3.0	255	‡ 495	1.9	2.3	60.0	2.4	3.2
9	2.6	2.4	2.1	3.1	3.0	70.2	356	1.9	‡ 2.1	‡ 16.6	2.4	‡ 3.2
10	2.6	‡ 2.4	‡ 2.1	3.1	3.0	‡ 4.0	329	36.6	2.1	3.2	‡147	3.2
11	2.6	2.4	2.3	3.1	3.0	3.8	* 100	9.8	2.1	2.5	232	3.2
12	2.6	2.4	2.6	43.2	275	3.6	* 42.2	‡ 2.2	2.1	2.2	35.6	‡ 3.2
13	‡ 2.6	2.4	‡ 2.8	34.4	‡ 80.1	3.4	* 18.6	2.2	2.1	‡ 2.0	13.5	3.1
14	2.6	2.4	2.6	7.7	11.5	3.2	* 5.4	2.3	2.1	2.0	‡ 4.4	3.1
15	2.5	2.4	2.4	‡ 2.4	3.3	3.0	‡ 1.9	2.3	2.1	2.1	3.9	‡ 3.0
16	2.5	2.4	2.3	2.4	16.7	‡ 1,840	16.8	2.3	‡ 2.1	‡ 2.1	3.3	3.0
17	2.5	2.4	‡ 2.1	2.5	3.0	‡ 123	‡ 573	2.4	2.1	2.1	‡ 2.8	3.0
18	2.5	2.4	2.1	2.5	2.1	37.0	49.3	‡ 2.4	320	2.1	2.9	3.0
19	2.4	‡ 2.4	2.1	2.5	2.1	12.3	69.2	2.4	152	2.1	3.0	‡ 3.0
20	‡ 2.4	2.4	2.1	2.5	‡ 2.1	7.9	44.5	2.3	20.9	2.1	3.0	3.1
21	2.4	2.3	2.1	2.6	2.1	6.1	73.7	2.2	6.0	‡ 2.1	3.1	3.2
22	2.4	2.3	2.1	‡ 2.6	2.1	4.3	14.5	‡ 2.2	‡ 70.4	2.0	3.2	3.2
23	2.4	2.2	2.1	2.5	2.1	‡ 3.1	‡ 244	2.2	270	1.9	3.2	‡ 3.3
24	2.5	‡ 2.2	2.1	2.4	2.1	3.1	9.7	2.3	4.1	‡ 1.8	3.3	3.3
25	2.5	2.2	2.1	2.3	50.8	3.0	‡ 10.5	‡536	3.7	1.9	‡ 3.4	3.3
26	2.5	2.3	‡ 2.1	2.3	‡ 6.5	‡ 3.0	4.4	543	3.5	2.0	3.3	3.3
27	‡ 2.5	2.3	2.1	2.2	3.7	15.5	18.3	347	3.3	2.0	3.3	3.2
28	2.5	2.3	2.1	2.1	3.5	5.7	‡ 291	‡ 30.6	3.1	‡ 32.2	3.2	3.2
29	2.5		2.1	‡ 2.0	3.5	2.7	67.6	9.8	‡ 2.9	43.2	3.1	3.2
30	2.5		2.0	2.2	3.3	2.1	* 4.9	5.0	2.4	7.8	3.1	‡ 3.2
31	‡ 2.5		2.0		3.3		3.7	4.9		‡ 2.6		3.2
Sum	77.7	65.7	69.1	209.7	518.8	3,626.0	3,424.8	1,574.4	904.4	1,757.1	505.9	97.4

Current Year 1969 — Period 1932-1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			† 5	ø 2.6	† 1	ø 2.4	2.5	154	192	875	82.7
Feb.			† 1	ø 2.4	† 23	ø 2.2	2.3	130	252	4,400	73.4
Mar.			13	ø 2.8	† 30	ø 2.0	2.2	137	235	2,410	72.4
Apr.	3.66		6	563	† 1	ø 2.0	7.0	416	1,072	15,500	55.1
May	3.77		12	685	† 18	ø 2.1	16.7	1,029	3,840	26,000	81.3
June	5.74	2.40	3	7,500	2	1.6	121	7,192	7,111	54,800	59.5
July	4.63	2.49	23	4,380	† 1	ø 1.9	110	6,793	8,604	28,700	518
Aug.	4.81	2.36	25	4,840	10	1.7	50.8	3,123	5,253	33,617	123
Sept.	5.08	2.39	18	5,560	† 9	2.1	30.1	1,794	6,718	42,200	123
Oct.	5.80	2.41	6	7,680	24	ø 1.8	56.7	3,485	2,790	17,243	50.8
Nov.	3.97		10	1,290	† 7	ø 2.4	16.9	1,003	375	2,980	64.9
Dec.			† 23	ø 3.3	† 1	ø 3.0	3.1	193	289	3,080	90.0
Yearly	5.80			7,680		1.6	35.2	25,449	36,731	105,807	3,958

‡ Discharge measurement made on this day * Partly estimated ø Mean daily † And other days

RIO GRANDE AT JOHNSON RANCH NEAR CASTOLON, TEXAS

DESCRIPTION: Cableway, gravity well, and digital water-stage recorder located on the left bank at latitude 29° 02' 05", longitude 103° 23' 30", and river mile 855.3; two miles west-northwest of old Johnson Ranch headquarters, 5.5 river miles downstream from Smoky Creek, 13.0 river miles upstream from Chisos Crossing and the Chihuahua-Coahuila state line, 14.0 river miles downstream from Castolon, Brewster County, Texas and Santa Helena Ranch, Chihuahua, and 392.9 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 2,045.30 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 70 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: April 1936 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 61,900 second-feet on September 27, 1958 with a gage height of 24.70 feet. A flow estimated at 97,000 second-feet with a stage of 24.6 feet occurred at this station site on October 3, 1932. Min. no flow several days in 1953, 1955, 1957 and 1958.

Average Flow in Second-Feet

Daily:	Max.	56,900	Sept. 10, 1942	Min.	0	Several days 1953, 1955, 1957 & 1958
Monthly:	Max.	23,600	Sept. 1942	Min.	0	May 1953
Yearly:	Max.	4,780	1942	Min.	167	1953

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,870	1,810	2,050	‡1,660	‡ 581	391	‡ 249	‡ 348	727	‡ 837	571	‡ 601
2	‡1,920	1,800	2,030	1,600	534	‡ 466	242	291	‡ 721	830	552	649
3	1,960	‡1,780	‡2,020	1,540	554	4,100	220	244	638	784	‡ 544	663
4	1,960	1,790	1,970	1,540	611	‡ 3,240	208	‡ 212	662	732	552	661
5	1,960	1,780	1,950	1,540	‡ 571	1,210	240	305	‡ 616	703	549	‡ 651
6	‡1,990	1,800	1,930	1,510	533	757	690	598	581	692	555	624
7	1,990	1,800	1,910	1,630	501	695	925	630	518	‡1,850	560	603
8	1,990	1,790	1,880	‡1,480	489	664	‡ 2,600	617	494	1,030	550	605
9	1,970	1,770	1,870	1,410	467	1,190	3,950	624	‡ 486	693	546	‡ 608
10	1,970	‡1,790	‡1,880	1,710	443	‡ 1,020	3,760	633	448	659	‡ 558	604
11	1,970	1,800	1,880	1,890	441	783	3,690	763	426	705	1,010	588
12	2,000	1,790	1,870	1,780	723	756	1,530	‡ 653	395	681	730	‡ 574
13	‡2,010	1,810	‡1,860	1,840	‡ 806	708	1,280	562	379	‡ 675	618	573
14	2,010	2,200	1,860	1,650	602	647	1,250	490	381	674	‡ 593	577
15	2,020	2,220	1,820	‡1,580	568	604	‡ 1,180	438	625	663	584	‡ 598
16	2,000	2,260	1,510	1,490	567	4,100	1,210	386	‡ 681	‡ 662	581	599
17	1,990	2,270	‡1,210	1,420	538	‡ 3,740	2,840	339	514	636	‡ 584	579
18	1,980	‡2,250	2,040	1,250	517	1,370	2,670	‡ 314	526	609	582	567
19	1,970	2,240	2,060	1,110	541	772	1,820	313	1,110	614	573	‡ 565
20	‡1,960	2,240	2,040	977	‡ 522	495	1,430	287	2,440	681	556	556
21	1,870	2,240	2,020	894	481	375	1,900	270	1,210	‡ 694	571	464
22	1,860	2,220	2,010	‡ 818	428	321	2,200	‡ 265	‡ 1,480	651	592	432
23	1,840	2,210	1,990	736	413	‡ 283	‡ 1,310	246	1,090	605	595	‡ 423
24	1,820	‡2,210	1,960	686	439	251	1,840	246	782	‡ 564	602	407
25	1,820	2,190	1,910	644	551	217	‡ 1,220	‡ 476	832	564	‡ 602	396
26	1,820	2,140	‡1,880	609	‡ 369	‡ 185	859	971	837	568	595	389
27	‡1,830	2,120	1,850	584	361	169	830	834	800	565	491	398
28	1,860	2,080	1,810	568	333	164	‡ 687	‡ 1,130	790	‡ 569	377	381
29	1,820		1,790	‡ 570	390	135	1,340	614	‡ 798	738	342	403
30	1,810		1,740	551	606	201	765	582	794	723	326	‡ 414
31	1,790		1,740		612		470	791		‡ 608		423
Sum	59,630	56,400	58,340	37,267	16,092	30,004	45,205	15,472	22,781	22,259	17,041	16,575

Month	Current Year 1969								Period 1968 - 1969		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	4.13	3.82	†13	2,030	31	1,770	1,920	118,276	71,053	118,276	23,830
Feb.	4.47	3.71	17	2,300	13	1,720	2,010	111,869	59,806	111,869	7,743
Mar.	4.30	2.76	19	2,090	17	873	1,880	115,717	60,892	115,717	6,067
Apr.	4.15	2.22	13	2,010	30	527	1,240	73,919	43,622	73,919	13,326
May	3.15	1.74	12	1,160	28	322	519	31,918	23,712	31,918	15,507
June	8.04	1.15	3	7,190	29	126	1,000	59,513	32,676	59,513	5,839
July	6.37	1.40	9	5,110	5	198	1,460	89,664	102,789	115,914	89,664
Aug.	4.37	1.33	25	2,230	5	191	499	30,689	75,385	120,081	30,689
Sept.	5.05	1.87	20	3,020	15	367	759	45,186	258,640	472,093	45,186
Oct.	5.81	2.32	7	4,150	24	544	718	44,151	116,568	188,986	44,151
Nov.	3.49	1.77	11	1,470	30	315	568	33,801	77,516	121,232	33,801
Dec.	2.49	1.91	4	669	28	373	535	32,877	33,650	34,422	32,877
Yearly	8.04	1.15		7,190		126	1,090	787,580	956,309	1,125,040	787,580

‡ Discharge measurement made on this day † And other days

RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TEXAS
(ABOVE MAIN STEM HEAD OF AMISTAD RESERVOIR)

DESCRIPTION: Cableway, bubbler gage, concrete control weir, and water-stage recorders (graphic and digital) located on the left bank at latitude 29° 46' 50", longitude 101° 45' 20", and river mile 651.0; 500 feet downstream from the Terrell-Val Verde County Line, 16.9 river miles upstream from Langtry, Texas, and 597.2 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 1,157.17 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS; Based on 57 discharge measurements during the year, 50 by the United States Section, and 7 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: September 1961 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The concrete control weir was placed in operation on February 21, 1967.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,690	1,880	2,250	✟1,900	916	526	385	✟ 1,230	749	955	935	✟ 659
2	1,820	1,880	2,260	1,850	812	✟ 673	372	897	755	958	903	597
3	1,910	✟1,890	✟ 2,150	1,780	1,200	730	353	716	821	941	✟ 794	572
4	1,950	1,880	2,120	1,720	2,830	6,030	364	✟ 602	970	949	743	741
5	1,970	1,880	2,110	1,650	✟ 1,110	5,010	415	561	859	951	761	837
6	✟ 2,010	1,890	2,060	1,600	810	2,620	749	510	757	✟ 953	756	860
7	2,030	1,880	2,030	✟1,630	833	1,640	✟ 879	449	773	1,910	765	835
8	2,030	1,880	2,060	1,830	789	1,200	605	424	751	1,870	761	✟ 832
9	2,060	1,860	2,070	1,740	753	✟ 994	923	657	✟ 715	2,080	759	804
10	2,040	✟1,860	✟ 2,030	1,920	727	1,620	2,100	777	642	1,330	✟ 756	777
11	2,040	1,850	2,000	1,790	721	1,340	3,570	✟ 755	516	1,080	757	776
12	2,040	1,830	2,070	6,200	✟ 680	1,260	3,120	747	641	923	757	801
13	✟ 2,040	2,150	2,100	3,310	718	1,090	3,180	777	461	✟ 862	780	810
14	2,060	2,410	2,070	✟1,990	715	980	✟ 1,890	861	3,080	867	1,020	809
15	2,060	1,860	2,050	1,990	3,190	948	1,540	774	✟ 4,130	861	860	✟ 811
16	2,060	2,140	2,010	1,890	1,360	✟ 890	1,400	708	754	876	773	808
17	✟ 2,080	✟2,250	✟ 1,980	1,800	1,050	837	1,310	656	631	871	✟ 754	798
18	2,100	2,260	1,830	1,710	1,020	3,570	✟ 1,310	✟ 605	3,080	847	738	809
19	2,080	2,260	1,400	✟1,660	✟ 744	2,930	2,950	560	1,060	844	739	821
20	✟ 2,060	2,250	1,960	1,570	701	1,870	2,530	525	783	✟ 835	749	806
21	2,060	✟2,230	2,160	✟1,440	675	✟ 1,310	2,170	499	1,310	853	751	803
22	2,040	2,250	2,210	1,320	✟ 670	999	✟ 1,810	488	✟ 2,560	824	750	✟ 794
23	1,970	✟ 2,260	2,210	1,200	672	✟ 817	1,900	489	2,500	866	744	783
24	1,930	2,260	✟ 2,160	1,120	642	708	2,440	473	2,780	888	✟ 764	721
25	1,930	2,300	2,130	1,030	620	621	1,770	✟ 453	1,480	830	791	652
26	1,910	2,280	2,120	959	✟ 741	543	2,050	1,920	1,180	788	801	640
27	✟ 1,910	2,260	2,080	896	915	492	1,510	721	1,030	✟ 775	818	626
28	1,910	2,250	2,050	✟ 835	735	455	✟ 1,490	892	1,050	832	828	626
29	1,910		2,010	794	599	427	1,150	1,060	✟ 1,020	1,080	811	638
30	1,940		1,980	773	558	427	879	1,130	952	835	763	623
31	1,910		1,940		537		1,190	1,010		775		610
Sum	61,550	58,130	63,660	51,897	29,043	43,557	48,304	22,926	38,790	31,109	23,681	23,079

Current Year 1969 — **Period 1968-1969**

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	2.97	2.73	18	2,100	1	1,600	1,990	122,084	81,379	122,084	40,674
Feb.	3.92	2.82	13	4,130	15	1,790	2,080	115,301	68,868	115,301	22,435
Mar.	3.12	2.56	2	2,520	19	1,270	2,050	126,270	73,030	126,270	19,789
Apr.	6.22	2.20	12	9,430	30	736	1,730	102,938	68,354	102,938	33,771
May	7.05	1.99	15	10,900	31	524	936	57,607	49,708	57,607	41,810
June	9.89	1.85	4	16,200	30	401	1,450	86,395	54,429	86,395	22,463
July	3.84	1.76	13	3,930	4	329	1,560	95,811	118,386	140,961	95,811
Aug.	2.70	1.86	1	1,540	† 8	409	740	45,474	93,468	141,463	45,474
Sept.	9.20		14	14,900	13	Ø 461	1,290	76,940	254,721	432,502	76,940
Oct.	4.04	2.21	7	4,420	†26	746	1,000	61,705	138,041	214,377	61,705
Nov.	2.45	2.16	14	1,080	† 4	693	789	46,971	88,356	129,741	46,971
Dec.	2.35	2.03	6	921	† 3	562	744	45,777	48,016	50,256	45,777
Yearly	9.89	1.76		16,200		329	1,360	983,273	1,136,756	1,290,242	983,273

✟ Discharge measurement made on this day † And other days Ø Mean daily

RIO GRANDE AT LANGTRY, TEXAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the right bank at Langtry, Texas, latitude 29° 48' 00", longitude 101° 33' 30", and river mile 634.1; 24.1 river miles upstream from Pecos River, 66.6 river miles upstream from Amistad Dam, and 614.1 river miles downstream from American Dam at El Paso, Texas. The cableway is located 1,500 feet downstream from the gage well. The zero of the gage is 1,091.69 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 50 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through October 1914; December 1919 through March 1920; 1924 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The highest known gage height was 56.9 feet, which occurred June 17, 1922 with a discharge of 204,000 second-feet, estimated by extension of the rating curve. The lowest recorded flow was 208 second-feet, which occurred July 12, 1953.

Average Flow in Second-Feet ‡

Daily:	Max.	70,930	Oct. 5, 1932	Min.	216	June 17 & 18, 1953
Monthly:	Max.	23,700	Sept. 1942	Min.	263	May 1953
Yearly:	Max.	5,320	1942	Min.	450	1953

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,730	1,960	2,320	⋔ 1,930	1,000	580	479	1,440	987	1,090	998	⋔ 746
2	1,900	1,960	2,300	1,900	994	⋔ 683	457	1,110	⋔ 789	1,090	1,030	672
3	1,960	⋔ 1,960	⋔ 2,250	1,880	1,120	897	437	885	978	1,090	⋔ 939	644
4	1,980	1,970	2,230	1,820	2,540	5,480	427	⋔ 705	1,070	1,090	897	728
5	2,000	1,970	2,240	1,750	⋔ 1,350	4,870	471	614	1,140	1,100	889	898
6	⋔ 2,040	1,980	2,200	1,700	983	2,840	575	572	902	⋔ 1,090	891	925
7	2,050	1,990	2,160	⋔ 1,720	942	1,710	⋔ 1,040	519	853	1,560	892	911
8	2,080	1,990	2,140	1,850	952	1,320	773	489	833	2,190	894	⋔ 898
9	2,100	1,990	2,080	1,820	857	⋔ 1,100	872	570	⋔ 778	2,000	886	881
10	2,080	⋔ 2,000	⋔ 2,050	1,760	809	1,560	1,840	808	701	1,560	⋔ 897	864
11	2,090	1,970	2,040	2,280	770	1,380	3,430	⋔ 825	669	1,190	1,010	856
12	2,080	1,920	2,060	7,290	⋔ 760	1,380	3,240	817	799	1,050	968	875
13	⋔ 2,100	1,970	2,100	3,880	800	1,260	3,370	836	638	952	868	876
14	2,120	2,940	2,090	2,020	820	1,130	2,070	957	941	954	1,110	868
15	2,160	1,930	2,110	1,910	3,040	1,090	1,650	900	5,730	948	992	852
16	2,170	2,110	2,070	1,870	1,350	⋔ 1,030	1,470	812	838	⋔ 936	893	844
17	2,180	⋔ 2,310	⋔ 2,050	1,790	1,170	990	⋔ 1,420	755	595	933	⋔ 868	845
18	2,180	2,340	1,930	1,620	1,130	3,120	1,370	⋔ 692	⋔ 2,590	923	850	855
19	2,180	2,350	1,530	1,560	⋔ 877	3,060	2,590	645	1,230	920	833	882
20	⋔ 2,170	2,370	1,820	1,480	810	2,020	2,690	613	771	⋔ 902	833	865
21	2,160	2,360	2,230	⋔ 1,360	780	1,450	2,110	584	1,010	923	833	858
22	2,140	2,370	2,240	1,280	755	1,160	2,020	583	⋔ 2,520	905	842	⋔ 850
23	2,060	2,380	2,240	1,190	740	⋔ 979	1,860	588	1,910	942	833	851
24	1,990	⋔ 2,360	⋔ 2,200	1,140	710	833	2,570	552	3,380	1,000	⋔ 833	783
25	1,960	2,370	2,180	1,090	680	748	⋔ 1,860	⋔ 540	1,510	977	872	721
26	1,960	2,380	2,140	1,050	⋔ 644	649	2,190	1,740	1,290	912	894	691
27	⋔ 1,930	2,370	2,120	1,000	1,030	584	1,640	1,220	1,100	⋔ 892	916	684
28	1,940	2,340	2,060	⋔ 960	870	552	⋔ 1,590	⋔ 795	1,100	909	929	685
29	1,960		2,050	920	670	519	1,360	1,280	⋔ 1,120	1,200	897	709
30	1,990		2,000	900	610	⋔ 513	1,090	1,160	1,110	975	848	673
31	1,970		1,960		590		1,080	1,280		902		660
Sum	60,910		54,720		45,487		25,886		34,105		24,950	
	63,410		65,190		31,153		50,041		39,882		27,135	

Current Year 1969 — Period 1968-1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	2.87	2.37	† 17	2,180	1	1,640	2,050	125,774	86,138	125,774	46,501
Feb.	4.86	2.60	14	4,280	12	1,920	2,180	120,815	74,120	120,815	27,426
Mar.	2.97	2.03	2	2,330	20	1,370	2,100	129,304	77,400	129,304	25,496
Apr.	11.81	1.48	12	13,600	30	893	1,820	108,537	73,559	108,537	38,581
May	8.75	1.11	15	9,400	31	578	1,000	61,792	54,284	61,792	46,777
June	11.88	.95	4	13,700	30	495	1,520	90,223	58,767	90,223	27,311
July		.81	11	ø 3,430	4	421	1,610	99,256	126,568	153,880	99,256
Aug.	4.36	.92	26	3,740	9	406	835	51,345	98,328	145,311	51,345
Sept.	12.67	1.27	15	14,700	14	576	1,330	79,106	258,482	437,858	79,106
Oct.	4.58	1.42	7	4,020	28	874	1,100	67,647	143,650	219,653	67,647
Nov.	1.92	1.34	11	1,280	30	798	904	53,822	94,410	134,997	53,822
Dec.	1.54	1.12	6	939	4	617	805	49,488	52,184	54,879	49,488
Yearly	12.67	0.81		14,700		406	1,430	1,037,109	1,197,890	1,358,670	1,037,109

‡ Period 1931 - 1969 ⋔ Discharge measurement made on this day ø Mean daily † And other days

PECOS RIVER NEAR LANGTRY, TEXAS

DESCRIPTION: Cableway, concrete control weir, bubbler gage, and water-stage recorders (graphic and digital) located on the right bank at latitude 29° 48' 10", longitude 101° 26' 45", about 7.5 miles east of Langtry, Texas, 9.5 river miles upstream from the Pecos High Bridge, and 15.0 river miles from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 610.0, 24.1 river miles downstream from Langtry, Texas, and 638.2 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 1,133.08 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 43 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on stable control weir rating curves defined by meter measurements. Records available: July 1967 through 1969. Records are also available for Pecos River near Comstock, 9.5 river miles downstream, from March 17 through December 3, 1898 and May 1900 through October 7, 1954; for Pecos River near Shumla, 3.5 river miles upstream, from October 8, 1954 through June 1967; and for Pecos River at Mouth near Comstock, from March 1961 through July 2, 1968.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The flood of June 1954, which had a discharge of 948,000 second-feet at the gaging station near the railroad bridge 9.5 river miles downstream, exceeded a gage height of 100 feet at this station. This station was placed in operation June 30, 1967.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	123	123	118	⋔ 131	216	179	126	113	114	113	233	⋔ 225
2	127	123	117	129	211	⋔ 179	123	108	⋔ 115	110	208	214
3	129	⋔ 123	⋔ 116	127	794	183	123	107	114	109	⋔ 199	206
4	129	123	116	125	442	619	120	109	112	115	190	201
5	129	121	114	123	⋔ 268	227	118	103	110	124	182	200
6	129	123	116	116	252	239	118	⋔ 100	107	⋔ 116	190	198
7	129	125	115	⋔ 111	1,130	209	113	102	107	115	196	200
8	129	124	113	109	2,680	190	110	99.5	106	115	194	⋔ 194
9	128	123	111	107	1,010	⋔ 183	111	99.0	104	114	183	190
10	125	⋔ 119	⋔ 110	110	566	173	113	100	99.2	115	⋔ 181	186
11	123	118	110	114	439	167	113	102	97.6	118	179	183
12	123	117	111	126	⋔ 373	166	110	100	141	135	179	182
13	⋔ 125	116	112	3,780	332	163	112	⋔ 96.4	112	⋔ 128	220	177
14	126	133	112	⋔ 1,870	296	162	⋔ 110	95.3	102	117	202	176
15	127	159	117	709	298	165	110	91.4	106	115	183	174
16	129	208	124	470	277	⋔ 163	110	90.9	110	115	173	173
17	129	⋔ 157	⋔ 120	1,310	488	158	110	92.5	107	115	⋔ 173	170
18	127	141	118	294	1,140	163	108	93.0	180	118	166	169
19	126	130	121	260	⋔ 444	159	130	91.9	510	117	160	169
20	⋔ 126	129	120	296	282	152	129	89.1	210	119	157	167
21	126	128	112	⋔ 426	243	149	118	89.1	198	123	160	169
22	126	128	110	397	230	148	⋔ 126	92.9	⋔ 165	123	160	⋔ 166
23	123	123	116	320	295	⋔ 147	117	93.9	149	123	160	166
24	121	⋔ 121	⋔ 113	276	291	144	115	92.3	561	127	160	166
25	121	121	113	249	258	138	115	⋔ 90.4	157	131	168	170
26	122	121	131	240	⋔ 237	137	112	99.7	140	134	184	170
27	⋔ 123	122	176	233	223	132	118	120	132	⋔ 144	205	170
28	123	121	168	⋔ 259	208	130	⋔ 117	152	124	176	223	176
29	125		153	269	202	129	120	118	118	434	267	202
30	126		146	227	193	⋔ 127	124	118	116	383	242	190
31	124		136		185		126	118		280		188
Sum	3,898	3,620	3,785	13,313	14,503	5,380	3,625	3,167.3	4,623.8	4,521	5,677	5,687

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.80	1.77	† 2	129	† 24	121	126	7,732	8,242	8,751	7,732
Feb.	2.12	1.74	† 15	237	† 12	112	129	7,180	7,512	7,845	7,180
Mar.	1.97	1.73	27	183	† 3	110	122	7,508	8,010	8,513	7,508
Apr.	6.54	1.68	† 13	6,160	9	96.4	444	26,406	18,001	26,406	9,596
May	6.35	1.96	7	5,870	31	179	468	28,767	22,348	28,767	15,928
June	3.26	1.79	4	1,450	30	126	179	10,671	9,504	10,671	8,337
July	1.89	1.72	27	156	† 18	107	117	7,190	15,061	27,884	7,190
Aug.	1.96	1.63	28	179	20	84.0	102	6,282	10,205	14,047	6,282
Sept.	3.07	1.67	24	1,130	† 11	93.9	154	9,171	10,324	14,126	7,674
Oct.	2.61	1.72	29	561	3	107	146	8,967	7,920	8,967	7,123
Nov.	2.24	1.89	29	284	20	156	189	11,260	8,508	11,260	6,589
Dec.	2.11	1.92	1	233	† 20	166	183	11,280	9,135	11,280	7,843
Yearly	6.54	1.63		6,160		84.0	197	142,414	134,770	142,414	130,130

Current Year 1969 — Period July 1967-1969

⋔ Discharge measurement made on this day † And other days

DOLAN SPRINGS NEAR LOMA ALTA, TEXAS

DESCRIPTION: Concrete wall with 90° V-notch weir of 14 second-foot capacity, bubbler gage, and water-stage recorder located on the left bank of Snake Creek near its mouth, latitude 29° 53' 40", longitude 100° 59' 00", and about 12 miles west of Loma Alta, Val Verde County, Texas. Snake Creek enters Dolan Creek from the left side, 0.9 creek mile from the confluence with Devils River. Dolan Creek enters Devils River from the left side, 16.8 river miles upstream from Pafford Crossing, and 42.3 river miles from the confluence with the Rio Grande. The elevation of the zero of the gage has not been determined.

RECORDS: Based on a continuous record of gage heights and the weir discharge table. Records available: 1966 through 1969.

REMARKS: The flow of these springs is very uniform during periods of dry weather and is not modified by diversions or storage. All storm flow passing this station is deducted and is not included in the tabulation below. This station was established for purposes of correlating the flow of these springs with precipitation data and the flow of other springs in the area.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	1.5	1.3	1.2	1.3	1.6	1.3	1.2	3.0	1.7	9.2	11.4
2	1.4	1.5	1.2	1.2	1.3	1.6	1.3	1.2	2.6	1.7	9.1	11.2
3	1.4	1.4	1.2	1.2	1.4	1.6	1.3	1.2	2.5	1.7	9.1	11.2
4	1.4	1.3	1.2	1.2	1.3	1.6	1.3	1.3	2.3	1.7	9.4	11.2
5	1.4	1.3	1.2	1.2	1.3	1.6	1.3	1.3	2.0	1.6	9.5	11.2
6	1.4	1.4	1.2	1.2	1.2	1.6	1.4	1.3	2.0	1.6	9.5	11.1
7	1.4	1.4	1.2	1.2	1.2	1.6	1.4	1.3	2.0	1.6	9.5	10.9
8	1.3	1.3	1.2	1.2	1.2	1.6	1.4	1.3	2.0	1.6	9.6	11.1
9	1.3	1.3	1.2	1.2	1.2	1.6	1.4	1.3	2.0	1.6	9.6	10.9
10	1.3	1.3	1.2	1.2	1.2	1.5	1.4	1.3	1.9	1.6	9.6	11.1
11	1.3	1.4	1.2	1.3	1.2	1.5	1.4	1.3	1.8	1.6	9.6	10.8
12	1.3	1.4	1.2	1.2	1.2	1.5	1.3	1.4	1.8	2.3	9.8	10.8
13	1.3	1.4	1.2	1.2	1.2	1.5	1.3	1.3	1.8	5.2	9.8	10.8
14	1.3	1.4	1.2	1.2	1.2	1.5	1.3	1.3	1.8	7.0	9.6	10.8
15	1.3	1.2	1.2	1.3	1.2	1.5	1.3	1.3	1.8	7.0	9.8	10.8
16	1.4	1.1	1.2	1.3	1.4	1.5	1.3	1.4	1.7	6.8	9.9	11.2
17	1.4	1.2	1.2	1.3	1.7	1.5	1.3	1.3	1.7	6.5	9.9	11.5
18	1.4	1.3	1.2	1.3	2.8	1.5	1.3	1.4	1.6	6.3	9.9	11.5
19	1.4	1.4	1.2	1.3	3.0	1.5	1.3	1.4	1.8	6.3	9.9	11.4
20	1.4	1.4	1.2	1.3	3.0	1.5	1.3	1.3	2.0	5.9	9.9	11.4
21	1.4	1.3	1.2	1.3	2.9	1.4	1.3	1.3	2.0	6.0	10.1	11.5
22	1.4	1.4	1.2	1.3	2.6	1.4	1.3	1.3	2.0	6.0	10.2	11.5
23	1.4	1.4	1.2	1.3	2.3	1.4	1.3	1.4	1.9	5.5	10.2	11.5
24	1.4	1.4	1.2	1.2	2.1	1.4	1.3	1.4	1.9	5.3	10.2	11.5
25	1.4	1.4	1.2	1.2	1.8	1.3	1.3	1.4	1.9	5.3	10.2	11.4
26	1.4	1.3	1.2	1.3	1.7	1.3	1.3	1.5	1.9	5.0	10.2	11.4
27	1.4	1.3	1.2	1.2	1.6	1.3	1.3	2.7	1.8	5.4	10.8	11.2
28	1.4	1.3	1.2	1.3	1.6	1.3	1.3	3.5	1.8	6.9	11.1	11.1
29	1.5		1.2	1.3	1.5	1.3	1.3	3.3	1.8	9.2	11.5	10.8
30	1.5		1.2	1.3	1.5	1.3	1.3	3.2	1.8	10.2	11.4	10.6
31	1.5		1.2		1.5		1.2	3.0		9.6		10.6
Sum	42.9	37.7	37.3	37.4	51.6	44.3	40.8	50.1	58.9	145.7	298.1	345.4

Current Year 1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1966-1969 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	0.81	0.77	† 29	1.5	† 8	1.3	1.4	85.1	161	300	85.1
Feb.	.82	.72	† 1	1.5	16	1.1	1.3	74.8	123	187	74.8
Mar.	.77	.75	1	Ø 1.3	† 2	Ø 1.2	1.2	74.0	115	151	74.0
Apr.	.76	.74	† 11	1.3	† 1	1.2	1.2	74.2	108	151	74.2
May	1.09	.73	19	3.1	† 6	1.2	1.7	102	212	415	102
June	.84	.77	† 1	1.6	† 25	1.3	1.5	87.9	171	372	87.9
July	.78	.75	† 6	1.4	31	1.2	1.3	80.9	169	369	80.9
Aug.	2.70	.75	28	Ø 3.5	† 1	1.2	1.6	99.4	167	354	93.8
Sept.	1.07	.83	1	3.0	18	1.6	2.0	117	191	387	85.5
Oct.		.83	30	10.2	† 5	1.6	4.7	289	246	439	87.9
Nov.	1.85	1.68	29	11.5	† 2	9.1	9.9	591	305	591	85.3
Dec.	1.87	1.78	22	11.8	31	10.5	11.1	685	320	685	83.9
Yearly		0.72		11.8		1.1	3.3	2,360.3	2,288	3,782	1,257.2

† And other days Ø Mean daily

DEVILS RIVER AT PAFFORD CROSSING NEAR COMSTOCK, TEXAS
(ABOVE HEAD OF DEVILS BRANCH, AMISTAD RESERVOIR)

DESCRIPTION: Concrete control wall with rectangular notch opening of 900 second-foot capacity, cableway, bubbler gage, water-stage recorders (graphic and digital), and binary decimal transmitter located on the left bank at latitude 29° 40' 35", longitude 101° 00' 00", about 11.5 miles east of Comstock, Val Verde County, Texas, and 25.5 river miles from the confluence with the Rio Grande. The confluence is located at river mile 568.1, 0.6 river mile upstream from Amistad Dam, and 680.1 river miles downstream from American Dam at El Paso, Texas. The zero of the gage is 1,131.88 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 41 discharge measurements during the year, 33 by the United States Section and 8 by the Mexican Section of this Commission, a stable rating curve based on meter measurements, and a continuous record of gage heights. Records available: 1960 through 1969. Records are also available from May 1900 through March 1914 for a station 23.8 river miles downstream; from December 1923 through September 1932 for a station 22.8 river miles downstream; from September 2, 1932 through August 1957 for a station 21.0 river miles downstream; from August 7, 1954 through January 1958 for a station 5.4 river miles upstream; and from August 1954 through May 31, 1968 for a station at the mouth 24.7 river miles downstream. A graph of Devils River flow from 1871 through 1939 may be found in Water Bulletin No. 9.

REMARKS: At this station the flow of this spring-fed stream is very uniform during periods of dry weather and is not modified by diversions or storage. The transmitter relays gage height data upon interrogation from the Amistad Dam hydrographic office of the United States Section of this Commission and is also programmed to relay similar data to this same office at predetermined time intervals. Transmission is via radio. On December 1968, the control wall was raised one-half foot and a cable was installed 550 feet upstream.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 114,000 second-feet on September 21, 1964 with a gage height of 11.35 feet. Min. 48.6 second-feet on August 20, 1969.

Average Flow in Second-Feet

Daily:	Max. 48,300	Sept. 21, 1964	Min. 53.7	Aug. 20, 1969
Monthly:	Max. 4,590	Sept. 1964	Min. 64.3	Aug. 1964
Yearly:	Max. 542	1964	Min. 99.9	1968

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	75.2	72.5	68.3	62.2	66.9	78.0	67.2	62.7	88.8	72.5	592	442
2	75.2	72.5	66.8	62.2	70.7	74.5	68.1	60.0	85.4	70.5	437	420
3	76.9	↟ 69.8	67.2	62.2	108	69.9	66.2	60.0	82.4	67.2	↟ 392	399
4	78.0	69.8	66.2	62.2	81.2	86.2	63.0	59.6	80.5	90.0	370	381
5	78.0	69.8	65.7	62.2	73.2	78.3	63.4	61.5	77.6	1,000 ↟	350	368
6	↟ 78.0	69.6	67.2	61.9	78.1	73.8	65.1	58.8	75.2	178	343	365
7	78.0	67.2	67.2	↟ 59.8	79.6	74.8	62.7	57.0	75.2	144	332	346
8	78.0	69.2	67.2	59.8	72.7	75.5	62.7	57.1	75.2	156	321	335
9	76.8	69.8	67.2	61.0	72.5	75.1	62.7	60.5	↟ 74.4	169	310	327
10	75.2	69.8	↟ 67.2	65.3	72.5	71.3	62.7	59.1	72.5	189	↟ 306	318
11	75.2	69.8	67.2	64.9	72.5	76.5	↟ 62.7	↟ 57.4	76.7	209	303	310
12	75.2	69.8	68.7	76.8	↟ 73.7	77.0	↟ 60.0	57.4	86.0	10,100 ↟	294	302
13	75.2	73.6	68.8	71.2	75.2	77.3	60.0	57.4	82.5	2,900 ↟	285	299
14	75.2	87.8	69.3	65.4	75.2	79.5	↟ 60.0	57.4	81.2	363	272	292
15	75.5	78.0	76.4	62.2	74.9	75.3	60.0	57.4	↟ 86.2	251	272	↟ 282
16	82.1	75.2	72.5	62.2	83.2	73.2	60.0	57.4	83.8	225	266	277
17	80.1	↟ 74.5	↟ 72.5	88.5	92.0	73.2	60.0	57.4	78.9	206	↟ 266	272
18	78.0	72.5	72.5	231	89.9	70.6	60.0	↟ 56.5	79.3	187	262	272
19	76.8	70.5	72.5	118	92.5	70.6	60.0	54.4	90.8	183	257	267
20	↟ 75.2	69.8	69.8	90.8	90.0	66.8	60.0	53.7	80.4	178 ↟	256	261
21	75.2	70.9	69.8	↟ 85.9	88.5	64.7	60.0	57.4	80.4	176	248	261
22	74.1	72.5	69.8	80.9	86.5	67.9	↟ 62.7	57.4	↟ 78.0	167	243	↟ 257
23	72.5	72.5	70.4	78.1	85.7	↟ 66.5	62.7	57.4	155	162	239	250
24	72.5	↟ 72.5	67.2	74.1	84.5	64.5	57.4	57.4	119	159	250	250
25	72.5	72.5	66.4	71.4	81.0	64.4	57.4	↟ 57.4	80.4	154	259	246
26	72.5	72.5	64.7	69.8	76.7	63.4	60.0	82.0	80.9	149	276	242
27	72.5	71.4	64.7	67.2	76.0	63.9	86.5	261	80.9	3,010 ↟	468	244
28	72.5	69.8	64.7	↟ 67.2	76.2	64.7	↟ 134	130	80.0	1,370	475	246
29	72.5		64.7	67.2	78.0	64.7	75.9	109	↟ 78.0	1,250	436	258
30	74.6		64.7	67.2	78.0	65.3	68.0	98.3	75.4	979	448	254
31	73.6		63.0		73.2		62.7	92.8		1,120		250
Sum	2,342.8	2,016.1	2,110.5	2,278.8	2,478.8	2,147.4	2,033.8	2,222.8	2,521.0	25,634.2	9,828	9,293

Current Year 1969 — Period 1960-1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	1.30	1.26	16	83.8	† 22	72.5	75.6	4,647	10,520	16,072	4,647
Feb.	1.35	1.24	† 13	99.5	† 6	67.2	72.0	3,999	8,793	13,464	3,999
Mar.	1.33	1.22	15	93.0	† 30	62.2	68.1	4,186	8,436	13,700	4,186
Apr.	1.91	1.21	18	356	† 6	59.8	76.0	4,520	10,718	38,777	4,520
May	1.43	1.23	3	128	† 1	64.7	80.0	4,917	10,792	32,716	4,884
June			4	Ø 86.2	26	Ø 63.4	71.6	4,259	16,222	54,328	4,259
July	1.95	1.20	28	376	† 13	57.4	65.6	4,034	9,978	24,000	4,034
Aug.	2.12	1.16	27	528	20	48.6	71.7	4,409	9,582	17,400	3,955
Sept.	2.21	1.26	23	642	† 9	72.5	84.0	5,000	35,787	273,004	5,000
Oct.	7.30	1.24	12	37,400	† 2	67.2	827	50,845	17,810	50,845	5,004
Nov.	2.46	1.71	27	839	† 22	240	328	19,494	11,570	20,494	4,532
Dec.	2.04	1.70	1	448	26	234	300	18,433	10,812	18,433	4,697
Yearly	7.30	1.16		37,400		48.6	178	128,743	161,020	393,573	72,494

↟ Discharge measurement made on this day Ø Mean daily † And other days

RIO GRANDE BELOW AMISTAD DAM, NEAR DEL RIO, TEXAS

DESCRIPTION: Cableway, gravity well, concrete control weir, and water-stage recorders (graphic and digital) located on the left bank at latitude 29° 25' 30", longitude 101° 02' 20", and river mile 565.3, 2.2 river miles downstream from Amistad Dam, 10.6 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, and 682.9 river miles downstream from American Dam at El Paso, Texas. The zero of the gage is 898.94 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 159 discharge measurements during the year, 102 by the Mexican Section and 57 by the United States Section of this Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: September 1954 through 1969. Records are also available from May 1900 through April 1915 for a station 1.9 miles upstream; from December 1919 through March 1920 for a station 1.7 miles downstream near McKee's Switch; from July 2, 1941 through August 1954, and October 1960 through 1967 for a station at the international highway bridge 10.6 miles downstream; and from December 1923 through July 2, 1941, 1968, and 1969 for a station approximately 10.4 miles downstream.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. On May 31, 1968, Amistad Dam started impounding water. After this day, flow at this station is controlled largely by releases from Amistad Reservoir, 2.3 river miles upstream. The concrete control weir was constructed 500 feet upstream from the old station site and placed in operation on April 29, 1968. The elevation of the zero of the gage at the old station site was 893.79 feet above mean sea level, U. S. C. & G. S. datum. The zero of the present gage was raised 0.94 foot in July 1969.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 172,000 second-feet on September 24, 1964 with a gage height of 29.90 feet. Min. 48.0 second-feet on December 21, 1968 with a gage height of 1.20 feet. The flood of June 1954 reached a peak gage height of 55.72 feet and a maximum discharge of 1,158,000 second-feet at the old station site, determined by slope-area computations. This is the greatest rate of discharge recorded at any point on the Rio Grande and is equivalent to a discharge of 133 second-feet per square mile from the 8,718 square mile flood-producing storm area which included the watersheds of the Pecos River below Sheffield, the Devils River, and the Rio Grande beginning above Osman Canyon near Langtry, except that in Mexico it included only 543 square miles of watershed.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,130	1,150	925	⋔ 1,030	848	777	1,030	1,050	999	1,020	⋔ 1,030	1,070
2	1,130	1,150	925	946	⋔ 950	784	1,070	1,050	1,000	⋔ 1,020	1,030	1,070
3	1,130	1,150	925	865	936	791	⋔ 1,050	1,060	1,000	1,020	1,030	⋔ 1,070
4	⋔ 1,130	1,150	⋔ 925	865	886	742	1,040	1,060	851	1,140	1,040	⋔ 1,070
5	1,130	1,150	⋔ 260	865	890	⋔ 738	1,050	1,060	⋔ 1,050	1,030	1,040	1,070
6	1,130	1,150	⋔ 519	865	⋔ 893	770	1,050	1,060	915	1,020	⋔ 1,040	1,070
7	⋔ 1,140	1,150	544	865	957	770	1,050	⋔ 1,060	777	1,020	1,040	1,080
8	1,140	1,130	851	⋔ 865	1,020	773	1,060	1,050	844	1,020	1,040	1,080
9	⋔ 1,130	1,150	1,190	886	1,020	⋔ 773	1,050	1,060	1,020	⋔ 1,020	1,040	1,080
10	1,130	1,150	1,310	915	⋔ 1,020	773	⋔ 1,020	1,050	1,020	1,020	1,040	1,080
11	1,130	⋔ 1,150	⋔ 1,400	932	1,020	749	1,010	1,050	1,020	1,020	1,040	⋔ 1,080
12	1,130	1,150	1,400	⋔ 961	1,030	742	1,010	1,050	⋔ 1,020	1,150	1,040	⋔ 1,080
13	1,130	1,150	1,400	925	⋔ 1,020	742	1,020	1,050	1,020	1,040	⋔ 1,040	1,080
14	⋔ 1,140	⋔ 660	⋔ 1,400	925	932	812	1,020	⋔ 1,050	1,020	1,040	1,040	1,080
15	1,140	⋔ 791	1,400	⋔ 936	897	879	1,030	1,050	1,020	1,040	1,040	1,080
16	⋔ 1,140	791	1,400	939	⋔ 904	879	1,040	1,050	1,020	⋔ 1,040	1,040	1,080
17	1,140	791	1,400	946	897	⋔ 879	⋔ 1,040	1,050	1,020	1,040	1,040	1,080
18	1,140	⋔ 791	⋔ 1,400	936	901	* 876	1,050	1,050	⋔ 1,040	1,040	1,040	⋔ 1,090
19	1,140	791	1,150	922	904	ᵘ⋔ 883	1,050	⋔ 1,050	1,030	1,040	1,040	1,090
20	1,140	⋔ 819	925	922	⋔ 904	*⋔ 901	1,050	⋔ 1,050	⋔ 1,020	1,040	⋔ 1,040	1,090
21	1,140	791	925	932	901	897	1,050	1,050	1,020	1,040	⋔ 1,050	1,090
22	1,140	⋔ 791	⋔ 925	950	904	862	1,050	⋔ 1,040	1,020	1,040	1,070	1,090
23	⋔ 1,140	791	922	950	⋔ 904	915	1,050	1,040	1,030	⋔ 1,040	1,080	1,090
24	1,140	791	925	⋔ 950	904	918	⋔ 1,050	1,040	1,020	⋔ 1,030	1,080	⋔ 1,090
25	1,140	⋔ 840	⋔ 925	946	904	929	⋔ 1,040	1,040	1,020	1,030	1,080	1,090
26	1,140	⋔ 925	968	946	908	964	1,040	1,060	1,020	1,030	1,090	1,090
27	1,140	⋔ 925	⋔ 1,010	936	911	971	1,040	1,060	1,020	1,060	1,080	1,090
28	⋔ 1,140	⋔ 925	1,040	901	848	⋔ 968	1,050	⋔ 1,050	1,020	1,040	1,080	1,100
29	1,140		1,040	⋔ 851	⋔ 788	961	1,040	1,050	1,020	1,040	⋔ 1,080	1,090
30	1,140		1,040	844	777	953	1,040	⋔ 1,040	1,020	⋔ 1,040	1,080	1,090
31	1,140		1,040		777		⋔ 1,040	1,040		1,040		1,090
Sum	35,230	27,143	32,409	27,517	28,355	25,371	32,280	32,570	29,916	32,250	31,540	33,570

Month	Extreme Gage ** Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	2.17	2.17	† 1	1,140	† 1	1,130	1,140	69,968	80,566	91,162	69,968
Feb.	2.20	1.08	13	1,190	14	22.2	971	53,949	59,861	65,773	53,949
Mar.	2.33	1.15	15	1,460	5	30.7	1,050	64,243	65,160	66,076	64,243
Apr.	2.13	1.97	12	1,110	29	840	918	54,593	74,246	93,899	54,593
May	2.49	1.94	2	1,760	†29	777	915	56,260	81,784	107,307	56,260
June	2.07	1.67	26	992	22	427	844	50,313	61,945	73,574	50,313
July	2.13	2.03	2	1,090	1	953	1,040	64,049	69,983	75,916	64,049
Aug.	1.18	1.08	26	1,180	†23	1,030	1,050	64,519	77,444	90,368	64,519
Sept.	1.28	.30	8	1,320	4	98.9	999	59,483	74,351	89,218	59,483
Oct.	1.64	1.12	12	2,020	† 1	1,020	1,040	64,078	75,677	87,274	64,078
Nov.	1.15	1.08	26	1,110	21	996	1,050	62,662	80,969	99,274	62,662
Dec.	1.15	1.15	28	1,110	† 1	1,070	1,080	66,690	82,358	98,025	66,690
Yearly	1.64	1.08		2,020		22.2	1,010	730,807	884,344	1,037,866	730,807

Current Year 1969 — Period 1968 - 1969

⋔ Discharge measurement made on this day † And other days ᵘ Estimated * Partly estimated
** See explanation in REMARKS above

CARMINA SPRINGS AT AMISTAD DAM NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipoletti weir of 70.6 second-foot capacity and staff gage located about 131 feet from the confluence with the Rio Grande at latitude 29° 26' 50" and longitude 101° 03' 35" and about 11.0 miles northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 567.3, 0.2 river mile downstream from Amistad Dam, 12.6 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila, and 680.9 river miles downstream from American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on monthly measurements prior to the construction of the weir in June 1969; and monthly staff gage readings and the weir discharge table thereafter. Mean daily discharges determined by prorating between readings. Records available: 1969.

REMARKS: Six separate springs have risen on a small creek that runs parallel to the dam about 130 feet from the dam. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. Prior to storing water at Amistad Dam, flow in this creek was exclusively from storm runoff.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.7	5.7	7.8	9.5	12.0	13.8	14.1	14.8	15.2	13.4	14.8	17.3
2	6.4	6.0	7.8	9.5	12.0	13.8	14.1	14.8	15.2	13.4	14.8	17.7
3	6.4	6.0	7.8	9.5	12.0	13.8	14.1	14.8	15.2	13.4	15.2	17.7
4	6.4	6.0	7.8	9.5	12.0	13.8	14.1	14.8	15.2	13.1	15.2	17.7
5	6.4	6.0	8.1	9.5	12.4	13.8	14.1	14.8	15.2	13.1	15.2	17.7
6	6.4	6.0	8.1	9.9	12.4	13.8	14.1	14.8	15.2	13.1	15.5	17.7
7	6.0	6.4	8.1	9.9	12.4	13.8	14.1	14.8	15.2	12.7	15.5	17.7
8	6.0	6.4	8.1	9.9	12.4	13.8	14.1	14.8	15.2	12.7	15.5	18.0
9	6.0	6.4	8.1	9.9	12.4	13.8	14.1	14.8	15.2	12.7	15.5	18.0
10	6.0	6.4	8.1	10.2	12.7	13.8	14.1	14.8	15.2	12.7	15.9	18.0
11	6.0	6.4	8.5	10.2	12.7	13.8	14.5	14.8	15.2	12.7	15.9	18.0
12	6.0	6.7	8.5	10.2	12.7	13.8	14.5	14.8	15.2	12.7	15.9	18.0
13	6.0	6.7	8.5	10.2	12.7	14.1	14.5	15.2	14.8	12.7	16.2	18.0
14	6.0	6.7	8.5	10.6	12.7	14.1	14.5	15.2	14.8	13.1	16.2	18.0
15	6.0	6.7	8.5	10.6	12.7	14.1	14.5	15.2	14.8	13.1	16.2	18.0
16	6.0	6.7	8.5	10.6	13.1	14.1	14.5	15.2	14.8	13.1	16.2	18.0
17	6.0	7.1	8.5	10.6	13.1	14.1	14.5	15.2	14.8	13.4	16.2	18.0
18	5.7	7.1	8.5	10.6	13.1	14.1	14.5	15.2	14.5	13.4	16.6	17.7
19	5.7	7.1	8.8	10.9	13.1	14.1	14.5	15.2	14.5	13.4	16.6	17.7
20	5.7	7.1	8.8	10.9	13.1	14.1	14.5	15.2	14.5	13.8	16.6	17.7
21	5.7	7.1	8.8	10.9	13.1	14.1	14.5	15.2	14.1	13.8	16.6	17.7
22	5.7	7.1	8.8	11.3	13.1	14.1	14.5	15.2	14.1	13.8	16.6	17.7
23	5.7	7.4	8.8	11.3	13.4	14.1	14.8	15.2	14.1	13.8	17.0	17.7
24	5.7	7.4	8.8	11.3	13.4	14.1	14.8	15.2	14.1	14.1	17.0	17.7
25	5.7	7.4	9.2	11.3	13.4	14.1	14.8	15.2	13.8	14.1	17.0	17.7
26	5.7	7.4	9.2	11.3	13.4	14.1	14.8	15.2	13.8	14.1	17.0	17.7
27	5.7	7.4	9.2	11.7	13.4	14.1	14.8	15.2	13.8	14.5	17.0	17.3
28	5.7	7.4	9.2	11.7	13.4	14.1	14.8	15.2	13.8	14.5	17.3	17.3
29	5.7		9.2	11.7	13.4	14.1	14.8	15.2	13.4	14.5	17.3	17.3
30	5.7		9.2	11.7	13.8	14.1	14.8	15.2	13.4	14.8	17.3	17.3
31	5.7		9.2		13.8		14.8	15.2		14.8		17.3
Sum	184.5	188.2	265.0	316.9	399.3	419.4	448.2	466.4	438.3	418.5	485.8	549.3

Current Year 1969

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			1	6.7	† 18	5.7	6.0	364			
Feb.			† 23	7.4	1	5.7	6.7	373			
Mar.			† 25	9.2	† 1	7.8	8.5	525			
Apr.			† 27	11.7	† 1	9.5	10.6	629			
May			† 30	13.8	† 1	12.0	12.7	791			
June			† 13	14.1	† 1	13.8	14.1	832			
July			† 23	14.8	† 1	14.1	14.5	889			
Aug.			† 13	15.2	† 1	14.8	15.2	925			
Sept.			† 1	15.2	† 29	13.4	14.5	869			
Oct.			† 30	14.8	† 7	12.7	13.4	830			
Nov.			† 28	17.3	† 1	14.8	16.2	964			
Dec.			† 8	18.0	† 1	17.3	17.7	1,089			
Yearly				18.0		5.7	12.7	9,080			

Ø Mean daily † And other days

ARROYO JABONCILLOS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipoletti weir of 70.6 second-foot capacity and staff gage located about 656 feet from the confluence with the Rio Grande at latitude 29° 24' 25", and longitude 101° 02' 25", and about 8.6 miles northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 564.5, 9.8 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila, and 683.7 river miles downstream from American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on monthly measurements prior to the construction of the weir in June 1969; and monthly staff gage readings and the weir discharge table thereafter. Mean daily discharges determined by prorating between readings. Records available: 1969.

REMARKS: Since Amistad Dam started impounding water in May 1968, about 9 separate springs have risen on this creek. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.3	6.4	7.8	9.5	12.0	10.9	11.7	13.4	14.5	19.8	20.5	23.7
2	5.3	6.4	7.8	9.5	12.0	10.9	11.7	13.4	14.5	19.8	20.5	24.0
3	5.3	6.4	7.8	9.5	12.4	10.9	12.0	13.4	14.5	19.8	20.5	24.0
4	5.3	6.4	7.8	9.9	12.4	10.9	12.0	13.4	14.5	19.8	20.5	24.0
5	5.3	6.4	7.8	9.9	12.4	11.3	12.0	13.4	14.5	19.8	20.5	24.4
6	5.3	6.4	7.8	9.9	12.4	11.3	12.0	13.4	14.5	19.8	20.5	24.4
7	5.3	6.4	8.1	9.9	12.4	11.3	12.0	13.8	14.8	19.8	20.5	24.0
8	5.3	6.7	8.1	9.9	12.0	11.3	12.0	13.8	14.8	20.1	20.5	24.0
9	5.3	6.7	8.1	10.2	12.0	11.3	12.0	13.8	15.2	20.1	20.8	23.7
10	5.7	6.7	8.1	10.2	12.0	11.3	12.4	13.8	15.5	20.1	20.8	23.7
11	5.7	6.7	8.1	10.2	12.0	11.3	12.4	13.8	15.5	20.1	20.8	23.7
12	5.7	6.7	8.5	10.2	12.0	11.3	12.4	13.8	15.9	20.1	21.2	23.3
13	5.7	6.7	8.5	10.2	12.0	11.3	12.4	13.8	16.2	20.1	21.2	23.3
14	5.7	6.7	8.5	10.6	12.0	11.3	12.4	13.8	16.2	20.1	21.5	23.0
15	5.7	6.7	8.5	10.6	11.7	11.3	12.4	13.8	16.6	20.1	21.5	23.0
16	5.7	7.1	8.5	10.6	11.7	11.3	12.4	13.8	17.0	20.1	21.5	23.0
17	5.7	7.1	8.5	10.9	11.7	11.3	12.7	14.1	17.0	20.1	21.9	22.6
18	5.7	7.1	8.8	10.9	11.7	11.3	12.7	14.1	17.3	20.5	21.9	22.6
19	5.7	7.1	8.8	10.9	11.7	11.7	12.7	14.1	17.7	20.5	21.9	22.6
20	6.0	7.1	8.8	10.9	11.7	11.7	12.7	14.1	17.7	20.5	22.2	22.2
21	6.0	7.1	8.8	11.3	11.7	11.7	12.7	14.1	18.0	20.5	22.2	22.2
22	6.0	7.1	8.8	11.3	11.3	11.7	12.7	14.1	18.4	20.5	22.6	21.9
23	6.0	7.4	8.8	11.3	11.3	11.7	12.7	14.1	18.4	20.5	22.6	21.9
24	6.0	7.4	9.2	11.3	11.3	11.7	13.1	14.1	18.7	20.5	23.0	21.9
25	6.0	7.4	9.2	11.7	11.3	11.7	13.1	14.1	19.1	20.5	23.0	21.5
26	6.0	7.4	9.2	11.7	11.3	11.7	13.1	14.1	19.1	20.5	23.0	21.5
27	6.0	7.4	9.2	11.7	11.3	11.7	13.1	14.5	19.4	20.5	23.3	21.2
28	6.0	7.4	9.2	11.7	11.3	11.7	13.1	14.5	19.8	20.5	23.3	21.2
29	6.0		9.2	12.0	10.9	11.7	13.1	14.5	19.8	20.5	23.3	21.2
30	6.0		9.5	12.0	10.9	11.7	13.1	14.5	19.8	20.5	23.7	20.8
31	6.0		9.5		10.9		13.4	14.5		20.5		20.8
Sum	176.7	192.5	265.3	320.4	363.7	342.2	388.2	431.9	504.9	626.6	651.2	705.3

Current Year 1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period Acre-Feet Average	Maximum	Minimum
Jan.			†20	6.0	† 1	5.3	5.7	349			
Feb.			†23	7.4	† 1	6.4	6.7	381			
Mar.			†30	9.5	† 1	7.8	8.5	526			
Apr.			†29	12.0	† 1	9.5	10.6	636			
May			† 3	12.4	†29	10.9	11.7	721			
June			†19	11.7	† 1	10.9	11.3	678			
July			31	13.4	† 1	11.7	12.4	769			
Aug.			†27	14.5	† 1	13.4	13.8	857			
Sept.			†28	19.8	† 1	14.5	17.0	1,001			
Oct.			†18	20.5	† 1	19.8	20.1	1,243			
Nov.			30	23.7	† 1	20.5	21.5	1,291			
Dec.			† 5	24.4	†30	20.8	22.6	1,398			
Yearly				24.4		5.3	13.4	9,850			

ø Mean daily † And other days

ARROYO DEL BUEY NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 35.3 second-foot capacity, located at latitude 29° 24' 20", longitude 101° 02' 25", 0.2 creek mile from the confluence with the Rio Grande, and about 8.5 miles northwest of Cd. Acuña, Coahuila. This stream enters the Rio Grande from the Mexican side at river mile 564.0, 3.5 river miles downstream from Amistad Dam, 4.1 river miles downstream from Devils River, 9.3 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, and 684.2 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on monthly staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 1961 through 1969.

REMARKS: The flow of this stream is not modified by diversions or storage. Prior to 1969 discharges were based on a continuous record of gage heights and the weir discharge table. Storm flow is deducted and not included in the tabulation below. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this stream. At approximately 0.3 creek mile upstream from the weir four springs have emerged since Amistad Reservoir storage began. Backwater from the Rio Grande will affect the flow of this stream when the flow in the river is approximately 20,000 second-feet.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.5	8.8	8.6	8.3	9.4	8.3	8.3	7.8	8.4	8.4	7.6	7.7
2	8.5	8.8	8.6	8.3	9.4	8.3	8.3	7.8	8.4	8.5	7.6	7.7
3	8.4	8.8	8.7	8.5	9.4	8.3	8.3	7.8	8.4	8.5	7.5	7.7
4	8.4	8.8	8.7	8.5	9.4	8.3	8.3	7.9	8.3	8.6	7.4	7.7
5	8.4	8.8	8.8	8.6	9.4	8.3	8.3	7.9	8.3	8.6	7.4	7.7
6	8.4	8.8	8.8	8.7	9.4	8.3	8.3	8.0	8.3	8.7	7.3	7.7
7	8.3	8.8	8.8	8.7	9.3	8.3	8.3	8.1	8.3	8.7	7.3	7.7
8	8.3	8.8	8.8	8.8	9.3	8.3	8.3	8.2	8.3	8.8	7.2	7.7
9	8.3	8.8	8.8	8.9	9.2	8.3	8.3	8.2	8.3	8.8	7.2	7.7
10	8.3	8.7	8.7	8.9	9.1	8.3	8.3	8.3	8.3	8.8	7.2	7.6
11	8.3	8.7	9.0	9.0	9.1	8.3	8.3	8.3	8.3	8.8	7.3	7.6
12	8.3	8.6	8.6	9.0	9.1	8.3	8.3	8.4	8.3	8.7	7.3	7.6
13	8.4	8.6	8.6	9.1	9.0	8.3	8.3	8.5	8.3	8.7	7.3	7.6
14	8.4	8.6	8.5	9.2	9.0	8.3	8.3	8.5	8.3	8.6	7.3	7.6
15	8.5	8.5	8.5	9.2	8.9	8.3	8.3	8.6	8.3	8.5	7.3	7.6
16	8.5	8.4	8.5	9.3	8.9	8.3	8.3	8.7	8.3	8.5	7.3	7.5
17	8.6	8.4	8.4	9.4	8.8	8.3	8.3	8.8	8.3	8.4	7.4	7.5
18	8.6	8.4	8.4	9.4	8.8	8.3	8.3	8.8	8.3	8.4	7.4	7.5
19	8.7	8.3	8.3	9.4	8.7	8.3	8.3	8.8	8.3	8.3	7.4	7.5
20	8.7	8.3	8.3	9.4	8.7	8.3	8.2	8.8	8.3	8.3	7.5	7.5
21	8.8	8.3	8.3	9.4	8.6	8.3	8.2	8.7	8.3	8.2	7.5	7.4
22	8.8	8.3	8.2	9.4	8.5	8.3	8.2	8.7	8.3	8.2	7.5	7.4
23	8.8	8.4	8.2	9.4	8.5	8.3	8.1	8.7	8.3	8.1	7.5	7.4
24	8.8	8.4	8.1	9.4	8.5	8.3	8.1	8.7	8.3	8.1	7.5	7.4
25	8.8	8.4	8.1	9.4	8.4	8.3	8.1	8.6	8.3	8.0	7.5	7.3
26	8.8	8.5	8.1	9.4	8.4	8.3	8.0	8.6	8.3	7.9	7.6	7.3
27	8.8	8.5	8.0	9.4	8.3	8.3	7.9	8.5	8.3	7.9	7.6	7.3
28	8.8	8.6	8.1	9.4	8.3	8.3	7.9	8.5	8.3	7.8	7.6	7.3
29	8.8		8.2	9.4	8.3	8.3	7.9	8.5	8.3	7.8	7.6	7.3
30	8.8		8.2	9.4	8.3	8.3	7.9	8.5	8.4	7.7	7.6	7.3
31	8.8		8.3		8.3		7.8	8.4		7.7		7.2
Sum	265.6	240.1	262.0	272.7	274.7	249.0	254.0	260.5	249.4	259.0	222.7	233.0

Month	Current Year 1969 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period #1961-1969 Acre-Feet ** Average	Maximum	Minimum
Jan.	0.82	0.79	†23	8.8	10	8.1	8.5	528	79.0	528	6.8
Feb.	.82	.79	† 1	8.8	20	8.1	8.5	477	70.0	477	5.4
Mar.	.82	.79	† 5	8.8	27	8.0	8.5	520	76.0	520	9.3
Apr.	.85	.79	†17	9.5	1	8.3	9.2	540	161	540	6.3
May	.85	.79	† 1	9.5	28	8.1	8.8	544	143		10.9
June	.79	.79	† 1	8.5	1	8.1	8.1	492	117		6.3
July	.79	.75	† 1	8.5	31	7.8	8.1	503	85.1	503	6.5
Aug.	.82	.75	†17	8.8	† 1	7.8	8.5	517	101		6.7
Sept.	.79	.79	† 1	8.5	† 6	8.1	8.1	493	146	493	6.6
Oct.	.82	.75	† 8	8.8	†30	7.7	8.5	513	148	513	6.5
Nov.	.75	.72	30	7.8	† 8	7.1	7.4	442	119	463	6.3
Dec.	.75	.72	5	7.8	31	7.1	7.4	462	125	538	6.5
Yearly	0.85	0.72		9.5		7.1	8.5	6,031	1,370.1	6,031	216.8

* Some months missing ** See explanation in REMARKS above † And other days

ERNESTINA AND MARIS SPRINGS NEAR CD. ACUNA, COAHUILA

In order to determine what effect storage in Amistad Reservoir will have on the flow of various Mexican springs in the vicinity of Amistad Dam, gaging stations were established in November 1961 at Ernestina and Maris Springs. The stations and springs are described as follows:

ERNESTINA SPRING

DESCRIPTION: A 90° V-notch weir of 1.4 second-foot capacity and staff gage located at the spring on the right high bank of Arroyo del Buey about 100 feet from the right bank of the Rio Grande at latitude 29° 24' 20", longitude 101° 02' 15", and about 8.5 miles northwest of Cd. Acuna, Coahuila. This spring enters the Rio Grande at river mile 564.0, 9.3 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila, 3.5 river miles downstream from Amistad Dam, 4.1 river miles downstream from Devils River, and 684.2 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on weekly staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. The flow of this spring is small and very uniform except during periods of very heavy rainfall at which time the capacity of the weir may be exceeded. The daily flow throughout the year ranged from 0.067 to 0.113 second-foot, or 30 to 51 gallons per minute, and the monthly average ranged from 0.081 to 0.102 second-foot, or 36 to 46 gallons per minute. The total volume for the year amounted to 67.0 acre-feet. Waters from this spring have a high sulphur content. Records available: November 7, 1961 through 1969.

MARIS SPRING (Tabulated below)

DESCRIPTION: Cipolletti weir of 106 second-foot capacity (prior to May 1969, 11.1 second-foot capacity) and staff gage located at the spring about 100 feet from the right bank of the Rio Grande at latitude 29° 24' 00", longitude 101° 01' 55", and about 8 miles northwest of Cd. Acuna, Coahuila. This spring enters the Rio Grande at river mile 563.5, 8.8 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila, 4.0 river miles downstream from Amistad Dam, 4.6 river miles downstream from Devils River, and 684.7 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on weekly staff gage readings and the weir discharge table. Mean daily discharges, determined by prorating between readings, and annual and period summary are tabulated below. Flows exceeding the capacity of the weir are not included. Records available: November 14, 1961 through 1969.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.0	10.2	10.7	11.0	16.2	13.0	12.3	12.5	15.5	20.9	23.0	21.9
2	9.0	10.2	10.7	11.0	16.6	12.9	12.2	12.5	15.7	21.3	23.0	21.8
3	9.1	10.2	10.7	11.0	17.0	12.8	12.2	12.5	16.0	21.6	23.0	21.8
4	9.3	10.2	10.7	11.0	17.3	12.8	12.2	12.5	16.2	21.9	22.9	21.8
5	9.3	10.2	10.7	11.0	17.7	12.8	12.1	12.5	16.4	22.2	22.9	21.7
6	9.4	10.2	10.7	11.0	18.1	12.8	12.1	12.4	16.7	22.5	22.8	21.5
7	9.5	10.2	10.7	11.0	17.9	12.7	12.1	12.4	16.8	22.9	22.8	21.3
8	9.6	10.3	10.7	11.1	17.7	12.7	12.1	12.4	17.0	23.2	22.8	21.1
9	9.7	10.3	10.7	11.1	17.5	12.7	12.0	12.4	17.1	23.5	22.7	20.9
10	9.8	10.3	10.7	11.1	17.3	12.7	12.0	12.3	17.2	23.8	22.7	20.7
11	9.9	10.4	10.7	11.1	17.1	12.7	12.0	12.3	17.4	23.8	22.7	20.4
12	9.9	10.4	10.8	11.1	16.9	12.6	11.9	12.3	17.5	23.8	22.6	20.2
13	9.9	10.5	10.8	11.1	16.7	12.6	11.9	12.3	17.7	23.7	22.6	20.0
14	10.0	10.5	10.8	11.1	16.5	12.6	11.9	12.2	17.8	23.7	22.5	19.8
15	10.0	10.5	10.8	11.1	16.4	12.6	11.8	12.2	17.9	23.7	22.5	19.6
16	10.0	10.6	10.8	11.1	16.1	12.6	11.8	12.2	18.1	23.6	22.5	19.4
17	10.0	10.6	10.8	11.1	16.0	12.5	11.8	12.1	18.2	23.6	22.4	19.1
18	10.1	10.6	10.8	11.5	15.8	12.5	11.7	12.1	18.4	23.6	22.4	18.9
19	10.1	10.7	10.8	11.9	15.6	12.5	11.7	12.4	18.5	23.5	22.4	18.7
20	10.1	10.7	10.8	12.2	15.4	12.5	11.8	12.6	18.6	23.5	22.3	18.5
21	10.2	10.7	10.8	12.6	15.2	12.5	11.8	12.8	18.8	23.4	22.3	18.3
22	10.2	10.7	10.9	13.0	15.0	12.4	11.9	13.1	18.9	23.4	22.2	18.1
23	10.2	10.7	10.9	13.3	14.8	12.4	11.9	13.3	19.1	23.4	22.2	17.9
24	10.2	10.7	10.9	13.7	14.6	12.4	12.0	13.6	19.2	23.3	22.1	17.7
25	10.2	10.7	10.9	14.1	14.4	12.4	12.0	13.8	19.4	23.3	22.1	17.4
26	10.2	10.7	10.9	14.4	14.2	12.4	12.1	14.0	19.5	23.2	22.1	17.2
27	10.2	10.7	10.9	14.8	14.0	12.3	12.2	14.3	19.6	23.2	22.0	17.0
28	10.2	10.7	10.9	15.1	13.8	12.3	12.2	14.5	20.0	23.2	22.0	16.8
29	10.2		10.9	15.5	13.6	12.3	12.3	14.8	20.3	23.1	22.0	16.6
30	10.2		10.9	15.9	13.4	12.2	12.4	15.0	20.6	23.0	21.9	16.4
31	10.2		10.9		13.2		12.4	15.2		23.1		16.1
Sum	305.9	293.4	334.7	366.0	492.0	377.2	372.8	401.5	540.1	715.9	674.4	598.6

Current Year 1969 — Period #Dec. 1961-1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet ** Average	Maximum	Minimum
Jan.			†21	10.2	† 1	9.0	9.9	608	90.8	608	4.4
Feb.			†19	10.7	† 1	10.2	10.6	582	82.7	582	4.1
Mar.			†22	10.9	† 1	10.7	10.9	664	93.2	664	4.9
Apr.			30	15.9	† 1	11.0	12.0	726	126	726	4.2
May			6	18.1	31	13.2	15.9	976	214	976	8.7
June			1	13.0	30	12.2	12.7	748	135	748	6.0
July			31	12.4	†18	11.7	12.0	739	118	739	7.9
Aug.			31	15.2	†17	12.1	13.1	796	126	796	6.2
Sept.			30	20.6	1	15.5	18.0	1,071	286	1,071	5.4
Oct.			†10	23.8	1	20.9	23.0	1,420	272	1,420	4.6
Nov.			† 1	23.0	30	21.9	22.6	1,338	263	1,338	4.2
Dec.			1	21.9	31	16.1	19.4	1,187	208	1,187	4.4
Yearly				23.8		9.0	14.8	10,855	2,014.7	10,855	146.2

† And other days ** See explanation in Maris Spring Records text above # Some months missing
Ø Mean daily

EIGHT MILE CREEK AND MCKEE SPRING NEAR DEL RIO, TEXAS

In order to determine what effect storage in Amistad Reservoir will have on the flow of various springs in the United States in the vicinity of Amistad Dam, gaging stations were established at Eight Mile Creek in March 1961 and at McKee Spring in December 1961.

EIGHT MILE CREEK

DESCRIPTION: Concrete wall with 90° V-notch weir of 6.9 second-foot capacity, bubbler gage, and water-stage recorder located on the left bank at latitude 29° 24' 05", longitude 101° 00' 55", 0.8 creek mile from the confluence with the Rio Grande, and about 8 miles northwest of Del Rio, Texas. This stream enters the Rio Grande at river mile 562.9, 4.6 river miles downstream from Amistad Dam, and 685.3 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on a continuous record of gage heights and the weir discharge table. *The source of flow of this stream is from surface runoff during rainy periods and the subsequent flow from underground seepage as a result of such rains. Storm water from surface runoff is excluded.* The daily seepage flow throughout the year ranged from zero to 0.7 second-foot, and the monthly average ranged from zero to 0.3 second-foot. The total volume for the year amounted to 47.9 acre-feet. Records available: March 1961 through 1969.

MCKEE SPRING (Tabulated below)

DESCRIPTION: Concrete wall with V-notch weir of 6.9 second-foot capacity, gravity well, and water-stage recorder located on the right bank of the discharge channel, a short distance from the spring. The spring is located on the left flood plain of the Rio Grande at latitude 29° 23' 35", longitude 101° 01' 15", about 150 feet from the edge of the low flow channel, and about 8 miles northwest of Del Rio, Texas. Water from this spring enters the Rio Grande at river mile 562.7, 4.8 river miles downstream from Amistad Dam, and 685.5 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 893.54 feet above mean sea level, *U. S. C. & G. S.* datum.

RECORDS: Based on a continuous record of gage heights, the weir discharge table until December 2 when the weir washed out, and 3 discharge measurements thereafter. *Mean daily discharges and annual and period summary* are tabulated below. Records available: November 1961 through 1969.

REMARKS: *The flow of this spring is uniform* during periods of dry weather and is not modified by diversions or storage. It is estimated that backwater from the Rio Grande will reach the emergence of the spring when the flow in the river is approximately 14,000 second-feet. The recorder and weir were installed on March 29, 1968.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.8	2.1	2.3	2.7	3.5	3.9	3.9	3.9	4.6	4.2	6.0	6.2
2	1.9	2.2	2.4	2.7	3.5	3.9	3.9	4.0	4.5	4.2	5.9	6.3
3	1.9	2.2	2.4	2.7	4.6	3.8	3.9	4.0	4.4	4.2	5.8	6.4
4	1.9	2.2	2.4	2.7	4.2	3.8	3.9	4.0	4.3	4.6	5.8	6.5
5	1.9	2.2	2.2	2.7	4.0	3.8	3.9	4.1	4.2	4.8	5.8	6.6
6	1.9	2.2	2.3	2.7	4.1	3.8	3.9	4.1	4.2	5.2	5.8	6.8
7	1.9	2.2	2.3	2.7	5.5	3.8	3.9	4.1	4.2	5.6	5.8	6.9
8	1.9	2.2	2.4	2.7	5.3	3.8	3.9	4.1	4.2	5.9	5.8	7.0
9	1.9	2.2	2.5	2.7	4.9	3.8	3.9	4.1	4.2	6.2	5.8	7.1
10	1.9	2.2	2.5	2.7	4.6	3.8	3.9	4.1	4.2	6.1	5.7	# 7.2
11	1.8	2.2	2.5	3.5	4.4	3.8	3.9	4.1	4.2	6.0	5.7	7.0
12	1.8	2.2	2.5	5.6	4.3	3.8	3.9	4.1	4.2	5.9	5.6	6.9
13	1.9	2.3	2.5	4.6	4.2	3.8	3.9	4.1	4.2	6.0	5.6	6.7
14	1.9	2.5	2.5	4.1	4.2	3.8	3.9	4.0	4.1	6.1	5.6	6.5
15	1.9	2.3	2.5	3.8	4.1	3.8	3.9	4.0	4.1	6.4	5.6	6.3
16	1.9	2.3	2.5	3.7	4.0	3.8	3.9	4.0	4.1	6.5	5.6	6.2
17	1.9	2.3	2.6	3.9	4.0	3.8	3.9	4.0	4.1	6.3	5.6	# 6.0
18	1.9	2.3	2.6	3.7	4.0	3.8	3.9	4.0	4.1	6.1	5.5	6.0
19	1.9	2.3	2.6	3.6	4.0	3.8	3.9	4.0	5.4	6.0	5.5	5.9
20	1.9	2.3	2.6	3.7	4.0	3.8	3.9	4.0	5.0	5.9	5.5	5.9
21	1.9	2.3	2.6	3.6	3.9	3.8	3.9	3.9	4.7	5.9	5.5	5.8
22	2.0	2.3	2.6	3.6	3.9	3.8	3.9	3.8	4.6	5.8	5.5	5.8
23	2.0	2.3	2.6	3.6	3.9	3.8	3.9	4.0	4.6	5.8	5.5	5.7
24	2.0	2.3	2.6	3.6	3.9	3.9	3.9	4.6	4.5	5.7	5.4	5.7
25	2.0	2.3	2.6	3.6	3.9	3.9	3.9	5.2	4.5	5.6	5.4	5.7
26	2.0	2.3	2.6	3.6	4.0	3.9	3.9	5.9	4.2	5.7	5.6	5.6
27	2.1	2.3	2.6	3.5	4.0	3.9	4.0	6.4	4.2	5.9	6.8	5.6
28	2.1	2.3	2.6	3.5	4.0	3.9	4.0	6.0	4.2	6.3	6.6	5.5
29	2.1		2.6	3.5	4.0	3.9	3.9	5.6	4.2	6.2	6.4	5.5
30	2.1		2.7	3.5	4.0	3.9	3.9	5.3	4.2	6.1	6.3	5.4
31	2.1		2.7		3.9		3.9	4.9		6.0		# 5.4
Sum	60.1	63.3	77.9	102.8	128.8	114.9	121.1	136.4	130.4	177.2	173.0	192.1

Current Year 1969 — Period Nov 1961-1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	0.93	0.88	†27	2.1	† 1	1.8	1.9	119	67.5	193	0
Feb.	1.06	.93	13	2.9	1	2.1	2.3	126	62.5	167	0
Mar.	1.03	.95	†30	2.7	5	2.2	2.5	155	73.6	205	0
Apr.	1.43	1.03	12	5.8	† 1	2.7	3.4	204	91.0	204	0
May	1.41	1.14	7	5.9	† 1	3.5	4.2	255	122	423	0.7
June	1.19	1.18	† 1	3.9	† 3	3.8	3.8	228	78.0	228	0
July	1.23	1.19	†27	4.2	† 1	3.9	3.9	240	67.1	240	0
Aug.			27	Ø 6.4	22	Ø 3.8	4.4	271	67.4	271	0
Sept.			19	Ø 5.4	†14	Ø 4.1	4.3	259	81.2	259	0
Oct.		1.23	16	Ø 6.5	† 1	4.2	5.7	351	95.2	351	0
Nov.	1.50	1.36	27	Ø 6.8	†24	Ø 5.4	5.8	343	110	343	0
Dec.			10	Ø 7.2	†30	Ø 5.4	6.2	381	108	381	0
Yearly				Ø 7.2		1.8	4.0	2,932	1,023.5	2,932	0.7

Discharge measurement made on this day Ø Mean daily † And other days

ARROYO DE LA TREINTA Y UNA NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 35.3 second-foot capacity, located at latitude 29° 22' 40", longitude 101° 01' 10", 0.6 creek mile from the confluence with the Rio Grande, and about 6.5 miles northwest of Cd. Acuña, Coahuila. This stream enters the Rio Grande from the Mexican side at river mile 561.2, 6.3 river miles downstream from Amistad Dam, 6.5 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, 6.9 river miles downstream from Devils River, and 687.0 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on monthly staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: May 1961 through 1969.

REMARKS: The flow of this stream is very uniform during periods of dry weather and is not modified by diversions or storage. Prior to 1969 discharges were based on a continuous record of gage heights and the weir discharge table. Storm flow is deducted and not included in tabulation below. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this stream. It is estimated that backwater from the Rio Grande will affect the flow at this station only during times of extremely high releases. From June through August 1969, the weir rating was affected by backwater from a small earthen dam which was destroyed by a small flood.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.1	3.2	3.2	3.4	3.2	2.1	0	0	2.1	4.6	4.2	4.5
2	3.1	3.2	3.2	3.5	3.2	2.1	0	0	2.1	4.6	4.2	4.6
3	3.1	3.2	3.2	3.5	3.1	0	0	0	2.1	4.6	4.2	4.6
4	3.1	3.2	3.2	3.5	3.1	0	0	0	2.1	4.6	4.2	4.6
5	3.1	3.2	3.2	3.6	3.0	0	0	0	2.1	4.6	4.1	4.7
6	3.1	3.2	3.2	3.6	3.0	0	0	0	2.1	4.6	4.1	4.6
7	3.1	3.2	3.2	3.7	2.9	0	0	0	2.5	4.6	4.1	4.6
8	3.1	3.2	3.2	3.7	2.9	0	0	0	2.8	4.6	4.1	4.6
9	3.1	3.2	3.2	3.7	2.9	0	0	0	3.5	4.6	4.1	4.6
10	3.1	3.2	3.2	3.8	2.8	0	0	0	3.9	4.6	4.1	4.5
11	3.1	3.2	3.2	3.8	2.8	0	0	0	4.2	4.4	4.1	4.5
12	3.1	3.2	3.2	3.8	2.8	0	0	0	4.2	4.4	4.1	4.4
13	3.1	3.2	3.2	3.9	2.7	0	0	0	4.2	4.4	4.1	4.4
14	3.1	3.2	3.2	3.9	2.7	0	0	0	4.2	4.4	4.0	4.4
15	3.1	3.2	3.2	4.0	2.6	0	0	0	4.2	4.4	4.0	4.4
16	3.1	3.2	3.2	4.0	2.6	0	0	0	4.2	4.4	4.1	4.3
17	3.2	3.2	3.2	4.0	2.6	0	0	0	4.2	4.4	4.1	4.3
18	3.2	3.2	3.2	4.0	2.5	0	0	0	4.2	4.4	4.1	4.3
19	3.2	3.2	3.2	3.9	2.5	0	0	0	4.2	4.3	4.2	4.2
20	3.2	3.2	3.2	3.8	2.5	0	0	0	4.2	4.3	4.2	4.2
21	3.2	3.2	3.2	3.8	2.4	0	0	0	4.2	4.3	4.2	4.2
22	3.2	3.2	3.2	3.7	2.4	0	0	0	4.2	4.3	4.2	4.2
23	3.2	3.2	3.2	3.7	2.4	0	0	0	4.2	4.3	4.3	4.1
24	3.2	3.2	3.2	3.6	2.3	0	0	0	4.2	4.3	4.3	4.1
25	3.2	3.2	3.2	3.5	2.3	0	0	0	4.2	4.3	4.3	4.1
26	3.2	3.2	3.2	3.5	2.3	0	0	0	4.2	4.3	4.4	4.1
27	3.2	3.2	3.2	3.4	2.2	0	0	0	4.2	4.3	4.4	4.0
28	3.2	3.2	3.3	3.4	2.2	0	0	0	4.2	4.2	4.4	4.0
29	3.2		3.3	3.3	2.2	0	0	0	4.2	4.2	4.5	4.0
30	3.2		3.4	3.2	2.1	0	0	0	4.2	4.2	4.5	3.9
31	3.2		3.4		2.1		0	0		4.2		3.9
Sum	97.6	89.6	99.8	110.2	81.3	4.2	0	0	109.3	136.7	125.9	133.9

Current Year 1969 — Period #May 1961-1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Acre-Feet ** Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	0.43	0.43	†17	3.2	† 1	2.8	3.2	195	43.5	195	15.2
Feb.	.43	.43	† 1	3.5	† 1	3.2	3.2	181	40.7	181	13.9
Mar.	.43	.43	31	3.5	† 1	3.2	3.2	200	43.8	200	14.2
Apr.	.49	.43	†15	4.0	30	3.2	3.5	219	83.3	219	10.5
May	.43	.33	1	3.2	30	2.1	2.5	161	52.9	161	5.9
June			† 1	2.1	† 3	0	.1	8.1	35.9		4.2
July				0		0	0	0	33.1		0
Aug.				0		0	0	0	38.6		0
Sept.			†11	4.2	† 1	2.1	3.5	219	83.5	219	13.1
Oct.			† 1	4.6	†11	4.4	4.2	269	89.2	269	12.1
Nov.	.52	.49	30	4.6	14	3.9	4.2	250	71.9	250	14.2
Dec.	.56	.49	5	4.7	30	3.9	4.2	266	69.7	266	15.2
Yearly	0.56			4.7		0	2.8	1,968.1	686.1		250.4

\# Some months missing
† And other days
** See explanation in REMARKS above

ROSITA SPRING NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 3.5 second-foot capacity and staff gage located at the spring about 65 feet from the right bank of the Rio Grande at latitude 29° 21' 55", longitude 101° 00' 25", and about 5.5 miles northwest of Cd. Acuna, Coahuila. This spring, located in Mexico, enters the Rio Grande at river mile 560.4, 5.7 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, 7.1 river miles downstream from Amistad Dam, 7.7 river miles downstream from Devils River, and 687.8 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on weekly staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. *Records available: November 17, 1961 through 1969.*

REMARKS: *The flow of this spring is very uniform during periods of dry weather and is not modified by diversions or storage.* This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this spring.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4
2	.1	.1	.1	.1	.1	.1	.1	.1	.3	.2	.2	.4
3	.1	.1	.1	.1	.2	.1	.1	.1	.3	.2	.2	.4
4	.1	.1	.1	.1	.2	.1	.1	.1	.3	.2	.2	.4
5	.1	.1	.1	.1	.2	.1	.1	.1	.3	.2	.2	.4
6	.1	.1	.1	.1	.2	.1	.1	.1	.3	.2	.2	.4
7	.1	.1	.1	.1	.2	.1	.1	.1	.3	.3	.2	.4
8	.1	.1	.1	.1	.3	.1	.1	.1	.3	.3	.2	.3
9	.1	.1	.1	.1	.3	.1	.1	.1	.3	.3	.2	.3
10	.1	.1	.1	.1	.3	.1	.1	.1	.3	.3	.2	.3
11	.1	.1	.1	.1	.2	.1	.1	.1	.2	.3	.2	.3
12	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.2	.3
13	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.3	.3
14	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.3	.3
15	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.3	.3
16	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.3	.3
17	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.3	.2
18	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.3	.2
19	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.3	.2
20	.1	.1	.1	.2	.2	.1	.1	.1	.2	.3	.3	.2
21	.1	.1	.1	.1	.2	.1	.1	.1	.1	.3	.3	.2
22	.1	.1	.1	.1	.2	.1	.1	.1	.1	.3	.3	.2
23	.1	.1	.1	.1	.1	.1	.1	.2	.1	.3	.3	.2
24	.1	.1	.1	.1	.1	.1	.1	.2	.1	.3	.3	.2
25	.1	.1	.1	.1	.1	.1	.1	.2	.1	.3	.3	.2
26	.1	.1	.1	.1	.1	.1	.1	.2	.1	.3	.3	.2
27	.1	.1	.1	.1	.1	.1	.1	.2	.1	.3	.3	.2
28	.1	.1	.1	.1	.1	.1	.1	.2	.1	.3	.3	.2
29	.1		.1	.1	.1	.1	.1	.2	.1	.3	.3	.2
30	.1		.1		.1		.1	.2		.3	.3	.2
31	.1		.1		.1		.1	.2		.3		.1
Sum	3.1	2.8	3.1	3.9	5.4	3.0	3.1	4.0	5.9	8.7	7.8	8.4

Month	Current Year 1969								Period #Dec. 1961-1969		
	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				** Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			† 1	0.1	† 1	0.1	0.1	6.5	11.3	15.2	6.5
Feb.			† 1	.1	† 1	.1	.1	5.9	9.8	13.7	5.9
Mar.			† 1	.1	† 1	.1	.1	6.5	10.8	15.2	6.5
Apr.			† 12	.2	† 1	.1	.1	8.7	8.7	14.7	8.7
May			† 8	.3	† 1	.1	.2	11.6	13.9		10.9
June			† 1	.1	† 1	.1	.1	6.3	12.2	17.3	6.3
July			† 1	.1	† 1	.1	.1	6.5	11.8	16.2	6.5
Aug.			† 23	.2	† 1	.1	.1	8.5	10.9	13.6	8.4
Sept.			† 2	.3	† 21	.1	.2	12.6	12.5		6.3
Oct.			† 7	.3	† 1	.2	.3	17.3	12.7	18.1	5.5
Nov.			† 13	.3	† 1	.2	.3	16.6	10.9	16.6	4.9
Dec.			† 1	.4	31	.1	.3	16.5	12.6	19.5	6.5
Yearly				0.4		0.1	0.2	123.5	138.1		123.5

\# Same months missing Ø Mean daily ** See explanation in REMARKS above
† And other days

CANTU SPRING ON CIENEGAS CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Gravity well and water-stage recorder located in a concrete enclosure in the channel of a small tributary to Cienegas Creek at latitude 29° 23' 15", longitude 100° 56' 00", about 2.5 miles northwest of Del Rio, Texas, and 3.5 creek miles from the confluence with the Rio Grande. The spring is isolated from surface runoff by the concrete enclosure and discharges through an opening near its top into the creek. Cienegas Creek enters the Rio Grande at river mile 556.6, 1.9 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, and 691.6 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 49 discharge measurements during the year and a continuous record of gage heights. Records available: March 1961 through 1969.

REMARKS: The flow of this spring is very uniform and is not modified by diversions or storage. A weir was installed on May 24, 1961 and removed November 21, 1962. Flows of 0.05 second-foot or less are shown as zero in the discharge *tabulations; however, the monthly volumes in the annual and period summary are based on the sum of mean daily discharges computed to the nearest hundredth of a second-foot when the mean daily flow is less than 0.1 second-foot.* This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this spring.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	1.0	1.2	1.6	2.6	1.8	2.3	2.5	3.6	2.6	5.4	5.3
2	✟ 1.2	1.0	1.2	1.6	2.6	1.8	✟ 2.3	2.5	3.5	✟ 2.5	5.2	✟ 5.4
3	1.2	1.0	1.2	✟ 1.6	2.7	1.8	2.3	2.4	3.5	2.8	5.1	5.4
4	1.2	1.0	1.2	1.6	2.8	✟ 1.8	2.2	2.4	3.4	3.2	4.9	5.4
5	1.2	✟ 1.0	✟ 1.2	1.6	2.9	1.8	2.2	2.3	3.4	3.5	✟ 4.8	5.4
6	1.1	1.0	1.2	1.6	2.9	1.9	2.2	✟ 2.3	3.3	3.8	4.7	5.4
7	1.1	.9	1.3	1.5	✟ 3.0	1.9	2.2	2.2	3.3	4.2	4.7	5.4
8	✟ 1.1	.9	1.3	1.5	2.9	2.0	2.1	2.2	3.2	4.5	4.6	5.4
9	1.1	.9	1.3	✟ 1.5	2.8	2.0	✟ 2.1	2.1	3.2	4.9	4.6	5.4
10	1.1	.9	1.3	1.6	2.7	2.1	2.1	2.0	✟ 3.1	✟ 5.2	4.5	✟ 5.4
11	1.1	.8	1.4	1.8	2.6	✟ 2.1	2.1	2.0	3.1	5.2	4.5	5.4
12	1.0	✟ .8	✟ 1.4	1.9	2.5	2.1	2.1	1.9	3.1	5.1	✟ 4.4	5.4
13	1.0	.9	1.5	2.0	2.4	2.1	2.2	1.8	3.1	5.1	4.4	5.4
14	1.0	.9	1.5	2.1	✟ 2.3	2.1	2.2	1.8	3.1	5.1	4.3	5.3
15	✟ 1.0	1.0	1.6	2.3	2.4	2.2	2.2	1.7	3.1	5.0	4.3	5.3
16	1.0	1.1	1.7	✟ 2.4	2.4	2.2	✟ 2.2	1.7	3.1	5.0	4.2	5.3
17	1.0	1.2	1.8	2.4	2.5	2.2	2.3	1.6	3.0	5.0	4.2	✟ 5.3
18	1.0	1.2	1.8	2.5	2.6	✟ 2.2	2.3	1.5	3.0	4.9	4.1	5.3
19	1.0	✟ 1.3	✟ 1.9	2.5	2.7	2.2	2.4	1.5	3.0	4.9	✟ 4.1	5.2
20	1.0	1.3	1.8	2.5	2.7	2.3	2.4	✟ 1.4	3.0	4.9	4.2	5.2
21	1.0	1.3	1.8	2.5	✟ 2.8	2.3	2.5	1.7	3.0	4.8	4.2	5.2
22	✟ 1.0	1.3	1.7	2.6	2.6	2.3	2.6	2.0	3.0	✟ 4.9	4.3	5.2
23	1.0	1.2	1.6	✟ 2.6	2.5	2.3	2.6	2.3	3.0	4.9	4.4	5.1
24	1.0	1.2	1.5	2.6	2.3	2.4	✟ 2.7	2.6	✟ 3.0	5.1	4.5	✟ 5.1
25	1.0	1.2	1.5	2.6	2.2	✟ 2.4	2.7	2.9	2.9	5.2	4.5	5.1
26	1.0	✟ 1.2	✟ 1.4	2.6	2.0	2.4	2.7	3.2	2.9	5.4	✟ 4.6	5.0
27	1.0	1.2	1.4	2.5	1.9	2.4	2.6	3.5	2.8	5.5	4.7	5.0
28	1.0	1.2	1.4	2.5	✟ 1.7	2.4	2.6	✟ 3.8	2.8	5.7	4.9	5.0
29	✟ 1.0		1.5	2.5	1.7	2.3	2.6	3.7	2.7	✟ 5.8	5.0	5.0
30	1.0		1.5	✟ 2.5	1.7	2.3	✟ 2.6	3.7	2.6	5.7	5.1	4.9
31	1.0		1.5		1.7		2.6	3.6		5.5		✟ 4.9
Sum	32.6	29.9	45.6	63.6	76.1	64.1	73.2	72.8	92.8	145.9	137.4	162.5

Current Year 1969 — Period Mar. 1961-1969

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.17	1.59	† 1	1.2	†12	1.0	1.1	64.7	92.1	201	0
Feb.	3.28	1.61	†19	1.3	†11	.8	1.1	59.3	71.9	178	0
Mar.	2.35	1.84	19	1.9	† 1	1.2	1.5	90.4	78.9	184	0
Apr.	5.00	1.87	†22	2.6	† 7	1.5	2.1	126	79.6	195	0
May	3.63	2.06	7	3.0	†28	1.7	2.5	151	86.2	225	0
June	2.29	2.08	†24	2.4	† 1	1.8	2.1	127	87.0	199	0
July	3.78	2.05	†24	2.7	† 8	2.1	2.4	145	80.1	167	0
Aug.	4.77	2.08	28	3.8	20	1.4	2.3	144	82.9	205	0
Sept.	2.22	2.16	1	3.6	30	2.6	3.1	184	92.5	193	0
Oct.	5.65	2.09	29	5.8	2	2.5	4.7	289	114	289	0
Nov.	3.20	2.29	1	5.4	†18	4.1	4.6	273	109	273	0
Dec.	2.65	2.42	† 2	5.4	†30	4.9	5.2	322	121	322	0
Yearly	5.65	1.59		5.8		0.8	2.7	1,975.4	1,095.2	2,194	0

✟ Discharge measurement made on this day Ø Mean daily † And other days

CIENEGAS CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Gravity wells and water-stage recorders located, one each, on the downstream side of the left abutment of the Cienegas Creek Road bridge at latitude 29° 21' 35", longitude 100° 56' 20", 1.1 creek miles from the confluence with the Rio Grande; and, for the Briggs Farm Ditch, on the right bank of a concrete flume at latitude 29° 21' 40", longitude 100° 56' 30", 2,900 feet from the ditch intake which branches off the right bank of Cienegas Creek immediately upstream from a small diversion dam across the creek, and about 2.5 miles west of Del Rio, Texas. The point of diversion is 1.8 creek-miles from the confluence with the Rio Grande. Cienegas Creek enters the Rio Grande at river mile 556.6, 1.9 river miles upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila, and 691.6 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gages has not been determined.

RECORDS: Based on 52 discharge measurements at each station during the year and a continuous record of gage heights. Mean daily discharge computations determined by prorating between weekly measurements at each station and combining the two records for the total yield of the springs. Records available: March 1965 through 1969. Discharge measurement data available since November 1962. Records are also available from September 1931 through June 1935 for a station 0.9 creek mile downstream.

REMARKS: Low flow of this stream is from springs, one of which is Cantu Spring whose discharge is shown on page 35. The flow of this stream is modified by irrigation diversions through the Briggs Farm ditch and, occasionally, by other smaller diversions upstream. During 1969 there were no appreciable diversions from the creek, other than through the Briggs Farm ditch which amounted to 1,314 acre-feet for the year and are included in the tabulation below. All storm flow passing this station is deducted and is not included in the tabulation. These stations were established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of these springs. The recorders were installed in March 1965. On May 21, 1969, the measuring section was moved 0.8 mile downstream to include additional spring flow originating below the station.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.8	4.0	4.1	5.1	4.9	5.4	4.0	3.9	6.9	↟ 6.5	15.8	17.2
2	↟ 3.9	4.0	4.0	5.3	4.9	5.6	↟ 4.1	3.8	6.8	8.2	14.6	↟ 18.1
3	3.9	4.0	3.9	↟ 5.5	6.8	5.7	4.1	3.7	6.7	10.0	13.3	17.8
4	4.0	4.0	4.0	5.3	6.9	↟ 5.9	4.1	3.6	6.5	11.7	12.0	17.5
5	4.0	↟ 4.0	↟ 3.9	5.3	6.2	5.7	4.1	3.6	6.4	13.4	↟ 10.7	17.2
6	4.0	3.9	4.0	5.2	6.7	5.5	4.2	↟ 3.5	6.3	15.1	10.3	17.0
7	4.0	3.7	4.1	5.0	↟ 10.8	5.3	4.2	3.4	6.2	16.9	10.0	16.7
8	↟ 4.1	3.6	4.2	4.9	8.8	4.9	4.2	3.3	6.0	↟ 18.6	9.6	16.4
9	4.2	3.6	4.4	↟ 4.8	6.7	4.7	↟ 4.2	3.2	6.0	18.2	10.4	16.1
10	4.2	3.5	4.5	5.3	6.2	4.5	4.0	3.1	↟ 5.8	17.9	9.0	↟ 15.8
11	4.3	3.3	4.6	5.9	5.9	↟ 4.3	3.7	3.0	5.8	17.5	8.7	14.6
12	4.3	↟ 3.2	↟ 4.7	6.4	5.7	4.3	3.5	2.9	5.8	17.1	↟ 8.3	13.5
13	4.4	3.4	4.7	7.0	5.3	4.2	3.4	↟ 2.8	5.8	16.7	8.6	13.3
14	4.4	3.6	4.7	7.5	↟ 5.0	4.2	3.2	2.8	5.7	16.4	8.8	13.2
15	↟ 4.5	3.8	4.7	8.1	5.4	4.3	2.9	2.7	5.7	↟ 16.0	9.1	13.0
16	4.5	4.1	4.7	↟ 8.6	6.1	4.3	↟ 2.7	2.7	5.7	15.4	9.5	12.9
17	4.4	4.3	4.7	8.2	6.4	4.2	2.7	2.6	↟ 5.7	14.6	9.8	↟ 12.7
18	4.4	4.5	4.7	7.8	6.7	↟ 4.2	2.8	2.6	6.0	14.0	10.0	12.5
19	4.4	↟ 4.7	↟ 4.7	7.4	7.1	4.1	3.0	2.5	6.2	13.2	↟ 10.3	12.3
20	4.4	4.6	4.7	6.9	7.6	4.0	3.0	↟ 2.5	6.5	12.6	10.6	12.1
21	4.3	4.5	4.6	6.5	↟ 8.0	3.9	3.0	2.6	6.6	11.8	11.1	12.0
22	↟ 4.3	4.4	4.6	6.1	7.7	3.6	3.2	2.7	6.9	↟ 11.2	11.4	11.8
23	4.3	4.4	4.5	↟ 5.7	7.2	3.5	3.3	2.9	7.1	12.4	11.8	11.6
24	4.2	4.3	4.5	5.5	6.8	3.4	↟ 3.3	3.0	↟ 7.4	13.6	12.1	↟ 11.4
25	4.2	4.2	4.4	5.4	6.3	↟ 3.3	3.5	3.1	7.2	14.8	12.6	11.5
26	4.1	↟ 4.1	↟ 4.4	5.2	5.9	3.4	3.5	3.3	7.2	16.1	↟ 12.9	11.6
27	4.1	4.2	4.6	5.1	5.4	3.5	3.6	4.9	7.0	17.3	13.8	11.7
28	4.0	4.3	4.7	4.9	↟ 4.8	3.6	3.8	↟ 7.4	6.9	18.5	14.6	11.8
29	↟ 4.0		4.8	4.8	5.0	3.8	3.9	7.2	6.7	↟ 19.7	15.5	11.9
30	4.0		4.9	↟ 4.6	5.0	3.9	↟ 4.0	7.2	6.7	18.4	16.4	12.0
31	4.0		5.1		4.6		3.9	7.0		17.1		↟ 12.1
Sum	129.6	112.2	139.1	179.3	196.8	131.2	111.1	113.5	192.2	460.9	341.6	429.3

Current Year 1969 — Period Mar. 1965-1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	ø Extreme Second-Feet High Day	High	ø Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.			† 15	4.5	1	3.8	4.2	257	274	376	134
Feb.			19	4.7	12	3.2	4.0	223	232	319	98.0
Mar.			31	5.1	† 3	3.9	4.5	276	271	419	102
Apr.			16	8.6	30	4.6	6.0	356	250	370	100
May			7	10.8	31	4.6	6.3	390	257	445	109
June			4	5.9	25	3.3	4.4	260	197	261	86.3
July			† 6	4.2	† 16	2.7	3.6	220	170	220	85.5
Aug.			28	7.4	† 19	2.5	3.7	225	164	230	48.4
Sept.			24	7.4	† 14	5.7	6.4	381	230	381	84.1
Oct.			29	19.7	1	6.5	14.9	914	361	914	150
Nov.			30	16.4	12	8.3	11.4	678	344	678	152
Dec.			2	18.1	24	11.4	13.8	852	382	852	133
Yearly				19.7		2.5	7.0	5,032	3,132	5,032	1,530.9

↟ Discharge measurement made on this day † And other days ø Mean daily

RIO GRANDE AT DEL RIO, TEXAS

DESCRIPTION: Cableway, gravity well, concrete control weir, water-stage recorders (graphic and digital), and binary decimal transmitter located on the right bank 1,200 feet upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila at latitude 29° 19' 35", longitude 100° 55' 50", and river mile 554.9; 12.6 river miles downstream from Amistad Dam, and 693.3 river miles downstream from the American Dam at El Paso, Texas. *The zero of the gage is* 869.20 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 108 discharge measurements during the year, 58 by the United States Section and 50 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations for high flow by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: December 1923 through July 2, 1941, 1968, and 1969. Records are also available from May 1900 through April 1915 for a station 12.2 miles upstream; from December 1919 through March 1920 for a station 8.7 miles upstream near McKee's Switch; from July 2, 1941 through 1954 and October 1960 through 1967 for a station 1,200 feet downstream at the international highway bridge; and from September 1954 through 1969 for a station, Rio Grande below Amistad Dam, 10.4 miles upstream.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows and small intervening diversions below Amistad Dam, flow at this station, after May 31, 1968 when Amistad Dam began impounding water, is controlled largely by releases from Amistad Reservoir, 12.6 river miles upstream. The concrete control weir was placed in operation on February 8, and the cable on June 7, 1968. The transmitter, operated in cooperation with the United States Weather Bureau, relays gage height data upon interrogation by telephone via commercial circuits.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow of 1,140,000 second-feet occurred on June 28, 1954, with a gage height of 38.25 feet at a station 1,200 feet downstream. This peak flow was deduced by subtracting 18,000 second-feet from the peak discharge which occurred below Amistad Dam Site, 10.5 miles upstream. This subtraction was for estimated flattening of the flood wave in traveling between these points. The lowest recorded flow was 176 second-feet which occurred July 13, 1968, with a gage height of 1.31 feet.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,160	‡ 1,160	925	‡ 1,040	880	789	976	1,020	1,060	1,050	1,090	1,160
2	1,160	1,160	930	973	956	763	1,040	1,020	1,060	1,050	1,090	1,160
3	1,160	1,160	922	878	1,160	763	‡ 1,020	1,030	1,050	1,040	1,090	1,160
4	‡ 1,160	‡ 1,160	‡ 919	884	928	752	1,020	1,020	903	8,780	1,090	1,150
5	1,160	1,160	‡ 427	888	909	‡ 731	1,020	1,030	1,090	2,520	1,090	1,160
6	1,160	1,160	‡ 475	885	‡ 979	763	1,010	1,030	1,010	1,140	‡ 1,090	1,140
7	‡ 1,150	‡ 1,160	534	883	1,240	763	1,010	‡ 1,020	833	1,100	1,090	1,150
8	1,150	1,170	774	‡ 893	1,060	763	1,020	1,020	858	1,100	1,090	1,150
9	‡ 1,140	1,180	1,130	913	‡ 1,050	769	1,020	1,030	1,050	‡ 1,100	1,090	1,150
10	1,140	1,180	1,220	942	1,050	760	‡ 1,020	1,020	1,050	1,090	1,110	1,150
11	1,140	‡ 1,180	‡ 1,360	1,620	1,050	750	1,010	1,020	1,060	1,090	1,110	1,150
12	1,150	1,170	1,360	2,170	1,050	744	1,010	1,020	‡ 1,050	2,550	1,100	1,150
13	1,150	1,190	‡ 1,360	1,020	‡ 1,050	744	1,010	1,020	1,050	1,210	‡ 1,110	1,150
14	‡ 1,160	‡ 801	1,360	971	976	792	1,020	‡ 1,020	1,040	1,120	1,100	1,160
15	1,180	778	1,380	‡ 953	‡ 937	883	1,020	1,020	1,050	1,110	1,090	‡ 1,170
16	‡ 1,180	830	1,380	947	954	877	1,020	1,020	1,040	‡ 1,100	1,100	1,160
17	1,180	‡ 836	1,380	957	964	885	‡ 1,020	1,030	1,020	1,090	1,100	1,170
18	1,160	836	‡ 1,390	958	951	884	1,020	1,020	‡ 1,050	1,090	1,100	1,170
19	1,160	827	1,220	961	942	‡ 874	1,020	1,020	1,050	1,100	1,090	1,160
20	1,160	‡ 836	937	967	‡ 931	880	1,020	1,020	1,030	1,110	‡ 1,100	1,160
21	‡ 1,160	826	932	954	931	874	1,010	‡ 1,030	1,030	1,110	1,100	1,160
22	1,160	‡ 814	938	‡ 954	931	840	1,020	1,020	1,040	1,090	1,130	‡ 1,160
23	‡ 1,160	818	933	951	‡ 923	876	1,010	1,020	1,040	‡ 1,100	1,140	1,160
24	1,150	818	931	951	912	873	‡ 1,010	1,020	1,050	1,090	1,140	1,160
25	1,150	‡ 851	‡ 934	‡ 951	907	894	1,010	1,030	1,040	1,090	1,140	1,160
26	1,160	931	967	957	893	‡ 938	1,010	1,300	‡ 1,060	1,080	1,220	1,160
27	1,160	‡ 931	1,010	951	893	941	1,030	1,510	1,070	1,370	1,220	1,160
28	‡ 1,160	931	‡ 1,040	924	850	943	1,030	‡ 1,180	1,060	1,130	1,170	‡ 1,160
29	1,150		1,050	‡ 874	‡ 776	944	1,030	1,110	1,060	1,100	1,160	1,170
30	1,150		1,050	877	768	941	1,030	1,070	1,050	‡ 1,100	1,160	1,160
31	1,150		1,050		783		‡ 1,020	1,070		1,090		1,160
Sum	35,870	27,854	32,218	30,047	29,584	24,993	31,536	32,810	30,904	44,890	33,500	35,900

Current Year 1969 — Period #1968-1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	1.99	1.96	† 15	1,200	† 2	1,140	1,160	71,148	80,292	89,436	71,148
Feb.	2.06	1.29	13	1,360	† 14	162	995	55,248	60,024	64,801	55,248
Mar.	2.08	1.24	† 15	1,400	† 5	124	1,040	63,904	63,852	63,904	63,801
Apr.	3.31	1.82	11	5,850	† 2	855	1,000	59,598	76,459	93,320	59,598
May	2.25	1.77	7	1,830	† 29	763	954	58,680	82,428	106,177	58,680
June	1.87	1.71	† 26	951	22	660	833	49,574	61,048	72,523	49,574
July	1.95	1.86	27	1,110	1	931	1,020	62,552	69,112	75,671	62,552
Aug.	2.46	1.85	27	2,410	20	914	1,060	65,079	77,297	89,515	65,079
Sept.	1.95	1.54	6	1,110	4	403	1,030	61,298	74,712	88,127	61,298
Oct.	6.80	1.91	4	33,600	† 1	1,080	1,450	89,039	88,196	89,039	87,353
Nov.	2.10	1.93	26	1,450	† 1	1,070	1,120	66,447	83,138	99,830	66,447
Dec.	2.00	1.95	29	1,220	† 6	1,110	1,160	71,208	84,140	97,072	71,208
Yearly	6.80	1.24		33,600		124	1,070	773,775	900,698	1,027,626	773,775

‡ Discharge measurement made on this day † And other days

Values for January 1968 are Rio Grande near Del Rio discharges less Arroyo Las Vacas flow

ARROYO LAS VACAS AT CD. ACUNA, COAHUILA

DESCRIPTION: Concrete wall with a 90° V-notch weir of 353 second-foot capacity, gravity well, and water-stage recorder located on the left bank at Cd. Acuña, Coahuila, latitude 29° 19' 45", longitude 100° 57' 20", and 1.8 creek miles from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 554.7, on the upstream side of the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, 12.8 river miles downstream from Amistad Dam, and 693.5 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 885.82 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 5 discharge measurements during the year, a stable rating curve up to 353 second-feet, which is the capacity of the weir, and a continuous record of gage heights. Computations by shifting control methods for flows exceeding the capacity of the weir. Records available: Occasional estimates from June 1935 to March 19, 1938 and a continuous record from March 20, 1938 through 1969.

REMARKS: Low flow of this stream is from springs and is modified by irrigation diversions upstream. On June 17, 1961, a flood destroyed the station leaving the control wall under several feet of silt. The station was reconstructed in September and a V-notch weir with a capacity of 353 second-feet, constructed at this station, started operating December 14, 1961. On June 28, 1954, backwater from the Rio Grande reached an elevation of 902.49 feet at this station. Records prior to 1965 were published under the title "Arroyo Las Vacas near Cd. Acuña, Coahuila."

EXTREME FLOWS FROM RECORDS: Momentary: Max. 63,570 second-feet with a gage height of 25.26 feet on June 17, 1961. Min. no flow several occasions in 1956, 1957, 1960, 1961, and September 1, 1967.

Average Flow in Second-Feet ‡

Daily:	Max.	23,940	June 17, 1961	Min.	0	Several days Dec. 1956, Jan. 1957, & Sept. 1, 1967
Monthly:	Max.	1,050	June 1961	Min.	0.4	Several months 1952, 1953, & 1954
Yearly:	Max.	96.7	1961	Min.	2.8	1952

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.7	1.1	1.4	2.1	3.5	2.5	1.1	1.1	3.2	1.4	20.8	14.1
2	.7	1.1	1.4	2.1	3.5	2.5	1.1	1.1	2.5	1.4	19.1	13.1
3	.7	1.1	1.4	1.8	198	2.5	1.1	.7	2.1	1.4	16.2	13.1
4	.7	2.1	1.4	1.4	13.4	2.1	1.1	.7	2.5	#5,720	15.2	13.1
5	.7	1.8	1.4	1.4	8.1	2.1	1.1	.7	2.5	957	15.2	13.1
6	.7	1.8	1.4	1.4	217	2.1	1.1	.7	2.1	108	15.2	13.1
7	.7	1.4	1.8	1.8	249	2.1	1.1	1.1	2.1	51.6	15.2	13.1
8	.7	1.4	1.8	2.1	16.2	2.1	1.1	1.1	1.8	35.0	15.5	12.4
9	.7	1.8	1.8	29.0	9.2	1.8	1.1	.7	1.4	27.5	14.1	12.4
10	.7	1.8	2.1	20.1	7.8	1.4	1.1	.7	1.4	22.6	14.1	11.7
11	.7	2.1	2.1	724	7.1	1.4	1.1	.7	1.4	20.1	14.1	10.9
12	.7	2.8	2.1	2,110	6.0	1.4	1.1	.7	1.4	#1,890	14.1	10.9
13	1.1	244	2.1	61.8	5.3	1.4	.7	.7	1.4	155	14.1	11.7
14	1.1	60.4	2.1	18.0	4.6	1.4	.7	.7	2.8	68.9	12.7	12.4
15	1.1	2.5	2.1	10.9	5.7	1.4	.7	.7	2.8	49.8	12.4	11.7
16	1.1	1.8	2.1	9.5	13.1	1.4	.7	.4	2.1	38.1	12.4	11.7
17	1.1	1.8	2.1	8.1	6.0	1.4	.7	.4	1.8	33.9	12.4	11.7
18	1.1	1.4	1.8	7.1	5.3	1.4	.7	.4	1.8	31.8	11.7	11.7
19	1.1	1.8	1.8	7.1	5.3	1.4	.7	.4	1.8	28.6	11.7	11.7
20	1.1	2.1	1.4	6.4	4.6	1.4	.7	.4	2.1	27.9	11.7	10.9
21	1.1	1.8	1.8	6.0	4.2	1.4	.7	.4	1.8	23.3	11.7	10.2
22	.7	1.4	2.5	6.0	4.2	1.4	.7	.4	1.4	22.6	11.7	10.2
23	.7	1.4	2.8	5.7	3.9	1.1	.7	.4	1.4	22.2	12.4	10.2
24	1.1	1.4	2.5	5.7	3.5	1.1	.7	.4	10.2	15.9	13.1	10.2
25	1.1	1.8	2.8	5.7	3.5	1.1	.7	.4	2.8	12.4	14.8	10.2
26	1.1	2.1	2.8	5.0	3.2	1.1	.7	1,130	2.5	11.7	152	10.2
27	1.1	2.5	2.8	3.9	2.8	1.1	9.9	# 742	2.1	# 791	71.7	10.9
28	1.1	2.1	1.8	3.5	2.8	1.1	6.0	# 752	2.1	58.6	18.4	10.9
29	1.1		2.1	3.5	2.8	1.1	1.8	77.0	1.8	29.7	15.2	19.4
30	1.1		2.1	3.5	2.8	1.1	1.1	21.5	1.4	26.1	14.1	14.5
31	1.1		2.1		2.8		1.1	4.9		23.7		12.7
Sum	28.5	350.6	61.7	3,074.6	825.2	46.8	42.9	2,743.5	68.5	10,307.2	623.0	374.1

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	0.23	0.16	† 13	1.1	8	0.4	1.1	55.1	328	910	31.5
Feb.	4.10	.20	13	1,970	2	.7	12.4	696	513	5,950	33.3
Mar.	.49	.26	22	7.1	† 1	1.4	2.1	122	582	2,600	59.2
Apr.	7.41	.23	12	7,770	4	1.1	102	6,095	1,562	16,610	75.4
May	3.35	.33	6	1,310	31	2.5	26.5	1,637	1,506	9,080	90.0
June	.39	.23	22	4.2	† 23	1.1	1.4	92.4	3,031	62,520	43.8
July	1.35	.20	27	102	† 13	.7	1.4	84.3	966	8,230	26.8
Aug.	6.53	.16	27	6,180	† 16	.4	88.3	5,433	779	5,433	42.2
Sept.	.89	.26	24	33.5	† 9	1.4	2.1	135	2,880	49,566	37.3
Oct.	11.15	.26	4	14,900	† 1	1.4	333	20,444	1,785	20,444	22.6
Nov.	2.62	.59	26	660	† 18	11.7	20.8	1,236	350	1,670	21.0
Dec.	.82	.56	29	26.1	† 21	10.2	12.0	742	310	780	22.0
Yearly	11.15	0.16		14,900		0.4	50.9	36,771.8	14,592	70,026.3	2,066.7

Current Year 1969 — Period 1938 - 1969

‡ Period 1938 - 1969 # Discharge measurement made on this day † And other days

SAN FELIPE SPRINGS AT DEL RIO, TEXAS

DESCRIPTION: Two large and at least two smaller springs rise near the northeast city limits of Del Rio, Texas in or near the channel of San Felipe Creek at latitude 29° 22' 20" and longitude 100° 53' 00". The total yield of these springs consists of waters measured in the Val Verde Canal at Del Rio, Texas and in San Felipe Creek at Moore Park, Del Rio, Texas, and diversions by the City of Del Rio. Diversions by the San Felipe Irrigation Company through the Val Verde Canal are measured at a gaging station consisting of a paved measuring section and gravity well and water-stage recorder located on the left side of the canal under the U. S. Highway 277 Bridge across San Felipe Creek at latitude 29° 21' 55" and longitude 100° 53' 10". The bridge is located about 0.6 creek mile downstream from the source of the springs and 2.9 creek miles from the confluence of the creek with the Rio Grande. The gaging station on San Felipe Creek at Moore Park consists of gravity well and water-stage recorder located on the left bank about 300 feet downstream from the U. S. Highway 277 Bridge at latitude 29° 21'50" and longitude 100° 53' 10". This stream enters the Rio Grande at river mile 553.1, 1.6 river miles downstream from the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, and 695.1 river miles downstream from the American Dam at El Paso, Texas. The zeros of the gages for the two stations are, respectively, 942.58 feet and 930.77 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records for the Val Verde Canal and San Felipe Creek at Moore Park are based on 54 and 54 discharge measurements, respectively, by wading during the year, and continuous records of gage heights. Computations by shifting control methods. Records for the Del Rio Pumping Plant are furnished by the City of Del Rio Water Department. Records available: Total yield of the springs, February 1961 through 1969.

REMARKS: The flows tabulated below represent only the total yield of the springs. All storm runoff has been eliminated from the tabulations.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	64.5	58.4	57.2	62.7	66.1	75.7	75.6	63.4	77.5	69.3	98.9	113
2	65.2	58.2	56.2	61.0	68.3	75.2	74.2	63.3	74.1	70.2	99.0	112
3	64.9	55.7	56.9	60.9	71.8	73.5	74.4	62.7	71.7	71.6	98.9	113
4	64.4	58.7	56.4	61.1	70.9	72.9	73.2	65.4	71.9	68.8	98.4	114
5	63.7	58.7	57.6	58.8	72.9	72.8	71.5	61.3	70.3	85.8	98.8	118
6	63.1	56.1	51.9	57.0	73.6	72.4	69.2	62.7	74.3	90.1	102	113
7	60.6	56.7	54.5	59.0	74.6	71.7	71.9	62.9	70.0	87.6	101	113
8	60.0	57.5	55.7	57.7	73.8	72.4	68.4	61.0	69.5	87.9	102	108
9	58.4	62.6	55.9	57.0	73.3	73.9	66.0	61.0	69.4	87.6	103	111
10	61.3	60.2	57.5	56.9	71.4	74.1	64.2	62.4	66.4	88.8	102	111
11	62.4	63.6	57.8	67.3	71.2	72.7	66.2	60.7	68.3	87.7	103	110
12	63.4	62.6	60.4	69.1	69.5	67.5	66.0	57.7	68.9	127	106	111
13	62.8	64.4	58.2	61.1	68.9	67.4	66.6	59.0	69.0	104	105	114
14	61.9	61.8	60.4	60.4	67.6	69.2	69.1	58.3	67.9	93.4	104	114
15	59.6	59.9	59.7	59.3	68.0	70.7	63.0	59.8	68.2	95.5	104	114
16	62.8	59.0	60.5	59.5	69.6	72.4	66.3	59.3	69.5	92.7	103	112
17	63.4	58.7	59.4	61.3	69.2	72.1	64.9	57.9	69.2	91.1	103	113
18	63.3	57.5	61.1	62.3	69.1	73.3	62.8	61.6	68.7	93.3	103	113
19	63.1	58.5	60.2	63.8	68.9	73.7	65.3	59.2	69.3	93.2	102	115
20	63.0	59.2	58.4	65.4	70.2	75.8	65.2	58.4	69.5	96.0	101	114
21	63.2	60.7	59.1	67.0	70.4	73.3	65.0	61.4	68.4	95.3	106	114
22	61.9	60.0	61.1	70.6	69.2	73.2	64.7	62.3	69.3	93.9	106	114
23	60.2	59.5	59.8	67.8	71.7	77.8	63.8	62.3	69.6	94.1	106	115
24	60.5	57.8	58.3	66.5	71.2	79.8	61.7	62.2	69.5	95.1	104	114
25	61.1	57.5	56.7	68.1	74.1	75.8	64.2	60.1	70.8	94.7	106	115
26	60.9	60.5	56.7	67.9	75.2	74.1	63.2	67.4	69.0	95.1	107	115
27	60.5	60.4	57.3	68.3	75.1	74.2	66.2	71.1	69.4	99.0	115	115
28	61.0	57.5	58.2	68.4	75.6	74.6	66.9	82.8	68.8	104	116	116
29	61.1		58.8	67.3	74.5	72.7	64.7	77.6	69.9	103	114	122
30	60.9		62.7	66.4	76.3	77.3	64.4	78.2	67.8	100	112	117
31	59.5		59.2		76.5		64.5	75.8		100		116
Sum	1,922.6	1,661.9	1,803.8	1,899.9	2,218.7	2,202.2	2,073.3	1,979.2	2,096.1	2,855.8	3,130.0	3,529

Current Year 1969 — Period Feb. 1961 - 1969

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			2	65.2	9	58.4	62.0	3,813	4,762	6,500	2,274
Feb.			13	64.4	3	55.7	59.4	3,296	4,375	5,909	2,119
Mar.			30	62.7	6	51.9	58.2	3,578	4,718	6,407	2,365
Apr.			22	70.6	10	56.9	63.3	3,768	4,501	6,239	2,291
May			31	76.5	1	66.1	71.6	4,401	4,858	6,379	2,842
June			24	79.8	13	67.4	73.4	4,368	4,714	6,073	2,481
July			1	75.6	24	61.7	66.9	4,112	4,715	6,292	2,214
Aug.			28	82.8	12	57.7	63.8	3,926	4,586	6,810	2,114
Sept.			1	77.5	10	66.4	69.9	4,158	4,553	6,400	2,555
Oct.			12	127	4	68.8	92.1	5,664	5,067	6,680	2,508
Nov.			28	116	4	98.4	104	6,208	4,893	6,208	2,384
Dec.			29	122	8	108	114	7,000	5,132	7,000	2,390
Yearly				127		51.9	75.0	54,292	56,874	74,062	36,580

Ø Mean Daily

SAN FELIPE CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Cableway, bubbler gage, and water-stage recorders (graphic and digital) located on the right bank at latitude 29° 19' 55", longitude 100° 53' 20", immediately upstream from the Silos Farm road bridge, 1.1 creek miles from the confluence with the Rio Grande, and about 2 miles south-southeast of Del Rio, Texas. This stream enters the Rio Grande at river mile 553.1, 1.6 river miles downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila, and 695.1 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 877.43 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 50 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: September 1931 through 1969.

REMARKS: Municipal diversions at Del Rio and irrigation diversions greatly modify the flow of this spring-fed creek at this station. Backwater from the Rio Grande reaches this station when the Rio Grande near Del Rio reaches a stage of 15 feet or a flow of about 60,000 second-feet. On June 28, 1954 combined creek flow and backwater from the Rio Grande reached a stage of 24.51 feet, the highest of record, at this station. On May 14, 1969, the gage was moved to the right bank and the cable was relocated 300 feet upstream. The zero of the gage was not changed.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 45,000 second-feet on June 14, 1935 with a gage height of 23.20 feet. Min. 0.4 second-foot on July 20, 1953.

Average Flow in Second-Feet

Daily:	Max.	16,200	June 14, 1935	Min.	1.5	July 21, 1953
Monthly:	Max.	805	June 1935	Min.	4.6	July 1953
Yearly:	Max.	136	1935	Min.	25.1	1953

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	53.6	37.6	45.6	42.2	✟ 52.1	39.4	✟ 24.8	24.9	60.3	40.3	106	114
2	53.3	36.6	45.0	40.0	51.0	40.1	26.5	25.6	50.8	40.3	105	✟ 113
3	✟ 55.2	36.8	46.4	✟ 39.9	57.4	✟ 43.9	25.0	25.8	53.8	40.3	105	112
4	56.2	40.9	46.5	41.8	49.5	46.3	25.6	24.8	55.9	3,260	✟ 102	113
5	57.2	42.9	45.7	38.9	46.7	43.3	26.7	✟ 21.8	57.7	576	97.5	126
6	55.7	✟ 44.7	✟ 38.0	39.8	287	41.9	27.7	24.0	53.7	103	96.9	124
7	54.7	44.1	36.8	40.0	75.2	38.3	25.9	24.5	52.9	✟ 88.8	96.6	122
8	57.6	46.2	44.7	43.8	✟ 63.7	40.0	✟ 24.2	25.3	50.7	88.2	95.4	122
9	✟ 60.3	46.8	44.6	43.9	59.9	37.1	27.6	29.4	48.6	83.8	95.8	✟ 118
10	60.5	45.8	44.8	✟ 147	57.2	✟ 38.0	27.8	30.0	✟ 46.0	79.4	96.9	110
11	59.0	46.3	46.6	1,590	55.6	42.3	27.6	26.3	48.9	77.4	96.3	110
12	59.9	43.7	43.1	2,140	55.3	44.4	28.9	✟ 24.9	49.6	✟ 417	✟ 96.4	111
13	58.2	92.5	✟ 41.2	65.8	50.2	48.2	30.9	24.2	41.9	101	96.4	111
14	58.7	71.9	42.3	61.0	46.0	46.9	29.0	24.4	41.8	97.2	96.4	110
15	51.7	48.6	40.7	59.0	✟ 52.6	45.9	✟ 25.5	25.2	50.0	93.8	95.9	113
16	✟ 63.6	50.3	39.4	58.1	64.7	44.9	24.5	24.6	✟ 48.2	92.5	95.9	✟ 115
17	55.2	50.0	39.1	✟ 58.9	55.5	✟ 42.6	24.0	24.2	45.5	92.4	96.3	115
18	55.2	52.3	37.0	57.2	55.5	36.9	24.6	23.4	46.5	91.2	✟ 96.7	110
19	63.2	56.8	35.4	57.9	55.0	29.8	28.6	✟ 19.1	47.0	90.3	96.5	109
20	74.5	✟ 53.3	✟ 36.7	57.1	52.7	27.0	28.2	20.3	46.4	89.5	96.8	112
21	72.9	50.1	38.7	54.7	51.4	26.8	26.4	26.2	46.5	✟ 89.3	96.1	113
22	62.0	50.3	44.0	53.5	✟ 51.7	29.2	26.4	25.0	40.4	89.6	95.7	109
23	✟ 47.6	50.3	51.3	53.2	50.6	26.1	✟ 31.6	25.1	✟ 41.2	90.1	96.1	✟ 111
24	44.1	49.7	44.0	✟ 53.5	49.3	✟ 23.8	42.5	25.0	41.2	90.3	99.2	113
25	43.6	49.5	43.5	54.9	50.9	27.8	37.8	26.8	36.4	89.7	106	113
26	43.2	51.1	44.7	53.1	48.4	28.7	25.5	✟ 249	34.7	90.5	163	115
27	42.5	✟ 48.0	44.6	51.6	✟ 47.4	28.5	31.2	540	35.9	538	155	114
28	44.2	45.2	✟ 43.4	49.6	45.5	29.2	35.2	75.2	37.0	128	122	115
29	45.7		42.7	49.8	43.0	30.7	✟ 32.6	65.2	35.6	111	116	135
30	✟ 43.6		43.3	50.4	40.8	29.0	29.3	65.7	✟ 36.7	108	114	✟ 120
31	40.0		43.8		39.5		26.7	66.8		107		116
Sum	1,692.9	1,382.3	1,323.6	5,246.6	1,861.3	1,097	878.8	1,682.7	1,381.8	7,173.9	3,123.8	3,564

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.03	1.05	16	161	31	34.1	54.6	3,358	4,130	7,450	934
Feb.	5.06	1.01	13	907	2	30.5	49.4	2,742	3,271	8,630	487
Mar.	1.70	.90	23	116	18	23.9	42.7	2,625	3,043	6,510	689
Apr.	12.90	.93	11	9,540	5	30.4	175	10,407	3,650	10,407	566
May	5.90	.94	6	1,410	30	31.5	60.0	3,692	4,588	17,600	739
June	1.22	.75	10	56.5	23	18.3	36.6	2,176	4,924	47,900	301
July	1.45	.70	27	83.0	7	17.3	28.3	1,743	3,294	8,800	285
Aug.	7.34	.75	27	2,570	19	14.6	54.3	3,338	3,087	7,150	350
Sept.	1.58	1.02	15	91.2	29	30.4	46.1	2,741	4,875	28,678	872
Oct.	13.65	1.09	4	10,900	1	33.4	231	14,229	4,542	14,229	1,000
Nov.	3.39	1.68	26	393	12	85.7	104	6,196	3,613	7,000	526
Dec.	2.07	1.71	29	151	11	101	115	7,069	3,700	7,069	496
Yearly	13.65	0.70		10,900		14.6	83.3	60,316	46,717	98,137	18,201

Current Year 1969 — Period 1932-1969

✟ Discharge measurement made on this day

DIVERSIONS FROM THE RIO GRANDE

MAVERICK CANAL AT MILE 13 NEAR QUEMADO, TEXAS

DESCRIPTION: Light-weight cableway for making current meter measurements from the bank, bubbler gage, and water-stage recorders (graphic and digital) located on the left bank of a gunnite-lined section of the canal at latitude 29° 03' 00", longitude 100° 39' 40", 0.5 canal mile downstream from the Tequesquite Creek Siphon, 3.5 canal miles upstream from the Las Moras Creek Siphon, about 7.5 miles north-northwest of Quemado, Maverick County, Texas, and 12.8 canal miles from the canal intake. The canal intake is at river mile 537.4, 17.3 river miles downstream from the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, and 710.8 river miles downstream from the American Dam at El Paso, Texas. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 67 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Gage heights at this station are affected by gate operation at Las Moras Siphon. Records available: June 21, 1949 through 1969.

REMARKS: Water from the Rio Grande is diverted into the main canal by Maverick County Water Control and Improvement District No. 1 for power generation and irrigation use. At a point 31.8 canal miles downstream from the headworks of this canal, a portion of the diverted water returns to the river through the Maverick Power Plant and the remainder enters the Maverick Canal Extension. In 1969, a total of 41,934 acres of land were irrigated from this canal and its extension. Of this total, 10,248 acres were between this point and the power plant and 31,686 acres were irrigated from the Maverick Canal Extension. A total of 680,697 acre-feet of water returned to the Rio Grande at the power plant and through the irrigation system (see pages 46, 48, and 51). The datum of the gage was lowered five feet in October 1969.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,680 second-feet on September 15, 1967. Min. no flow several days in June, July, and November 1954.

Average Flow in Second-Feet

Daily:	Max.	1,620	July 13, 1952 & Sept. 13, 1963	Min.	0	June 28 through July 11 & Nov. 2, 1954
Monthly:	Max.	1,530	July 1952	Min.	319	July 1954
Yearly:	Max.	1,420	1961	Min.	914	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,180	1,180	990	1,090	‡ 959	827	924	1,050	1,170	1,100	1,280	1,350
2	1,200	1,180	992	1,060	951	831	980	1,050	1,150	1,100	1,270	‡1,350
3	‡1,200	1,170	979	‡ 927	1,260	‡ 836	‡ 1,010	1,050	‡ 1,140	1,100	1,260	1,340
4	1,190	1,190	963	‡ 909	1,250	835	1,020	1,060	1,130	1,200	1,270	1,340
5	1,200	‡1,210	‡ 913	910	1,050	‡ 759	1,020	1,060	1,020	1,440	‡1,280	1,370
6	1,200	1,220	‡ 19.2	898	‡ 1,050	763	1,030	‡ 1,050	1,180	1,470	1,270	1,370
7	1,180	1,210	‡ .5	898	1,420	750	1,030	1,060	1,040	1,420	1,280	1,320
8	‡1,170	1,210	‡ .5	‡ 907	1,300	805	997	1,060	937	1,320	1,270	1,330
9	1,170	1,200	‡ 362	905	1,130	777	‡ 980	1,070	1,020	‡1,300	1,260	1,320
10	1,170	1,220	1,190	‡ 986	1,100	754	981	1,080	‡ 1,130	1,260	1,260	‡1,320
11	1,170	1,220	‡1,350	1,220	1,110	‡ 752	1,010	1,070	1,130	1,230	1,270	1,320
12	1,180	‡1,210	1,460	1,420	1,100	‡ 743	1,010	‡ 1,060	1,140	1,250	‡1,260	1,310
13	1,180	1,220	1,460	1,440	1,100	764	1,010	1,060	1,130	1,420	1,240	1,320
14	1,180	‡1,350	‡1,440	1,260	‡ 1,080	750	1,010	1,050	1,120	‡1,400	1,230	1,320
15	‡1,180	757	1,440	1,130	1,000	835	‡ 1,020	1,060	1,150	1,330	1,230	1,320
16	1,220	877	1,430	‡1,100	994	860	1,030	1,050	1,130	1,300	1,240	‡1,320
17	1,200	904	1,430	1,100	990	‡ 872	1,000	1,050	‡ 1,130	1,270	1,240	1,310
18	1,180	898	1,420	1,070	962	868	1,010	1,050	1,140	1,270	‡1,230	1,320
19	1,180	‡ 891	‡1,430	1,060	956	837	1,060	1,040	1,160	1,260	1,220	1,320
20	1,190	907	‡1,110	1,060	‡ 949	853	1,070	‡ 1,070	1,180	1,260	1,220	1,320
21	1,180	907	971	1,060	942	863	1,050	1,080	1,130	‡1,260	1,220	1,330
22	‡1,190	895	964	‡1,060	936	859	1,030	1,070	1,120	1,230	1,240	1,330
23	1,200	904	1,010	1,050	931	842	1,020	1,070	‡ 1,120	1,210	1,270	1,330
24	1,200	898	971	1,040	931	863	‡ 1,030	1,070	1,130	1,220	1,310	‡1,320
25	1,200	895	‡ 961	1,040	933	‡ 878	1,040	1,080	1,130	1,200	1,340	1,310
26	1,200	943	966	1,040	962	895	1,060	1,120	1,120	1,200	‡1,370	1,300
27	1,200	‡ 990	994	1,050	1,010	918	1,050	1,410	1,110	1,300	1,470	1,300
28	‡1,200	988	‡1,040	1,000	988	917	1,090	1,440	1,110	1,470	1,430	1,310
29	1,190		1,120	973	‡ 897	918	‡ 1,060	‡ 1,420	1,110	‡1,480	1,380	1,340
30	1,180		1,100	951	848	922	1,060	1,250	‡ 1,110	1,370	1,350	1,350
31	1,170		1,050		839		1,050	1,190		1,300		‡1,300
Sum	36,830	29,644	31,526.2	31,614	31,928	24,946	31,742	34,350	33,517	39,940	38,460	41,110

Month	Extreme Gage ** Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1950 - 1969 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	3.10	2.76	16	1,250	10	1,160	1,190	73,052	76,420	89,500	61,900
Feb.	3.59	-0.35	14	1,380	15	460	1,060	58,799	68,372	82,500	52,700
Mar.	3.60	-4.95	12	1,490	† 6	0.5	1,020	62,532	71,828	90,700	52,000
Apr.	3.87	1.56	12	1,490	7	887	1,050	62,706	66,013	81,000	45,400
May	3.88	1.45	7	1,520	31	828	1,030	63,329	71,212	84,973	39,400
June	2.12	.93	30	938	5	733	832	49,480	72,997	88,900	34,400
July	2.85	1.80	28	1,130	1	919	1,020	62,960	73,488	93,900	19,600
Aug.	4.19	1.97	29	1,540	† 6	1,030	1,110	68,133	78,042	91,459	53,000
Sept.	2.78	1.37	20	1,210	5	881	1,120	66,481	76,830	89,039	47,000
Oct.	9.01	7.30	6	1,510	† 1	1,100	1,290	79,221	79,451	91,578	54,300
Nov.	8.95	7.85	27	1,500	19	1,210	1,280	76,285	76,251	89,991	55,900
Dec.	8.60	8.22	† 5	1,390	27	1,290	1,330	81,542	78,026	89,158	58,600
Yearly	4.19	-4.95		1,540		0.5	1,110	804,520	888,930	1,027,400	663,500

Current Year 1969

‡ Discharge measurement made on this day ** See explanation in REMARKS above † And other days

PINTO CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Cableway, solid ledge rock and concrete control, bubbler gage, and digital water-stage recorder located on the right bank at latitude 29° 08' 45", longitude 100° 43' 05", 1.6 creek miles from the confluence with the Rio Grande, and about 19 miles southeast of Del Rio, Texas. This stream enters the Rio Grande at river mile 530.1, 6.1 river miles downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam, and 718.1 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 813.68 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 53 discharge measurements during the year and a continuous record of gage heights. Records available: September 1955 through 1969 at this station, and November 22, 1928 through August 1955 at a site 3.9 miles upstream.

REMARKS: Small irrigation diversions modify the flow of this spring-fed creek at this station. When the flow in the Rio Grande at the confluence of this creek exceeds about 80,000 second-feet, backwater may reach this station. Backwater from the Rio Grande flood of June 1954 reached a gage height of 28.8 feet, or an elevation of 842.50 feet above mean sea level, at this station. On June 29, 1966 the graphical water-stage recorder was replaced by a digital recorder.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 186,000 second-feet on June 24, 1948 with a gage height of 32.0 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max. 28,200	June 24, 1948	Min. 0		Frequently
Monthly:	Max. 953	June 1948	Min. 0		Frequently
Yearly:	Max. 105	1932	Min. 1.8		1945

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.4	0.4	0.5	0.3	0.7	0.3	0.2	0.1	0.7	0.3	11.2	9.8
2	.5	.4	.4	.2	.7	.4	.2	.1	.8	.3	8.9	↟ 9.0
3	↟ .5	.3	.4	↟ .3	16.5	↟ .5	↟ .2	.1	↟ .8	.3	8.0	8.3
4	.4	.3	.4	.4	4.1	.5	.1	.1	.8	.5	8.6	7.9
5	.4	↟ .3	↟ .3	.6	1.6	.5	.1	.1	.8	18.1	↟ 7.9	9.9
6	.4	.4	.3	.7	↟ 79.7	.6	.1	↟ 0	.8	4.5	7.1	10.3
7	.4	.4	.4	.5	76.9	.6	.1	0	.9	1.7	6.8	7.6
8	↟ .4	.4	.4	↟ .3	8.9	.5	.1	0	.9	1.4	6.4	7.7
9	.4	.5	.4	.3	2.8	.4	↟ .1	0	1.1	↟ 1.3	5.8	7.7
10	.4	.5	.5	.5	1.9	.3	.1	0	↟ 1.0	1.2	5.7	↟ 7.8
11	.4	.5	↟ .5	47.8	1.4	↟ .3	.1	0	.9	1.2	5.3	7.8
12	.5	↟ .5	.5	2,380	1.5	.3	.1	↟ 0	.8	28.2	↟ 2.6	7.8
13	.5	.7	.4	77.6	.9	.3	.1	0	1.0	22.5	1.9	7.8
14	.8	19.5	.4	16.4	↟ .6	.4	.1	0	1.4	↟ 14.2	1.5	7.8
15	↟ .6	1.8	.4	7.1	.6	1.2	↟ .1	0	1.6	6.9	1.3	7.9
16	.6	.8	.4	↟ 2.8	.7	1.0	.1	0	1.4	2.5	1.2	↟ 7.9
17	.5	.7	.4	1.7	.8	↟ .7	.1	0	↟ 1.3	2.0	1.4	7.9
18	.5	.6	.3	1.2	.7	.6	13.8	0	1.2	1.9	↟ 1.6	7.9
19	.4	↟ .5	↟ .3	.9	.7	.5	30.8	0	1.2	1.7	1.4	7.9
20	.4	.5	.3	.7	↟ .8	.6	2.5	↟ 0	1.2	1.5	1.0	7.5
21	.4	.5	.4	.9	.9	2.0	.8	0	1.3	↟ 1.5	1.0	6.6
22	↟ .4	.5	.4	↟ .9	.8	1.0	.4	0	1.2	1.5	1.1	5.9
23	.3	.5	.6	.6	.7	.5	.2	0	↟ 1.3	1.4	1.3	5.9
24	.4	.5	.5	.6	.5	.3	↟ .1	0	1.2	1.4	39.9	↟ 5.9
25	.4	.5	↟ .6	.6	.5	↟ .3	.1	0	1.1	1.4	29.4	5.6
26	.4	.6	.7	.6	.4	.3	.1	383	.9	1.4	↟ 20.6	5.6
27	.4	↟ .6	.7	.5	.5	.3	.1	456	.7	1,370	38.9	5.4
28	↟ .5	.6	.7	.5	.4	.2	.2	64.4	.6	429	22.6	5.5
29	.5		.5	.5	↟ .4	.2	↟ .2	↟ 19.0	.6	↟ 66.2	14.5	7.2
30	.4		.4	↟ .5	.3	.2	.2	10.4	↟ .5	26.9	11.3	6.1
31	.4		.4		.2		.2	2.2		15.9		↟ 5.7
Sum	13.9	34.3	13.8	2,546.5	208.1	15.8	51.7	935.5	30.0	2,028.8	276.4	229.6

Current Year 1969 — Period 1929-1969

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	0.96	0.57	14	6.6	† 21	0.3	0.4	27.6	471	2,270	0
Feb.	2.08	.58	14	73.2	† 3	.3	1.2	68.0	562	5,760	0
Mar.			†26	Ø .7	† 5	Ø .3	.4	27.4	496	2,500	0
Apr.	7.61	.56	12	5,010	† 1	.1	84.9	5,051	1,507	27,100	0
May	4.88	.63	5	1,440	†25	.2	6.7	413	2,433	29,400	0
June	.79	.50	21	2.6	28	.1	.5	31.3	4,326	56,700	0
July	2.71		18	244	18	0	1.7	103	1,691	30,000	0
Aug.	4.78		26	1,350	† 6	0	30.2	1,856	1,570	48,700	0
Sept.	.79		15	2.2	30	Ø .5	1.0	59.5	2,645	48,965	0
Oct.	7.66	.59	27	5,100	† 1	.2	65.4	4,024	1,009	8,940	0
Nov.	2.38	.76	24	134	21	.9	9.2	548	400	2,590	0
Dec.	1.16	.94	6	11.3	† 26	5.4	7.4	455	485	2,470	0
Yearly	7.66			5,100		0	17.5	12,663.8	17,595	76,259.3	1,325.2

† And other days Ø Mean daily ↟ Discharge measurement made on this day

RIO SAN DIEGO AT JIMENEZ, COAHUILA

DESCRIPTION: Cableway, masonry and concrete Cipolletti weir of 777 second-foot capacity, gravity well, and water-stage recorder located on the left bank on Río San Diego, and gravity well and water-stage recorder on Acequia de Dolores, an irrigation canal that runs along the left bank of the river under the cable, located at latitude 29° 04' 20", longitude 100° 43' 50", about 3.5 miles west of Jiménez, Coahuila, and 4.1 river miles from the confluence with the Rio Grande. Part of the canal flow measured here returns to the river downstream. This stream enters the Rio Grande at river mile 525.2, 11.0 river miles downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam, 29.4 river miles downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila, and 723.0 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 831.72 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: For the river, based on the weir discharge table and a continuous record of gage heights; and for the canal, on 37 discharge measurements during the year and a continuous record of gage heights. The flows tabulated below include the flow of the canal. Records published for this station prior to 1964 do not include the discharge of the canal. Records available: 1922 through 1969. The records from 1922 through September 1932 are considered doubtful.

REMARKS: Reservoirs and irrigation diversions upstream from these stations modify the flow of this spring-fed stream. On December 24, 1955, the zero of the gage was raised 2.62 feet to make it coincide with the crest of the weir. In November 1961, the zero of the gage was raised an additional 0.20 foot and the capacity of the weir was increased from 706 to 777 second-feet at the time the weir, which was damaged by the June 17, 1961 flood, was repaired.

EXTREME FLOWS FROM RECORDS‡: Momentary: Max. 81,930 second-feet on June 17, 1961 with a gage height of 20.70 feet. Min. no flow occurred on several occasions during April, May, and June 1939, May and August 1952, and July and August 1953.

Average Flow in Second-Feet ‡

Daily:	Max.	33,730	June 17, 1961	Min.	0	Occasionally
Monthly:	Max.	2,380	Oct. 1932	Min.	8.0	July 1956
Yearly:	Max.	527	1935	Min.	24.0	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	66.4	57.6	53.7	53.7	65.0	64.6	45.9	57.2	269	123	324	127
2	61.4	53.3	48.4	53.7	65.0	65.3	40.6	56.5	269	123	278	119
3	61.8	54.0	43.4	53.7	85.5	66.0	37.4	56.5	279	123	265	117
4	61.8	53.7	43.4	53.7	84.8	78.0	37.4	51.6	279	862	255	119
5	61.8	53.7	53.3	54.0	78.0	78.0	39.9	52.2	279	2,530	236	119
6	61.8	59.7	53.3	54.0	92.9	78.0	42.0	43.3	268	798	226	119
7	55.8	54.0	53.3	54.0	120	72.0	42.0	45.9	268	558	216	119
8	55.8	54.4	53.3	54.0	135	72.0	42.0	45.9	268	441	200	119
9	55.8	55.8	53.3	54.0	136	72.0	42.0	45.9	268	371	189	119
10	55.8	55.8	53.3	67.8	167	66.0	41.7	45.6	248	333	189	109
11	55.8	55.4	53.3	105	151	66.0	41.3	45.6	266	308	170	97.8
12	55.8	55.4	59.0	537	151	66.0	41.3	45.6	248	678	151	97.8
13	55.8	110	59.7	183	143	66.0	36.7	45.2	204	763	140	105
14	55.8	318	59.7	95.0	135	66.0	36.7	45.2	177	526	122	105
15	55.8	86.5	59.3	84.4	120	66.0	31.4	45.2	306	424	123	105
16	55.8	72.7	59.3	84.4	133	66.0	26.5	45.2	188	388	123	105
17	55.8	66.7	59.3	84.0	126	66.0	26.5	44.8	175	352	115	105
18	55.8	66.7	53.7	83.7	120	66.0	26.8	44.8	166	308	108	97.8
19	55.8	66.7	53.7	83.3	120	66.0	24.4	44.8	172	287	106	97.8
20	55.8	66.7	59.7	83.0	120	66.0	25.8	44.8	172	265	104	97.8
21	55.8	55.8	65.0	83.0	105	60.7	25.8	44.8	172	240	104	97.8
22	55.8	55.8	64.6	77.0	105	54.7	29.3	44.8	172	226	104	91.1
23	55.8	55.8	65.3	70.3	105	54.4	35.7	44.8	164	216	104	91.1
24	55.8	55.8	66.0	69.6	105	54.4	31.8	44.8	155	205	122	91.1
25	55.8	55.8	66.4	67.8	90.8	49.4	31.8	60.4	149	199	129	91.1
26	55.8	55.8	66.4	70.3	90.4	49.4	31.8	1,150	138	196	150	97.5
27	55.8	50.1	66.4	62.5	84.4	54.0	31.8	985	138	932	168	104
28	55.8	52.3	61.1	64.3	77.3	54.0	448	463	132	622	149	104
29	55.8		61.1	65.0	77.3	53.7	132	533	123	441	133	104
30	55.8		55.1	65.0	77.0	48.7	83.3	374	123	388	133	104
31	55.8		55.1		71.0		65.3	269		360		104
Sum	1,770.0	1,954.0	1,777.9	2,670.2	3,336.4	1,905.3	1,674.9	4,965.4	6,235	14,586	4,936	3,279.7

Current Year 1969 — Period 1933-1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	0.26	0.20	1	66.4	† 7	44.8	57.2	3,510	6,836	36,430	1,860
Feb.	1.41	.16	14	890	†27	45.2	69.9	3,876	5,514	25,760	1,060
Mar.	.26	.16	†25	70.3	† 3	43.4	57.2	3,527	4,896	27,040	1,340
Apr.	2.03	.20	12	1,470	† 1	53.7	89.0	5,296	6,039	40,270	1,110
May	.46	.23	10	167	† 1	65.0	108	6,619	11,846	120,200	861
June	.26	.20	† 4	78.0	30	48.7	63.6	3,781	11,168	108,300	543
July	1.90	.13	28	1,340	19	21.9	54.0	3,325	7,908	37,890	490
Aug.	5.71	.16	26	6,070	†17	44.8	160	9,850	6,660	32,180	738
Sept.	1.08	.39	15	586	†29	123	208	12,371	15,475	94,667	1,183
Oct.	4.89	.36	5	4,870	4	108	470	28,927	14,599	71,830	1,698
Nov.	.79	.33	1	352	†20	93.6	165	9,786	9,891	64,060	803
Dec.	.39	.30	1	127	†22	91.1	106	6,504	6,748	45,320	1,130
Yearly	5.71	0.13		6,070		21.9	135	97,372	107,580	381,720	17,430

‡ Period October 1932-1969 † And other days

RIO GRANDE BELOW MAVERICK DAM NEAR QUEMADO, TEXAS

DESCRIPTION: Cableway, bubbler gage, control weir of 1,270 second-foot capacity, gravity well, and water-stage recorders located on the right bank at latitude 29° 03' 00", longitude 100° 40' 00", and river mile 523.3; 1.5 miles southsoutheast of Jiménez, Coahuila, 1.9 river miles downstream from Rio San Diego, about 7.5 miles north-northwest of Quemado, Maverick County, Texas, 12.8 river miles downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam, 31.3 river miles downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila, and 724.9 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 769.00 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 41 discharge measurements during the year, and a continuous record of gage heights. Computations by shifting control methods prior to completion of the weir and for flows exceeding the capacity of the weir thereafter. Computations for flows within the capacity of the weir were based on a stable control weir rating curve defined by meter measurements. Records available: 1965 through 1969. Records, excluding some high flow periods, are also available from 1956 through May 1965 for a station 8.1 river miles upstream.

REMARKS: This station was placed in operation January 1, 1965 and replaces the station "Rio Grande below Maverick Dam near Del Rio, Texas" which stopped operating June 1, 1965. Irrigation diversions 14.0 river miles upstream largely control the flow at this station. A bubbler gage replaced the gravity well on May 1, 1966. The weir was placed in operation June 1, 1967 at which time a bubbler gage and gravity well were installed and the zero of the gage was set 3.28 feet higher.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	77.7	84.8	27.5	49.4	21.5	31.8	✟ 17.0	33.2	296	138	✟ 395	185
2	84.8	78.0	23.3	61.1	21.2	28.3	12.4	29.0	290	130	330	148
3	✟ 94.6	74.2	17.7	63.2	175	✟ 35.3	17.7	29.0	290	130	304	133
4	91.8	✟ 74.5	✟ 17.7	✟ 53.0	167	35.3	19.4	29.0	290	4,630	✟ 280	133
5	91.8	84.8	26.1	44.5	90.1	35.3	19.4	✟ 29.0	296	22,800	265	150
6	88.3	84.8	340.0	31.8	87.6	35.3	19.4	29.0	274	1,640	252	162
7	✟ 84.8	84.8	385.0	31.8	✟ 459	28.3	19.4	29.0	277	✟ 756	242	148
8	84.8	76.3	710.0	42.4	239	28.3	✟ 19.4	29.0	252	583	229	137
9	84.8	63.6	802.0	35.3	139	28.3	19.4	29.0	252	456	222	133
10	84.8	61.4	22.2	27.9	148	✟ 28.3	19.4	29.0	✟ 252	396	211	129
11	84.8	64.3	✟ 30.7	237	146	28.3	19.4	29.0	304	352	✟ 201	113
12	84.8	60.0	53.3	11,400	149	28.3	19.4	✟ 29.0	282	4,380	178	116
13	84.8	71.0	57.9	597	✟ 133	28.3	12.4	29.0	231	2,060	157	107
14	84.8	1,130	45.2	165	101	28.3	12.4	29.0	197	✟ 752	136	119
15	84.8	173	39.9	✟ 114	95.7	28.3	✟ 12.4	29.0	347	530	127	112
16	84.8	91.8	42.0	106	127	28.3	7.1	29.0	221	445	131	99.9
17	84.8	77.7	35.0	98.9	120	✟ 35.3	7.1	29.0	207	396	133	106
18	84.8	✟ 65.3	28.6	83.0	109	35.3	7.1	29.0	✟ 224	353	✟ 118	116
19	84.8	56.5	24.7	79.5	109	28.3	130	29.0	197	322	105	120
20	84.8	56.5	17.7	79.5	✟ 111	28.3	56.9	✟ 29.0	201	303	107	116
21	✟ 84.8	56.5	14.1	75.9	103	28.3	24.4	29.0	197	✟ 277	107	116
22	84.8	41.7	7.1	✟ 61.8	87.6	28.3	✟ 19.4	29.0	197	245	107	116
23	77.7	36.7	17.7	64.6	70.6	26.5	15.9	29.0	202	232	107	116
24	83.0	39.2	14.1	65.7	56.5	21.2	10.9	29.0	185	219	193	107
25	74.2	✟ 35.3	✟ 14.1	✟ 70.6	53.0	✟ 21.2	8.8	30.0	166	221	193	107
26	78.4	31.8	11.7	66.7	45.9	21.2	10.2	2,420	166	219	280	99.9
27	84.8	31.8	17.7	54.4	✟ 44.1	21.2	11.7	4,770	159	6,430	851	99.9
28	91.8	31.8	19.4	52.6	35.3	21.2	344	1,350	148	4,060	331	99.9
29	95.3		23.0	✟ 33.2	28.3	21.2	✟ 138	996	148	904	234	112
30	84.8		29.7	17.7	24.7	21.2	75.6	491	✟ 148	576	200	109
31	✟ 84.8		47.3		17.7		43.8	335		484		107
Sum	2,640.6	2,918.1	2,962.4	13,963.5	3,314.8	843.0	1,169.8	11,092.2	6,896	55,419	6,726	3,772.6

Current Year 1969 — Period 1968-1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	0.36	0.30	3	98.9	25	72.4	85.1	5,236	14,050	22,863	5,236
Feb.	2.10	.20	14	2,120	†26	21.2	104	5,788	6,872	7,956	5,788
Mar.	1.74	.16	9	1,500	22	3.5	95.7	5,874	6,679	7,484	5,874
Apr.	8.33	.20	12	22,400	30	14.1	466	27,781	30,115	32,447	27,781
May	1.21	.20	7	780	31	17.7	107	6,574	20,922	35,270	6,574
June	.23	.20	† 3	35.3	†24	17.7	28.3	1,671	2,862	4,052	1,671
July	1.35	.13	28	957	†16	7.1	37.8	2,322	10,826	19,331	2,322
Aug.	6.76	.16	26	16,200	† 2	25.4	357	21,991	17,046	21,991	12,101
Sept.	.98	.46	15	572	30	143	230	13,678	14,830	15,981	13,678
Oct.	12.24	.43	5	45,600	† 2	130	1790	109,924	61,662	109,924	13,399
Nov.	1.67	.36	27	1,420	†19	99.9	224	13,343	16,088	18,832	13,343
Dec.	.52	.36	1	190	†16	99.9	122	7,486	12,885	18,282	7,486
Yearly	12.24	0.13		45,600		3.5	306	221,668	214,837	221,668	207,998

† And other days ✟ Discharge measurement made on this day

RIO SAN RODRIGO NEAR MOUTH AT EL MORAL, COAHUILA

DESCRIPTION: Cableway, gravity well, concrete control weir of 3,200 second-foot capacity, and water-stage recorder located on the left bank at El Moral, Coahuila, latitude 28° 53' 45", longitude 100° 38' 05", 0.6 river mile from the confluence with the Rio Grande, and about 15.5 miles northwest of Piedras Negras, Coahuila. The stream enters the Rio Grande at river mile 512.0, 19.5 river miles downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam, 20.7 river miles upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila, and 736.2 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 751.61 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 50 discharge measurements made during the year and a continuous record of gage heights. Computations by shifting control methods prior to completion of the weir. Records available: 1962 through 1969.

REMARKS: This station, located 10.6 river miles downstream from the permanent station which was in operation from 1922 through May 1966, was originally installed on a provisional basis; however, it became the permanent station on June 1, 1966 when the operation of the upstream station was discontinued. The rating curve for this station is affected by backwater from the Rio Grande when its flow is approximately 10,000 second-feet. The flow of this spring-fed stream is modified by diversions above this station. A pilot channel was constructed in October 1963. On November 25, 1969, a concrete control weir was finished and placed in operation. Prior to this date the zero of the gage was 746.82 feet above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS‡: Momentary: Max. 72,000 second-feet on June 17, 1961 determined by slope-area computations. Min. frequently no flow.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20.5	15.9	16.2	10.2	18.4	80.5	21.5	23.0	82.6	↟ 21.1	67.8	35.3
2	↟ 21.1	15.9	15.9	10.2	18.7	78.4	↟ 20.8	22.2	70.6	18.0	61.4	33.2
3	19.1	15.9	15.5	10.2	↟ 342	68.5	20.8	21.5	62.2	18.0	55.4	↟ 31.8
4	19.1	16.2	14.1	10.2	162	67.8	19.8	20.1	↟ 55.4	18.0	49.1	30.4
5	18.4	16.2	↟ 14.1	10.2	96.1	↟ 67.8	19.4	19.8	48.7	32.5	↟ 43.1	32.5
6	18.4	↟ 15.9	14.5	10.2	269	63.6	19.8	↟ 18.4	45.2	65.0	42.7	32.5
7	17.3	15.2	13.8	10.2	406	60.7	19.4	18.0	42.0	35.3	42.4	30.7
8	↟ 17.7	15.2	13.4	↟ 10.2	159	59.7	19.4	17.7	39.2	↟ 26.1	42.0	29.3
9	17.7	15.2	13.8	10.2	110	58.3	↟ 19.1	16.6	35.7	21.9	41.3	↟ 28.3
10	17.7	15.2	13.8	10.2	87.6	51.6	18.0	15.9	32.1	17.3	41.0	27.9
11	17.0	15.5	13.8	5,930	75.2	↟ 47.3	18.4	15.5	↟ 32.5	15.2	40.6	26.8
12	16.2	15.5	↟ 13.1	3,810	67.1	45.9	17.7	15.2	32.8	207	↟ 40.3	26.5
13	16.2	17.0	12.4	287	61.1	45.6	17.7	↟ 14.8	29.7	61.8	39.9	26.1
14	16.2	116	12.7	↟ 160	↟ 54.4	44.5	17.7	14.8	28.6	50.9	↟ 39.6	25.4
15	↟ 16.2	30.0	13.4	111	53.0	43.4	17.7	14.1	124	↟ 39.9	39.2	24.7
16	17.0	17.7	13.1	82.3	93.6	42.0	↟ 17.3	14.1	47.7	38.1	38.5	↟ 24.0
17	16.2	14.8	12.4	68.9	101	40.6	17.3	13.4	38.8	36.4	38.1	24.0
18	16.2	14.1	11.7	53.0	91.5	↟ 39.9	17.0	13.1	34.3	34.6	37.8	24.0
19	17.3	↟ 14.1	11.3	42.4	80.9	37.4	17.0	12.7	↟ 50.9	32.8	↟ 37.4	23.3
20	17.3	14.8	11.3	36.7	77.7	33.2	17.0	12.4	43.4	31.1	37.4	23.0
21	17.3	15.2	11.3	31.8	↟ 75.9	30.0	16.2	↟ 12.0	33.9	29.3	37.1	22.6
22	↟ 14.1	15.2	12.0	29.7	77.7	28.3	16.2	11.7	30.4	↟ 27.5	37.1	22.2
23	17.0	15.2	11.7	↟ 27.5	76.3	27.5	↟ 16.2	12.0	29.3	36.0	36.7	21.9
24	15.9	15.2	10.6	25.8	72.7	26.5	16.2	12.0	↟ 26.1	44.1	36.7	21.5
25	15.9	16.2	10.6	24.7	71.0	25.4	16.2	12.0	26.1	52.6	36.4	21.2
26	14.8	↟ 16.2	↟ 10.6	24.0	70.6	↟ 24.7	16.2	13.1	26.1	61.1	36.4	20.5
27	15.5	16.2	10.9	22.6	70.6	23.7	16.6	3,050	26.1	69.6	36.0	↟ 20.1
28	15.9	16.2	10.6	21.2	↟ 71.7	23.0	102	812	26.1	77.7	36.0	20.1
29	↟ 15.9		10.6	20.1	74.2	22.6	36.4	1,240	24.4	↟ 86.2	35.7	20.5
30	15.5		10.6	↟ 19.4	77.7	22.2	↟ 26.1	230	24.4	80.2	35.7	20.1
31	15.9		10.6		80.5		24.4	91.1		73.8		↟ 19.8
Sum	526.5	551.9	390.4	10,930.1	3,243.2	1,330.6	675.5	5,829.2	1,249.3	1,459.1	1,238.8	790.2

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	0.92	0.85	2	21.2	26	14.8	17.0	1,048	1,117	2,881	0
Feb.	2.17	.82	14	309	†17	13.4	19.8	1,095	743	1,874	0
Mar.	.85	.79	† 1	16.2	29	10.2	12.7	774	643		0
Apr.	12.96	.75	11	24,500	10	9.2	364	21,692	3,900	21,692	122
May	3.81	.92	6	1,660	1	17.7	105	6,431	3,108		17.0
June	1.38	.92	† 1	80.5	30	21.9	44.5	2,640	1,021	2,640	0
July	2.00	.79	28	245	†21	16.2	21.9	1,341	3,877	28,394	0
Aug.	7.28	.69	27	11,000	24	10.9	188	11,570	2,301	11,570	0
Sept.	2.53	.75	15	491	†29	24.4	41.7	2,479	6,778		0
Oct.	.33	.72	12	1,390	11	15.2	47.0	2,895	3,921	11,438	0
Nov.			1	67.8	†29	35.7	41.3	2,457	2,129	6,147	0
Dec.	.85	.59	1	36.0	†30	19.8	25.4	1,568	1,483	4,269	0
Yearly	12.96			24,500		9.2	77.3	55,990	31,021		3,850.7

Current Year 1969 — Period #1962 - 1969

‡ Period 1961 - 1969 ↟ Discharge measurement made on this day # Some months missing
† And other days

RETURN FLOW TO THE RIO GRANDE AT MAVERICK POWER PLANT NEAR EAGLE PASS, TEXAS

DESCRIPTION: A part of the water diverted from the river into the Maverick Canal is returned to the Rio Grande through the hydroelectric power plant located on the left bank of the Rio Grande at latitude 28° 49' 50", longitude 100° 33' 10", about 9 miles north-northwest of Eagle Pass, Texas, and about 32.2 canal miles downstream from the point of diversion. The return enters the Rio Grande at river mile 501.5 and 746.7 river miles downstream from the American Dam at El Paso, Texas.

RECORDS: Based on records furnished by the Maverick County Water Control and Improvement District No. 1, showing hourly discharge in cubic feet per second based on hourly manometer readings, through each turbine at the Central Power and Light Company hydroelectric power plant. The mean daily discharges computed from the manometer readings have been multiplied by a factor to make them agree with periodic current meter measurements of flows made under stable flow conditions by hydrographers of this Commission. There were 57 discharge measurements made during the year. Records available: 1949 through 1969.

REMARKS: This power plant began operating April 6, 1932 with hydroelectric power generating facilities for 12,000 kw. Because the September 1932 flood washed out the upper end of the Maverick Canal, this plant did not operate from September 2, 1932 until March 17, 1937. Since then it has operated continuously except for 44 days in 1953 and short periods in 1969 when shortage of water prevented operation and from June 30 through July 19, during flood of 1954, and while the canal was being repaired.

Average Flow in Second-Feet

Daily:	Max.	1,460	Aug. 29, 1969	Min.	0	Frequently 1953 & 1954; July 14, 1968; & March 8 & 9, 1969
Monthly:	Max.	1,270	Sept. 1966	Min.	14.1	June 1953
Yearly:	Max.	1,020	1950 & 1961	Min.	443	1953 & 1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	730	743	556	457	349	108	190	553	1,110	↟ 658	1,240	1,230
2	785	745	560	↟ 454	343	93.2	218	560	1,110	639	1,100	↟1,250
3	800	740	590	399	612	94.2	293	566	1,100	619	1,110	1,240
4	801	↟738	↟548	334	907	↟ 119	285	533	↟ 1,030	634	↟1,120	1,220
5	824	783	610	352	759	↟ 105	305	↟ 485	858	1,080	1,130	1,220
6	836	818	↟ 244	527	↟ 686	↟ 87.6	349	473	1,070	1,120	1,120	1,240
7	779	833	1.8	299	1,160	77.0	313	429	981	1,050	1,110	1,180
8	↟ 747	816	0	↟ 218	1,200	77.0	↟ 256	320	787	964	1,070	1,210
9	741	840	0	116	1,000	77.0	216	369	701	949	1,060	↟1,230
10	733	809	418	173	974	↟ 77.7	212	454	↟ 877	↟ 926	1,050	1,230
11	756	↟747	↟ 708	650	973	47.7	247	403	900	903	1,050	1,240
12	770	743	862	1,040	933	↟ 2.9	246	↟ 412	940	1,060	↟1,040	1,230
13	751	764	853	1,190	↟ 814	2.9	296	415	925	1,170	985	1,230
14	↟ 761	920	813	977	776	2.9	289	381	910	↟1,140	954	1,170
15	784	619	844	↟ 719	780	59.2	↟ 275	393	967	1,070	954	1,190
16	793	479	835	651	842	151	278	440	952	1,050	990	↟1,220
17	809	539	787	647	922	↟ 143	271	503	↟ 932	1,030	973	1,180
18	818	↟568	↟ 776	639	904	146	274	388	944	1,020	↟ 922	1,160
19	829	608	751	618	821	136	376	↟ 436	956	1,010	872	1,150
20	828	631	590	615	↟ 716	126	440	452	993	1,010	876	1,120
21	↟ 858	646	397	606	690	155	378	467	951	↟ 1,000	873	1,130
22	886	630	398	↟ 586	596	191	↟ 363	508	926	969	897	↟1,140
23	888	633	467	545	524	149	363	507	↟ 922	948	940	1,110
24	880	613	452	528	412	↟ 136	385	522	929	955	1,070	1,140
25	865	↟609	↟ 430	518	422	130	372	537	921	942	↟1,170	1,140
26	858	634	428	530	355	134	378	↟ 590	886	935	1,220	1,110
27	857	679	446	555	329	159	402	1,190	879	1,110	1,320	1,100
28	↟ 848	676	463	502	↟ 351	144	506	1,390	875	↟ 1,370	1,310	1,110
29	842		492	↟ 415	272	215	↟ 617	1,460	832	1,410	1,270	1,140
30	796		511	324	88.6	↟ 190	584	1,290	724	1,350	1,250	1,170
31	772		478		89.6		520	1,180		1,280		1,140
Sum	25,025	19,603	16,308.8	16,184	20,600.2	3,336.3	10,497	18,606	27,888	31,371	32,046	36,570

Month	Current Year 1969 Extreme Gage Feet High	Extreme Gage Feet Low	∅ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1949-1969 Acre-Feet Average	Maximum	Minimum
Jan.			23	888	1	730	807	49,637	53,916	72,800	34,400
Feb.			14	920	16	479	700	38,883	47,397	68,500	24,900
Mar.			12	862	† 8	0	526	32,349	44,447	65,400	18,900
Apr.			13	1,190	9	116	539	32,101	38,629	58,600	6,080
May			8	1,200	30	88.6	665	40,860	46,819	69,188	2,280
June			29	215	†12	2.9	111	6,618	41,319	68,900	841
July			29	617	1	190	339	20,821	39,469	63,000	2,880
Aug.			29	1,460	8	320	600	36,905	47,918	69,000	22,600
Sept.			† 1	1,110	9	701	930	55,316	54,533	75,591	18,500
Oct.			29	1,410	3	619	1,010	62,224	56,449	70,870	23,000
Nov.			27	1,320	19	872	1,070	63,563	53,541	67,400	27,300
Dec.			2	1,250	27	1,100	1,180	72,537	56,865	73,130	34,300
Yearly				1,460		0	707	511,814	581,302	740,000	320,701

↟ Discharge measurement made on this day ∅ Mean daily † And other days

DIVERSIONS FROM THE RIO GRANDE
MAVERICK CANAL EXTENSION BELOW THE POWER PLANT
NEAR EAGLE PASS, TEXAS

DESCRIPTION: Gage well and digital water-stage recorder located on the downstream side of a wooden pile bridge at latitude 28° 49' 50", longitude 100° 32' 40", about 1 mile downstream from the heading of this canal extension, about 9 miles north-northwest of Eagle Pass, Texas, and about 32.8 canal miles downstream from the point of diversion from the Rio Grande, which is located at river mile 537.4. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 54 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1939 through 1969.

REMARKS: The main Maverick Canal divides into two branches at a point about 9 miles north-northwest of Eagle Pass, Texas, and about 31.8 canal miles downstream from the point at which water from the Rio Grande is diverted. One branch leads to the Maverick Power Plant and back to the Rio Grande while the other branch forms this Maverick Canal Extension, which is used to transmit irrigation water. Irrigation from this canal extension began in June 1938. In 1969, 31,686 acres of land north and south of Eagle Pass were irrigated. A total of 109,447 acre-feet of water from this canal extension returned to the river through the irrigation system which extends approximately 67 canal miles downstream.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 580 second-feet on July 25, 1964. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max.	559	July 14, 1964	Min.	0	Occasionally
Monthly:	Max.	525	July 1964	Min.	18.7	March 1939
Yearly:	Max.	345	1964	Min.	62.1	1939

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	263	252	225	417	391	482	458	274	20.6	✱ 227	14.3	29.0
2	247	251	260	✱ 415	391	473	✱ 460	256	20.7	248	118	✱ 29.5
3	236	251	260	416	393	456	459	262	20.8	249	119	29.4
4	223	✱ 235	✱ 260	417	374	445	460	290	✱ 72.8	251	✱ 81.2	37.0
5	219	217	260	420	292	✱ 442	461	✱ 305	138	108	82.1	65.4
6	218	216	✱ 108	242	✱ 255	430	463	321	20.4	134	82.8	63.8
7	242	203	10.4	406	144	393	461	361	50.8	216	95.2	63.8
8	✱ 261	192	10.4	✱ 426	145	423	✱ 459	440	69.8	199	119	56.2
9	259	193	49.2	443	143	480	457	416	139	174	119	✱ 33.3
10	261	201	377	470	143	✱ 458	457	396	✱ 88.5	✱ 175	120	33.3
11	263	✱ 228	✱ 356	385	146	447	457	396	89.8	175	120	33.1
12	264	228	339	234	177	✱ 466	457	✱ 357	92.0	88.9	✱ 120	33.1
13	265	230	339	158	✱ 243	484	460	336	93.0	105	119	32.9
14	✱ 265	202	350	233	241	505	460	359	94.1	✱ 205	119	84.8
15	265	180	383	✱ 329	184	534	✱ 458	369	96.1	203	119	72.6
16	264	183	383	359	✱ 97.8	493	457	322	125	201	119	✱ 30.2
17	262	201	395	360	9.1	473	459	301	✱ 166	191	132	59.3
18	242	✱ 181	✱ 425	360	10.3	✱ 471	452	395	169	182	✱ 166	78.6
19	231	159	426	362	90.2	467	431	✱ 348	171	180	166	86.8
20	229	159	421	362	✱ 164	468	435	313	173	179	167	103
21	✱ 221	159	418	363	164	468	444	313	177	✱ 178	167	103
22	215	159	420	✱ 363	229	468	437	316	177	178	167	✱ 99.0
23	218	159	406	378	281	461	✱ 424	312	✱ 174	177	168	99.0
24	218	159	397	387	385	✱ 461	403	304	172	178	110	75.8
25	220	✱ 159	✱ 396	380	385	459	391	275	172	177	✱ 70.0	74.4
26	222	159	397	380	383	458	392	✱ 275	171	194	51.0	92.6
27	222	158	398	380	357	460	392	116	170	114	28.6	108
28	✱ 224	159	397	376	✱ 339	458	334	24.7	170	✱ 17.6	28.4	107
29	224		398	✱ 385	371	462	✱ 228	23.3	196	16.7	28.8	106
30	240		407	402	452	459	242	20.8	265	15.9	28.9	107
31	252		418		482		295	20.7		15.1		107
Sum	7,455	5,433	10,089	11,008	7,861.4	13,904	13,103	8,817.5	3,754.4	4,952.2	3,145.3	2,133.9

Month	Average Rainfall Inches**		Extreme Second-Feet				Average Second Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	1939-1969	1969	Day		Day				Average	Maximum	Minimum
	Current Year 1969								**Period 1939-1969**		
Jan.	0.79	0.27	15	276	† 4	214	240	14,787	12,556	19,800	2,140
Feb.	.97	.69	4	261	10	155	194	10,776	11,732	18,200	2,120
Mar.	.74	.18	19	Ø 426	† 7	*Ø 10.4	325	20,012	14,865	23,310	1,150
Apr.	1.84	2.26	9	482	6	* 17.4	367	21,834	14,770	24,802	3,430
May	3.12	3.86	31	493	17	6.8	254	15,593	12,820	27,664	2,840
June	1.61	.21	15	547	7	302	463	27,577	16,287	30,173	3,750
July	1.40	1.89	6	466	† 29	196	423	25,990	17,918	32,276	4,510
Aug.	2.04	6.02	† 8	448	31	20.4	284	17,525	16,040	29,812	3,480
Sept.	2.93	1.00	30	267	8	18.2	125	7,447	12,265	22,640	4,600
Oct.	2.03	4.76	5	258	31	14.9	160	9,823	13,129	21,800	5,130
Nov.	.72	2.01	3	187	2	14.0	105	6,239	12,905	20,117	4,170
Dec.	.69	.87	23	182	† 1	28.8	68.8	4,233	12,742	20,200	4,233
Yearly	18.88	24.02		547		6.8	251	181,836	168,029	250,801	44,950

✱ Discharge measurement made on this day ** On the United States side from Maverick Power Plant to Cuervo Creek Ø Mean daily † And other days

RETURN FLOW TO THE RIO GRANDE FROM MAVERICK CANAL
MAVERICK DAM TO EAGLE PASS, TEXAS

DESCRIPTION: Part of the water diverted from the Rio Grande into the Maverick Canal is returned to the river through various drains and spillways of the irrigation system located between Maverick Diversion Dam and Eagle Pass, Texas. These return flows are measured at gaging stations consisting of sharp-crested Cipolletti weirs or control structures equipped with continuous water-stage recorders located at Lateral 2 Spill, Cañon Grande, Quemado Creek, Lateral 15 Spill, Hardt Spill, Houchin Spill, Lateral 12 Spill, Lateral 8B Spill, Elm Creek, and Seco Creek; and a Parshall flume at the Lateral 2 Sand Trap Spill into Las Moras Creek immediately below the canal siphon.

RECORDS: Based on the weir discharge table and a continuous record of gage heights. All storm flow occurring at these stations is deducted from the records and is not shown below. Records available: April 1959 through 1969.

REMARKS: *In addition to the flows listed below,* water from the Maverick Canal is returned to the Rio Grande in this reach at the Maverick Power Plant (see page 46).

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	139	128	91.2	98.1	119	138	141	92.8	47.9	76.5	49.7	63.3
2	147	141	104	102	129	142	124	112	46.4	91.5	49.9	64.1
3	134	128	96.0	130	99.6	140	109	133	39.9	109	51.1	68.2
4	132	140	99.5	135	71.2	131	102	118	39.0	130	49.0	65.8
5	125	148	162	123	61.1	128	111	124	38.3	137	45.7	62.9
6	109	142	73.2	145	48.7	101	139	114	38.9	117	49.5	67.3
7	116	130	27.4	98.8	53.9	109	97.3	115	49.5	101	51.2	84.1
8	126	124	20.2	109	50.9	123	108	106	47.2	107	47.8	79.5
9	122	118	18.3	125	45.0	112	144	123	66.0	115	48.8	70.8
10	113	121	64.2	151	40.3	96.7	150	120	72.3	118	52.2	60.3
11	122	132	99.2	152	34.3	116	154	114	77.6	118	53.8	45.4
12	119	162	121	103	40.8	140	145	109	74.4	120	58.7	40.8
13	114	142	139	87.1	52.8	121	153	113	78.8	104	89.3	40.0
14	123	154	144	71.5	44.7	129	134	133	96.8	92.2	104	38.6
15	123	128	121	76.8	49.0	138	128	116	88.1	91.5	110	36.2
16	126	120	98.6	93.6	65.6	133	132	112	73.1	74.1	94.0	41.9
17	120	109	105	83.7	59.5	117	124	124	47.0	69.7	89.9	42.5
18	116	91.6	121	66.3	64.6	132	117	101	44.1	73.3	99.8	44.9
19	117	64.7	125	68.4	63.0	136	118	102	47.5	62.4	101	46.9
20	122	52.0	124	70.5	71.7	142	121	95.3	44.5	57.2	101	59.5
21	112	55.3	122	76.6	72.5	132	124	110	45.9	60.1	96.2	54.0
22	103	60.6	127	81.6	75.2	136	140	114	51.7	70.7	89.5	50.3
23	102	55.8	128	86.3	81.1	113	121	105	51.1	84.3	84.1	59.5
24	97.8	64.0	121	79.6	89.7	107	119	109	45.2	80.0	78.2	64.7
25	97.7	63.7	101	107	100.0	115	112	99.1	55.3	75.3	71.2	66.8
26	111	73.0	110	85.6	89.9	142	119	91.6	74.8	79.7	70.2	62.4
27	118	73.9	108	67.2	98.3	135	135	94.1	83.2	71.7	73.6	62.5
28	134	80.2	112	75.7	93.4	126	137	86.8	85.2	63.6	74.5	65.7
29	143		119	106	114	139	130	74.5	75.0	66.3	71.2	58.7
30	140		111	111	128	136	106	58.8	69.4	58.5	68.1	51.2
31	134		109		129		101	51.4		51.2		49.1
Sum	3,757.5	3,001.8	3,221.8	2,966.4	2,335.8	3,805.7	3,895.3	3,271.4	1,794.1	2,725.8	2,173.2	1,767.9

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period Apr. 1959-1969 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
				Current Year 1969							
Jan.			2	147	25	97.7	121	7,453	7,815	13,430	5,860
Feb.			12	162	20	52.0	107	5,954	6,372	7,652	4,830
Mar.			5	162	9	18.3	104	6,390	7,228	8,952	6,390
Apr.			11	152	18	66.3	98.9	5,884	7,119	7,795	5,884
May			† 2	129	11	34.3	75.3	4,633	6,898	8,777	4,633
June			† 2	142	10	96.7	127	7,549	7,754	9,219	5,484
July			11	154	7	97.3	126	7,726	8,260	9,858	6,830
Aug.			† 3	133	31	51.4	106	6,489	8,048	9,666	6,262
Sept.			14	96.8	5	38.3	59.8	3,559	6,921	9,477	3,559
Oct.			5	137	31	51.2	87.9	5,407	6,921	8,583	4,144
Nov.			15	110	5	45.7	72.4	4,311	7,088	8,696	4,311
Dec.			7	84.1	15	36.2	57.0	3,507	6,992	8,821	3,507
Yearly				162		18.3	95.1	68,862	87,416	104,997	68,862

Ø Mean daily † And other days

RIO GRANDE AT EAGLE PASS, TEXAS

DESCRIPTION: Cableway, gravity well, water-stage recorder, and resistance-type transmitter located on the left bank at latitude 29° 42' 50", longitude 100° 30' 25", and river mile 491.8; 0.5 river mile upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila, 73.4 river miles downstream from Amistad Dam, and 756.4 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 682.91 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 105 discharge measurements during the year, 56 by the Mexican Section and 49 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through March 1914; August 1914 through April 1916; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September, November, and December 1923; and 1924 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The transmitter is coupled, via leased telephone circuits, to a receiver located in the office of the Eagle Pass and Piedras Negras Bridge Company from where the Wheatstone bridge circuit can be balanced to indicate the existing gage height. This system is operated in cooperation with the United States Weather Bureau.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 964,100 second-feet, determined by slope-area calculations, on June 29, 1954 with a gage height of 53.51 feet. Well-authenticated information indicates the occurrence of a flood in June 1865 with an estimated discharge of 1,236,000 second-feet and a gage height of 56.00 feet on the present gage and also that these were the only floods since 1745 with flows greater than 825,000 second-feet. Min. 24.4 second-feet on June 22, 1953 with a gage height of 0.07 foot.

Average Flow in Second-Feet ‡

Daily:	Max.	572,100	June 28, 1954	Min.	30.7	June 22, 1953
Monthly:	Max.	48,000	Sept. 1932	Min.	248	April 1953
Yearly:	Max.	9,180	1932	Min.	870	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,000	1,020	742	562	565	371	392	780	1,620	982	⋔1,870	⋔1,680
2	1,100	1,050	745	554	569	388	403	788	⋔1,580	953	1,740	1,630
3	1,130	⋔1,020	⋔ 706	⋔ 551	992	364	491	816	1,540	943	⋔1,600	⋔1,580
4	1,130	1,010	643	484	1,460	374	463	⋔ 766	1,490	975	1,580	1,550
5	1,130	⋔1,080	⋔ 643	470	1,000	360	480	720	1,290	17,900	⋔1,560	1,560
6	⋔1,110	1,120	⋔ 551	763	⋔ 957	⋔ 322	544	685	1,450	⋔ 5,580	1,550	1,610
7	1,070	1,120	⋔ 388	⋔ 434	⋔2,410	289	⋔ 533	671	1,420	2,220	1,520	1,580
8	1,020	1,080	452	403	1,950	311	434	540	1,210	1,820	1,480	⋔1,580
9	999	1,100	855	⋔ 381	1,380	⋔ 298	410	572	⋔ 1,080	1,700	1,450	1,550
10	975	1,070	⋔ 671	403	1,220	277	417	685	1,270	1,770	1,440	⋔1,550
11	989	⋔ 992	795	5,900	1,210	⋔ 253	470	⋔ 664	⋔ 1,400	1,680	1,430	1,530
12	1,020	985	⋔ 982	⋔13,400	⋔1,150	⋔ 243	445	611	⋔ 1,860	3,670	1,410	1,520
13	⋔1,010	⋔1,060	1,010	6,960	1,060	220	505	636	1,400	⋔ 6,530	⋔1,370	1,520
14	1,020	⋔1,790	985	1,850	⋔1,050	219	⋔ 501	618	1,310	2,380	1,320	⋔1,470
15	⋔1,080	1,540	1,000	1,140	1,090	248	466	636	2,290	⋔ 1,890	1,310	⋔1,470
16	1,110	766	961	⋔ 961	1,550	⋔ 371	459	650	⋔ 1,540	1,710	1,340	1,530
17	1,110	⋔ 795	890	918	1,300	⋔ 360	473	738	1,290	1,620	⋔1,310	⋔1,510
18	1,110	784	879	855	1,190	351	445	639	1,270	1,580	1,240	1,490
19	1,120	⋔ 802	⋔ 858	795	⋔1,080	351	533	⋔ 639	1,270	1,530	⋔1,200	1,490
20	⋔1,120	798	756	784	978	328	731	⋔ 678	1,320	⋔ 1,480	1,200	1,470
21	1,120	805	516	⋔ 773	⋔ 950	340	⋔ 650	675	1,290	1,450	1,200	1,470
22	⋔1,120	798	494	745	879	374	600	745	⋔ 1,230	⋔ 1,410	1,200	1,470
23	1,120	823	544	⋔ 689	819	349	⋔ 579	720	1,210	1,370	1,240	⋔1,450
24	1,110	763	⋔ 558	657	717	⋔ 309	590	738	1,210	1,370	⋔1,410	1,450
25	1,090	756	512	653	706	286	583	812	1,200	1,340	1,670	1,470
26	1,090	⋔ 777	⋔ 501	660	⋔ 667	324	572	844	1,180	1,340	⋔1,890	1,440
27	1,110	830	523	671	625	⋔ 352	625	⋔16,200	1,170	2,300	2,670	1,410
28	1,110	830	533	600	646	330	⋔ 1,130	5,580	1,170	10,500	2,670	1,420
29	⋔1,110		583	537	607	367	1,260	4,980	⋔ 1,130	3,220	2,070	⋔1,440
30	⋔1,090		614	⋔ 494	413	⋔ 378	⋔ 971	3,060	1,010	2,320	1,780	1,490
31	1,040		⋔ 593		374		823	1,900		2,000		1,450
Sum	33,463	27,364	21,483	45,047	31,564	9,707	17,978	49,786	40,700	87,533	46,720	46,830

Current Year 1969 — **Period 1968 - 1969**

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	2.66	2.49	† 3	1,140	10	953	1,080	66,375	80,090	93,805	66,375
Feb.	3.90	2.20	14	2,900	16	699	978	54,243	59,570	64,897	54,243
Mar.	2.72	1.54	9	1,160	8	335	692	42,616	54,022	65,429	42,616
Apr.	10.99	1.35	12	24,400	9	219	1,500	89,308	88,615	89,308	87,921
May	3.81	1.57	7	2,830	31	357	1,020	62,621	93,070	123,518	62,621
June	1.87	1.18	16	484	†14	215	323	19,254	32,655	46,055	19,254
July	2.89	1.51	29	1,410	1	318	579	35,646	63,822	91,998	35,646
Aug.	11.71	1.84	27	26,700	8	491	1,610	98,764	86,160	98,764	73,555
Sept.	4.40	2.53	15	3,710	8	953	1,360	80,699	86,779	92,859	80,699
Oct.	11.71	2.46	5	25,600	3	908	2,830	173,664	136,680	173,664	99,695
Nov.	4.07	2.76	27	3,140	21	1,180	1,560	92,705	93,640	94,575	92,705
Dec.	3.18	2.85	1	1,740	27	1,330	1,510	92,894	98,964	105,033	92,894
Yearly	11.71	1.18		26,700		215	1,250	908,789	974,067	1,039,340	908,789

‡ Period 1924 - 1969 ⋔ Discharge Measurement made on this day † And other days

RIO ESCONDIDO AT VILLA DE FUENTE, COAHUILA

DESCRIPTION: Cableway, gravity well, concrete control weir of 1,750 second-foot capacity, and water-stage recorder located on the downstream side of the left abutment of the highway bridge over Río Escondido on the outskirts of Villa de Fuente, Coahuila, 1.2 river miles downstream from the cableway, at latitude 28° 40' 10", longitude 100° 32' 50", about 3 miles southwest of Piedras Negras, Coahuila, 3.7 river miles from the confluence with the Río Grande, and 6.8 river miles downstream from the confluence of Río San Antonio with Río Escondido. Río Escondido enters the Río Grande at river mile 488.2, 3.1 river miles downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila, and 760.0 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 718.37 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 53 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods prior to completion of the weir. Records available: 1922 through 1969. Records from 1922 through September 1932 are considered doubtful.

REMARKS: Diversions and drainage returns modify the flow of this spring-fed stream at this station. Backwater from the Río Grande reached an elevation of 729.92 feet during the flood of June 1954. Prior to November 1954, the gage well was located at the present cableway site. The weir was destroyed by a flood on September 24, 1964. On November 25, 1969, a concrete control weir was finished and placed in operation. Prior to this date the zero of the gage was 708.78 feet above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS‡: Momentary: Max. 24,000 second-feet on June 29, 1936 with a gage height of 19.13 feet. Min. frequently no flow.

Average Flow in Second-Feet ‡

Daily:	Max.	13,100	Sept. 24, 1964	Min.	0	Several days 1956-1958 & 1965
Monthly:	Max.	827	Sept. 1964	Min.	0.3	September 1965
Yearly:	Max.	115	1958	Min.	2.4	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.9	3.2	3.2	2.5	1.8	4.6	1.8	2.8	77.0	12.0	18.7	⋔12.0
2	10.6	3.5	3.2	2.5	1.8	⋔ 4.6	1.4	2.5	⋔ 77.6	12.0	17.0	12.0
3	8.5	⋔ 3.2	⋔3.2	2.5	35.0	4.6	1.4	2.5	57.9	12.0	15.9	12.0
4	7.1	2.8	3.2	2.8	97.1	4.2	1.4	⋔ 2.1	47.3	⋔ 21.2	14.1	12.0
5	4.6	2.8	3.2	2.8	7.8	4.2	1.4	1.8	40.3	65.7	⋔14.1	38.8
6	⋔ 7.4	2.8	3.2	2.5	⋔ 5.7	4.2	1.4	1.8	35.0	⋔ 11.3	13.4	19.8
7	10.2	3.2	3.2	⋔ 2.5	130	4.2	⋔ 1.1	1.8	31.1	8.8	12.4	13.4
8	9.5	3.5	3.2	2.5	54.4	4.2	1.1	1.8	36.0	7.8	11.3	21.5
9	9.2	3.5	3.2	2.5	41.7	⋔ 4.6	1.1	1.4	⋔ 29.0	7.8	9.2	⋔23.3
10	8.5	3.5	⋔2.8	39.9	15.9	4.6	1.1	1.4	27.9	8.1	10.6	23.3
11	7.8	3.5	3.2	44.8	13.1	4.2	1.1	⋔ 1.1	26.8	8.5	10.2	23.3
12	7.8	3.2	3.2	70.3	⋔ 11.3	4.2	1.1	1.1	25.8	7.8	⋔ 7.8	22.2
13	⋔ 7.1	8.8	3.2	4.2	10.6	3.2	1.1	1.1	24.7	⋔136	7.8	22.2
14	7.8	⋔28.3	3.2	5.7	9.9	2.8	⋔ 1.1	1.1	23.7	61.4	7.8	22.2
15	8.5	10.2	2.8	10.6	11.7	2.8	.7	1.1	22.6	⋔ 31.8	8.1	20.8
16	8.5	4.2	2.8	⋔ 8.5	316	⋔ 2.8	.7	1.1	21.5	27.2	9.9	⋔20.8
17	8.5	3.5	2.8	8.1	79.5	2.5	.7	.7	⋔ 20.5	27.2	9.5	20.8
18	8.5	3.2	2.8	7.8	23.7	2.5	.7	.7	58.6	27.2	7.4	20.8
19	8.5	2.8	3.2	7.4	⋔ 20.1	2.5	.7	⋔ .7	23.3	19.8	⋔ 7.1	20.8
20	⋔ 9.2	2.8	2.8	6.7	11.3	2.5	.7	.7	21.2	⋔ 18.4	7.1	19.4
21	9.9	2.8	2.8	⋔ 6.7	9.2	2.5	⋔ .7	⋔ .7	21.9	16.2	7.1	18.4
22	10.6	2.8	2.5	6.4	8.5	2.5	.7	.7	⋔ 20.5	14.1	7.4	18.4
23	10.6	3.2	3.2	6.4	6.7	2.1	.7	.7	18.0	14.1	7.4	18.4
24	10.6	⋔ 3.2	⋔2.8	5.7	7.1	⋔ 2.1	.7	.7	24.7	14.1	10.9	18.4
25	10.6	3.2	2.5	5.3	6.0	1.8	.7	⋔ .7	21.5	12.7	⋔ 9.2	18.4
26	10.6	3.2	2.8	5.3	⋔ 5.3	1.8	.7	12.0	21.2	12.7	9.2	17.3
27	9.9	3.2	2.8	5.3	4.9	1.8	.7	6,820	21.2	⋔106	9.2	⋔13.4
28	4.9	3.2	2.8	⋔ 4.6	4.2	1.8	⋔ 96.1	1,230	21.2	79.5	9.2	6.4
29	3.9		2.8	2.8	4.2	1.8	8.5	477	⋔ 21.2	37.1	9.2	7.4
30	⋔ 3.2		2.8	2.1	4.6	⋔ 1.8	3.5	190	19.4	29.0	9.2	7.4
31	3.2		⋔2.5		4.2		2.8	124		25.4		⋔ 7.4
Sum	255.7	127.3	91.9	287.7	963.3	94.0	137.6	8,885.8	938.6	892.9	307.4	552.7

Month	Current Year 1969 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1933 - 1969 Acre-Feet Average	Maximum	Minimum
Jan.	0.00	-0.46	6	31.8	†30	3.2	8.1	507	1,869	15,990	43.8
Feb.	.16	- .49	13	52.3	† 4	2.5	4.6	253	1,316	9,990	38.9
Mar.	- .46	- .49	† 1	3.2	†22	2.5	2.8	182	1,148	6,910	92.4
Apr.	2.79	- .52	12	614	30	2.1	9.5	570	1,861	21,950	81.1
May	4.07	- .52	16	897	† 1	1.8	31.1	1,911	3,776	25,470	154
June	- .49	- .62	† 1	4.6	25	1.4	3.2	186	2,276	19,730	60.3
July	.95	- .69	28	215	†15	.7	4.6	272	1,607	9,740	57.6
Aug.	12.17	- .72	27	13,100	†17	.7	286	17,612	2,272	20,830	34.9
Sept.	2.66	- .20	18	614	†23	17.7	31.1	1,848	3,877	49,182	17.8
Oct.	1.54	- .36	27	223	9	7.1	28.6	1,769	2,368	20,530	43.8
Nov.	- .03	- .36	1	19.1	†19	7.1	10.2	610	1,564	25,730	43.8
Dec.	1.41	.39	5	131	28	5.3	17.7	1,095	1,377	3,580	67.3
Yearly	12.17	-0.72		13,100		0.7	37.1	26,815	25,311	83,164	1,755.3

‡ Period 1932 - 1969 ⋔ Discharge measurement made on this day † And other days

RETURN FLOW TO THE RIO GRANDE FROM MAVERICK CANAL EAGLE PASS TO SAN ANTONIO CROSSING

DESCRIPTION: Part of the water diverted from the Rio Grande into the Maverick Canal is returned to the river through various drains and spillways of the irrigation system located between Eagle Pass, Texas and the San Antonio Crossing Gaging Station. These return flows are measured at gaging stations consisting of sharp-crested Cipolletti weirs or control structures equipped with continuous water-stage recorders located at Lateral 40 Spill, Lateral 40 D Spill, Cañon Diablo, Lateral 50 Lowline No. 1, Lateral 50 Spill, Lateral 50 Lowline No. 2, Rosita Creek, Lateral 60 K Spill, Sauz Creek, Lateral 70 Spill No. 1, Lateral 70 Spill No. 2, Indio Creek, Gravel Spill, Lateral 71 Spill, and Cuervo Creek.

RECORDS: Based on the weir discharge table, stable station control rating tables, and a continuous record of gage heights. All storm flow occurring at these stations is deducted from the records and is not shown below. Records available: April 1959 through 1969.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	175	154	98.8	196	174	244	182	137	37.4	124	39.7	37.7
2	200	170	126	188	174	253	167	161	29.3	159	35.5	30.7
3	197	173	139	168	221	221	167	152	24.2	159	32.8	31.7
4	189	189	148	178	246	199	163	152	29.1	169	56.5	30.1
5	164	172	150	199	230	192	170	139	21.8	191	90.5	48.5
6	174	143	138	183	230	198	181	134	28.1	204	88.9	47.5
7	180	131	97.2	149	180	222	167	127	34.4	128	74.8	50.9
8	169	138	43.9	174	174	219	158	140	32.0	103	74.8	57.6
9	156	148	22.5	166	150	189	164	186	27.6	159	77.6	52.5
10	166	127	15.7	168	125	173	158	232	48.1	165	93.8	51.3
11	166	118	32.2	166	120	172	154	247	71.0	131	110	40.7
12	186	91.7	148	225	108	174	153	198	69.3	118	103	36.4
13	200	111	159	171	106	173	146	182	69.5	118	97.7	39.0
14	191	130	162	117	138	190	167	139	73.8	102	84.5	38.6
15	181	124	170	92.1	152	218	164	128	72.5	79.9	91.9	32.3
16	182	130	202	137	158	208	163	138	70.0	141	89.2	46.9
17	175	113	217	190	122	211	161	138	67.9	141	86.1	60.9
18	168	110	203	211	69.9	221	169	140	83.2	143	90.1	62.0
19	178	138	205	248	47.7	195	211	130	89.3	150	81.5	49.9
20	164	145	181	240	35.5	175	190	156	107	153	110	46.4
21	170	130	167	228	61.0	175	233	136	116	152	114	63.4
22	175	130	200	196	121	195	170	118	124	135	114	77.2
23	156	134	235	196	130	196	196	117	133	118	117	80.8
24	131	128	242	196	164	190	195	136	139	112	125	82.1
25	140	118	202	212	205	167	189	150	126	109	125	69.3
26	154	118	177	209	208	136	196	153	120	99.3	101	66.0
27	148	110	176	223	219	141	178	138	118	121	76.8	61.3
28	153	97.8	187	214	210	145	225	118	117	105	70.0	67.5
29	156		189	176	184	187	256	91.9	106	71.6	57.1	72.8
30	147		192	167	174	198	198	56.2	105	58.5	46.0	84.5
31	144		205		209		123	45.7		48.7		74.6
Sum	5,235	3,721.5	4,830.3	5,583.1	4,846.1	5,777	5,514	4,415.8	2,289.5	3,968.0	2,554.8	1,691.1

Current Year 1969 — Period Apr. 1959-1969

Month	Extreme Gage Feet		ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			† 2	200	24	131	169	10,384	10,337	12,435	7,079
Feb.			4	189	12	91.7	133	7,382	9,845	13,117	6,000
Mar.			24	242	10	15.7	156	9,581	11,375	13,498	8,987
Apr.			19	248	15	92.1	186	11,074	11,063	13,030	9,380
May			4	246	20	35.5	156	9,612	10,256	13,926	6,205
June			2	253	26	136	193	11,459	11,782	14,430	8,900
July			29	256	31	123	178	10,937	12,646	15,219	9,940
Aug.			11	247	31	45.7	142	8,759	11,689	14,299	8,390
Sept.			24	139	5	21.8	76.3	4,541	9,760	13,974	4,541
Oct.			6	204	31	48.7	128	7,871	9,995	12,248	7,493
Nov.			† 24	125	3	32.8	85.2	5,067	9,711	11,843	5,067
Dec.			30	84.5	4	30.1	54.6	3,354	9,309	12,157	3,354
Yearly				256		15.7	138	100,021	127,768	149,031	100,021

ø Mean daily † And other days

RIO GRANDE AT SAN ANTONIO CROSSING NEAR EL INDIO, TEXAS

DESCRIPTION: Cableway, bubbler gage, concrete control weir, and water-stage recorders (graphic and digital) located on the left bank at latitude 28° 20' 40", longitude 100° 18' 35", and river mile 455.8; 0.5 river mile downstream from Cuervo Creek, which marks the lower end of the Maverick County Water Control and Improvement District No. 1, 1.9 river miles upstream from Tovar Creek, 5 miles northeast of Villa Guerrero, Coahuila, about 11.5 miles south of El Indio, Texas, 35.5 river miles downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila, and 792.4 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 580.00 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 68 discharge measurements during the year, 56 by the United States Section and 12 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: March, April, May, October, November, and December 1952 with some days missing; January through August 20, 1953; September 23, 1953 through June 14, 1954; and May 27, 1955 through 1969 with some days missing prior to September 1955.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The June 1954 flood reached an elevation of 624.31 feet at this station with a discharge of 912,000 second-feet, determined by slope-area computations. The lowest recorded flow was 54.4 second-feet on June 24, 1953 with an elevation of 581.96 feet at a station 1,700 feet upstream from the present site. The concrete control weir was placed in operation on April 2, 1966 and the cableway was installed in March 1967.

EXTREME FLOWS FROM RECORDS‡: Momentary: Max. 250,000 second-feet on September 25, 1964, determined by slope-area computations, with a gage height of 26.03 feet. Min. 262 second-feet on several days in August 1956 with a gage height of 0.38 foot.

Average Flow in Second-Feet ‡

Daily:	Max.	185,000	Sept. 25, 1964	Min.	299	July 20 & Aug. 2-4,	1956
Monthly:	Max.	31,700	Sept. 1964	Min.	445	July	1956
Yearly:	Max.	6,130	1958	Min.	1,040		1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,210	1,110	909	814	743	611	532	870	1,780	⋔ 1,070	1,900	1,710
2	⋔ 1,220	1,130	877	⋔ 789	756	629	⋔ 527	858	1,610	1,080	1,800	1,640
3	1,270	1,160	895	759	840	628	536	876	1,540	1,070	1,580	⋔ 1,600
4	1,270	⋔ 1,150	⋔ 876	764	2,130	⋔ 581	605	869	⋔ 1,490	1,080	⋔ 1,600	1,590
5	1,260	1,170	851	707	2,130	579	585	⋔ 819	1,380	9,920	1,620	1,770
6	⋔ 1,260	1,180	851	701	1,230	559	611	771	1,280	12,500	1,620	1,750
7	1,240	1,180	⋔ 737	942	⋔ 2,510	514	662	740	1,460	2,960	1,580	1,710
8	1,180	1,170	527	587	2,440	519	⋔ 639	726	1,340	⋔ 2,040	1,560	1,650
9	1,140	1,140	⋔ 571	⋔ 629	1,730	502	577	662	1,150	1,820	1,510	⋔ 1,660
10	1,140	1,150	970	602	1,400	⋔ 471	546	767	1,140	1,710	1,500	1,620
11	1,120	⋔ 1,110	774	3,260	1,320	445	542	855	⋔ 1,320	1,590	1,500	1,620
12	1,160	1,040	⋔ 1,020	10,900	1,310	412	586	795	1,800	1,770	⋔ 1,500	1,580
13	1,220	1,070	1,210	12,300	⋔ 1,240	⋔ 390	558	⋔ 745	1,530	8,050	1,450	1,580
14	⋔ 1,180	1,180	1,210	2,560	1,210	425	621	696	1,360	3,250	1,400	1,570
15	1,180	2,120	1,200	⋔ 1,600	1,370	426	621	660	1,620	⋔ 2,080	1,370	1,500
16	1,200	1,130	1,210	1,260	2,190	446	⋔ 615	678	⋔ 2,030	1,860	1,370	1,540
17	1,210	924	1,200	1,210	2,470	564	614	712	1,440	1,730	1,380	⋔ 1,570
18	1,180	⋔ 908	⋔ 1,140	1,190	1,440	⋔ 560	617	⋔ 782	1,360	1,660	1,350	1,540
19	1,200	933	1,100	1,150	1,250	526	684	694	1,390	1,620	⋔ 1,320	1,530
20	1,210	954	1,080	1,120	1,100	495	733	717	1,360	1,590	1,320	1,500
21	⋔ 1,200	944	924	1,120	⋔ 1,040	465	907	740	1,370	1,560	1,350	1,500
22	1,220	926	760	1,080	1,060	495	812	731	1,350	⋔ 1,520	1,330	1,510
23	1,210	916	792	⋔ 1,030	996	538	⋔ 766	766	1,300	1,440	1,350	⋔ 1,520
24	1,180	916	847	942	952	499	742	764	⋔ 1,280	1,430	1,440	1,490
25	1,180	881	820	917	910	436	738	816	1,270	1,430	⋔ 1,650	1,500
26	1,170	⋔ 881	⋔ 758	914	925	⋔ 408	723	1,100	1,240	1,400	1,890	1,480
27	1,190	903	756	909	⋔ 860	436	738	19,800	1,230	3,050	2,130	1,440
28	1,180	918	782	884	860	456	1,360	⋔ 13,200	1,220	⋔ 10,200	2,970	1,450
29	⋔ 1,180		791	⋔ 824	836	484	1,430	5,760	1,220	4,540	2,440	1,450
30	1,180		842	768	762	529	⋔ 1,260	4,970	1,150	2,830	1,900	1,490
31	1,130		879		620		946	2,440		2,140		1,500
Sum	37,070	30,194	28,159	53,232	40,630	15,028	22,433	66,379	42,010	91,990	48,680	48,560

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Current Year 1969									Period 1968 - 1969		
Jan.	6.38	6.24	3	1,310	31	1,110	1,200	73,528	90,824	108,121	73,528
Feb.	7.09	6.06	15	2,780	25	865	1,080	59,890	69,556	79,221	59,890
Mar.	6.33	5.70	† 14	1,240	† 8	441	908	55,853	67,126	78,398	55,853
Apr.	9.65	5.75	13	20,300	10	502	1,770	105,586	104,206	105,586	102,827
May	7.57	5.82	16	4,200	31	589	1,310	80,590	118,246	155,903	80,590
June	5.89	5.61	† 2	667	†12	367	501	29,808	45,134	60,459	29,808
July	6.61	5.71	† 28	1,680	1	458	724	44,496	74,997	105,498	44,496
Aug.	11.65	5.85	27	41,500	15	616	2,140	131,663	106,830	131,663	81,998
Sept.	7.20	6.18	† 15	3,120	† 9	1,070	1,400	83,327	90,458	97,588	83,327
Oct.	9.89	6.17	6	22,500	† 1	1,050	2,970	182,462	143,714	182,462	104,967
Nov.	7.26	6.33	28	3,300	20	1,260	1,620	96,557	96,904	97,251	96,557
Dec.	6.69	6.41	5	1,890	†27	1,430	1,570	96,319	100,246	104,173	96,319
Yearly	11.65	5.61		41,500		367	1,440	1,040,079	1,108,241	1,176,404	1,040,079

‡ Period 1956 - 1969 ⋔ Discharge measurement made on this day † And other days

RIO GRANDE AT PALAFOX NEAR LAREDO, TEXAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the right bank on the outskirts of Palafox, Webb County, Texas and Villa Hidalgo, Coahuila at latitude 27° 47' 55", longitude 99° 52' 40", and river mile 403.0; 1.9 river miles downstream from Arroyo Agua Verde in Mexico, 13.1 river miles upstream from Santo Tomas Creek in United States, 44.7 river miles upstream from the international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas, and 845.2 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 436.02 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 56 discharge measurements during the year, 46 by the Mexican Section and 10 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting control methods. High flows prior to early 1962 were computed from a rating curve developed after the cableway was installed. Records available: August 1959 through 1969.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The recorder was installed on August 5, 1959 and the cableway in early 1962.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 214,000 second-feet on September 25, 1964 with a gage height of 42.06 feet. Min. 332 second-feet on June 28, 1969 with a gage height of -0.49 foot.

Average Flow in Second-Feet ‡

Daily:	Max.	163,000	Sept. 26, 1964	Min.	349	June 28, 1969
Monthly:	Max.	30,400	Sept. 1964	Min.	434	June 1969
Yearly:	Max.	4,420	1964	Min.	1,550	1969

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,190	1,140	879	ft 855	756	572	473	922	2,670	1,120	2,300	2,070
2	1,210	1,130	869	805	720	544	ft 530	837	1,990	1,050	2,060	1,880
3	1,280	1,140	840	749	886	ft 551	480	830	ft 1,740	1,070	1,840	1,800
4	1,340	ft 1,160	840	689	1,060	523	487	837	1,650	1,050	ft 1,690	ft 1,740
5	1,310	1,170	848	791	2,510	494	537	ft 837	1,590	3,600	1,710	1,950
6	1,310	1,180	819	699	2,060	480	544	788	1,410	18,600	1,770	1,970
7	1,310	1,210	805	607	ft 3,880	466	544	749	1,380	ft 4,980	1,710	1,880
8	ft 1,280	1,200	ft 713	ft 855	3,210	441	ft 583	720	1,590	2,540	1,710	1,800
9	1,230	1,180	ft 547	ft 622	2,460	427	611	706	ft 1,360	2,070	1,660	ft 1,770
10	1,180	1,160	487	925	1,820	ft 427	530	653	1,110	1,910	1,640	1,740
11	1,190	ft 1,180	ft 890	759	1,500	410	516	706	1,160	1,790	ft 1,610	1,720
12	1,170	1,110	ft 745	1,030	1,410	403	509	809	1,720	1,910	1,610	1,690
13	1,210	1,110	1,010	15,600	1,990	399	530	ft 749	2,000	4,660	1,590	1,660
14	ft 1,270	1,350	1,200	5,930	1,380	385	530	706	1,580	ft 5,470	1,540	1,660
15	1,220	1,460	1,210	2,380	ft 1,560	371	ft 544	678	1,410	2,590	1,460	1,610
16	1,230	2,090	1,170	1,570	2,030	367	597	639	1,980	2,040	1,440	ft 1,560
17	1,250	1,110	1,210	1,290	3,110	ft 360	572	646	ft 1,820	1,880	1,490	1,610
18	1,260	ft 897	ft 1,200	1,210	2,110	463	583	671	1,460	1,780	ft 1,490	1,640
19	1,230	879	1,130	1,150	1,470	480	576	ft 735	1,460	1,730	1,390	1,590
20	1,260	922	1,110	1,140	ft 1,290	448	576	664	1,530	1,680	1,310	1,560
21	ft 1,260	939	1,070	1,100	1,120	403	650	678	1,940	ft 1,660	1,360	1,540
22	1,240	911	929	ft 1,090	1,070	374	848	713	1,650	1,640	1,390	1,560
23	1,250	897	777	1,050	1,070	403	ft 759	706	ft 1,520	1,580	1,360	ft 1,560
24	1,240	897	745	996	985	473	713	720	1,770	1,510	1,790	1,560
25	1,210	ft 879	ft 805	925	929	ft 456	692	727	1,440	1,500	1,660	1,510
26	1,200	862	791	925	872	392	678	ft 802	1,360	1,490	1,820	1,510
27	1,210	848	735	925	ft 890	353	720	6,640	1,290	2,160	2,070	1,540
28	1,250	862	727	918	819	349	1,420	34,500	1,250	9,320	2,460	1,490
29	1,240		749	925	809	374	1,780	9,850	1,250	10,600	3,050	1,510
30	ft 1,250		763	ft 805	788	403	1,430	8,260	ft 1,220	3,850	2,590	1,490
31	1,230		805		713		ft 1,200	6,040		2,810		1,540
Sum	38,510	30,873	27,418	49,315	47,277	12,991	21,742	84,518	47,300	101,640	52,570	51,710

Current Year 1969 — Period 1968 - 1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	1.61	1.25	4	1,350	12	1,150	1,240	76,482	91,879	107,275	76,482
Feb.	2.99	.79	16	2,680	26	848	1,100	61,241	70,649	80,055	61,241
Mar.	1.54	-.20	15	1,250	10	424	883	54,362	67,783	81,204	54,362
Apr.	10.96	.30	13	21,600	9	576	1,640	97,769	101,527	105,285	97,769
May	5.38	.23	7	6,920	31	629	1,530	93,734	127,317	160,901	93,734
June	.23	-.49	1	604	28	332	434	25,768	42,934	60,099	25,768
July	2.79	-.30	28	2,500	1	417	699	43,113	73,057	103,002	43,113
Aug.	17.75	.16	28	43,100	16	614	2,730	167,653	123,938	167,653	80,223
Sept.	3.44	1.12	1	3,350	10	1,030	1,580	93,812	102,021	110,231	93,812
Oct.	11.58	1.12	6	23,600	2	1,030	3,280	201,548	159,480	201,548	117,410
Nov.	3.38	1.51	29	3,260	20	1,310	1,750	104,269	102,466	104,269	100,662
Dec.	2.59	1.71	1	2,260	30	1,460	1,670	102,505	106,771	111,036	102,505
Yearly	17.75	-0.49		43,100		332	1,550	1,122,256	1,169,822	1,217,383	1,122,256

‡ Period Aug. 1959 - 1969 ft Discharge measurement made on this day

RIO GRANDE AT LAREDO, TEXAS

DESCRIPTION: Cableway, bubbler gage, and water-stage recorder located on the right bank at Laredo, Texas at latitude 27° 29' 45", longitude 99° 29' 30", and river mile 357.2; immediately downstream from the Laredo, Texas sewage plant, 1.1 river mile downstream from the international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas, and 891.0 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 345.28 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 94 discharge measurements during the year, 84 by the Mexican Section and 10 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through 1913; May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June, November, and December 1922; and 1923 through 1969. Gage height records are available for January, February, and March 1914.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. This station was established in January 1955 to replace the station 1.7 miles upstream which was destroyed by the June-July 1954 flood. Prior to July 11, 1968 the recorder was located 0.2 river mile upstream, where the cableway is still located, and the zero of the gage was 347.90 feet above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 716,900 second-feet on June 30, 1954, determined by slope-area calculations with a gage height of 61.35 feet. Much well-authenticated information establishes the occurrence of a greater flood in June 1865 with a gage height of 62.5 feet on the same gage and discharge of approximately 950,000 second-feet and also that these were the only floods since 1745 with flows greater than 600,000 second-feet. Min. no flow several days in June and July 1953 and on July 24, 1956.

Average Flow in Second-Feet ‡

Daily:	Max.	576,000	June 30, 1954	Min.	0	Several days June, July	1953
Monthly:	Max.	49,500	Sept. 1932	Min.	5.5	June	1953
Yearly:	Max.	9,670	1932	Min.	1,080		1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,190	1,170	837	731	851	583	360	1,140	↟ 3,740	1,140	2,520	↟ 2,270
2	1,210	1,140	837	770	770	↟ 473	378	918	↟ 2,710	1,040	2,150	1,940
3	1,230	↟ 1,120	823	731	735	550	399	780	↟ 1,850	1,010	↟ 2,020	1,800
4	1,310	1,120	↟ 795	692	901	946	388	↟ 780	1,670	1,020	1,800	1,730
5	1,360	1,140	795	678	1,320	540	378	766	1,580	1,040	1,640	2,000
6	1,330	1,150	756	795	↟ 2,560	473	420	766	1,460	↟ 11,900	1,690	2,080
7	↟ 1,330	1,150	727	↟ 610	↟ 1,690	441	↟ 452	752	1,330	↟ 12,400	↟ 1,690	1,960
8	1,310	1,170	713	558	↟ 3,990	427	441	713	↟ 1,370	↟ 3,430	1,660	↟ 1,840
9	1,270	1,170	↟ 607	858	2,750	↟ 410	487	671	1,450	2,300	1,620	1,730
10	1,190	↟ 1,140	↟ 498	685	2,050	410	498	671	1,240	2,010	↟ 1,530	1,720
11	1,140	1,110	↟ 413	↟ 985	1,580	388	452	↟ 600	↟ 1,060	1,860	1,520	1,700
12	1,140	1,120	↟ 879	↟ 5,330	↟ 1,440	367	420	↟ 639	1,230	1,720	1,490	1,670
13	↟ 1,120	1,070	692	↟ 13,000	↟ 2,080	360	420	738	1,760	↟ 2,110	1,480	1,620
14	1,140	1,110	1,010	↟ 12,800	1,650	328	431	643	1,840	↟ 7,170	1,460	1,600
15	1,210	↟ 1,320	1,170	↟ 3,230	1,300	328	↟ 441	600	1,420	3,640	1,430	↟ 1,570
16	1,170	1,790	1,170	2,030	1,580	↟ 328	463	600	1,300	2,340	1,390	1,540
17	↟ 1,190	↟ 1,650	↟ 1,140	1,480	2,480	309	498	586	↟ 2,110	1,980	↟ 1,360	1,500
18	1,190	992	1,140	1,350	2,970	291	473	↟ 576	↟ 1,590	1,860	1,370	1,560
19	1,230	890	1,110	1,220	↟ 1,730	350	487	586	1,550	1,740	1,370	1,540
20	↟ 1,190	890	1,070	1,180	1,310	↟ 388	487	636	1,450	↟ 1,680	1,320	1,540
21	1,230	925	1,060	↟ 1,180	1,180	378	530	738	1,570	1,600	1,300	1,510
22	1,250	911	1,040	1,170	1,010	378	586	713	↟ 1,900	1,580	1,320	↟ 1,490
23	1,190	901	890	1,140	975	↟ 350	756	699	1,450	1,540	1,320	1,500
24	1,190	↟ 879	↟ 699	1,070	975	339	↟ 657	699	1,740	1,480	↟ 1,350	1,510
25	1,190	869	657	1,040	915	445	576	↟ 657	1,440	↟ 1,430	1,880	1,530
26	1,120	855	756	932	↟ 851	1,730	554	622	↟ 1,300	1,550	1,660	1,530
27	↟ 1,120	812	727	918	816	1,490	554	862	1,240	↟ 2,280	1,920	1,510
28	1,120	↟ 795	643	↟ 918	805	448	↟ 1,130	↟ 23,300	1,190	6,070	2,280	1,510
29	1,210		629	918	↟ 720	360	1,170	↟ 19,800	↟ 1,170	↟ 12,700	3,160	↟ 1,510
30	1,190		671	918	689	↟ 360	↟ 1,600	↟ 7,030	1,170	↟ 5,510	2,870	1,540
31	1,210		↟ 671		660		1,350	↟ 6,290		3,270		1,510
Sum	37,470	30,359	25,625	59,917	45,333	14,968	18,286	75,571	47,880	102,400	51,570	51,560

Month	Current Year 1969 — Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1968 - 1969 — Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	2.53	2.26	5	1,400	26	1,080	1,210	74,318	91,903	109,488	74,318
Feb.	3.61	1.87	16	2,380	28	777	1,080	60,197	69,205	78,212	60,197
Mar.	2.43	1.31	16	1,200	11	371	826	50,846	65,345	79,844	50,846
Apr.	12.24	1.51	14	21,300	8	509	2,000	118,874	111,137	118,874	103,401
May	6.07	1.61	8	5,900	31	614	1,460	89,917	125,626	161,335	89,917
June	3.90	1.02	26	2,780	18	247	498	29,685	46,233	62,781	29,685
July	3.05	1.21	28	1,850	1	360	590	36,179	67,997	99,815	36,179
Aug.	18.77	1.51	28	36,700	17	565	2,440	149,848	113,509	149,848	77,169
Sept.	5.61	2.17	1	5,230	11	1,030	1,600	94,988	103,306	111,624	94,988
Oct.	12.96	2.10	7	21,900	2	989	3,300	203,041	165,755	203,041	128,470
Nov.	4.46	2.49	29	3,410	20	1,300	1,720	102,252	99,325	102,252	96,397
Dec.	3.77	2.69	1	2,630	21	1,490	1,660	102,329	108,697	115,063	102,329
Yearly	18.77	1.02		36,700		247	1,540	1,112,474	1,168,038	1,223,599	1,112,474

‡ Period 1924 - 1969 ↟ Discharge measurement made on this day

RIO SALADO AT LAS TORTILLAS, TAMAULIPAS

DESCRIPTION: Cableway, control weir with notch opening of 2,500 second-foot capacity, gravity well, and water-stage recorder located on the right bank at latitude 26° 50' 10", longitude 99° 33' 50", 2.0 river miles downstream from the confluence of Río Sabinas with Río Salado, 6 miles southeast of the town of Las Tortillas, Tamaulipas, and 24.8 river miles from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 298.4, 24.6 river miles upstream from Falcon Dam, and 949.8 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 325.72 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 13 discharge measurements during the year, a stable rating curve up to 2,500 second-feet, and a continuous record of gage heights. Computations by shifting control methods for flows greater than 2,500 second-feet. Records available: September 9, 1953 through 1969. Records are also available for a station at old Cd. Guerrero, 18.6 miles downstream, from 1900 through 1913 and 1923 through September 8, 1953.

REMARKS: Reservoirs and irrigation diversions modify the flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 49,400 second-feet on September 25, 1967 with a gage height of 32.94 feet. Min. frequently no flow. The maximum discharge was measured at the highway bridge 13.0 river miles downstream from the station. Extreme flow data for the Río Salado at Cd. Guerrero prior to September 8, 1953 may be found in previous bulletins.

Average Flow in Second-Feet ‡

Daily:	Max.	49,100	Sept. 25, 1967	Min.	0	Frequently
Monthly:	Max.	8,500	Oct. 1958	Min.	0	Frequently
Yearly:	Max.	2,020	1958	Min.	56.8	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	73.5	45.2	35.0	23.3	50.1	29.7	63.2	86.5	175	63.2	ft 45.2	129
2	73.5	45.2	29.7	24.7	45.2	29.7	53.0	ft 55.4	ft 166	ft 55.4	45.2	139
3	73.5	45.2	40.3	40.3	ft 160	29.7	40.3	50.1	211	55.4	45.2	145
4	73.5	55.4	45.2	37.4	129	63.2	32.5	47.7	97.1	53.0	45.2	113
5	75.9	55.4	40.3	40.3	55.4	ft 795	27.2	40.3	60.7	53.0	42.7	102
6	ft 75.9	ft 50.1	32.5	60.7	45.2	1,360	45.2	35.0	55.4	53.0	42.3	98.5
7	75.9	47.7	37.4	320	70.6	290	68.2	24.7	50.1	50.1	42.3	171
8	75.9	50.1	47.7	192	60.7	155	53.0	21.2	126	805	37.4	157
9	65.7	55.1	40.3	86.5	50.1	97.1	35.0	24.7	75.9	1,560	29.7	161
10	60.7	50.1	45.2	86.5	42.7	70.6	23.3	49.4	47.7	1,410	32.5	108
11	55.4	55.1	55.4	150	45.2	65.7	18.4	109	40.3	523	32.5	ft 86.5
12	57.9	50.1	45.2	97.1	233	55.4	18.4	60.7	45.2	251	24.7	75.9
13	65.7	47.7	45.2	70.6	752	55.4	17.3	45.2	45.2	139	21.2	81.2
14	60.7	78.8	50.1	60.7	865	55.4	14.8	40.3	45.2	97.1	19.8	86.5
15	50.1	86.5	42.7	ft 60.7	918	55.4	14.8	40.3	45.2	73.5	18.4	81.2
16	ft 47.7	45.2	40.3	118	2,970	63.2	13.4	35.0	60.7	110	17.3	70.6
17	50.1	35.0	35.0	129	590	63.2	14.8	29.7	65.7	250	17.3	68.2
18	45.2	29.7	40.3	86.5	197	60.7	14.8	29.7	81.2	65.7	14.8	65.7
19	45.2	29.7	32.5	70.6	113	55.4	12.4	24.7	156	60.7	12.4	63.2
20	45.2	45.2	24.7	70.6	ft 113	53.0	8.5	22.2	155	57.9	12.4	60.7
21	45.2	50.1	23.3	65.7	86.5	45.2	3.5	30.0	664	53.0	11.3	68.2
22	40.3	45.2	24.7	60.7	65.7	40.3	0	161	682	50.1	12.4	73.5
23	29.7	35.0	22.2	60.7	57.9	37.4	44.5	102	565	47.7	12.4	70.6
24	40.2	29.7	24.7	60.7	55.4	42.7	50.1	63.2	509	50.1	12.4	65.7
25	45.2	45.2	40.3	57.9	50.1	42.7	45.2	48.0	286	50.1	12.4	68.2
26	42.7	50.1	40.3	53.0	47.7	40.3	40.3	42.7	124	50.1	14.8	63.2
27	50.1	47.7	40.3	50.1	42.7	42.7	29.7	35.0	73.5	50.1	14.8	60.7
28	60.7	42.7	29.7	47.7	40.3	50.1	24.7	230	73.5	50.1	83.7	63.2
29	55.4		29.7	45.2	35.0	57.9	23.7	107	70.6	50.1	85.6	65.7
30	50.1		24.7	45.2	40.3	63.2	809	333	68.2	47.7	212	65.7
31	45.2		24.7		35.0		266	301		47.7		73.5
Sum	1,752.0	1,348.2	1,129.6	2,372.4	8,061.8	3,965.3	1,925.2	2,324.7	4,920.4	6,332.8	1,070.3	2,801.4

Current Year 1969 — Period 1954 - 1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	0.66	0.36	† 5	75.9	† 23	29.7	56.5	3,476	5,721	57,070	0
Feb.	1.05	.43	14	220	18	29.7	48.0	2,675	5,378	66,880	0
Mar.	.52	.30	11	57.9	† 23	22.2	36.4	2,240	2,755	29,690	0
Apr.	1.51	.26	7	456	2	19.8	79.1	4,706	5,333	19,300	0
May	4.79	.36	16	5,160	31	29.7	260	15,999	22,068	100,919	302
June	2.46	.33	6	1,360	† 1	24.7	132	7,864	11,288	27,410	0
July	2.36	0	30	1,210	† 21	0	62.2	3,818	4,874	20,820	0
Aug.	2.23	.26	28	1,060	21	18.4	74.9	4,613	10,883	52,110	0
Sept.	2.20	.43	21	1,020	11	40.3	164	9,757	83,930	491,452	2,860
Oct.	2.89	.46	9	1,920	30	45.2	204	12,568	48,630	522,800	110
Nov.	1.18	.13	30	274	23	9.9	38.8	2,116	25,295	338,000	0
Dec.	1.12	.52	7	243	20	55.4	90.4	5,557	13,495	176,100	0
Yearly	4.79	0		5,160		0	104	75,389	239,650	1,463,797	41,238.2

‡ Period September 1953 - 1969 ft Discharge measurement made on this day † And other days

RIO GRANDE BELOW FALCON DAM, TEXAS

DESCRIPTION: The discharges reported below represent water measured as it leaves Falcon Reservoir through turbine penstocks, bypass valves, spillway gates, and leakage. Falcon Dam, astride the Rio Grande, is located at latitude 26° 33' 25", longitude 99° 10' 05", and river mile 273.8; about 7 miles southwest of Falcon, Texas, 84.5 river miles downstream from the international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas, and 974.4 river miles downstream from the American Dam at El Paso, Texas. A gravity well and water-stage recorder located 2.5 river miles downstream and a cableway located one mile further downstream are used to measure the flow of this station at times when spillway gates are in operation.

RECORDS: Based on daily Simplex meter records of releases through the six turbines, established rating curves for the four hollow-jet bypass valves, estimates of gate leakage, and measurements of flow at the cable during spillgate operations, and two discharge measurements during the year, one by the United States Section and one by the Mexican Section of this Commission. Records available: 1958 through 1969. Records are also available from December 17, 1952 through 1957 for a station at Chapeno, 2.5 miles downstream, where discharges included arroyo inflow below Falcon Dam, which inflow is eliminated from the records reported below.

REMARKS: Computation of flow was made jointly by the United States and Mexican Sections of this Commission from a consolidation of the basic data gathered by each Section incident to the international operation of Falcon Reservoir.

EXTREME FLOWS FROM RECORDS‡: Momentary: Max. 48,900 second-feet on November 9, 1958. Min. 1.5 second-feet on March 24 and 25, 1957 (at Chapeno gaging station).

Average Flow in Second-Feet ‡

Daily:	Max.	47,800	Nov. 9, 1958	Min.	1.5	March 24 & 25, 1957
Monthly:	Max.	32,500	Oct. 1958	Min.	24.0	Sept. 1967
Yearly:	Max.	6,930	1958	Min.	1,830	1968

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,000	7,890	2,010	1,600	6,840	8,140	3,000	2,860	681	1,380	509	18.0
2	2,220	8,240	2,020	1,670	4,830	7,010	2,520	3,320	1,430	1,410	728	18.0
3	2,020	8,710	2,030	1,770	4,820	6,210	2,540	3,820	3,680	1,020	1,170	18.0
4	2,030	8,740	2,020	1,770	4,960	6,700	2,530	4,260	1,010	1,030	2,130	18.0
5	2,000	7,560	1,850	1,780	5,000	7,060	1,640	4,400	747	1,020	1,750	268
6	2,960	7,460	1,850	1,910	6,900	7,900	996	4,040	310	525	1,010	516
7	3,460	6,750	1,850	1,780	7,660	6,390	1,520	2,950	361	517	1,020	517
8	4,110	6,150	1,860	1,790	7,440	6,210	2,020	2,730	317	533	1,200	517
9	3,620	5,040	1,870	1,780	7,280	5,870	2,620	1,880	317	1,040	1,210	1,670
10	3,120	5,380	1,860	1,790	7,280	5,720	2,630	1,090	322	1,290	1,410	4,030
11	3,380	6,810	1,850	1,790	7,830	6,010	2,420	2,850	269	1,060	1,720	536
12	4,460	6,480	1,860	1,670	7,580	7,410	2,440	4,060	117	1,470	1,810	290
13	4,250	3,370	1,860	1,760	4,150	7,850	2,520	3,310	18.0	1,460	1,420	18.0
14	4,290	1,210	1,850	2,510	3,060	7,860	2,430	2,060	18.0	1,980	1,010	18.0
15	5,040	1,010	1,490	3,350	4,360	6,980	2,440	1,400	118	2,210	1,230	320
16	5,780	1,010	1,510	3,070	4,720	6,480	2,450	1,210	217	2,230	1,220	324
17	6,660	1,020	1,520	2,870	2,070	6,220	2,410	1,460	518	1,080	1,000	321
18	7,230	1,030	1,550	3,040	1,370	5,630	1,620	2,540	537	602	1,460	325
19	7,390	806	1,540	3,600	1,920	6,420	2,010	2,000	768	820	1,980	330
20	7,900	1,510	1,330	4,220	1,930	5,850	2,730	1,360	765	1,410	1,530	324
21	10,800	1,490	1,490	4,440	2,590	5,100	2,750	675	756	2,630	913	327
22	9,810	1,490	1,650	5,230	3,630	4,020	2,740	167	616	2,480	821	325
23	10,700	2,380	1,520	5,420	4,400	4,770	3,040	317	618	1,480	807	325
24	10,800	1,500	1,560	5,020	4,740	5,020	3,340	400	327	1,040	818	326
25	11,300	1,500	1,550	5,320	4,560	4,810	3,280	273	18.0	1,040	655	410
26	11,300	1,500	1,650	6,510	4,570	5,000	2,970	214	18.0	1,220	545	515
27	10,900	1,480	1,440	6,800	5,440	5,890	2,970	226	18.0	1,530	397	1,020
28	10,700	1,500	1,500	5,590	6,460	5,230	2,980	223	512	1,170	109	907
29	10,600		1,500	6,490	8,040	4,020	4,300	211	993	509	18.0	770
30	10,900		1,500	7,290	8,290	3,520	4,480	222	1,210	516	18.0	590
31	9,960		1,510		8,040		3,560	450		515		509
Sum	109,016		103,630		181,300		56,978		38,217			16,420.0
	202,690		52,450		162,760		81,896		17,606.0		31,618	

Month	Extreme Gage Feet		ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Current Year 1969 Acre-Feet			Period #1954-1969 Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum	Average	Maximum	Minimum
Jan.			† 25	11,300	5	2,000	6,540	402,036	210,608	412,727	46,100			
Feb.			4	8,740	19	806	3,890	216,233	177,844	367,384	16,600			
Mar.			3	2,030	20	1,330	1,690	104,035	136,676	347,000	2,390			
Apr.			30	7,290	1	1,600	3,450	205,550	225,460	461,541	19,530			
May			30	8,290	18	1,370	5,250	322,834	295,560	526,000	48,754			
June			1	8,140	30	3,520	6,040	359,609	288,572	551,000	119,917			
July			30	4,480	6	996	2,640	162,441	119,928	229,828	18,300			
Aug.			5	4,400	22	167	1,840	113,016	129,190	206,000	25,900			
Sept.			3	3,680	† 13	18.0	587	34,922	133,499	674,219	1,428			
Oct.			21	2,630	29	509	1,230	75,803	217,763	1,997,000	27,100			
Nov.			4	2,130	† 29	18.0	1,050	62,714	125,437	1,128,000	9,376			
Dec.			10	4,030	† 1	18.0	530	32,569	118,098	465,000	32,569			
Yearly				11,300		18.0	2,890	2,091,762	2,178,635	5,016,800	1,331,914			

† And other days ø Mean daily # Values prior to 1958 are Chapeno discharges less arroyo inflow
‡ Period 1954-1969

RIO ALAMO AT CD. MIER, TAMAULIPAS

DESCRIPTION: Cableway, reinforced concrete weir of 177 second-foot capacity, gravity well, and water-stage recorder located on the right bank at a point called "El Paso del Cántaro", latitude 26° 27' 10", longitude 99° 09' 20", about 0.5 mile north of Cd. Mier, Tamaulipas, and 5.0 river miles from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 261.4, 12.4 river miles downstream from Falcon Dam, and 986.8 river miles downstream from the American Dam at El Paso, Texas. The weir is located about 300 feet downstream from the recorder. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 5 discharge measurements made at high flows during the year, the weir discharge table at low flows, and a continuous record of gage heights. High flow computations by shifting control methods. Records available: July 1923 through 1969.

REMARKS: Small reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station. On June 11, 1952 the zero of the gage was raised 1.31 feet to make it coincide with the weir crest elevation. Prior to January 1, 1969, the zero of the gage was 188.35 feet above mean sea level, U. S. C. & G. S. Datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 144,800 second-feet on September 11, 1948 with a gage height of 33.56 feet. Min. periods of no flow have occurred at times during all years of record except 1934, 1935, and 1968.

Average Flow in Second-Feet ‡

Daily:	Max.	87,230	Sept. 11, 1948	Min.	0	Frequently
Monthly:	Max.	7,310	Sept. 1967	Min.	0	Frequently
Yearly:	Max.	837	1967	Min.	16.4	1929

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.1	21.5	21.5	26.1	5.6	1.8	1.1	0	108	26.1	15.9	26.1
2	30.7	23.3	21.5	24.7	31.1	1,300	.7	4.9	58.3	21.5	14.5	24.7
3	37.1	24.7	24.7	23.3	15.5	ft 1,330	.7	3.2	29.7	13.1	13.1	23.3
4	33.9	24.7	27.9	18.7	55.1	94.3	.7	0	20.8	10.6	13.1	23.3
5	30.7	24.7	24.7	20.1	75.2	27.2	.7	0	13.1	53.3	12.0	23.3
6	30.7	24.7	24.7	23.3	21.2	17.3	.7	0	10.6	65.3	14.5	24.7
7	33.9	24.7	24.7	24.7	13.1	17.3	0	0	10.6	60.0	15.9	24.7
8	33.9	23.3	24.7	24.7	7.1	18.7	0	13.8	9.2	106	13.1	24.7
9	33.9	21.5	24.7	23.3	11.7	13.1	0	346	15.9	51.6	15.9	24.7
10	26.1	21.5	26.1	23.3	22.6	8.1	0	42.7	14.8	23.3	17.3	26.1
11	26.1	21.5	27.9	47.3	10.6	6.0	0	14.1	9.2	18.7	17.3	23.3
12	26.1	23.3	33.9	21.5	9.9	7.1	0	7.1	6.0	15.9	15.9	24.7
13	30.7	24.7	33.9	17.3	ft 978	7.1	0	3.5	68.2	13.1	14.5	24.7
14	30.7	31.1	33.9	18.7	207	4.9	0	1.8	21.9	12.0	10.6	24.7
15	30.7	31.1	31.1	18.7	ft 823	4.2	0	1.1	13.1	10.6	9.2	24.7
16	27.9	26.1	27.9	18.7	138	3.5	0	0	12.0	10.6	9.2	24.7
17	27.9	24.7	26.1	18.7	61.1	2.5	0	0	7.1	2,440 ft	10.6	24.7
18	27.9	23.3	26.1	15.9	44.5	2.5	0	0	12.4	664	10.6	27.9
19	26.1	23.3	26.1	14.5	27.9	1.8	0	0	347	193	10.6	24.7
20	26.1	26.1	24.7	10.6	24.7	1.1	0	0	87.6	72.7	9.2	24.7
21	26.1	24.7	24.7	8.1	23.3	1.1	0	0	293	41.7	9.2	23.3
22	21.5	23.3	26.1	9.2	15.9	.7	0	35.0	321	27.9	10.6	23.3
23	20.1	23.3	26.1	10.6	13.1	0	0	32.8	798	21.5	12.0	23.3
24	20.1	23.3	26.1	9.2	13.1	0	0	25.4	533	17.3	13.1	23.3
25	21.5	23.3	24.7	9.2	14.5	0	0	10.6	597	15.9	15.9	23.3
26	21.5	23.3	24.7	9.2	13.1	0	0	6.0	228	14.5	18.7	23.3
27	20.1	24.7	26.1	8.1	9.2	0	0	3.9	123	186	20.1	23.3
28	21.5	24.7	26.1	7.1	7.1	11.3	0	445	72.7	70.3	23.3	23.3
29	21.5		26.1	6.0	4.9	8.1	11.3	110	48.7	28.6	24.7	23.3
30	21.5		27.9	4.9	3.5	3.2	.7	31.4	37.1	21.5	31.1	24.7
31	21.5		27.9		2.5		0	80.9		18.7		24.7
Sum	834.1	680.4	823.3	515.7	2,703.1	2,892.9	16.6	1,219.2	3,927.0	4,345.3	441.7	753.5

Month	Current Year 1969 Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1924-1969 Acre-Feet Average	Maximum	Minimum
Jan.	188.81	188.65	3	37.1	†23	20.1	26.8	1,655	3,250	34,920	0
Feb.	188.75	188.68	† 14	31.1	† 1	21.5	24.4	1,351	2,459	25,550	0
Mar.	188.78	188.68	† 12	33.9	† 1	21.5	26.5	1,634	2,426	19,830	0
Apr.	189.07	188.48	11	69.2	30	4.9	17.3	1,023	6,456	36,210	0
May	191.47	188.42	15	1,680	31	2.5	87.2	5,361	13,427	137,000	0
June	196.36		2	9,750	†22	0	96.4	5,740	11,589	83,240	0
July	188.75		29	27.9	† 7	0	.7	33.2	5,982	37,590	0
Aug.	190.98		28	1,080	† 1	0	39.2	2,418	17,296	205,700	0
Sept.	193.60	188.45	23	3,780	†12	4.9	131	7,791	41,105	434,387	135
Oct.	194.55	188.55	17	5,160	† 4	10.6	140	8,625	18,599	193,700	0
Nov.	188.78	188.52	30	31.1	†15	9.2	14.8	876	3,735	25,165	0
Dec.	188.75	188.71	18	27.9	† 3	23.3	23.3	1,496	3,154	15,982	0
Yearly	196.36			9,750		0	52.6	38,003.2	129,478	605,678.4	11,898.7

† And other days ft Discharge measurement made on this day ‡ Period 1924-1969

CONTRIBUTIONS FROM RIO SAN JUAN
FALCON DAM TO FORT RINGGOLD

DESCRIPTION: The Lower Río San Juan Irrigation District in Mexico lies along the Rio Grande between Cd. Miguel Alemán and Río Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gómez Dam situated on the Río San Juan 12.4 river miles upstream from the confluence with the Rio Grande. The Río San Juan enters the Rio Grande at river mile 237.8 and 1,010.4 river miles downstream from the American Dam at El Paso, Texas. Drain water from this irrigation district enters the Rio Grande between Falcon Dam and the Fort Ringgold Gaging Station through the Río San Juan Channel, Rancherías Drain, and Los Fresnos Drain; and between this station and Anzalddas Dam through Puertecitos, Los Indios, Huizache, and Morillo Drains. Only the portion of water reaching the Rio Grande via channels located upstream from the Fort Ringgold Gaging Station is shown below. The portion of drain water from this irrigation district reaching the Rio Grande via channels located downstream from the Fort Ringgold Gaging Station is shown on page 62 in this bulletin.

RECORDS: Water entering the Rio Grande through the Río San Juan Channel, included in the tabulation below and composed of spills and leakage from Marte R. Gómez Dam, and storm inflow and drainage below the dam, was measured at the Río San Juan Gaging Station at Camargo, Tamaulipas 3.1 river miles upstream from the confluence with the Rio Grande. (See next page for station description and separate tabulation of discharge for this station). The discharge through Rancherías Drain was determined by prorating between 51 current meter measurements made during the year. There was no drainage flow through Los Fresnos Drain in 1969. All storm water measured at these two drains was deducted and is not included in the tabulation below. Records available: 1953 through 1969.

REMARKS: In 1969 there were 171,465 irrigable acres in the Lower Río San Juan Irrigation District.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	228	30.1	19.3	10.7	23.0	28.1	13.9	11.0	86.3	14.8	34.4	121
2	220	30.9	18.4	9.7	23.5	29.4	13.1	10.6	41.6	9.0	34.5	128
3	265	31.8	17.5	9.7	24.0	30.7	11.9	9.8	18.0	8.7	34.0	135
4	412	32.6	16.2	9.7	24.3	32.0	11.6	9.4	18.2	8.0	33.6	129
5	276	33.4	15.3	9.8	24.8	33.3	11.3	9.0	18.8	7.6	33.2	124
6	232	33.2	15.5	9.9	25.4	31.3	11.0	8.6	19.0	7.3	37.8	118
7	245	32.9	15.7	9.9	25.9	29.7	10.7	8.2	19.2	7.0	42.4	112
8	253	33.4	15.9	10.0	27.4	27.7	10.5	7.9	19.5	6.3	47.0	107
9	319	33.8	16.1	10.0	28.9	25.7	10.2	7.7	20.1	5.9	51.6	101
10	239	34.3	16.2	10.0	30.4	23.7	9.9	7.5	20.3	6.0	56.2	95.7
11	153	35.1	16.8	9.6	31.5	22.1	10.1	7.2	21.9	6.0	60.4	90.1
12	127	35.6	17.0	9.5	33.0	20.1	10.4	7.3	87.5	6.0	65.0	84.1
13	119	34.5	17.2	9.0	34.5	20.9	11.0	7.1	74.2	6.4	69.6	78.5
14	111	33.7	16.7	8.9	36.0	21.6	11.2	6.9	61.0	6.4	67.1	72.9
15	97.3	32.9	16.3	8.5	37.4	22.4	11.4	6.6	47.7	6.5	65.0	66.9
16	61.6	31.9	15.9	8.4	38.6	23.2	12.0	7.4	34.5	6.8	62.5	61.3
17	26.3	31.1	15.4	7.9	40.0	24.3	12.3	7.9	21.2	7.1	60.0	55.7
18	26.3	30.3	14.9	9.2	33.7	25.1	11.9	8.3	8.0	7.4	57.9	55.7
19	26.3	29.2	14.5	10.5	27.0	24.3	11.5	9.1	13.7	7.7	55.4	56.4
20	26.2	28.4	14.6	11.4	20.6	23.5	11.1	9.5	19.8	7.6	53.0	56.4
21	26.2	27.2	14.7	12.7	13.9	22.7	10.6	21.3	25.5	7.9	50.9	56.8
22	26.2	26.4	14.8	13.6	15.4	22.3	10.2	112	31.5	8.2	57.6	57.1
23	26.4	25.2	14.6	14.9	16.5	21.5	9.8	68.9	37.3	8.5	64.7	57.4
24	26.6	24.4	14.7	15.9	17.6	20.7	9.4	25.5	43.3	8.6	71.8	57.8
25	26.8	23.6	14.8	17.0	19.0	19.9	9.7	15.6	49.1	8.6	78.9	57.7
26	27.0	22.4	14.9	18.2	20.1	19.1	10.1	13.1	43.3	8.7	86.0	57.7
27	27.2	21.5	14.3	19.3	21.3	17.9	10.0	11.0	37.5	81.1	92.7	57.7
28	27.4	20.2	13.2	20.1	22.7	17.1	10.4	13.8	31.7	305	99.8	57.7
29	27.6		12.6	21.3	23.8	15.9	10.4	48.2	26.3	35.6	107	140
30	28.4		12.0	22.4	25.1	15.0	10.7	131	20.6	35.2	114	221
31	29.2		11.3		26.4		10.7	60.4		34.8		213
Sum	3,762.0	840.0	477.3	367.7	811.7	711.2	339.0	687.8	1,016.6	690.7	1,844.0	2,882.6

Current Year 1969 — Period 1954-1969

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			4	412	†20	26.2	121	7,461	9,113	77,184	126
Feb.			12	35.6	28	20.2	30.0	1,667	4,798	40,778	246
Mar.			1	19.3	31	11.3	15.5	947	3,359	24,706	250
Apr.			30	22.4	17	7.9	12.4	729	4,266	36,208	196
May			17	40.0	21	13.9	26.1	1,609	4,984	29,121	555
June			5	33.3	30	15.0	23.7	1,411	5,733	33,142	476
July			1	13.9	24	9.4	10.9	672	12,908	122,305	312
Aug.			30	131	15	6.6	22.2	1,364	19,565	274,079	202
Sept.			12	87.5	18	8.0	33.9	2,016	131,729	1,878,782	298
Oct.			28	305	9	5.9	22.2	1,369	92,138	901,800	229
Nov.			30	114	5	33.2	61.4	3,657	27,848	230,400	154
Dec.			30	221	†17	55.7	92.9	5,719	12,705	98,974	200
Yearly				412		5.9	39.6	28,621	329,146	2,896,004	11,025

Ø Mean daily † And other days

RIO SAN JUAN AT CAMARGO, TAMAULIPAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank opposite Camargo, Tamaulipas at latitude 26° 18' 50", longitude 98° 50' 20", 3.1 river miles from the confluence with the Rio Grande, and 9.3 river miles downstream from Marte R. Gómez Dam. This stream enters the Rio Grande at river mile 237.8, 3.9 river miles upstream from the Rio Grande gaging station at Fort Ringgold, 36.0 river miles downstream from Falcon Dam, and 1,010.4 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum. See note in REMARKS.

RECORDS: Based on 45 discharge measurements during the year, staff gage readings through February 28, and a continuous record of gage heights thereafter. Computations by shifting control methods. Discharge prorated between measurements during times of extremely low flow. Records available: January 1954 through 1969.

REMARKS: Except for storm inflow, diversion, and drainage returns below Marte R. Gómez Dam, the flow at this station is controlled by spills from Marte R. Gómez Reservoir and leakage through the dam. Backwater from the Rio Grande frequently reaches this station. Flow passing this station, combined with drain water entering the Rio Grande through Rancherías and Los Fresnos drains, is also published under heading "Contributions from Río San Juan - Falcon Dam to Fort Ringgold" (see previous page). Prior to July 1, 1968 the zero of the gage was 130.45 feet above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 115,000 second-feet on September 25, 1967 with a gage height of 42.03 feet. Min. 0.7 second-foot several days in April 1960.

Average Flow in Second-Feet

Daily:	Max.	115,000	Sept. 25, 1967	Min.	0.7	April 23, 24 & 25, 1960
Monthly:	Max.	31,600	Sept. 1967	Min.	2.1	November 1964
Yearly:	Max.	3,990	1967	Min.	14.6	1963

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	226	24.4	11.3	6.4	10.2	7.1	5.3	✱ 6.7	83.7	12.7	33.2	119
2	218	24.4	10.6	✱ 5.7	10.9	7.1	4.9	6.4	38.8	✱ 7.8	33.2	126
3	263	24.4	9.9	5.7	11.7	7.1	4.2	5 7	✱ 15.2	7.4	32.8	✱133
4	410	24.4	8.9	5.7	12.0	7.1	4.2	5.3	13.8	6.7	32.5	128
5	274	24.4	✱ 8.1	5.7	12.7	7.1	4.2	4.9	12.7	6.4	✱ 32.1	123
6	230	24.4	8.5	5.7	12.4	7.1	4.2	4.6	11.3	6.0	36.7	117
7	243	✱24.4	8.8	5.7	14.1	7.4	4.2	✱ 4.2	9.9	5.7	41.3	111
8	✱251	25.1	9.2	5.7	14.2	7.4	4.2	4 2	8.5	4.9	45.9	106
9	317	25.8	9.5	5.7	15.5	7.4	4.2	4.2	7.4	✱ 4.6	50.5	100
10	237	26.5	9.9	✱ 5.7	16.2	7.4	4.2	4.2	6.0	4.6	55.1	✱ 94.6
11	151	27.5	10.6	5.3	16.6	7.8	4.6	4.2	6.0	4.6	59.3	89.0
12	125	✱28.3	10.9	5.3	17.3	7.8	4.9	4.6	✱ 69.9	4.6	63.9	83.0
13	✱117	26.8	✱ 11.3	4.9	18.0	7.8	5.6	4.6	59.3	4 9	✱ 68.5	77.3
14	109	25.8	10.9	4.9	18.7	7.8	6.0	4.6	48.7	4.9	66.0	71.7
15	✱ 95.3	24.7	10.6	4.6	19.4	7.8	6.4	✱ 4.6	38.1	✱ 4.9	63.9	65.7
16	59.7	23.3	10.2	4.6	19.8	7.8	7.1	4.9	27.5	5.3	61.4	60.0
17	24.4	22.2	9.9	✱ 4.2	✱ 20.5	8.1	7.4	4.9	17.0	5.7	59.0	✱ 54.4
18	24.4	21.2	9.5	4.6	17.0	8.1	7.1	4.9	✱ 6.4	6.0	56.9	54.4
19	24.4	✱19.8	✱ 9.2	4.9	13.1	8.1	6.7	5.3	11.3	6.4	54.4	55.1
20	24.4	19.1	9.2	4.9	9.5	8.1	6.4	5.3	16.6	6.4	51.9	55.1
21	24.4	18.0	9.2	5.3	✱ 5.7	8.1	6.0	✱ 16.6	21.5	6.7	✱ 49.8	55.4
22	24.4	17.3	9.2	5.3	6.0	8.5	5.6	108	26.8	7.1	56.5	55.8
23	24.4	16.2	8.8	5.7	6.0	8.5	5.3	65.0	31.8	✱ 7.4	63.6	56.2
24	24.4	15.5	8.8	✱ 5.7	6.0	8.5	4.9	21.9	37.1	7.4	70.6	✱ 56.5
25	24.4	14.8	8.8	6.4	6.4	✱ 8.5	✱ 5.3	12.4	✱ 42.0	7.4	77.7	56.5
26	24.4	✱ 13.8	✱ 8.8	7.1	6.4	8.1	5.6	10.2	37.1	7.4	84.8	56.5
27	24.4	13.1	8.5	7.8	6.4	7.4	5.6	8.5	32.1	79.8	91.4	56.5
28	24.4	12.0	7.8	8.1	6.7	7.1	6.0	✱ 11.7	27.2	303	98.5	56.5
29	24.4		7.4	8.8	✱ 6.7	6.4	6.0	45.9	22.6	✱ 34.2	106	138
30	24.4		7.1	9.5	6.7	6.0	6.4	128	17.7	33.9	113	✱220
31	24.4		6.7		6.7		6.4	57.9		33.5		212
Sum	3,692.0	607.6	288.1	175.6	369.5	228.5	169.1	584.4	804.0	648.3	1,810.4	2,843.2

Month	Current Year 1969 Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1954-1969 Acre-Feet Average	Maximum	Minimum
Jan.	136.61		4	473	†17	24.4	119	7,320	9,015	76,938	88.4
Feb.			12	28.3	28	12.0	21.5	1,205	4,663	40,536	203
Mar.			† 1	11.3	31	6.7	9.2	572	3,233	24,513	212
Apr.			30	9.5	17	4.2	6.0	348	4,109	35,876	177
May			17	20.5	21	5.7	12.0	736	4,664	28,709	245
June			†22	8.5	30	6.0	7.8	452	5,418	32,689	274
July			17	7.4	† 3	4.2	5.3	336	12,755	122,020	182
Aug.	135.43		30	200	† 7	4.2	18.7	1,160	19,454	273,904	161
Sept.	134.97		1	120	†10	6.0	26.8	1,595	131,589	1,878,406	226
Oct.	137.43		†27	770	† 9	4.6	20.8	1,287	92,025	901,500	193
Nov.			30	113	5	32.1	60.4	3,590	27,733	230,100	126
Dec.	135.89		30	220	†17	54.4	91.8	5,643	12,605	98,547	163
Yearly	137.43			770		4.2	33.5	24,244	327,263	2,891,093	10,534

† And other days ✱ Discharge measurements made on this day

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE - FALCON DAM TO FORT RINGGOLD

Since June 1956 the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam has been under the jurisdiction of the 93rd District Court of Texas, the disposition of such water being made through its Special Water Master.

During 1969, 8,955 irrigable acres and several towns and rural homes were served water diverted from the Rio Grande between Falcon Dam and the river gaging station at Fort Ringgold under the jurisdiction of this Court. The area irrigated from the Rio Grande in this river reach was 1.2% of the total irrigable acres below Falcon Dam.

The total diversion during 1969 in this river reach was 8,052 acre-feet, or 0.8% of the total water diverted from the Rio Grande below Falcon Dam. All the records of diversions in this river reach were furnished by the Special Water Master. About 39% of the water diverted was measured by means of flow meters and the rest was determined by periodic current meter measurements of pump discharges and recorded pump operating time. More than one crop per year is often grown on parts of this land.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.9	17.0	6.9	20.4	9.7	11.6	15.2	13.3	3.9	11.5	11.0	1.6
2	6.8	8.5	7.5	20.5	9.9	28.8	15.2	13.8	2.3	11.5	5.8	1.6
3	6.8	17.8	12.2	21.1	10.5	5.2	15.7	10.8	8.8	11.6	9.0	1.6
4	5.0	18.4	11.7	28.2	17.4	4.5	7.0	10.7	5.0	11.8	9.1	1.7
5	5.8	17.8	12.0	30.3	18.8	4.5	16.1	10.7	5.0	6.2	9.1	2.4
6	7.4	18.0	12.2	10.6	18.5	5.4	15.8	10.7	2.2	6.6	9.3	1.7
7	6.7	18.6	13.5	9.9	18.9	10.5	15.8	10.7	4.5	6.1	9.2	1.7
8	8.6	17.7	13.9	9.7	17.8	4.8	16.0	10.7	2.9	13.5	9.2	3.8
9	8.8	7.4	11.1	9.8	17.2	4.8	16.1	10.7	4.4	13.6	4.6	3.8
10	9.1	13.1	11.1	9.7	21.9	5.5	16.1	8.0	5.3	13.6	9.3	3.8
11	17.6	11.9	11.3	11.4	6.2	4.8	16.8	8.0	4.9	15.3	9.4	3.7
12	14.2	11.8	11.1	16.7	6.8	5.1	16.3	8.0	7.1	9.9	9.5	4.5
13	15.4	9.7	13.3	21.9	5.4	11.7	11.6	8.0	4.9	9.8	9.2	3.8
14	15.8	11.9	13.1	20.7	5.2	11.6	11.7	8.0	5.0	9.8	8.9	5.0
15	15.5	10.7	19.5	22.0	5.8	21.7	11.8	8.1	7.5	9.8	9.0	5.1
16	15.4	5.2	15.0	20.7	5.3	21.7	11.7	8.2	7.5	9.8	3.3	4.9
17	16.3	3.5	22.1	20.6	5.3	21.7	11.7	9.1	7.6	9.9	9.2	5.2
18	20.4	3.3	24.5	21.0	4.8	21.8	11.8	9.1	7.5	9.9	9.2	4.9
19	12.3	1.3	22.5	28.8	4.9	21.8	15.8	8.9	7.5	13.3	9.2	5.1
20	15.5	3.3	21.8	12.0	4.9	21.7	13.1	9.2	7.5	13.3	9.1	5.0
21	16.5	3.5	21.5	12.1	5.3	21.9	12.8	8.9	10.2	13.4	9.2	5.0
22	19.3	3.9	30.3	12.0	5.6	22.6	13.0	9.1	11.1	13.5	10.7	5.0
23	18.4	2.7	5.1	11.6	5.5	23.1	11.9	9.1	10.3	13.4	2.0	5.1
24	16.2	2.6	13.7	16.9	2.5	22.8	11.9	7.5	9.8	13.4	7.8	5.1
25	21.5	8.5	13.1	12.0	16.6	23.5	12.5	7.5	9.8	13.5	6.6	5.1
26	6.6	8.6	18.0	12.7	16.5	22.6	11.8	7.4	10.4	11.3	2.8	4.9
27	13.2	7.8	13.1	10.2	16.8	22.6	13.1	7.4	9.8	11.3	2.6	4.9
28	15.4	8.1	14.4	11.2	16.7	24.7	13.1	7.3	11.6	11.2	1.8	5.1
29	16.0		16.7	13.3	16.9	15.3	13.1	7.3	11.6	11.2	1.6	3.4
30	15.3		24.5	9.8	16.8	14.0	13.2	7.4	11.6	11.2	1.5	3.4
31	14.7		18.9		17.7		13.3	2.4		11.1		6.4
Sum	401.4	272.6	475.6	487.8	352.1	462.3	421.0	276.0	217.5	351.3	218.2	124.3

Current Year 1969 — Period 1957-1969

Month	Average Rainfall Inches** 1957-1969	Average Rainfall Inches** 1969	Ø Extreme Second-Feet High Day	High	Ø Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	1.13	0.32	25	21.5	1	4.9	12.9	796	623	1,291	159
Feb.	1.19	.97	7	18.6	19	1.3	9.7	541	653	1,480	223
Mar.	.66	.15	22	30.3	23	5.1	15.3	943	981	1,845	158
Apr.	1.65	.54	5	30.3	† 8	9.7	16.3	968	1,005	1,890	357
May	2.63	2.34	10	21.9	24	2.5	11.4	698	1,187	2,624	251
June	2.31	3.33	2	28.8	† 4	4.5	15.4	917	1,284	2,610	449
July	.85	.38	11	16.8	4	7.0	13.6	835	825	1,620	278
Aug.	2.38	2.88	2	13.8	31	2.4	8.9	547	709	935	481
Sept.	4.72	1.90	† 28	11.6	6	2.2	7.2	431	580	1,230	178
Oct.	2.30	.87	11	15.3	7	6.1	11.3	697	712	1,220	131
Nov.	1.41	2.32	1	11.0	30	1.5	7.3	433	543	1,170	216
Dec.	.84	.50	31	6.4	† 1	1.6	4.0	246	623	1,580	145
Yearly	22.07	16.50		30.3		1.3	11.1	8,052	9,725	14,754	4,989

Ø Mean daily
† And other days
** United States side - Average of several stations in this reach

RIO GRANDE AT FORT RINGGOLD, RIO GRANDE CITY, TEXAS

DESCRIPTION: Cableway, bubbler gage, gravity well, water-stage recorders (graphic and digital), and impulse-type transmitter located on the left bank at Fort Ringgold, latitude 26° 22' 05", longitude 98° 48' 20", and river mile 233.9; about 1 mile downstream from Rio Grande City, Texas, 3.9 river miles downstream from Río San Juan, and 1,014.3 river miles downstream from American Dam at El Paso, Texas. The zero of the gage is 100.00 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 27 discharge measurements during the year, 20 by the United States Section, and 7 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: January 1955 through 1969. Records composed of the addition of discharges of the Río Grande at Roma, Texas, and the Río San Juan at Santa Rosalía, Tamaulipas are available for May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September 1923; and 1924 through 1931. Records are also available for the station "Rio Grande near Rio Grande City," 3.0 miles downstream, for 1932 through 1954.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows and intervening diversions below Falcon Dam, flow at this station is controlled largely by releases from Falcon Reservoir, 39.9 river miles upstream. The transmitter relays gage height data to the Anzaldúas Dam office of the United States Section of this Commission and to the Anzaldúas Dam control room via leased telephone circuits. The data is recorded automatically at both locations.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 220,000 second-feet on September 22 and 23, 1967 with a gage height of 61.40 feet. Min. no flow occurred several days in June and July 1953.

Average Flow in Second-Feet ‡

Daily:	Max.	207,000	September 23, 1967	Min.	14.6	April 13, 1957
Monthly:	Max.	49,600	October 1958	Min.	235	March 1957
Yearly:	Max.	9,140	1958	Min.	2,260	1957 & 1964

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,410	10,100	1,490	1,530	8,520	8,690	# 3,620	3,120	581	1,160	537	266
2	3,450	8,020	2,020	1,610	5,110	8,260	2,910	2,790	685	1,310	529	213
3	2,640	8,800	2,020	1,690	4,790	# 11,100	2,630	3,420	# 1,330	1,420	674	208
4	2,460	9,320	2,050	1,800	5,200	6,520	2,560	3,930	3,420	1,050	# 1,080	212
5	2,340	8,340	2,040	1,780	4,710	7,830	2,560	4,200	955	981	2,040	220
6	2,250	7,860	1,850	1,850	5,620	8,640	1,570	4,310	689	1,030	1,800	244
7	3,200	7,390	1,870	1,950	# 7,760	8,190	928	3,720	411	583	1,030	657
8	# 3,990	7,100	1,840	1,840	7,870	6,500	1,380	2,900	372	537	999	616
9	4,660	6,010	1,860	1,830	7,570	6,480	# 1,900	2,820	352	570	1,180	592
10	4,020	4,800	1,880	1,800	7,460	6,080	2,620	1,960	332	962	1,210	1,810
11	3,420	6,070	1,890	# 1,800	8,340	5,760	2,570	1,010	329	1,220	1,420	3,710
12	3,960	8,050	1,870	1,800	7,510	6,710	2,410	2,900	327	1,020	1,750	747
13	4,830	# 4,990	1,880	1,670	# 8,540	8,960	2,440	# 3,960	289	1,340	1,840	449
14	4,810	3,080	1,880	1,750	3,040	8,490	2,550	3,120	223	1,400	1,430	333
15	4,860	1,270	1,830	2,460	3,960	8,420	2,440	1,950	174	2,070	1,080	203
16	6,250	1,010	1,450	3,270	6,040	6,810	2,460	1,280	# 128	# 2,350	1,280	197
17	6,930	998	1,470	3,010	4,180	7,050	2,450	1,050	129	2,610	1,280	361
18	7,760	1,010	# 1,490	2,820	2,150	5,860	2,390	1,300	343	3,470	1,030	381
19	7,910	1,000	# 1,520	3,020	1,420	5,970	1,510	2,410	610	1,010	1,510	385
20	7,700	840	1,540	3,860	2,010	7,180	1,950	1,910	953	872	2,070	380
21	# 9,350	1,390	1,340	3,940	# 1,970	5,550	2,700	1,270	770	# 1,320	# 1,620	374
22	10,600	1,440	1,490	# 4,500	2,910	4,430	2,800	831	1,030	2,750	1,010	377
23	9,630	1,430	1,630	5,670	4,030	4,480	2,790	442	803	2,710	875	367
24	10,600	2,270	1,500	5,390	5,000	# 5,150	# 3,090	339	2,930	1,550	845	380
25	11,000	# 1,440	1,530	4,980	5,140	5,200	3,380	398	1,030	1,050	924	376
26	11,400	1,420	# 1,540	# 6,000	4,390	5,030	3,370	348	601	1,010	823	444
27	11,300	1,400	1,650	7,770	5,070	5,300	3,180	286	296	1,170	658	551
28	11,000	1,390	1,460	6,320	6,060	6,710	2,850	252	220	2,340	688	958
29	11,000		1,500	5,290	7,980	4,850	3,300	595	302	1,480	498	972
30	# 10,900		1,490	7,210	# 9,100	3,760	4,310	479	774	654	360	1,060
31	11,100		1,490		8,860		4,440	445		550		731
Sum	208,730	118,238	52,360	100,210	172,310	199,960	82,058	59,745	21,388	43,549	34,070	18,774

Current Year 1969 — Period # 1954 - 1969

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	33.33	27.04	26	12,000	6	1,050	6,730	414,016	217,294	414,016	55,635
Feb.	32.64	26.21	1	10,800	20	494	4,220	234,525	189,062	376,607	25,500
Mar.	29.13	26.28	5	3,720	† 1	563	1,690	103,856	141,046	378,000	14,400
Apr.	31.84	26.35	27	8,710	1	613	3,340	198,767	234,182	447,815	75,100
May	32.04	26.56	31	9,430	19	750	5,560	341,777	315,675	521,000	80,891
June	33.29	27.51	3	12,000	30	1,630	6,670	396,621	308,370	560,000	120,468
July	30.51	26.33	30	6,490	8	600	2,650	162,762	140,572	303,952	22,300
Aug.	30.31	25.51	5	6,140	28	216	1,930	118,504	159,723	522,593	25,000
Sept.	29.83	25.15	4	5,340	17	114	713	42,423	338,448	2,712,754	42,423
Oct.	29.41	25.86	18	4,680	† 8	378	1,400	86,379	331,433	3,047,000	30,000
Nov.	28.75	25.73	20	3,720	30	313	1,140	67,578	162,011	1,442,000	29,274
Dec.	29.97	25.34	11	5,570	16	161	606	37,238	130,768	540,000	36,100
Yearly	33.33	25.15		12,000		114	3,040	2,204,446	2,668,584	6,619,700	1,637,900

‡ Period 1955 - 1969 # Discharge measurement made on this day † And other days
# 1954 Values are Rio Grande City station less arroyo inflow

CONTRIBUTIONS FROM RIO SAN JUAN FORT RINGGOLD TO ANZALDUAS DAM

DESCRIPTION: The Lower Río San Juan Irrigation District in Mexico lies along the Rio Grande between Cd. Miguel Alemán and Río Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gómez Dam situated on the Río San Juan 12.4 river miles upstream from the confluence with the Rio Grande. The Río San Juan enters the Rio Grande at river mile 237.8 and 1,010.4 river miles downstream from the American Dam at El Paso, Texas. Drain water from this irrigation district enters the Rio Grande between Falcon Dam and the Fort Ringgold Gaging Station through the Río San Juan Channel, Rancherías Drain, and Los Fresnos Drain; and between this station and Anzaldúas Dam through Puertecitos, Los Indios, Huizache, and Morillo Drains. Only the portion of drain water from this irrigation district reaching the Rio Grande via drains located downstream from the Fort Ringgold Gaging Station is shown below. The portion of water reaching the Rio Grande via channels located upstream from the Fort Ringgold Gaging Station is shown on page 58 in this bulletin.

RECORDS: Drain water reaching the Rio Grande through Puertecitos, Los Indios, Huizache, and Morillo Drains was determined by prorating between frequent current meter measurements. In 1969, 51, 51, 51, and 39 meter measurements were made at Puertecitos, Los Indios, Huizache, and Morillo Drains, respectively. All storm water measured at these drains was deducted and is not included in the tabulation below. In 1969, 77% of the drain water from this irrigation district reaching the Rio Grande between Fort Ringgold Gaging Station and Anzaldúas Dam was contributed by Morillo Drain. Records available: 1953 through 1969.

REMARKS: In 1969 there were 171,465 irrigable acres in the Lower Río San Juan Irrigation District.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	38.0	94.9	111	63.7	134	167	83.4	18.2	17.2	13.0	14.9	16.0
2	38.1	101	107	62.3	138	171	81.7	17.9	17.2	18.6	14.8	15.8
3	38.2	108	104	62.2	141	176	79.7	17.6	17.3	18.8	14.6	116
4	38.0	114	100	62.0	144	181	77.8	17.3	17.0	19.1	14.5	882
5	37.7	120	96.8	61.9	147	186	75.8	17.1	16.7	19.4	14.4	882
6	37.5	127	96.3	61.8	151	183	73.4	16.7	16.4	19.6	14.1	828
7	37.5	133	97.0	61.6	154	180	71.1	16.5	16.1	19.8	13.7	905
8	37.4	134	97.7	61.5	155	177	68.7	16.6	15.8	20.0	13.3	906
9	37.4	134	98.4	61.3	155	174	52.9	16.9	15.5	20.3	12.9	902
10	37.4	135	99.1	61.6	156	171	24.9	17.1	15.1	20.3	12.5	900
11	37.4	136	99.8	61.9	157	168	24.4	17.3	14.9	20.0	12.1	903
12	37.4	137	100	62.2	158	159	23.7	16.5	14.6	19.6	11.8	906
13	37.5	138	96.8	62.5	159	153	23.1	17.7	14.4	19.3	11.4	909
14	37.5	139	93.1	62.8	160	146	22.5	17.9	14.3	19.0	11.3	912
15	37.5	137	89.4	63.1	161	140	21.9	18.1	14.2	18.6	15.3	915
16	38.0	135	85.6	63.4	160	134	21.3	18.3	14.1	18.4	19.3	917
17	38.5	133	81.9	67.5	160	128	20.7	19.5	13.9	18.4	19.2	918
18	41.6	132	78.3	71.8	160	122	20.2	20.7	13.8	18.4	18.5	918
19	44.6	130	74.5	76.1	159	115	19.7	21.9	13.9	18.5	17.8	918
20	47.6	128	74.8	80.5	146	112	19.2	23.1	14.1	18.5	17.2	918
21	50.7	129	74.9	84.8	132	109	18.5	24.2	14.2	18.6	16.6	918
22	53.7	131	75.1	89.1	120	105	17.9	23.2	14.4	18.6	16.5	403
23	57.4	132	75.3	93.4	126	102	17.4	22.2	14.5	18.7	16.5	191
24	61.4	133	75.5	97.6	132	98.8	16.9	21.2	14.7	18.1	16.4	67.8
25	65.4	129	73.7	103	137	95.5	17.1	20.1	14.8	17.5	16.3	14.8
26	69.5	124	71.9	109	143	92.0	17.3	19.1	14.5	17.0	16.3	14.7
27	73.5	120	70.6	114	148	90.3	17.4	18.1	14.2	16.4	16.2	14.7
28	77.5	115	69.2	120	154	88.5	17.6	17.1	13.8	15.8	16.1	14.3
29	81.5		67.8	126	155	86.8	17.7	17.1	13.6	15.3	16.1	14.0
30	86.0		66.5	131	157	85.1	17.9	17.1	13.3	15.1	16.0	13.6
31	90.5		65.1		162		18.1	17.2		15.0		13.2
Sum	1,541.9	3,558.9	2,667.1	2,359.6	4,621	4,096.0	1,099.9	579.5	448.5	563.7	456.6	17,165.9

Current Year 1969 — Period 1954 - 1969

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			31	90.5	† 8	37.4	49.8	3,058	2,148	4,745	561
Feb.			14	139	1	94.9	127	7,059	3,519	7,059	1,230
Mar.			1	111	31	65.1	86.2	5,291	2,906	5,291	1,006
Apr.			30	131	9	61.3	78.8	4,681	3,172	6,111	899
May			31	162	22	120	149	9,166	5,840	9,166	1,557
June			5	186	30	85.1	137	8,125	5,669	8,210	2,422
July			1	83.4	24	16.9	35.3	2,182	3,265	4,760	1,638
Aug.			21	24.2	† 7	16.5	18.7	1,152	2,246	3,948	889
Sept.			3	17.3	30	13.3	14.8	889	2,064	4,150	665
Oct.			† 9	20.3	1	13.0	18.0	1,118	2,627	9,831	623
Nov.			16	19.3	14	11.3	15.2	906	2,232	10,461	562
Dec.			† 17	918	31	13.2	554	34,043	3,945	34,043	592
Yearly				918		11.3	107	77,670	39,633	77,670	13,462

Ø Mean daily † And other days

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE - FORT RINGGOLD TO ANZALDUAS DAM

Since June 1956 the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam has been under the jurisdiction of the 93rd District Court of Texas, the disposition of such water being made through its Special Water Master.

During 1969, 186,372 irrigable acres and several towns and rural homes were served water diverted from the Rio Grande between the river gaging station at Fort Ringgold and Anzaldúas Dam under the jurisdiction of this Court. The area irrigated from the Rio Grande in this river reach was 24.0% of the total irrigable acres below Falcon Dam.

The total diversion during 1969 in this river reach was 230,202 acre-feet, or 21.6% of the total water diverted from the Rio Grande below Falcon Dam. About 91% of the water diverted in this river reach was determined by this Commission through continuous records of discharge at open channel rating stations and at deflection meter stations developed by this Commission. The records for the rest of these diversions were furnished by the Special Water Master and were either measured by flow meters or were determined from periodic current meter measurements of pump discharges and recorded pump operating time. More than one crop per year is often grown on parts of this land.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	163	446	207	491	655	117	* 621	391	2.6	250	97.3	51.9
2	266	322	117	492	553	428	* 612	210	2.6	305	109	58.1
3	222	550	216	570	402	427	586	166	12.5	241	144	107
4	132	569	343	533	224	484	436	428	2.6	207	282	37.3
5	99.5	571	298	288	563	416	323	466	114	158	308	0
6	298	467	248	168	588	380	215	475	99.3	355	331	0
7	370	457	228	528	627	242	479	418	18.3	288	278	7.2
8	412	328	217	531	650	176	496	212	88.3	363	175	7.2
9	365	249	120	530	553	472	565	120	68.7	374	130	7.2
10	236	601	232	566	258	504	573	109	156	310	440	15.5
11	203	646	242	512	118	533	498	210	113	210	474	39.1
12	144	647	88.6	368	525	528	385	364	146	198	496	149
13	412	598	252	207	182	487	262	420	60.8	403	461	119
14	428	421	228	553	293	390	536	439	119	438	391	38.4
15	477	296	125	588	263	291	571	347	188	451	211	141
16	476	168	93.8	656	167	632	562	189	188	444	135	176
17	402	275	198	653	11.9	657	580	97.7	188	388	415	278
18	297	230	359	583	2.3	655	506	440	292	260	411	229
19	210	226	339	441	70.8	662	361	480	202	214	377	223
20	479	115	319	274	152	628	263	388	108	525	353	154
21	501	71.2	285	669	102	441	535	164	52.8	515	284	55.1
22	574	92.1	181	698	182	342	448	135	148	507	193	176
23	579	71.5	152	674	190	685	467	59.5	156	526	106	231
24	497	69.8	399	686	103	694	457	44.9	110	488	406	171
25	351	133	449	663	58.8	779	426	173	167	325	383	27.9
26	255	349	400	421	221	781	244	176	179	164	275	125
27	653	328	395	278	375	756	177	284	130	434	80.4	93.9
28	630	323	316	637	340	484	415	244	131	129	67.8	17.9
29	685		217	718	368	212	440	141	220	178	55.6	176
30	755		166	712	320	555	451	10.4	202	167	.2	188
31	680		456		196		359	2.7		158		201
Sum	9,619.6		15,688		14,838		7,804.2		9,973		3,300.7	
	12,251.5	7,886.4		9,313.8		13,849		3,665.5		7,869.3		

Current Year 1969 — **Period 1957-1969**

Month	Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	1957-1969	1969	Day		Day				Average	Maximum	Minimum
Jan.	1.26	0.25	30	755	5	99.5	395	24,301	10,987	28,747	2,010
Feb.	1.15	.96	12	647	24	69.8	344	19,080	10,641	38,599	1,640
Mar.	.67	.54	31	456	12	88.6	254	15,643	16,571	41,200	637
Apr.	1.40	.16	29	718	6	168	523	31,117	23,583	36,074	5,760
May	2.13	1.59	1	655	18	2.3	300	18,474	24,116	48,400	3,996
June	2.33	1.02	26	781	1	117	495	29,431	28,823	59,900	10,689
July	.76	1.03	1	* 621	27	177	447	27,469	23,385	45,400	7,973
Aug.	1.64	3.34	19	480	31	2.7	252	15,479	20,647	30,000	15,479
Sept.	3.73	2.76	18	292	† 1	2.6	122	7,271	15,425	35,000	4,136
Oct.	2.61	1.94	23	526	28	129	320	19,781	15,576	30,400	2,830
Nov.	1.26	1.69	12	496	30	.2	262	15,609	12,149	21,932	2,930
Dec.	1.09	.22	17	278	† 5	0	106	6,547	9,745	17,615	2,506
Yearly	20.03	15.50		781		0	318	230,202	211,648	302,180	136,460

* Partly estimated Ø Mean daily

** United States side - Average of several stations in the reach

† And other days

DIVERSIONS FROM THE RIO GRANDE

ANZALDUAS CANAL NEAR REYNOSA, TAMAULIPAS

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank at latitude 26° 08' 05", longitude 98° 20' 10", 0.5 canal mile from the canal intake, and about 5 miles northwest of Reynosa, Tamaulipas. The canal intake is immediately upstream from Anzaldúas Dam at river mile 171.6, 102.2 river miles downstream from Falcon Dam, and 1,076.6 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is 86.32 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 54 discharge measurements during the year, 53 by the Mexican Section and 1 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1969.

REMARKS: Diversions by this canal are for irrigation and domestic use in Mexico and for conveying water for storage in Culebrón, Villa Cárdenas, and Palito Blanco reservoirs about 23 canal miles downstream from this station. During 1969, 481,719 acres were irrigated with water delivered through this canal. More than one crop per year was grown on parts of this land. Flow at this canal station is affected by backwater from the operation of canal gates 4.5 miles, 11.3 miles, and 22.5 miles below this station. During 1969 there was no water returned to the Rio Grande through Poniente Drain.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 10,950 second-feet on June 2, 1957 with a gage height of 16.01 feet. Min. no flow occurs frequently.

Average Flow in Second-Feet

Daily:	Max.	9,350	May 29, 1957	Min.	0	Frequently
Monthly:	Max.	4,640	May 1964	Min.	0	Several months
Yearly:	Max.	1,980	1959	Min.	150	1952

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.2	6,990 ¶	21.2	21.2	3,190	6,710	540	1,940	0	353	¶ 523	21.2
2	21.2	7,030	21.2	21.2	¶ 3,450	5,860	533	¶ 1,940	0	346	21.2	21.2
3	21.2	6,780	21.2	21.2	3,240	5,790	540	2,050	0	357	21.2	21.2
4	21.2	6,780	21.2	53.0	2,690	6,040	21.2	2,420	0	374	21.2	21.2
5	21.2	6,640	487	682	2,620	4,450	21.2	2,650	0	347	21.2	0
6	364	6,000 ¶	1,240	886	¶ 2,600	¶ 4,060	¶ 21.2	2,650	10.6	21.2	21.2	0
7	653	5,470 ¶	1,120	381	2,830	3,570	21.2	2,660	21.2	21.2	21.2	0
8	653	4,730 ¶	1,150 ¶	371	¶ 3,640	3,670	21.2	¶ 2,560	21.2	21.2	21.2	0
9	653	4,310	1,260	512	¶ 4,340	¶ 3,280	¶ 21.2	2,470	21.2	28.3	21.2	0
10	653 ¶	3,850 ¶	1,290	618	4,840	2,990	21.2	2,470	21.2	28.3	21.2	0
11	742	3,530	1,480	618 ¶	5,010	2,650	21.2	1,730	21.2	194	21.2	10.6
12	848	3,430 ¶	1,590	618	¶ 5,370	¶ 2,530	¶ 21.2	1,470	21.2	335	21.2	21.2
13	992 ¶	3,280	1,260	618	5,830	2,540	21.2	¶ 1,420	21.2	346 ¶	21.2	21.2
14	1,070	2,000	1,520	254	6,390	2,540	21.2	1,150	21.2	335	21.2	21.2
15	1,070	569	1,210 ¶	21.2	3,470	2,660	21.2	¶ 1,130	21.2	424	21.2	0
16	1,410	353	1,200	21.2	3,990	¶ 2,660	¶ 21.2	1,060	21.2	533	21.2	0
17	1,600	353	1,140	300	¶ 4,940	2,570	21.2	982	21.2	579	21.2	0
18	2,220 ¶	353	953	689	3,950	2,470	21.2	805	21.2	1,400	526	10.6
19	2,830	215	953	692 ¶	1,990	1,890	206	713	173	1,740	537	21.2
20	3,450 ¶	21.2	1,240 ¶	1,050	1,380	1,180	328	710	374	893	523	21.2
21	3,960 ¶	21.2	1,070	1,410 ¶	¶ 1,560	¶ 1,170	¶ 316	367	350	544	551	21.2
22	5,330 ¶	21.2	879	1,430	1,970	724	321	360	351	537	21.2	21.2
23	5,510	21.2	883	1,400	2,410	611	328	¶ 374	¶ 353	537 ¶	21.2	21.2
24	6,070	21.2	1,090	1,390	¶ 3,530	530	328	371	392	523	21.2	21.2
25	6,850 ¶	21.2	840	1,530	3,990	530	1,540	357	182	530	21.2	21.2
26	7,170	21.2	357	1,820 ¶	¶ 3,880	533	1,950	364	322	533	21.2	21.2
27	7,270 ¶	21.2	367	2,500	4,030	¶ 540	¶ 1,840	360	547	537	206	21.2
28	7,200	21.2	576	3,330 ¶	4,480	537	1,770	357	353	540	551	21.2
29	7,270 ¶		1,020	3,260	¶ 4,630	537	1,670	745	360	830	551	21.2
30	7,130 ¶		798	3,170	5,260	544	1,760	925	367	1,060	277	21.2
31	6,780		159		¶ 6,250		1,950	173		812		21.2
Sum	89,854	72,853.8	27,216.8	29,688	117,750	76,366	16,238.0	39,733	4,389.0	15,659.2	4,690.2	445.2

Current Year 1969									Period 1954-1969		
Month	Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	1954-1969	1969	Day		Day						
Jan.	1.12	0.28	† 27	7,270	† 1	21.2	2,900	178,258	97,511	197,745	1,520
Feb.	1.47	2.20	2	7,030	† 20	21.2	2,600	144,532	109,843	251,519	1,086
Mar.	.68	.83	12	1,590	† 1	21.2	879	54,005	44,539	147,900	1,128
Apr.	1.64	.31	28	3,330	† 1	21.2	989	58,894	119,188	265,969	23,381
May	2.28	2.36	14	6,390	20	1,380	3,810	233,594	183,349	285,477	29,169
June	2.32	.47	1	6,710	† 24	530	2,550	151,459	133,373	270,700	15,256
July	1.11	.12	† 26	1,950	† 4	21.2	523	32,192	44,728	162,400	5,730
Aug.	2.10	5.79	7	2,660	31	173	1,280	78,822	77,897	186,909	6,709
Sept.	4.61	4.61	27	547	† 1	0	146	8,708	68,391	165,800	8,708
Oct.	2.64	2.05	19	1,740	† 6	21.2	505	31,068	42,835	162,400	0
Nov.	1.58	2.24	† 21	551	† 2	21.2	156	9,300	15,410	83,690	0
Dec.	1.15	.04	† 1	21.2	† 5	0	14.5	883	36,090	166,700	883
Yearly	22.70	21.30		7,270		0	1,360	981,715	973,154	1,434,920	564,686

¶ Discharge measurement made on this day Ø Mean daily ** Average of several stations
† And other days

RIO GRANDE BELOW ANZALDUAS DAM, TEXAS

DESCRIPTION: Cableway, gravity well, water-stage recorder, and selsyn-type transmitter, located on the right bank at latitude 26° 08' 00", longitude 98° 20' 05", and river mile 171.1; 0.5 river mile downstream from Anzaldúas Dam, about 4.5 miles northwest of Reynosa, Tamaulipas, 12.2 river miles upstream from the international highway bridge between Hidalgo, Texas and Reynosa, Tamaulipas, and 1,077.1 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum. See note in REMARKS.

RECORDS: Based on 57 discharge measurements during the year, 56 by the Mexican Section and 1 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1969.

REMARKS: Except during local storms, flow at this station is controlled largely by releases from Falcon Reservoir and by diversions into Anzaldúas Canal. Excessive upstream flood flows are partly diverted into the Mission Inlet of the United States floodway system before reaching this station. Prior to January 1, 1968 the zero of the gage was 82.61 feet above mean sea level, U. S. C. & G. S. datum. The transmitter relays gage height data to the Anzaldúas Dam control room.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 131,000 second-feet on September 24, 1967 with a gage height of 30.51 feet. Min. periods of no flow have occurred on several occasions in 1953, 1954, 1956, and 1957.

Average Flow in Second-Feet

Daily:	Max.	121,000	Sept. 25, 1967	Min.	0	Occasionally
Monthly:	Max.	37,830	Oct. 1958	Min.	5.5	March 1957
Yearly:	Max.	6,410	1958	Min.	158	1957

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	✟2,160	2,640	1,510	✟ 982	2,440	1,420	2,870	1,100	✟ 1,140	✟ 629	618	✟ 1,320
2	2,440	2,050	1,730	982	2,170	2,220	2,570	✟ 1,010	1,150	639	611	1,130
3	2,310	✟ 1,080	2,000	929	✟ 1,860	2,550	✟ 2,310	1,050	999	427	✟ 893	1,070
4	1,790	1,250	1,960	872	1,770	3,080	2,020	1,240	1,140	298	925	1,770
5	2,260	1,760	1,630	929	2,460	✟ 3,220	1,860	1,450	338	311	1,010	✟ 1,730
6	2,230	2,100	706	830	2,510	3,530	2,130	1,080	328	791	957	1,540
7	2,330	2,070	✟ 720	1,190	2,410	3,310	1,620	862	328	710	816	1,480
8	2,630	1,650	710	1,390	2,370	4,130	✟ 1,690	795	328	✟ 710	819	✟ 1,560
9	2,700	1,710	643	✟ 1,410	2,370	3,210	1,810	✟ 583	424	703	862	1,690
10	✟2,620	✟ 1,860	✟ 562	1,300	✟ 2,360	3,350	1,960	480	✟ 459	523	1,010	1,650
11	2,500	2,030	417	929	2,270	3,740	1,870	1,225	258	406	1,210	434
12	2,390	1,870	385	812	2,420	3,810	1,810	1,120	230	480	✟ 1,220	1,270
13	2,750	2,280	470	1,190	2,810	3,810	1,730	1,230	163	791	1,230	✟ 1,460
14	3,010	2,150	✟ 357	1,390	2,180	✟ 4,590	1,850	✟ 1,090	132	809	1,030	1,270
15	3,050	✟ 1,920	316	1,370	✟ 509	4,450	✟ 1,910	798	371	1,020	869	1,060
16	✟3,080	1,200	324	1,610	501	4,840	1,900	600	332	✟ 957	858	1,190
17	3,100	650	385	1,800	1,060	4,200	1,780	572	✟ 456	706	1,020	✟ 1,200
18	3,390	727	487	✟ 1,640	487	✟ 4,270	✟ 1,510	1,160	682	565	1,010	922
19	3,570	763	551	1,420	339	4,270	1,490	✟ 1,320	537	551	840	848
20	3,500	1,640	533	1,590	327	4,240	1,550	1,230	396	798	646	830
21	✟3,380	✟ 2,280	501	2,080	327	4,240	1,680	660	519	777	632	1,170
22	3,300	2,490	✟ 388	2,580	✟ 327	4,310	1,590	✟ 304	586	742	625	554
23	3,390	2,450	310	2,790	322	4,270	✟ 1,560	459	586	614	583	✟ 417
24	3,420	2,370	554	2,780	505	4,030	1,480	456	424	✟ 505	646	305
25	3,060	1,480	745	✟ 2,690	858	✟ 4,170	1,340	498	1,670	459	✟ 505	374
26	3,140	1,280	833	2,540	879	4,380	1,300	505	✟ 1,520	473	381	480
27	3,210	1,490	780	2,670	713	4,240	1,280	583	731	883	353	519
28	3,040	✟ 1,370	✟ 494	2,810	925	4,170	1,470	519	261	844	300	463
29	2,900		381	2,820	1,020	4,170	1,480	420	343	717	295	664
30	✟3,080		657	2,850	✟ 1,310	3,880	1,480	664	424	773	886	650
31	2,690		975		1,300		✟ 1,370	1,300		660		901
Sum	88,420	48,610	23,014	51,175	44,109	114,100	54,270	26,363	17,255	20,271	23,660	31,921

Current Year 1969									Period 1954 - 1969		
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.	88.91	83.66	24	7,060	4	1,280	2,850	175,421	96,586	220,916	1,090
Feb.	86.61	82.32	† 14	3,050	† 25	611	1,740	96,432	74,831	241,900	830
Mar.	85.37	81.27	3	2,320	23	290	742	45,648	77,639	235,500	339
Apr.	86.42	82.64	† 28	2,930	4	749	1,710	101,489	88,329	155,700	3,160
May	89.11	81.43	13	7,060	† 19	318	1,420	87,477	114,400	202,400	35,360
June	88.88	83.73	16	5,260	1	1,320	3,810	226,345	155,563	226,345	7,850
July	86.61	83.53	1	3,350	27	1,270	1,750	107,702	80,560	253,970	2,000
Aug.	84.09	81.04	2	1,730	† 21	230	851	52,297	59,665	257,297	943
Sept.	84.68	80.25	25	2,210	28	65.0	576	34,252	207,447	1,862,856	3,920
Oct.	83.01	81.10	15	1,090	† 3	258	653	40,201	258,910	2,326,000	1,370
Nov.	83.53	81.17	30	1,410	† 26	290	788	46,927	141,849	1,438,000	1,430
Dec.	85.24	81.07	12	2,300	20	258	1,030	63,302	87,853	540,100	1,500
Yearly	89.11	80.25		7,060		65.0	1,490	1,077,493	1,443,632	4,640,968	114,749

✟ Discharge measurement made on this day † And other days

RIO GRANDE FLOODWAY DISCHARGES
LOWER RIO GRANDE VALLEY

On the United States Side

Part of the excess water from floods entering the Lower Rio Grande Valley is diverted from the river through the United States floodway system, whose inlet is located approximately 6 miles upstream from Anzalduas Dam.

Floodwater entering the system is measured at the Mission Branch Station South of McAllen and continues to flow eastward for about 22 miles to a point 3 miles southwest of Mercedes, Texas, where the floodway divides, one channel going northeastward through the Arroyo Colorado Floodway to the Gulf of Mexico, and the other going to the Gulf via the North Floodway, traveling first northward and then eastward to the Gulf. The flow into the Arroyo Colorado Floodway is controlled by a divisor dike presently under construction at the point of division. The flow of the Arroyo Colorado Floodway is measured at El Fuste Siphon South of Mercedes and further downstream at the bridge on U. S. Highway No. 83 south of Harlingen. The North Floodway flow is measured at the bridge on old U. S. Highway No. 83 west of Mercedes and further downstream at the bridge on U. S. Highway No. 77 near Sebastian.

In 1969 no flood flow was diverted through this floodway system.

On the Mexican Side

Part of the excess water from floods entering the Lower Rio Grande Valley is diverted from the river through the Mexican floodway system, with inlets located approximately 38 miles (Retamal Heading), 51 miles (San Rafael), and 107 miles (Floodway No. 2), respectively, downstream from Anzalduas Dam. Floodway No. 3, 1.2 miles upstream from the Brownsville-Matamoros Bridge, is greatly obstructed and is considered to be inoperative.

Floodwater diverted through Retamal Heading is measured at a cableway station 0.9 mile downstream from the headgate. It flows through Retamal Canal into Culebrón and Villa Cárdenas Lakes from which it discharges through floodgates into Floodway No. 1 and flows southeastward into the Gulf of Mexico. Floodwater diverted at San Rafael is measured near the intake and flows through San Rafael Drain into Culebrón and Villa Cárdenas Lakes from which it discharges into Floodway No. 1. Floodwater entering Floodway No. 2 is measured at the Matamoros-Reynosa highway crossing and flows south and east into the Gulf of Mexico.

In 1969 no flood flows were diverted into this floodway system. There were no diversions for irrigation purposes through Retamal Canal in 1969.

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE - ANZALDUAS DAM TO PROGRESO

Since June 1956 the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam has been under the jurisdiction of the 93rd District Court of Texas, the disposition of such water being made through its Special Water Master.

During 1969, 145,638 irrigable acres and several towns and rural homes were served water diverted from the Rio Grande between Anzalduas Dam and the Progreso International Bridge under the jurisdiction of this Court. The area irrigated from the Rio Grande in this river reach was 18.7% of the total irrigable acres below Falcon Dam.

The total diversion during 1969 in this river reach was 219,539 acre-feet, or 20.6% of the total water diverted from the Rio Grande below Falcon Dam. About 95% of the water diverted in this river reach was determined by this Commission through continuous records of discharge at open channel rating stations and at deflection meter stations developed by this Commission. The records for the rest of these diversions were furnished by the Special Water Master and were either measured by flow meters or were determined from periodic current meter measurements of pump discharges and recorded pump operating time. More than one crop per year is often grown on parts of this land.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	322	602	13.8	344	460	213	527	355	7.1	303	238	0
2	362	152	0	341	409	600	512	290	0	299	98.0	97.9
3	339	168	15.2	418	158	754	521	87.5	9.5	296	281	76.4
4	195	158	9.2	458	85.6	846	502	368	6.5	233	312	20.6
5	174	163	1.8	371	439	788	278	330	0	70.9	315	15.2
6	422	499	90.1	99.7	436	667	146	273	0	370	316	9.8
7	534	462	155	362	474	673	461	262	5.0	368	292	0
8	598	370	181	422	546	484	* 585	215	15.7	284	250	8.7
9	525	108	45.3	401	578	761	596	57.8	101	276	92.7	8.1
10	440	345	198	305	344	855	611	52.6	110	280	244	7.8
11	387	458	152	288	131	890	518	237	107	244	297	9.8
12	206	522	57.2	326	564	897	547	274	81.5	70.6	289	5.8
13	544	320	71.2	88.8	328	939	424	232	15.1	315	307	3.9
14	652	126	173	412	96.4	876	498	217	5.3	308	301	7.5
15	662	107	34.0	470	178	539	621	204	116	273	230	188
16	660	40.9	34.6	482	179	807	609	131	167	294	71.2	189
17	634	128	189	504	93.9	863	622	13	163	306	239	208
18	640	12.3	231	481	0	888	587	195	245	292	268	204
19	419	4.8	109	354	0	932	550	245	248	71.7	254	206
20	667	9.4	170	174	0	886	212	335	171	260	256	180
21	772	75.4	189	495	64.7	800	504	62.2	69.1	402	271	63.4
22	773	13.9	54.9	671	112	466	510	59.7	172	428	261	211
23	779	0	40.0	673	21.9	724	508	97.6	77.3	386	59.9	246
24	789	0	147	675	6.5	846	481	2.0	77.1	365	124	150
25	683	15.4	285	672	19.9	868	460	15.0	66.0	377	142	61.7
26	333	12.9	282	642	234	858	320	22.2	65.1	65.3	67.1	172
27	860	26.9	318	319	329	847	152	16.7	163	369	53.7	173
28	877	27.4	333	634	423	846	394	36.8	12.9	296	73.8	61.2
29	853		311	630	463	639	492	179	304	138	57.5	174
30	784		92.6	633	470	404	467	93.0	282	188	31.8	140
31	740		429		448		424			286		60.5
Sum	4,927.3		13,145.5		22,456		4,958.1		8,514.5			2,959.3
	17,625		4,411.9		8,091.9		14,639		2,862.2		6,092.7	

Month	Average Rainfall Inches **		Current Year 1969 Ø Extreme Second-Feet High		Low		Average Second-Feet	Total Acre-Feet	Period 1957-1969 Acre-Feet		
	1957-1969	1969	Day		Day				Average	Maximum	Minimum
Jan.	1.36	0.56	28	877	5	174	569	34,959	11,204	34,959	723
Feb.	1.33	1.80	1	602	† 23	0	176	9,773	8,711	28,535	1,140
Mar.	.72	.59	31	429	2	0	142	8,751	13,457	36,100	1,050
Apr.	1.39	.13	24	675	13	88.8	438	26,074	18,266	26,074	3,630
May	2.58	2.25	9	578	† 18	0	261	16,050	19,820	35,500	3,091
June	2.35	.93	13	939	1	213	749	44,541	30,258	44,541	14,658
July	.85	.44	17	622	6	146	472	29,036	24,704	41,100	13,105
Aug.	1.70	3.92	4	368	31	0	156	9,834	16,138	25,800	7,922
Sept.	3.77	3.84	29	304	† 2	0	95.4	5,677	13,087	28,000	3,214
Oct.	2.87	1.02	22	428	26	65.3	275	16,889	14,939	29,215	2,059
Nov.	1.52	1.58	6	316	30	31.8	203	12,085	10,144	22,818	1,015
Dec.	1.30	.17	23	246	† 1	0	95.5	5,870	9,444	17,500	1,978
Yearly	21.74	17.23		939		0	303	219,539	190,172	241,270	147,810

* Partly estimated Ø Mean daily ** United States side - Average of several stations in the reach
† And other days

RIO GRANDE NEAR PROGRESO, TEXAS

DESCRIPTION: Gravity well, water-stage recorder, and digital transmitter located on the downstream side of the center pier of the Progreso International Bridge at latitude 26° 03' 45", longitude 97° 57' 00", and river mile 123.8; 0.8 river mile downstream from the Progreso pumping plant, 2 miles south of Progreso, Texas, 47.3 river miles downstream from Anzaldúas Dam, and 1,124.4 river miles downstream from the American Dam at El Paso, Texas. Meter measurements are made from the bridge. An auxiliary gage well and water-stage recorder located about 300 feet upstream from the bridge are used when the low-flow channel shifts to the left bank. The zero of the gage at both recorders is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 60 discharge measurements during the year, 54 by the Mexican Section and 6 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: December 1952 through August 24, 1953; and December 1953 through 1969.

REMARKS: Except for diversions, tributary inflows, and drainage returns below Falcon Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcon Reservoir, 150 miles upstream. Excessive upstream flood flows are partly diverted through the Mission inlet of the United States floodway system and through Retamal Heading of the Mexican floodway system before reaching this station. The transmitter relays gage height data upon interrogation by telephone via commercial circuits. Prior to January 1, 1969, the zero of the gage was 52.56 feet above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 60,700 second-feet on September 26, 1967 with a gage height of 24.84 feet. Min. no flow several days in June, July, and August 1953.

Average Flow in Second-Feet

Daily:	Max. 48,400	Sept. 26, 1967	Min. 0	Frequently	1953
Monthly:	Max. 16,730	Oct. 1958	Min. 5.1	June	1953
Yearly:	Max. 3,960	1967	Min. 666		1957

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	982	2,080	1,430	‡ 629	2,520	908	3,380	1,060	‡ 1,250	237	438	667
2	1,580	2,270	1,550	643	2,200	‡ 1,130	2,640	904	1,250	277	357	‡1,210
3	1,920	1,850	1,840	622	2,000	1,550	2,300	865	1,250	305	480	1,070
4	1,850	‡1,120	‡2,100	551	1,880	1,770	2,080	908	1,360	287	‡ 544	1,040
5	1,600	1,060	2,090	445	1,900	2,050	1,890	‡ 897	1,190	249	551	‡1,640
6	1,890	1,380	1,740	643	‡ 2,170	2,400	2,030	1,110	692	‡ 237	618	1,760
7	‡1,630	1,480	876	791	2,260	2,660	‡ 2,170	900	477	258	614	1,570
8	1,720	1,510	583	‡ 745	2,140	2,760	1,420	682	470	346	537	1,520
9	2,030	1,330	611	865	2,040	3,160	1,320	738	‡ 448	364	554	‡1,640
10	2,120	1,480	685	968	2,050	‡ 2,500	1,410	664	364	385	717	1,760
11	2,150	‡1,400	540	961	2,340	2,400	1,520	‡ 477	424	342	‡ 703	1,670
12	2,120	1,450	‡ 367	798	2,280	2,790	1,470	646	338	231	777	893
13	2,120	1,330	321	636	‡ 2,290	2,840	1,490	770	243	‡ 294	823	1,110
14	‡2,210	1,980	338	971	2,950	2,970	‡ 1,610	904	257	406	830	1,580
15	2,360	2,240	424	‡ 961	2,330	3,570	1,470	855	232	445	763	‡1,290
16	2,460	2,010	313	872	876	3,810	1,490	717	216	604	742	1,020
17	2,510	1,380	340	‡ 1,020	548	‡ 3,710	1,470	576	‡ 237	629	773	953
18	2,540	‡ 876	‡ 307	1,250	1,060	3,350	1,340	‡ 572	216	480	‡ 742	1,060
19	2,870	840	317	1,170	925	3,290	1,110	735	318	338	713	791
20	3,170	925	452	1,110	‡ 512	3,230	1,150	957	364	‡ 431	671	671
21	‡2,900	1,650	427	1,410	438	3,280	1,440	989	333	420	533	724
22	2,750	2,310	466	‡ 1,560	360	3,470	‡ 1,350	809	‡ 388	420	‡ 364	‡ 996
23	2,710	2,590	463	2,010	‡ 248	‡ 3,710	1,250	463	396	357	438	682
24	2,750	2,610	374	2,220	262	3,380	1,190	385	406	309	544	364
25	2,790	‡2,490	‡ 367	2,240	431	3,100	1,130	‡ 558	452	244	579	286
26	2,730	1,680	445	2,100	745	3,180	1,030	540	1,160	191	‡ 456	326
27	2,860	1,320	618	2,180	‡ 770	3,330	1,110	572	1,340	‡ 264	396	353
28	‡2,530	1,450	597	2,510	431	3,310	1,160	576	953	456	357	360
29	2,310		403	‡ 2,410	420	3,470	1,110	586	‡ 342	533	374	441
30	2,260		156	2,430	494	‡ 3,780	1,110	509	203	579	364	424
31	2,440		353		766		1,120	533		540		459
Sum	70,862	46,091	21,893	37,721	42,636	86,858	47,760	22,457	17,569	11,458	17,352	30,330

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1954 - 1969 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	59.78	56.17	20	3,220	1	890	2,280	140,567	97,301	241,800	17,340
Feb.	59.12	56.00	24	2,660	18	788	1,650	91,451	77,069	371,900	12,620
Mar.	58.40	53.77	† 4	2,160	30	86.5	706	43,447	72,970	379,400	4,990
Apr.	58.56	54.79	28	2,560	5	403	1,260	74,822	81,512	144,000	32,060
May	59.45	54.13	14	3,150	† 23	184	1,380	84,577	104,310	153,028	33,164
June	60.53	55.81	†16	3,880	1	830	2,900	172,283	127,481	176,300	63,350
July	60.50	56.17	1	3,850	26	1,010	1,540	94,680	76,781	235,822	16,970
Aug.	56.43	54.40	6	1,150	24	314	724	44,542	55,621	189,578	10,400
Sept.	56.89	53.74	4	1,360	30	187	586	34,843	137,489	837,532	21,650
Oct.	55.28	53.74	†16	664	26	184	371	22,725	157,463	1,028,000	14,080
Nov.	55.77	54.30	14	848	2	319	579	34,413	92,243	735,000	18,000
Dec.	57.64	54.13	†10	1,790	25	270	978	60,150	80,476	487,200	7,370
Yearly	60.53	53.74		3,880		86.5	1,240	898,500	1,160,716	2,869,204	482,410

Current Year 1969

‡ Discharge measurement made on this day † And other days

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE – PROGRESO TO SAN BENITO

Since June 1956 the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam has been under the jurisdiction of the 93rd District Court of Texas, the disposition of such water being made through its Special Water Master.

During 1969, 313,361 irrigable acres and several towns and rural homes were served water diverted from the Rio Grande between the Progreso International Bridge and the gage near San Benito under the jurisdiction of this Court. The area irrigated from the Rio Grande in this river reach was 40.3% of the total irrigable acres below Falcon Dam.

The total diversion during 1969 in this river reach was 471,764 acre-feet or 44.4% of the total water diverted from the Rio Grande below Falcon Dam. About 98% of the water diverted in this river reach was determined by this Commission through continuous records of discharges at open channel rating stations and at deflection meter stations developed by this Commission. The records for the rest of these diversions were furnished by the Special Water Master and were either measured by flow meters or were determined from periodic current meter measurements of pump discharges and recorded pump operating time. More than one crop per year is often grown on parts of this land.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	839	1,320	61.2	403	1,330	565	1,440	654	72.0	91.1	444	327
2	1,140	967	53.4	447	1,290	875	1,340	514	42.1	85.1	406	450
3	1,140	908	118	536	1,200	1,060	1,110	446	29.7	204	312	592
4	989	851	90.7	509	1,160	1,430	1,060	701	0	180	401	605
5	861	1,030	44.1	215	1,170	1,440	1,040	501	38.5	38.5	541	390
6	1,340	934	103	125	1,240	1,460	952	448	52.6	41.3	535	367
7	1,520	775	385	402	1,320	1,570	784	408	48.0	57.2	534	366
8	1,520	708	262	466	1,350	1,650	* 938	395	30.0	227	403	153
9	1,730	504	60.5	478	1,210	1,840	* 940	195	0	308	404	104
10	1,750	784	107	612	1,220	1,900	* 931	179	50.5	270	542	179
11	1,560	847	68.0	633	1,110	1,770	* 798	371	237	75.1	602	78.4
12	1,560	883	11.8	483	1,180	1,730	* 786	493	214	38.7	632	171
13	1,700	670	159	367	499	1,860	* 831	405	121	73.8	631	56.0
14	1,690	384	23.2	622	709	1,790	* 842	615	37.4	292	613	54.1
15	1,870	312	29.9	704	351	2,010	982	619	79.1	340	467	130
16	1,660	171	25.4	694	229	1,570	1,100	499	74.2	454	378	316
17	1,690	191	86.6	875	84.0	2,100	1,120	372	60.0	471	534	344
18	1,900	218	48.8	928	55.5	2,170	1,100	512	92.4	396	560	184
19	2,010	373	145	934	149	2,200	888	683	190	138	612	194
20	2,050	147	343	708	96.3	2,360	725	719	162	258	465	108
21	1,960	139	289	1,130	63.1	2,350	848	638	70.8	362	420	105
22	1,940	116	95.7	1,190	294	2,120	* 858	567	257	361	343	307
23	1,920	36.3	78.8	1,260	267	2,100	* 841	362	252	358	285	328
24	1,900	0	167	1,460	261	2,280	* 827	275	154	339	313	154
25	1,700	44.7	275	1,590	144	2,430	799	211	59.9	148	472	53.1
26	1,400	83.3	323	1,450	307	2,330	557	247	69.8	140	310	325
27	1,690	71.0	238	1,180	451	2,330	538	227	72.0	276	115	218
28	1,530	281	83.1	1,370	416	2,100	* 728	240	0	356	169	166
29	1,610		49.3	1,480	514	1,360	* 693	205	41.1	338	151	188
30	1,330		104	1,450	481	1,430	* 672	127	77.6	484	140	302
31	1,470		219		494		* 641	58.2		534		390
Sum	48,969	13,748.3	4,147.5	24,701	20,644.9	54,180	27,709	12,886.2	2,684.7	7,734.8	12,734	7,704.6

Current Year 1969 — **Period 1957 - 1969**

Month	Average Rainfall inches** 1957-1969	Average Rainfall inches** 1969	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	1.45	0.49	20	2,050	1	839	1,580	97,130	37,325	97,130	4,872
Feb.	1.67	2.55	1	1,320	24	0	491	27,270	19,494	45,337	4,807
Mar.	.78	.68	7	385	12	11.8	134	8,227	21,543	54,200	3,280
Apr.	1.43	.18	25	1,590	6	125	823	48,994	43,190	74,653	12,900
May	3.10	2.69	8	1,350	18	55.5	666	40,949	48,835	74,629	10,366
June	2.65	.77	25	2,430	1	565	1,810	107,466	79,112	123,000	46,957
July	1.12	.45	1	1,440	27	538	894	54,961	43,110	77,132	13,077
Aug.	2.22	4.90	20	719	31	58.2	416	25,560	27,551	45,900	13,538
Sept.	4.53	6.63	22	257	† 4	0	89.5	5,325	24,906	59,400	4,308
Oct.	3.01	.85	31	534	5	38.5	250	15,342	24,565	58,164	5,146
Nov.	1.83	1.53	12	632	27	115	424	25,258	19,452	44,359	4,853
Dec.	1.48	.21	4	605	25	53.1	249	15,282	21,565	37,500	6,663
Yearly	25.27	21.93		2,430		0	652	471,764	410,648	525,771	266,680

* Partly estimated Ø Mean daily ** United States side - Average of several stations in the reach
† And other days

RIO GRANDE NEAR SAN BENITO, TEXAS

DESCRIPTION: Cableway, concrete control weir, bubbler gage, water-stage recorders (graphic and digital), and impulse-type transmitter, located on the left bank at latitude 26° 02' 00", longitude 97° 43' 40", and river mile 96.5; 5.6 river miles downstream from San Benito pumping plant, about 9.5 miles southwest of San Benito, Texas, and 1,151.7 river miles downstream from the American Dam at El Paso, Texas. An auxiliary gage well is located 0.2 river mile upstream from the gage. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 23 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: November 26, 1952 through August 25, 1953, and December 1953 through 1969.

REMARKS: Except for diversions, tributary inflows, and drainage returns below Falcon Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcon Reservoir, 177.3 river miles upstream. Excessive upstream flood flows are partly diverted through the United States and Mexican floodway systems before reaching this station. The transmitter relays gage height data via leased telephone circuits to the Anzalduas Dam office of the United States Section of this Commission and to the McAllen, Texas office of the Special Water Master, who, under the jurisdiction of the 93rd District Court of Texas, has control of the United States portion of water in Falcon Reservoir and in the Rio Grande below Falcon Dam. The data is recorded automatically at both locations. The concrete control weir was constructed in December 1965 and the gage was moved to its present location just above the weir on January 4, 1967.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 25,000 second-feet on September 29, 1967 with a gage height of 61.05 feet. Min. no flow occurs frequently.

Average Flow in Second-Feet ‡

Daily:	Max.	24,800	September 29, 1967	Min.	0	Frequently
Monthly:	Max.	13,400	October 1967	Min.	39.5	December 1956
Yearly:	Max.	2,970	1967	Min.	200	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	289	699	1,080	169	897	196	1,820	399	785	189	147	228
2	261	931	1,230	✟ 222	802	262	1,150	353	1,110	158	139	410
3	635	1,030	1,370	164	651	241	838	354	✟ 1,180	✟ 164	120	✟ 610
4	809	524	1,640	130	572	266	714	305	1,140	149	132	419
5	836	✟ 207	1,790	123	501	✟ 235	610	281	✟ 1,110	158	✟ 136	786
6	587	161	1,690	319	526	454	542	✟ 422	936	172	115	1,250
7	✟ 384	489	913	426	✟ 661	676	705	552	644	180	110	1,230
8	181	647	413	317	582	658	459	388	558	187	130	1,150
9	252	756	416	309	562	887	✟ 273	394	610	174	140	1,330
10	363	621	550	362	548	506	304	454	534	153	146	1,490
11	490	542	557	337	742	276	392	334	387	175	161	✟ 1,580
12	535	525	489	291	830	548	465	148	343	248	155	1,200
13	492	539	344	315	1,170	694	432	180	256	219	164	754
14	441	975	290	255	1,440	583	614	273	211	188	209	1,320
15	490	1,460	389	298	1,840	1,030	541	280	215	157	282	1,220
16	614	1,730	354	✟ 210	991	1,380	360	260	184	✟ 162	286	895
17	734	1,250	287	171	576	1,220	329	259	✟ 166	184	282	✟ 576
18	578	830	283	169	596	926	264	180	177	175	228	771
19	585	518	254	202	836	768	204	118	165	156	170	715
20	866	620	✟ 195	182	534	674	254	✟ 102	161	182	✟ 147	564
21	841	901	172	202	434	747	385	239	206	173	164	553
22	✟ 669	1,520	192	217	✟ 336	903	412	301	260	148	165	677
23	612	1,990	327	355	193	1,130	367	263	210	127	146	557
24	669	2,230	287	559	147	962	293	219	240	118	147	382
25	760	2,200	228	457	140	592	264	233	283	109	178	305
26	965	✟ 1,830	162	427	233	565	313	266	571	128	185	232
27	938	1,160	177	602	394	761	394	276	1,010	116	192	134
28	817	1,110	390	830	282	845	431	339	999	101	271	150
29	622		426	716	149	1,430	397	352	572	117	221	181
30	644		305	645	102	1,760	365	383	281	153	219	250
31	825		145		100		385	413		161		189
Sum	18,784	27,995	17,345	9,981	18,367	22,175	15,276	9,320	15,504	4,981	5,287	22,108

Current Year 1969 — **Period 1954-1969**

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	35.94	34.46	26	993	8	141	606	37,258	48,649	227,000	2,920
Feb.	39.80	34.40	24	2,260	6	109	1,000	55,528	50,587	363,000	3,380
Mar.	38.49	34.42	5	1,850	31	119	560	34,404	44,954	360,000	2,560
Apr.	35.76	34.40	28	886	5	112	333	19,797	36,414	118,000	11,500
May	39.02	34.35	15	2,000	31	90.0	592	36,431	47,654	128,576	16,873
June	38.83	34.44	30	1,920	1	120	739	43,984	47,140	81,119	16,100
July	39.26	34.60	1	2,050	19	164	493	30,300	38,129	197,219	4,690
Aug.	35.36	34.38	7	601	20	90.5	301	18,486	27,723	136,690	3,100
Sept.	36.26	34.36	3	1,210	21	120	517	30,752	96,461	599,652	7,710
Oct.	34.77	34.31	12	262	29	87.8	161	9,880	122,972	826,802	3,840
Nov.	34.88	34.38	15	309	7	107	176	10,487	68,266	662,000	5,640
Dec.	37.32	34.40	11	1,610	27	111	713	43,851	58,430	479,000	2,430
Yearly	39.80	34.31		2,260		87.8	513	371,158	687,379	2,152,943	145,520

‡ Period 1954-1969 ✟ Discharge measurement made on this day

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE - SAN BENITO TO BROWNSVILLE

Since June 1956 the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam has been under the jurisdiction of the 93rd District Court of Texas, the disposition of such water being made through its Special Water Master.

During 1969, 116,559 irrigable acres and several towns and rural homes were served water diverted from the Rio Grande between the river gages near San Benito and near Brownsville under the jurisdiction of this Court. The area irrigated from the Rio Grande in this river reach was 15.0% of the total irrigable acres below Falcon Dam.

The total diversion during 1969 in this river reach was 130,822 acre-feet or 12.3% of the total water diverted from the Rio Grande below Falcon Dam. About 89% of the water diverted in this river reach was determined by this Commission through continuous records of discharge at open channel rating stations and at deflection meter stations developed by this Commission. The records for the rest of these diversions were furnished by the Special Water Master and were either measured by flow meters or were determined from periodic current meter measurements of pump discharges and recorded pump operating time. More than one crop per year is often grown on parts of this land.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	262	346	6.2	42.1	366	97.8	485	310	86.2	19.7	40.0	7.9
2	252	264	21.1	45.7	330	123	530	261	142	83.3	6.6	3.7
3	285	393	9.9	32.1	365	213	* 555	139	88.4	31.9	124	11.2
4	267	408	21.4	39.0	387	277	* 527	208	21.4	17.7	52.8	12.2
5	280	353	8.9	8.8	396	255	* 524	215	7.7	24.9	61.5	26.0
6	270	252	27.1	25.9	320	245	* 470	158	18.4	79.9	98.9	40.5
7	235	248	9.2	188	410	344	* 438	253	12.0	96.8	76.2	4.6
8	267	311	21.1	245	418	482	451	200	10.2	134	58.0	8.4
9	165	307	20.6	220	391	527	451	84.4	17.5	106	55.1	8.6
10	219	386	9.6	241	361	549	294	24.2	11.3	108	133	8.2
11	326	400	15.6	268	314	397	396	92.9	49.9	136	128	52.0
12	439	334	13.6	159	318	198	409	82.1	22.3	71.2	121	13.3
13	484	196	40.7	65.1	36.0	529	441	54.7	11.6	135	147	28.9
14	422	53.1	37.5	165	42.0	542	469	132	9.8	142	150	23.9
15	414	64.2	33.5	140	46.6	606	* 310	86.8	12.7	112	135	23.6
16	437	36.3	8.4	157	39.8	697	* 292	81.5	17.0	92.2	34.8	63.5
17	535	31.0	14.0	184	44.3	707	* 298	41.0	14.9	75.6	162	64.0
18	557	36.1	1.8	76.9	22.4	701	226	152	88.1	16.9	240	143
19	443	37.0	7.7	77.8	38.5	671	204	130	16.6	13.7	140	195
20	520	38.5	27.9	121	41.4	647	143	102	11.5	27.1	133	71.2
21	607	40.1	6.1	129	35.8	629	248	61.7	21.2	16.4	118	43.6
22	565	33.9	19.4	160	124	580	* 317	104	38.3	46.9	48.1	193
23	516	40.2	7.6	146	64.5	528	* 335	120	75.9	70.4	9.7	161
24	471	37.9	35.0	271	50.4	581	* 292	34.0	72.2	77.8	78.6	33.6
25	480	33.6	53.9	358	21.7	571	* 231	143	117	8.1	11.6	27.3
26	419	31.4	48.9	329	24.9	596	* 231	164	96.5	18.8	13.8	25.8
27	425	39.5	56.4	344	56.1	564	* 265	195	17.7	14.1	8.4	24.8
28	442	36.5	47.9	415	44.5	598	* 267	192	26.9	34.3	4.8	29.1
29	462		30.8	447	150	556	367	211	27.2	126	4.9	38.3
30	463		21.9	444	160	539	299	61.8	21.2	127	5.4	82.7
31	457		42.7		56.3		300	2.0		123		84.9
Sum	12,386	4,787.3	726.4	5,544.4	5,475.2	14,549.8	*11,065	4,096.1	1,183.6	2,186.7	2,400.2	1,553.8

Month	Average Rainfall Inches**		Current Year 1969 ø Extreme Second-Feet High			Low	Average Second-Feet	Total Acre-Feet	Period 1957-1969 Acre-Feet		
	1957-1969	1969	Day		Day				Average	Maximum	Minimum
Jan.	1.65	0.46	21	607	9	165	400	24,568	10,769	24,568	1,290
Feb.	2.08	4.04	4	408	17	31.0	171	9,496	6,219	12,284	1,028
Mar.	.73	1.05	27	56.4	18	1.8	23.4	1,441	5,710	15,200	705
Apr.	1.45	.14	29	447	5	8.8	185	10,997	11,246	21,828	2,180
May	2.98	4.26	8	418	25	21.7	177	10,860	14,366	27,670	2,561
June	2.67	.22	17	707	1	97.8	485	28,860	20,103	32,279	8,280
July	1.08	.45	3	* 555	20	143	* 357	* 21,947	12,408	23,145	3,687
Aug.	2.50	4.53	1	310	31	2.0	132	8,125	8,072	10,700	4,291
Sept.	5.46	5.35	2	142	5	7.7	39.5	2,348	5,956	12,600	876
Oct.	3.11	2.58	14	142	25	8.1	70.5	4,337	6,200	11,300	1,591
Nov.	1.69	2.77	18	240	28	4.8	80.0	4,761	5,078	9,021	2,320
Dec.	1.70	.08	19	195	2	3.7	50.1	3,082	6,384	11,200	2,163
Yearly	27.10	25.93		707		1.8	181	130,822	112,511	161,503	73,788

* Partly estimated ø Mean daily

** United States side - Average of several stations in the reach

RIO GRANDE NEAR BROWNSVILLE, TEXAS

DESCRIPTION: Cableway, bubbler gage, and water-stage recorder located on the left bank at latitude 25° 52' 35", longitude 97° 27' 15", and river mile 48.8; 1,000 feet downstream from El Jardín pumping plant, 6.8 river miles downstream from the international highway bridge (Gateway) between Brownsville, Texas and Matamoros, Tamaulipas, and 1,199.4 river miles downstream from the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 20 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1934 through 1969.

REMARKS: Except for diversions, tributary inflows, and drainage returns below Falcon Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcon Reservoir, 225 river miles upstream. Excessive upstream flood flows are partly diverted into the United States and Mexican floodway systems before reaching this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 31,700 second-feet on October 8, 1945 with a gage height of 31.48 feet. Min. no flow occurs frequently.

Average Flow in Second-Feet

Daily:	Max.	30,800	Sept. 14, 1942; Oct. 8, 1945	Min.	0	Frequently
Monthly:	Max.	23,200	Oct. 1941	Min.	0	June, July 1953
Yearly:	Max.	9,010	1941	Min.	42.1	1956

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	92.8	312	1,060	212	244	59.7	1,130	85.3	440	322	57.7	228
2	85.2	398	1,080	156	475	59.6	1,030	98.9	677	147	123	259
3	84.1	537	1,190	203	429	141	627	150	853	↟ 159	90.6	370
4	297	552	1,290	185	279	↟ 64.3	434	199	↟ 984	160	62.4	↟ 573
5	526	238	1,660	160	180	56.1	364	98.1	961	158	↟ 68.2	639
6	513	↟ 83.6	↟1,750	157	124	38.4	295	↟ 89.2	945	124	72.6	732
7	392	50.7	1,560	205	108	112	434	184	790	95.1	57.9	833
8	219	116	909	219	↟ 186	294	652	273	597	60.1	62.9	926
9	↟105	337	569	↟186	132	251	↟ 321	239	498	66.0	59.8	1,040
10	103	885	499	↟138	104	360	121	332	517	76.2	67.1	1,200
11	90.7	247	562	134	156	106	144	377	466	32.2	55.6	1,260
12	103	163	594	105	326	42.2	156	286	373	41.3	63.1	1,360
13	72.1	283	519	166	762	110	224	158	327	166	56.2	968
14	56.5	517	418	225	1,020	79.4	229	120	257	120	35.6	751
15	↟ 59.0	919	365	148	1,500	96.0	328	199	214	66.8	41.8	1,180
16	54.4	1,360	426	136	1,670	459	318	186	191	110	159	1,040
17	61.9	1,480	428	74.6	953	627	174	260	↟ 170	↟ 108	231	780
18	80.6	1,110	374	47.4	624	540	105	197	115	98.2	138	↟ 562
19	59.7	753	354	37.2	618	341	83.1	80.3	150	164	122	583
20	62.7	543	307	57.8	728	199	75.0	↟ 53.4	168	147	↟ 59.5	568
21	150	554	286	68.5	↟ 573	102	95.1	67.1	154	171	30.9	544
22	185	903	250	43.9	451	121	112	173	180	154	30.0	457
23	89.7	1,600	245	58.7	327	404	116	201	182	131	108	475
24	77.9	2,030	297	93.3	271	590	75.7	244	190	103	139	470
25	119	2,170	285	137	226	436	53.8	188	140	81.4	110	408
26	240	2,130	237	80.7	202	156	58.2	125	197	102	137	341
27	455	1,650	194	97.0	113	52.7	136	120	451	115	170	282
28	449	1,130	165	148	368	151	111	146	857	133	147	214
29	323		324	230	300	355	116	175	824	101	169	191
30	171		406	207	63.1	873	100	235	542	54.5	200	171
31	151		326		31.4		98.9	431		61.2		172
Sum	5,528.3	22,551.3	18,929	4,116.1	13,543.5	7,276.4	8,316.8	5,770.3	13,410	3,628.0	2,924.9	19,577

Month	Current Year 1969 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1954 - 1969 Acre-Feet Average	Maximum	Minimum
Jan.	7.43	4.11	6	578	13	51.3	178	10,965	35,648	224,000	283
Feb.	13.09	4.05	26	2,210	7	43.8	805	44,731	44,582	362,000	1,060
Mar.	11.85	4.55	6	1,770	28	137	611	37,546	39,112	361,000	2,050
Apr.	5.50	3.61	1	285	22	1.2	137	8,164	24,458	127,000	875
May	11.97		16	1,820	†27	0	437	26,864	30,806	127,595	4,140
June	9.92		30	1,140	12	0	243	14,433	26,090	60,836	2,430
July	10.62	3.62	1	1,350	19	4.2	268	16,496	29,692	190,638	1,120
Aug.	6.07	3.74	31	473	20	38.7	186	11,445	18,537	97,786	218
Sept.	9.08	4.18	4	1,000	18	68.2	447	26,599	82,538	516,325	950
Oct.	6.17	3.75	1	409	11	7.8	117	7,196	98,626	738,596	756
Nov.	5.13	3.40	17	266	20	11.8	97.5	5,802	58,264	528,000	1,290
Dec.	10.70	4.47	12	1,400	†30	143	632	38,831	53,031	480,000	524
Yearly	13.09			2,210		0	344	249,072	541,384	1,863,269	30,596

↟ Discharge measurement made on this day † And other days

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE – BROWNSVILLE TO THE GULF

Since June 1956 the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam has been under the jurisdiction of the 93rd District Court of Texas, the disposition of such water being made through its Special Water Master.

During 1969, 6,400 acres, or 0.8% of the total irrigable acreage below Falcon Dam, were served by diversions between the gage near Brownsville and the mouth of the river under the jurisdiction of this Court.

The total diversion during 1969 in this river reach was 3,154 acre-feet, or 0.3% of the total water diverted from the Rio Grande below Falcon Dam. All the records of diversions in this river reach were furnished by the Special Water Master and were determined by periodic current meter measurements of pump discharges and recorded pump operating time. More than one crop per year is often grown on parts of this land.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	19.3	0	1.0	13.5	0	11.6	0	0	0	0	0
2	0	25.7	0	0	13.5	0	11.6	0	0	0	0	0
3	1.3	35.6	0	.5	13.5	2.5	11.6	0	9.6	0	0	0
4	0	27.8	0	.5	15.9	3.0	11.6	0	5.4	0	0	0
5	0	27.6	0	0	15.9	3.0	11.6	0	.8	0	0	0
6	3.3	33.1	0	0	15.9	3.0	9.8	0	0	0	0	0
7	6.2	33.3	0	0	18.4	2.2	3.0	0	0	0	0	0
8	4.0	37.9	0	0	18.4	12.5	0	0	0	.3	0	0
9	4.0	17.3	0	0	18.4	12.5	2.0	0	0	1.0	0	0
10	4.9	17.8	0	0	19.3	12.5	1.9	0	0	.3	0	.8
11	14.1	17.3	0	.5	5.0	12.5	2.0	0	0	0	0	0
12	10.5	17.6	0	2.2	4.8	12.5	2.0	0	0	0	0	0
13	7.7	11.8	0	1.2	1.2	12.5	.5	0	0	0	0	0
14	7.7	4.1	0	.5	1.5	12.5	.3	0	0	0	0	0
15	8.5	4.1	0	0	1.6	29.7	.5	0	0	0	0	0
16	10.7	0	0	.5	0	29.9	.5	0	0	0	0	0
17	10.7	0	0	.8	0	29.3	1.0	0	0	0	0	0
18	11.0	0	0	0	0	30.2	1.6	2.5	0	0	0	0
19	8.4	2.0	0	1.5	0	27.2	.4	2.5	0	0	0	0
20	7.4	2.7	0	0	0	27.4	.3	1.9	0	0	2.5	0
21	11.1	2.0	3.5	3.0	4.0	26.7	0	0	1.5	0	2.8	0
22	14.7	0	2.0	2.8	4.0	25.8	3.8	0	1.5	0	2.5	0
23	18.7	0	2.0	3.0	4.5	25.6	3.8	0	0	0	0	0
24	19.2	0	2.0	3.0	4.7	25.6	0	0	0	0	0	0
25	17.1	0	3.1	5.0	5.0	24.8	0	0	0	0	0	0
26	19.3	0	1.9	6.4	6.0	17.1	5.6	0	0	0	0	0
27	19.3	0	0	13.5	2.6	17.1	3.3	0	0	0	0	0
28	19.7	0	0	13.5	0	17.1	3.3	0	0	0	0	0
29	19.3		0	13.5	0	11.6	3.3	0	0	0	0	.1
30	19.3		0	13.5	0	11.6	3.3	0	0	0	0	0
31	19.4		0		0		3.3	0		0		0
Sum	317.5	337.0	14.5	86.4	207.6	477.9	113.5	6.9	18.8	1.6	7.8	0.9

Month	Average Rainfall Inches**		Current Year 1969 Ø Extreme Second-Feet High		Low		Average Second-Feet	Total Acre-Feet	Period 1957-1969 Acre-Feet		
	1957-1969	1969	Day		Day				Average	Maximum	Minimum
Jan.	1.82	0.34	28	19.7	† 1	0	10.2	630	468	1,275	0
Feb.	2.20	3.72	8	37.9	†16	0	12.0	668	199	668	0
Mar.	.78	1.16	21	3.5	† 1	0	.5	28.8	121	305	0
Apr.	1.44	.16	† 27	13.5	† 2	0	2.9	171	234	633	0
May	2.72	3.99	10	19.3	†16	0	6.7	412	366	1,356	0
June	2.40	.14	18	30.2	† 1	0	15.9	948	578	1,393	132
July	.91	.16	† 1	11.6	† 8	0	3.7	225	250	778	43.6
Aug.	2.34	4.44	† 18	2.5	† 1	0	.2	13.7	148	317	13.7
Sept.	5.56	2.98	3	9.6	† 1	0	.6	37.3	70.4	190	0
Oct.	2.94	3.38	9	1.0	† 1	0	.1	3.2	72.6	218	0
Nov.	1.76	3.40	21	2.8	† 1	0	.3	15.5	86.3	252	0
Dec.	1.78	.04	10	.8	† 1	0	0	1.8	108	335	0
Yearly	26.65	23.91		37.9		0	4.4	3,154.3	2,701.3	5,036.3	1,204.7

Ø Mean daily
† And other days
** United States side - Average of several stations in the reach

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE BELOW FALCON DAM

Since June 1956 the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam has been under the jurisdiction of the 93rd District Court of Texas, the disposition of such water being made through its Special Water Master.

The official records for 1969 show that, in this area, 777,285 irrigable acres, several towns and many rural homes were served Rio Grande water under the jurisdiction of this Court.

The total diversion in 1969 was 1,063,603 acre-feet, most of which was made by pumping from the river. About 94% of the water diverted was determined by this Commission through continuous records of discharges at open channel rating stations and at deflection meter stations developed by this Commission. The records for the rest of the diversions were furnished by the Special Water Master and were either measured by flow meters or were determined from periodic current meter measurements of pump discharges and recorded pump operating time. Drainage from more than 90% of this area does not return to the Rio Grande but some of it is re-used in the area. More than one crop per year is often grown on parts of this land.

Diversion data pertaining to "Diversions from the Rio Grande - United States Side below Rio Grande City" for the period 1922 through 1957 may be found in previous issues of these Water Bulletins. The area irrigated below Rio Grande City is about 99% of the total acreage irrigated on the United States side below Falcon Dam.

A breakdown by river reaches of the total diversion below Falcon Dam shown in the tabulation below may be found in appropriate downstream order on preceding pages of this Water Bulletin. Because the mean daily discharges are rounded, the total acre-feet shown in the summary below may not equal the sum of the acre-feet of the individual reaches.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,590	2,750	295	1,300	2,830	1,000	3,100	1,720	172	675	830	388
2	2,030	1,740	199	1,350	2,610	2,050	3,020	1,290	189	784	625	611
3	1,990	2,070	371	1,580	2,150	2,460	2,800	849	158	784	870	788
4	1,590	2,030	476	1,570	1,890	3,040	2,540	1,720	40.9	650	1,060	677
5	1,420	2,160	365	913	2,600	2,910	2,190	1,520	166	298	1,230	434
6	2,340	2,200	480	429	2,620	2,760	1,810	1,360	172	853	1,290	419
7	2,670	1,990	791	1,490	2,870	2,840	2,180	1,350	87.8	816	1,190	380
8	2,810	1,770	695	1,670	3,000	2,810	* 2,490	1,030	147	1,020	895	181
9	2,800	1,190	258	1,640	2,770	3,620	2,570	468	192	1,080	686	132
10	2,660	2,150	558	1,730	2,220	3,830	2,430	373	333	982	1,370	215
11	2,510	2,380	489	1,710	1,680	3,610	2,230	920	512	680	1,510	183
12	2,370	2,420	182	1,350	2,600	3,370	2,150	1,220	471	388	1,550	344
13	3,160	1,810	536	751	1,050	3,840	1,970	1,120	213	937	1,560	212
14	3,220	1,000	475	1,770	1,150	3,620	2,360	1,410	176	1,190	1,460	129
15	3,450	794	242	1,920	846	3,500	2,500	1,260	403	1,190	1,050	488
16	3,260	421	177	2,010	620	3,760	2,580	909	454	1,290	622	749
17	3,290	628	510	2,240	239	4,380	2,630	533	434	1,250	1,360	899
18	3,430	500	665	2,090	85	4,470	2,430	1,310	725	975	1,490	765
19	3,100	644	623	1,840	263	4,510	2,020	1,550	664	451	1,390	823
20	3,740	316	882	1,290	295	4,570	1,360	1,560	460	1,080	1,220	518
21	3,870	331	794	2,440	275	4,270	2,150	935	226	1,310	1,100	272
22	3,890	260	383	2,730	722	3,560	2,150	875	628	1,360	858	892
23	3,830	151	286	2,770	553	4,090	2,170	648	572	1,350	463	971
24	3,690	110	764	3,110	428	4,450	2,070	363	423	1,280	929	514
25	3,250	235	1,080	3,300	266	4,700	1,930	550	420	872	1,020	175
26	2,430	485	1,070	2,860	809	4,600	1,370	620	421	399	669	653
27	3,660	473	1,020	2,140	1,230	4,540	1,150	730	392	1,100	260	515
28	3,510	676	794	3,080	1,240	4,070	1,820	720	182	826	317	279
29	3,650		625	3,300	1,510	2,790	2,010	740	604	791	271	580
30	3,370		409	3,260	1,450	2,940	1,910	300	594	977	179	716
31	3,380		1,170		1,210		1,740	65.3		1,110		743
Sum	91,960	33,684	17,664	59,633	44,081	106,960	67,830	30,018.6	10,631.7	28,748	29,324	15,645

Month	Average Rainfall Inches** 1957-1969	Average Rainfall Inches** 1969	Ø Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
			Current Year 1969						Period 1957-1969		
Jan.	1.38	0.41	22	3,890	5	1,420	2,970	182,403	71,377	182,403	9,717
Feb.	1.48	1.98	1	2,750	24	110	1,200	66,812	45,918	126,230	11,785
Mar.	.71	.65	31	1,170	16	177	570	35,037	58,404	149,000	6,280
Apr.	1.46	.21	† 25	3,300	6	429	1,990	118,282	97,519	157,807	25,100
May	2.58	2.48	8	3,000	18	85.0	1,420	87,435	108,732	171,000	20,436
June	2.48	1.06	25	4,700	1	1,000	3,570	212,155	160,236	259,000	86,810
July	.89	.51	1	3,100	27	1,150	2,190	134,541	104,709	178,000	41,158
Aug.	2.05	3.95	† 1	1,720	31	65.3	968	59,541	73,258	113,000	48,709
Sept.	4.39	3.62	18	725	4	40.9	354	21,088	59,987	136,000	12,709
Oct.	2.82	1.61	22	1,360	5	298	927	57,113	62,084	124,598	12,991
Nov.	1.52	1.98	13	1,560	30	179	977	58,164	47,443	97,969	12,674
Dec.	1.29	.22	23	971	14	129	505	31,032	47,880	84,500	14,034
Yearly	23.05	18.68		4,700		40.9	1,470	1,063,603	937,547	1,153,049	654,886

* Partly estimated Ø Mean daily ** United States side - Average of several stations in the reach
† And other days

OUTFALLS FROM SEWERS INTO THE RIO GRANDE
In Acre-Feet

EL PASO SEWAGE OUTFALL

This sewage enters the Rio Grande through the outfalls of the El Paso, Ascarate, and Ysleta Sewage Plants, located 6.6, 8.2, and 15 river miles, respectively, downstream from the American Dam. The outfall from the El Paso Plant consists of flows measured by a Parshall meter and estimates of amounts which bypass the meter. The effluent from the Socorro Plant, located 17 miles below American Dam, is discharged into ponds at the approximate rate of 10 c.f.s. When the ponds overflow, the effluent may enter either the Rio Grande or Riverside Canal. No record has been kept of the amount of this effluent entering the Rio Grande and it is not included in the table below. All of the plants are operated by the El Paso Water Utilities of the Public Service Board of the City of El Paso, Texas and the records are furnished by that agency.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1969	1,456	1,344	1,406	1,552	1,802	1,786	1,820	1,791	1,569	1,704	1,493	1,763	19,486
* Average	1,652	1,550	1,717	1,657	1,807	1,783	1,877	1,917	1,786	1,804	1,669	1,661	20,880

EAGLE PASS SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 757.5 river miles downstream from the American Dam at El Paso, Texas and about 600 feet upstream from the Eagle Pass-Piedras Negras International Railroad Bridge. The records are based on weekly current meter measurements or gage height observations made by personnel of the International Boundary and Water Commission. There are no records available prior to 1962.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1969	78.3	74.6	75.4	67.0	76.0	50.2	54.5	73.2	64.3	94.6	62.3	52.0	822.4
# Average	58.8	57.3	52.8	47.8	47.8	40.8	40.2	48.7	53.4	58.4	57.4	59.0	622.4

LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 890.8 river miles downstream from the American Dam at El Paso, Texas and immediately upstream from the Laredo Gaging Station. The record is based on estimates by the Texas State Health Department.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1969	464	471	560	488	563	530	591	568	431	544	511	485	6,206
* Average	354	373	442	431	483	461	461	436	363	373	404	366	4,947

BROWNSVILLE SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 3.4 river miles downstream from the Gateway Bridge between Brownsville, Texas and Matamoros, Tamaulipas; 3.4 river miles upstream from the Brownsville Gaging Station; and 52.2 river miles from the Gulf of Mexico. Records are furnished by the City of Brownsville. No cooling water waste was returned to the Rio Grande by the City of Brownsville Water Plant.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1969	210	413	402	396	376	406	233	257	365	363	337	286	4,044
* Average	287	286	330	287	311	327	328	333	342	340	305	286	3,762

* Period averages are for past 10 years # Period 1962-1969

MUNICIPAL AND INDUSTRIAL WATER USES

In Acre-Feet

Tabulated below are monthly and yearly amounts of water pumped directly from the Rio Grande into the municipal distribution systems of several cities along the border, except the City of El Paso which pumps its water from the Franklin Canal and the City of Del Rio which pumps its water from San Felipe Springs. The basic data for the cities are furnished by the municipalities. Central Power and Light Company furnishes the data for the Laredo Power Station. All diversions in the United States listed below are in the State of Texas, while those in Mexico are in the State of Tamaulipas, except for Piedras Negras which is in the State of Coahuila. Because of changing conditions, the period records are limited here to the past 10 years.

During March through June 1969, the City of El Paso pumped water from wells near Canutillo, Texas into the Rio Grande about 17 miles upstream from the point of diversion at the water plant. This water amounted to 2,602 acre-feet and is included in the figures below. All Rio Grande water used by United States municipalities below Falcon Dam is included in the figures shown under "Diversions from the Rio Grande - United States Side. . ." (by river reaches and total below Falcon Dam) on pages 60, 63, 67, 69, 71, 73, and 74 herein. The City of Reynosa, Tamaulipas, Mexico no longer pumps water from the Rio Grande. All its water supply is from the Rode Canal of the Marte R. Gómez Reservoir. Cd. Mier, Tamaulipas started diverting water from the Rio Grande for municipal use January 1953. There were no actual records kept of this diversion prior to May 1960. This diversion has been estimated to be 32.4 acre-feet per month during this period. The Del Mar Conservation District started diverting water from the Rio Grande in late December 1961, Piedras Negras in November 1964, and San Ygnacio in November 1965. The Laredo Power Station, Central Power and Light Company, started operation in April 1951. The Cd. Miguel Aleman, Tamaulipas water plant started operation in late August 1967. Prior to this date, all water for municipal use was supplied by the Roma, Texas water plant. The city of Roma, Texas no longer supplies water to Cd. Miguel Aleman, Tamaulipas.

Population data for all cities are from the 1970 official census, except for Falcon Village which was estimated by the International Boundary and Water Commission, Del Mar and Escobares which were estimated from the number of meter connections, San Ygnacio which was based on a local census, and Zapata and Rio Grande City which were taken from the 1970 Texas Almanac.

In United States

Month	EL PASO (Pop. 317,462)				DEL RIO Ø (Pop. 20,928)			
	1969	Period 1960 - 1969			1969	Period 1960 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	0	0	0	0	346.2	308.4	407.0	212.4
Feb.	0	0	0	0	353.8	314.3	411.5	240.7
Mar.	550	362.2	831	37.9	586.9	470.2	599.2	338.4
Apr.	1,091	1,178.7	2,096	671.4	499.9	518.4	611.1	424.0
May	1,365	1,355.1	2,540	3.0	545.0	553.7	768.8	376.5
June	2,217	1,671.6	2,498	637.0	875.4	716.2	907.6	571.7
July	2,330	1,659.9	2,565	830.8	1,093.2	871.8	1,093.2	588.4
Aug.	2,800	1,733.7	2,800	881.5	967.8	832.8	1,147.4	532.5
Sept.	1,958	1,215.9	1,958	343.9	560.3	560.2	731.7	431.0
Oct.	348	314.4	1,016	0	402.0	412.4	521.1	282.1
Nov.	264	137.6	397	0	322.8	319.2	413.5	217.0
Dec.	93	87.9	677.1	0	313.3	288.8	372.0	220.1
Yearly	13,016	9,717.0	15,517.0	3,805.3	6,866.6	6,166.4	6,969.4	5,068.3

Month	EAGLE PASS (Pop. 15,277)				DEL MAR (Pop. 1,280)			
	1969	Period 1960 - 1969			1969	Period 1962 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	178.8	136.1	178.8	100.3	11.8	8.2	22.6	0.3
Feb.	172.2	134.0	172.2	109.6	17.0	8.7	21.0	.6
Mar.	220.3	170.5	220.3	144.2	16.3	7.9	21.9	0
Apr.	215.6	172.3	215.6	149.0	27.2	14.5	35.3	0
May	218.8	187.7	254.9	144.3	21.2	13.0	31.9	0
June	298.8	234.2	298.8	188.2	26.6	16.0	35.3	0
July	365.0	261.6	365.0	185.0	40.9	17.1	40.9	0
Aug.	346.9	251.3	346.9	184.0	51.3	26.4	51.3	1.9
Sept.	224.3	190.9	229.9	164.8	32.6	17.2	32.6	1.7
Oct.	223.4	170.0	223.4	134.3	31.7	13.4	31.7	1.7
Nov.	183.9	147.4	187.1	101.4	21.3	15.4	32.1	1.5
Dec.	177.3	138.1	179.4	92.3	12.2	13.6	31.8	1.5
Yearly	2,825.3	2,194.1	2,825.3	1,810.7	310.1	171.4	346.7	15.0

Ø Includes Laughlin Air Force Base

MUNICIPAL AND INDUSTRIAL WATER USES

In Acre-Feet

In United States

Month	LAREDO (Pop. 65,491)				LAREDO POWER STATION			
	1969	Period 1960 - 1969			1969	Period 1960 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	843.8	644.4	843.8	479.3	54.7	31.2	54.7	15.4
Feb.	825.7	653.9	825.7	529.6	45.6	33.4	72.7	13.5
Mar.	1,077.3	850.2	1,077.3	671.0	62.6	37.5	79.3	10.7
Apr.	1,059.8	936.3	1,059.8	745.0	72.4	47.7	76.4	26.0
May	1,224.7	1,050.8	1,449.0	822.6	65.2	54.0	74.4	35.6
June	1,323.9	1,151.8	1,429.3	952.7	75.5	64.9	80.3	46.9
July	1,689.4	1,317.1	1,703.7	972.7	86.3	85.0	102.9	63.4
Aug.	1,624.2	1,273.3	1,624.2	970.0	89.5	91.1	109.1	75.6
Sept.	1,105.4	929.9	1,245.1	742.1	82.5	69.8	83.8	49.8
Oct.	1,326.2	910.6	1,326.2	773.6	87.8	50.3	87.8	29.7
Nov.	945.6	748.0	969.0	533.4	71.3	47.1	71.3	21.8
Dec.	882.0	666.9	882.0	482.1	71.3	45.3	71.3	21.5
Yearly	13,928.0	11,133.2	13,928.0	9,295.2	864.7	657.3	864.7	475.6

Month	SAN YGNACIO (Pop. 1,000)				NEW ZAPATA (Pop. 2,261)			
	1969	Period 1965 - 1969			1969	Period 1960 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	2.6	1.6	2.6	0.8	25.2	24.0	43.0	14.6
Feb.	2.3	2.0	2.5	1.1	24.6	23.4	40.2	17.4
Mar.	2.6	2.6	3.4	2.1	32.7	30.4	41.2	23.0
Apr.	4.6	3.5	4.6	2.4	38.8	34.1	46.0	27.0
May	2.8	2.2	2.8	1.5	33.9	33.8	46.4	18.3
June	4.2	2.5	4.2	1.4	37.5	39.1	49.2	27.7
July	4.7	2.9	4.7	.8	56.6	45.7	57.6	34.4
Aug.	4.5	3.5	4.5	1.4	47.0	42.4	52.7	31.7
Sept.	2.5	2.1	2.5	1.5	26.2	31.4	50.4	21.1
Oct.	2.9	2.2	2.9	1.5	32.8	31.4	47.6	24.2
Nov.	2.3	2.1	2.7	1.4	18.9	24.9	44.3	17.4
Dec.	1.7	1.7	2.4	1.1	20.7	24.4	43.1	16.4
Yearly	37.7	28.9	37.7	21.3	394.9	385.0	483.8	310.5

Month	FALCON VILLAGE (Pop. 122)				ROMA * (Pop. 2,440)			
	1969	Period 1960 - 1969			1969	Period 1960 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	6.9	5.8	6.9	4.2	19.2	28.4	38.6	14.4
Feb.	6.2	5.8	7.2	4.4	17.2	27.8	36.0	14.4
Mar.	8.3	7.6	9.8	6.5	21.7	34.4	45.3	18.2
Apr.	10.0	8.6	10.1	6.5	25.1	36.6	48.7	17.0
May	9.0	9.0	11.5	6.5	26.1	39.0	49.7	19.9
June	10.2	9.6	12.8	7.8	26.0	40.3	50.1	21.1
July	14.3	12.0	14.7	9.5	33.0	44.2	54.9	21.9
Aug.	11.7	10.9	13.2	8.3	27.1	41.2	51.8	25.7
Sept.	8.2	7.9	11.0	5.8	22.2	34.2	49.5	18.6
Oct.	7.7	7.5	8.9	6.4	25.7	33.6	44.5	19.5
Nov.	6.9	6.1	7.9	4.9	20.9	29.5	44.0	15.7
Dec.	5.7	5.6	7.7	3.8	18.9	27.7	43.2	15.4
Yearly	105.1	96.4	105.9	87.5	283.1	416.9	528.0	228.2

Month	RIO GRANDE CITY (Pop. 6,950)				BROWNSVILLE (Pop. 51,080)			
	1969	Period 1960 - 1969			1969	Period 1960 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	61.4	57.6	67.5	49.4	899.7	672.4	899.7	547.0
Feb.	55.9	55.2	63.2	50.3	791.4	629.2	791.4	540.9
Mar.	66.3	67.9	83.2	56.2	867.2	760.4	870.3	612.8
Apr.	75.8	73.4	92.1	61.4	910.0	777.5	910.0	661.3
May	71.2	76.0	88.1	61.4	854.7	774.3	952.5	664.2
June	75.5	83.8	105.3	74.6	1,020.9	884.8	1,047.4	727.3
July	97.3	89.7	107.7	59.2	1,264.0	1,051.6	1,264.0	860.4
Aug.	99.7	88.8	99.7	77.6	926.5	981.4	1,177.1	790.2
Sept.	77.3	71.7	92.1	56.4	835.5	766.7	927.7	665.4
Oct.	90.5	65.5	90.5	58.0	902.5	754.3	902.5	657.2
Nov.	83.2	60.4	83.2	46.0	798.5	698.5	848.1	573.9
Dec.	80.7	60.1	80.7	46.7	775.4	699.4	896.5	538.4
Yearly	934.8	850.1	939.7	768.2	10,846.3	9,450.5	10,846.3	8,382.7

* Includes Los Saenz and Escobares, Texas

MUNICIPAL AND INDUSTRIAL WATER USES

In Acre-Feet

In Mexico

Month	PIEDRAS NEGRAS (Pop. 60,076)				NUEVO LAREDO (Pop. 149,266)			
	1969	Period 1965 - 1969			1969	Period 1960 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	200.2	189.6	212.2	163.8	1,126.2	818.6	1,126.2	567.7
Feb.	183.5	169.4	183.5	160.3	1,024.8	788.0	1,024.8	582.6
Mar.	229.7	204.1	229.7	184.6	1,182.0	961.6	1,182.0	785.1
Apr.	244.7	221.9	244.7	194.2	1,187.0	1,036.2	1,187.0	900.5
May	269.5	242.5	287.6	198.5	1,375.4	1,133.1	1,375.4	956.3
June	336.8	284.2	336.8	241.8	1,612.3	1,187.3	1,630.7	915.0
July	375.4	318.9	375.4	297.2	1,746.3	1,282.7	1,746.3	997.7
Aug.	344.2	302.0	346.3	248.2	1,745.5	1,291.5	1,856.3	957.4
Sept.	270.5	240.5	270.5	222.1	1,389.2	1,096.7	1,389.2	913.2
Oct.	251.2	231.3	251.2	208.5	1,453.0	1,089.2	1,453.0	928.7
Nov.	213.8	204.0	224.3	176.4	1,241.4	919.1	1,241.4	717.0
Dec.	199.5	190.4	208.5	171.1	1,243.4	880.8	1,243.4	664.9
Yearly	3,119.0	2,798.8	3,119.0	2,599.5	16,326.5	12,484.8	16,326.5	10,584.6

Month	NUEVA CD. GUERRERO (Pop. 3,270)				CD. MIER (Pop. 5,555)			
	1969	Period 1960 - 1969			1969	Period 1960 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	26.3	33.0	48.7	19.8	27.2	30.1	38.9	21.8
Feb.	21.7	29.9	44.3	19.1	24.7	30.3	41.3	20.1
Mar.	25.9	36.5	48.0	25.4	26.6	35.9	47.0	26.6
Apr.	34.5	36.9	52.5	19.9	35.8	36.8	46.2	25.5
May	35.3	41.5	53.8	35.2	36.4	40.0	50.3	34.5
June	35.2	39.4	52.9	21.2	36.7	37.6	49.7	24.8
July	36.9	40.5	54.6	26.2	39.4	40.1	50.3	28.9
Aug.	35.9	39.6	52.0	26.8	39.6	39.1	49.7	29.2
Sept.	34.9	37.2	46.4	22.2	36.9	37.5	47.2	24.7
Oct.	35.9	36.9	49.1	24.0	45.6	37.6	46.9	25.6
Nov.	31.1	35.5	46.5	24.6	32.0	34.8	41.3	25.4
Dec.	25.8	34.2	48.6	24.6	28.9	32.4	38.9	25.0
Yearly	379.4	441.1	552.8	325.4	409.8	432.2	533.3	340.7

Month	CD. MIGUEL ALEMAN (Pop. 11,310)				MATAMOROS (Pop. 137,321)			
	1969	Period Aug. 1967 - 1969			1969	Period 1960 - 1969		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	35.2	32.1	35.2	29.0	521.0	499.8	730.6	278.5
Feb.	32.2	30.6	32.2	29.0	393.5	447.7	618.2	286.7
Mar.	38.3	35.4	38.3	32.4	433.3	507.0	729.7	302.9
Apr.	40.7	35.8	40.7	31.0	852.7	560.7	852.7	288.8
May	41.8	39.2	41.8	36.5	881.9	590.2	881.9	335.7
June	45.7	41.8	45.7	37.8	834.2	599.1	834.2	382.6
July	51.9	46.4	51.9	40.9	869.9	637.9	869.9	364.3
Aug.	47.0	31.0	47.0	9.7	848.2	658.8	868.3	428.1
Sept.	42.0	34.5	42.0	26.0	758.1	582.6	830.2	406.8
Oct.	41.3	31.9	41.3	19.9	746.6	588.3	821.6	416.8
Nov.	38.3	36.6	42.3	29.3	637.7	545.9	751.2	357.0
Dec.	39.3	35.2	39.3	28.9	778.2	560.0	778.2	315.7
Yearly	493.7	430.5	493.7	422.6	8,555.3	6,778.0	8,914.5	4,301.4

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

Data are presented below for all storage reservoirs in the Rio Grande Basin in the United States and Mexico that exceed 15,000 acre-feet in capacity, except San Esteban Reservoir on Alamito Creek which according to the Texas Water Commission has a capacity of 18,800 acre-feet. There are no monthly storage data available for this reservoir. Also presented below are data for International Amistad Reservoir and Falcon Reservoir on the Rio Grande. The monthly figures represent the water in storage on the last day of each month, in thousands of acre-feet. The capacities indicated are at spillway level. Storage figures greater than the capacity indicate that the water surface was above spillway level.

The reservoirs and the source of the data are: Rio Grande, Continental, Santa Maria, Terrace, and Mountain Home from the State of Colorado, Division of Water Resources; Sanchez from the Sanchez Ditch and Reservoir Company; Platoro El Vado, and Abiquiu from the Rio Grande Compact Commission; Costilla and Bluewater from the United States Geological Survey; Storrie from State Engineer Office of New Mexico; Elephant Butte, Caballo Dam, Alamogordo, McMilan, and Avalon from the United States Bureau of Reclamation; Red Bluff from the Red Bluff Water Power Control District; Lake Casa Blanca from the Webb County Office; Willacy from the Willacy County Water Control and Improvement District No. 1; Boquilla, La Colina, and Rosetilla from the Federal Power Commission of Mexico; Francisco I. Madero, Luis L. León, Centenario, San Miguel, Venustiano Carranza, La Boca, Marte R. Gómez, Culebrón, Villa Cárdenas, and Palito Blanco from the Ministry of Hydraulic Resources of Mexico; Amistad Reservoir (International) and Falcon Reservoir (International) from International Boundary and Water Commission.

In the United States

Month	RIO GRANDE (Capacity 51.1)		CONTINENTAL (Capacity 22.7)		SANTA MARIA (Capacity 45.1)		TERRACE (Capacity 17.2)		MOUNTAIN HOME (Capacity 18.6)	
	1969	#Average 1927-1969	1969	#Average 1928-1969	1969	#Average 1928-1969	1969	#Average 1925-1969	1969	#Average 1924-1969
Jan.	20.1	12.7	5.9	4.7	3.5	6.6	11.3	3.3	2.8	3.7
Feb.	21.3	13.9	6.4	5.1	3.8	7.1	11.2	3.5	2.9	4.1
Mar.	22.4	15.3	6.9	5.5	4.3	8.0	11.3	3.9	3.2	4.4
Apr.	23.3	15.6	7.2	6.1	4.7	9.3	9.9	4.7	3.3	5.0
May	23.3	21.0	7.2	7.8	4.7	13.2	9.3	7.0	3.3	6.8
June	20.7	22.4	7.9	8.1	4.7	14.9	11.1	8.3	4.2	6.9
July	5.8	12.8	3.7	5.6	.7	9.8	10.9	5.5	3.4	5.0
Aug.	5.3	6.4	2.7	3.6	.3	5.0	9.5	3.4	2.2	3.2
Sept.	10.1	6.4	1.3	3.7	2.9	4.8	12.5	3.1	2.3	2.8
Oct.	18.7	7.4	2.9	3.6	4.1	5.0	12.5	3.2	2.8	2.8
Nov.	22.8	10.2	4.0	4.0	4.9	5.6	13.0	3.1	3.4	3.1
Dec.	25.3	11.8	4.9	4.4	5.5	6.1	12.4	3.3	3.7	3.4
Avg.	18.3	13.0	5.1	5.2	3.7	8.0	11.2	4.4	3.1	4.3
Max.	25.3	52.1	7.9	26.7	5.5	42.1	13.0	17.7	4.2	16.4
Min.	5.3	0	1.3	0	.3	0	9.3	0	2.2	0

Month	SANCHEZ (Capacity 103.2)		PLATORO (Capacity 60.0)		COSTILLA (Capacity 15.7)		EL VADO (Capacity 196.5)		ABIQUIU (Capacity 1,225.4)	
	1969	#Average 1927-1969	1969	Average 1952-1969	1969	#Average 1922-1969	1969	Average 1935-1969	1969	Average 1965-1969
Jan.	11.7	10.8	3.0	6.3	6.7	4.3	1.1	31.8	2.1	0.4
Feb.	11.7	11.0	3.0	6.4	7.2	4.7	1.2	28.8	2.1	.7
Mar.	11.8	11.6	3.0	6.4	7.8	5.2	4.0	28.3	4.1	2.3
Apr.	12.7	13.2	4.6	7.3	8.7	6.4	3.7	68.4	22.7	5.8
May	13.2	17.1	5.3	10.2	11.0	8.4	21.4	116.8	54.6	23.9
June	15.5	16.3	5.6	16.9	9.8	7.8	21.1	105.7	2.7	18.8
July	13.8	11.7	5.6	13.9	7.3	5.1	21.0	84.8	4.3	17.9
Aug.	14.6	9.4	5.6	12.6	5.5	3.6	21.2	61.9	2.5	26.3
Sep.	16.5	9.7	5.6	12.6	5.8	3.1	21.2	50.1	3.9	28.1
Oct.	18.0	10.2	5.6	12.3	6.8	3.3	20.9	46.1	2.1	27.8
Nov.	18.6	10.4	3.0	6.6	7.6	3.7	14.5	35.5	2.0	12.9
Dec.	18.9	10.8	3.0	6.6	8.3	4.0	1.1	30.4	2.1	1.1
Avg.	14.8	11.8	4.4	9.8	7.7	5.0	12.7	57.4	8.8	13.8
Max.	18.9	62.4	5.6	54.0	11.0	15.1	21.4	203.5	54.6	99.0
Min.	11.7	0	3.0	0	5.5	0	1.1	0	2.0	0

Some months missing

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

In the United States

Month	BLUEWATER (Capacity 43.5)		ELEPHANT BUTTE (Capacity 2,195.0)		CABALLO (Capacity 344.0)		STORRIE (Capacity 23.3)		ALAMOGORDO (Capacity 110.7)	
	1969	#Average 1927-1969	1969	Average 1915-1969	1969	#Average 1938-1969	1969	#Average 1939-1969	1969	#Average 1937-1969
Jan.	5.0	5.8	382.1	776.9	46.5	107.2	4.6	8.1	68.5	67.7
Feb.	5.0	6.6	406.2	778.0	60.8	132.3	4.5	8.0	72.4	71.5
Mar.	9.1	10.2	364.0	758.0	18.2	115.0	5.1	8.7	44.1	60.2
Apr.	11.7	13.2	352.2	755.7	54.3	107.7	5.5	9.1	34.2	53.4
May	10.9	11.4	435.1	856.4	77.8	106.9	7.1	10.0	48.2	57.8
June	9.4	9.2	467.4	890.6	68.2	86.8	5.7	8.6	46.7	51.5
July	8.4	7.9	363.0	833.3	54.9	64.9	4.8	8.8	38.3	49.7
Aug.	7.4	6.9	253.8	776.4	38.3	37.7	4.6	9.7	8.2	53.6
Sept.	7.0	6.6	274.0	747.7	38.4	28.0	5.8	9.1	52.7	54.7
Oct.	6.9	6.3	346.8	745.1	40.6	44.7	8.0	8.7	64.0	59.0
Nov.	6.8	6.1	443.8	757.0	41.4	61.8	8.9	9.0	69.4	60.2
Dec.	6.6	5.9	528.2	773.0	43.1	79.6	9.3	8.0	74.7	64.7
Avg.	7.8	8.0	384.7	787.3	48.5	81.0	6.2	8.8	51.8	58.7
Max.	11.7	47.1	ø 528.2	2,302.8 ø	ø 83.4	ø 346.6	9.3	26.3	74.7	156.3
Min.	5.0	0	ø 238.5	3.3 ø	ø 18.0	ø 0.1	4.5	0	8.2	0.4

Month	McMILLAN and AVALON (Capacity 38.0)		RED BLUFF (Capacity 310.0)		LAKE CASA BLANCA (Capacity 22.1)		WILLACY (Capacity 25.0)		TOTAL IN U. S. RESERVOIRS (Capacity 4,867.1)	
	1969	#Average 1908-1969	1969	#Average 1936-1969	1969	Average 1962-1969	1969	#Average 1939-1969	1969	Estimated ‡ Average
Jan.	7.2	26.6	57.9	99.2	21.2	10.0	18.7	14.5	679.9	1,200.6
Feb.	8.4	26.7	59.0	100.9	20.5	9.8	19.7	13.7	727.3	1,232.8
Mar.	20.4	26.4	51.8	97.7	19.5	9.4	17.9	12.9	628.9	1,189.4
Apr.	19.4	17.5	50.1	83.0	21.4	10.0	16.5	13.2	666.1	1,204.6
May	10.9	20.1	48.8	87.4	20.0	10.5	18.6	14.0	830.7	1,406.7
June	18.7	19.5	43.2	89.7	18.8	11.0	15.0	14.2	796.4	1,407.2
July	15.4	18.3	38.9	79.2	17.7	10.6	18.2	13.8	636.1	1,258.6
Aug.	21.8	17.1	32.7	75.4	17.7	10.2	17.5	12.2	471.4	1,134.6
Sept.	36.1	18.3	37.3	76.6	17.0	12.9	21.5	14.4	571.9	1,092.7
Oct.	37.9	20.6	91.5	87.5	16.3	11.8	12.8	14.7	719.2	1,120.1
Nov.	37.8	22.1	96.5	90.5	16.3	11.6	14.8	14.6	829.5	1,128.0
Dec.	38.6	25.2	99.6	95.0	16.1	11.4	14.6	14.2	916.0	1,158.9
Avg.	22.7	21.5	58.9	88.5	18.5	10.8	17.2	13.9	706.1	1,211.2
Max.	38.6	85.5	99.6	327.5	21.4	28.2	21.5	22.6	916.0	
Min.	7.2	0	32.7	10.0	16.1	3.5	12.8	0	471.4	

\# Some months missing ø Daily extremes ‡ Totals of period averages in all reservoirs

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

In Mexico

Month	LA BOQUILLA (Capacity 2,417.5)		LA COLINA (Capacity 19.5)		ROSETILLA (Capacity 15.4)		FRANCISCO I. MADERO (Capacity 344.6)		LUIS L. LEON (Capacity 689.1)	
	1969	#Average 1914-1969	1969	Average 1940-1969	1969	Average 1940-1969	1969	#Average 1948-1969	1969	Average 1968-1969
Jan.	2,281.9	1,422.6	19.1	17.8	3.6	12.4	326.5	208.9	485.8	250.2
Feb.	2,212.8	1,391.2	19.0	18.2	3.4	13.0	313.9	206.8	412.7	228.8
Mar.	2,117.1	1,339.4	18.9	18.1	13.1	18.6	286.9	200.0	325.9	193.6
Apr.	2,021.3	1,269.7	19.1	18.6	14.1	12.1	230.8	171.9	279.7	175.3
May	1,907.8	1,211.7	19.0	18.4	15.0	11.7	181.2	149.7	281.3	181.7
June	1,833.4	1,131.4	18.8	18.4	13.5	12.1	145.0	134.5	278.9	187.1
July	1,901.1	1,170.6	18.7	18.6	13.9	11.5	159.5	147.7	291.9	258.9
Aug.	1,851.2	1,337.5	18.6	18.1	14.3	12.6	98.7	168.3	282.9	278.8
Sept.	1,794.7	1,495.4	18.6	17.9	14.6	13.0	109.2	201.5	282.9	448.9
Oct.	1,746.3	1,500.1	18.6	17.7	14.4	13.0	114.1	206.4	274.0	431.4
Nov.	1,717.7	1,468.1	13.1	17.0	14.1	12.2	115.9	206.0	275.6	409.6
Dec.	1,687.5	1,444.1	18.6	17.9	13.1	13.3	119.1	206.0	275.6	413.8
Avg.	1,922.7	1,348.5	18.3	18.1	12.3	12.5	183.4	184.0	312.3	288.2
Max.	2,281.9	2,544.7	19.1	20.5	15.0	19.4	326.5	366.6	ø 549.4	ø 615.9
Min.	1,687.5	16.9	13.1	11.9	3.4	0.4	98.7	1.4	ø 273.2	ø 3.8

Month	CENTENARIO and SAN MIGUEL (Capacity 19.9)		VENUSTIANO CARRANZA (Capacity 1,122.8)		LA BOCA (Capacity 33.2)		MARTE R. GOMEZ (Capacity 898.3)		CULEBRON and VILLA CARDENAS (Capacity 90.0)	
	1969	Average 1934-1969	1969	Average 1930-1969	1969	Average 1963-1969	1969	#Average 1943-1969	1969	#Average 1939-1969
Jan.	17.0	13.0	247.8	351.3	32.5	20.9	836.9	553.0	5.9	40.1
Feb.	16.7	12.8	208.6	332.2	32.5	20.9	765.7	500.0	5.1	36.9
Mar.	11.7	9.6	189.6	312.2	32.5	20.5	749.7	466.9	46.9	34.8
Apr.	10.5	8.2	190.5	302.4	32.3	20.0	684.6	446.7	38.8	36.7
May	12.6	9.1	127.5	290.2	31.3	20.0	588.2	421.1	32.2	39.5
June	8.0	7.8	76.9	275.6	30.4	19.6	569.8	394.0	17.8	41.1
July	2.7	7.2	72.2	266.3	28.4	20.5	530.9	371.3	23.7	36.2
Aug.	3.7	7.8	66.7	268.2	28.9	22.1	496.2	439.4	23.3	36.0
Sept.	4.7	10.0	95.9	322.6	32.8	23.5	694.2	543.2	26.2	45.8
Oct.	8.0	12.2	125.9	352.1	33.0	24.1	849.1	603.5	22.9	48.2
Nov.	10.9	12.4	134.7	357.8	33.1	24.5	895.4	604.0	19.3	41.1
Dec.	13.3	12.8	141.0	357.0	32.8	24.6	899.9	602.8	17.1	45.8
Avg.	10.0	10.2	139.8	315.7	31.7	21.8	713.4	495.5	23.3	40.2
Max.	17.0	20.7	ø 247.8	1,163.4	33.1	33.6	ø 902.9	ø 1,465.4	46.9	116.8
Min.	2.7	0	ø 66.6	* 1.0	28.4	0	ø 494.0	** 17.8	5.1	0

Month	PALITO BLANCO (Capacity 124.0)								TOTAL IN MEXICAN RESERVOIRS (Capacity 5,774.8)	
	1969	Average 1942-1969							1969	Estimated ‡Average
Jan.	12.9	39.5							4,269.9	2,929.7
Feb.	22.9	35.0							4,013.3	2,795.8
Mar.	20.3	35.3							3,812.6	2,643.0
Apr.	10.5	31.8							3,532.2	2,493.4
May	14.6	31.6							3,210.7	2,384.7
June	16.9	32.8							3,009.4	2,254.4
July	7.9	31.7							3,050.9	2,340.5
Aug.	15.2	29.8							2,899.7	2,618.6
Sept.	22.1	41.3							3,095.9	3,163.1
Oct.	27.7	47.4							3,234.0	3,256.1
Nov.	55.3	46.5							3,285.1	3,199.2
Dec.	45.4	46.3							3,263.4	3,184.4
Avg.	22.6	37.4							3,389.8	2,771.9
Max.	55.3	140.1							4,269.9	
Min.	7.9	0							2,899.7	

\# Some months missing ø Daily extremes * Minimum since full reservoir in 1932
** Minimum since full reservoir in 1947 ‡ Totals of period averages in all reservoirs

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

International Falcon Reservoir

Falcon Dam is the lowermost of the major international storage dams authorized for construction on the Rio Grande by the Water Treaty of 1944 between the United States and Mexico and was the first dam constructed. It is located 84.5 river miles downstream from Laredo, Texas and Nuevo Laredo, Tamaulipas, 974.4 river miles downstream from the American Dam, and 273.8 river miles upstream from the Gulf of Mexico.

Maximum storage for period of record: 3,490,000 acre-feet on October 19, 1958.

Storage Capacities

(1956 Survey)

Elevation	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Acre-Feet	Reservoir Area Acres	Storage Volume Acre-Feet	Type of Storage
175.0	Original River Bed at Dam Axis	0	0	2,816	Silt and Dead
203.33	Lowest Outlet (Mexican Penstock)	2,816	676	2,764,578	Silt and Conservation
301.2	Top of Conservation Storage	2,767,394	87,207	513,289	Ordinary Flood
306.7	Top of Spillway Gates	3,280,683	98,959	800,134	Super Flood
314.2	Maximum Water Surface	4,080,817	115,613		

Storage in Thousands of Acre-Feet at 24:00 Hours 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,712.9	2,355.6	2,199.3	2,113.5	1,989.1	1,766.7	1,418.3	1,238.6	1,260.2	1,322.1	1,444.3	1,468.9
2	2,711.2	2,340.0	2,197.0	2,109.8	1,978.0	1,760.4	1,412.2	1,233.6	1,265.3	1,319.0	1,448.2	1,473.5
3	2,706.9	2,324.5	2,193.3	2,107.7	1,968.4	1,752.1	1,405.7	1,227.7	1,263.7	1,316.4	1,448.2	1,476.9
4	2,701.8	2,307.6	2,188.1	2,106.2	1,958.8	1,743.2	1,399.1	1,219.2	1,262.2	1,314.3	1,447.0	1,481.4
5	2,697.5	2,296.0	2,184.4	2,104.8	1,950.0	1,729.3	1,394.2	1,209.4	1,263.2	1,316.4	1,445.9	1,487.1
6	2,964.1	2,283.8	2,180.7	2,103.4	1,941.1	1,712.9	1,390.5	1,200.5	1,265.3	1,319.0	1,446.5	1,489.4
7	2,689.0	2,271.6	2,177.8	2,100.5	1,929.0	1,699.1	1,386.1	1,194.6	1,267.3	1,347.2	1,447.0	1,491.1
8	2,684.7	2,260.2	2,174.8	2,098.3	1,922.9	1,686.7	1,380.7	1,189.2	1,268.8	1,358.3	1,447.6	1,492.8
9	2,679.6	2,251.1	2,171.9	2,096.9	1,912.8	1,674.2	1,374.3	1,184.9	1,270.8	1,364.2	1,448.2	1,493.4
10	2,672.8	2,239.7	2,168.9	2,095.5	1,900.7	1,661.9	1,367.9	1,181.4	1,272.8	1,366.8	1,448.7	1,491.7
11	2,666.0	2,229.2	2,166.0	2,091.9	1,888.1	1,649.0	1,362.0	1,175.6	1,275.4	1,369.0	1,448.7	1,490.5
12	2,660.1	2,218.7	2,161.6	2,097.6	1,881.4	1,633.7	1,356.2	1,167.4	1,277.9	1,371.6	1,448.2	1,492.8
13	2,652.5	2,216.4	2,157.2	2,108.4	1,880.1	1,617.3	1,350.9	1,160.6	1,280.0	1,374.3	1,448.2	1,496.2
14	2,645.8	2,216.4	2,155.0	2,128.0	1,888.1	1,600.9	1,345.1	1,156.3	1,281.5	1,378.6	1,446.5	1,499.7
15	2,638.2	2,216.4	2,154.2	2,132.3	1,886.7	1,586.5	1,339.8	1,153.0	1,283.0	1,384.0	1,444.8	1,501.4
16	2,629.8	2,216.4	2,153.5	2,132.3	1,901.4	1,572.2	1,334.6	1,150.1	1,285.6	1,387.8	1,443.1	1,503.1
17	2,618.9	2,220.9	2,150.6	2,130.9	1,906.8	1,559.1	1,328.8	1,147.2	1,287.1	1,390.5	1,444.8	1,505.4
18	2,607.3	2,221.7	2,146.9	2,122.9	1,904.1	1,546.7	1,324.2	1,142.4	1,290.2	1,392.6	1,445.4	1,507.7
19	2,593.1	2,220.2	2,144.0	2,115.6	1,904.8	1,532.7	1,319.0	1,138.1	1,292.2	1,394.8	1,442.0	1,510.0
20	2,579.8	2,218.7	2,143.2	2,109.1	1,902.1	1,519.3	1,312.8	1,137.7	1,294.2	1,397.0	1,438.7	1,510.6
21	2,560.9	2,217.9	2,142.5	2,101.9	1,899.4	1,507.2	1,308.1	1,138.1	1,296.8	1,394.8	1,435.9	1,514.1
22	2,543.6	2,215.7	2,141.1	2,091.1	1,894.7	1,497.4	1,303.0	1,137.7	1,298.9	1,392.1	1,435.4	1,517.0
23	2,524.0	2,214.2	2,139.6	2,081.8	1,886.8	1,486.5	1,296.8	1,137.7	1,305.0	1,390.5	1,436.5	1,519.3
24	2,506.0	2,211.2	2,138.1	2,071.1	1,876.8	1,475.2	1,289.6	1,137.2	1,311.7	1,390.5	1,438.7	1,519.9
25	2,483.4	2,208.2	2,133.0	2,059.8	1,867.5	1,463.3	1,282.0	1,135.8	1,317.4	1,389.9	1,442.0	1,520.5
26	2,463.2	2,207.5	2,129.4	2,047.7	1,858.3	1,452.6	1,275.4	1,135.3	1,320.5	1,389.9	1,445.9	1,521.0
27	2,443.2	2,206.7	2,124.3	2,040.0	1,847.8	1,445.4	1,269.3	1,135.3	1,322.6	1,394.8	1,453.2	1,522.8
28	2,424.1	2,203.0	2,121.4	2,027.3	1,834.6	1,439.2	1,265.3	1,145.8	1,323.6	1,401.3	1,456.6	1,525.7
29	2,405.9		2,119.2	2,014.1	1,817.7	1,432.0	1,258.2	1,201.5	1,324.2	1,415.0	1,459.9	1,528.6
30	2,389.3		2,117.8	2,000.1	1,798.9	1,424.9	1,251.1	1,231.1	1,323.6	1,437.0	1,464.4	1,529.8
31	2,371.2		2,116.4		1,782.1		1,243.1	1,248.1		1,441.5		1,529.8

Month	1969							Period 1954-1969		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage		
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum	Minimum
Jan.	300.60	2,715.5	1	296.40	2,371.2	31	2,592.2	2,018.8	2,963.3	218.7
Feb.	296.40	2,371.2	1	294.20	2,203.0	28	2,243.2	1,889.7	2,962.5	156.2
Mar.	294.20	2,203.0	1	293.02	2,116.4	31	2,154.6	1,830.0	2,959.5	226.7
Apr.	293.24	2,132.3	† 15	291.38	2,000.1	30	2,091.4	1,726.7	2,954.6	325.6
May	291.38	2,000.1	1	288.11	1,782.1	31	1,895.4	1,649.4	2,869.9	490.1
June	288.11	1,782.1	1	282.15	1,424.9	30	1,587.6	1,537.6	2,623.8	273.7
July	282.15	1,424.9	1	278.68	1,243.1	31	1,333.7	1,591.6	2,614.1	209.9
Aug.	278.78	1,248.1	31	276.47	1,135.3	† 26	1,173.9	1,572.2	2,564.9	208.0
Sept.	280.27	1,324.2	29	278.78	1,248.1	1	1,288.4	1,713.4	2,600.9	256.2
Oct.	282.45	1,441.5	31	280.08	1,314.3	4	1,374.9	2,021.7	3,250.2	308.3
Nov.	282.86	1,464.4	30	282.34	1,435.4	22	1,446.4	2,077.4	2,964.4	390.9
Dec.	284.00	1,529.8	† 30	282.86	1,464.4	1	1,503.6	2,098.7	2,960.5	343.4
Yearly	300.60	2,715.5		276.47	1,135.3		1,720.8	1,810.6	2,764.5	544.3

† And other days

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

International Amistad Reservoir

Amistad Dam is the second of the major international storage dams constructed on the Rio Grande as authorized by the Water Treaty of 1944 between the United States and Mexico. It is located at mile 567.5, 12.8 river miles upstream from Del Rio, Texas and Cd. Acuna, Coahuila, and 680.7 river miles downstream from the American Dam at El Paso, Texas.

Permanent storage began July 12, 1968 when the last of the temporary outlets used during the course of construction was closed. *Maximum storage* for period of record: 1,299,200 acre-feet on December 29, 1969.

Storage Capacities

(1961 Survey)

Elevation	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Acre-Feet	Reservoir Area Acres	Storage Volume Acre-Feet	Type of Storage
898.0	Original River Bed at Dam Axis	0	0		
				8,029	Silt and Dead
930.0	Lowest Outlet (United States Penstocks)	8,029	712		
				3,497,410	Silt and Conservation
1,117.0	Top of Conservation Storage	3,505,439	64,860		
				1,744,222	Ordinary Flood
1,140.4	Top of Spillway Gates	5,249,661	84,358		
				407,116	Super Flood
1,145.1	Maximum Water Surface	5,656,777	88,984		

Storage in Thousands of Acre-Feet at 24:00 Hours 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	688.6	756.5	829.8	893.9	1,008.1	1,050.7	1,092.5	1,120.8	1,110.5	1,146.7	1,253.8	1,280.1
2	690.8	758.4	832.3	896.1	1,009.6	1,050.4	1,091.5	1,120.8	1,110.5	1,146.4	1,254.1	1,280.8
3	692.9	759.5	834.5	898.4	1,013.8	1,051.2	1,090.1	1,120.5	1,109.6	1,146.1	1,254.4	1,281.4
4	694.8	761.0	836.8	900.8	1,017.8	1,062.8	1,087.7	1,119.4	1,110.2	1,167.4	1,255.0	1,282.0
5	697.2	763.1	841.4	902.1	1,019.8	1,071.7	1,086.4	1,117.8	1,110.2	1,170.8	1,255.6	1,283.5
6	699.7	765.2	844.3	903.5	1,022.8	1,076.4	1,084.8	1,116.4	1,110.2	1,172.2	1,256.5	1,284.4
7	702.3	767.5	847.7	905.2	1,024.0	1,078.5	1,084.0	1,114.8	1,110.5	1,172.2	1,257.4	1,284.4
8	704.7	768.7	849.8	907.2	1,032.1	1,079.8	1,083.5	1,113.5	1,110.7	1,175.9	1,258.0	1,285.0
9	706.5	770.0	850.9	910.4	1,033.6	1,080.8	1,083.0	1,112.6	1,110.2	1,177.9	1,258.6	1,286.3
10	708.4	771.9	851.9	918.5	1,034.9	1,081.9	1,083.8	1,111.8	1,109.6	1,179.3	1,259.5	1,286.9
11	710.7	773.9	853.2	933.8	1,035.1	1,083.2	1,088.3	1,111.5	1,109.1	1,180.4	1,260.4	1,287.5
12	712.9	775.4	855.3	955.2	1,035.4	1,084.6	1,092.8	1,109.9	1,108.6	1,214.8	1,261.3	1,288.1
13	715.4	778.7	856.6	971.6	1,035.9	1,084.6	1,097.1	1,109.4	1,108.0	1,222.4	1,261.9	1,289.3
14	717.9	784.1	858.1	979.3	1,036.4	1,085.9	1,098.7	1,109.1	1,112.6	1,222.4	1,262.2	1,289.7
15	720.7	786.5	859.8	982.7	1,041.8	1,086.4	1,099.5	1,108.3	1,126.2	1,222.7	1,262.2	1,290.3
16	723.4	789.3	860.4	986.1	1,045.1	1,086.4	1,099.7	1,107.7	1,126.2	1,222.7	1,262.8	1,290.6
17	725.8	792.6	862.1	993.1	1,046.3	1,086.7	1,100.3	1,106.9	1,126.2	1,222.7	1,263.4	1,291.5
18	728.3	795.6	863.6	995.6	1,048.9	1,090.7	1,101.1	1,105.9	1,130.1	1,223.0	1,263.7	1,292.1
19	730.5	798.8	865.3	997.5	1,049.7	1,096.0	1,103.2	1,104.5	1,132.0	1,223.6	1,263.7	1,292.7
20	733.1	802.5	866.8	999.2	1,049.9	1,097.9	1,107.2	1,103.2	1,132.2	1,224.2	1,263.7	1,293.7
21	735.3	806.1	868.8	1,001.2	1,049.9	1,099.2	1,109.1	1,102.4	1,132.5	1,224.5	1,263.7	1,294.3
22	737.9	809.0	872.0	1,002.6	1,050.2	1,099.7	1,110.5	1,101.9	1,135.5	1,225.1	1,264.0	1,294.9
23	739.9	812.4	875.1	1,003.9	1,050.2	1,100.0	1,111.8	1,100.3	1,138.9	1,225.4	1,264.6	1,295.2
24	741.2	815.9	877.0	1,004.6	1,050.4	1,099.5	1,114.0	1,098.7	1,144.2	1,225.4	1,266.1	1,296.4
25	742.8	818.9	878.8	1,005.3	1,050.4	1,098.9	1,115.6	1,097.9	1,145.8	1,225.6	1,268.0	1,296.1
26	744.6	821.7	880.5	1,006.6	1,050.2	1,098.4	1,117.0	1,102.7	1,146.4	1,225.9	1,272.5	1,295.5
27	747.1	825.2	883.3	1,007.1	1,050.7	1,097.1	1,118.6	1,105.1	1,146.7	1,242.3	1,275.9	1,296.4
28	749.0	827.5	885.7	1,007.3	1,050.9	1,096.5	1,120.5	1,107.5	1,147.2	1,245.2	1,277.1	1,298.6
29	751.2		888.1	1,006.8	1,051.4	1,095.2	1,121.3	1,108.8	1,147.2	1,247.9	1,278.0	1,299.2
30	752.7		889.9	1,007.1	1,051.2	1,093.9	1,121.1	1,109.4	1,147.2	1,250.3	1,278.9	1,298.3
	754.4		891.5		1,050.7		1,120.5	1,110.5		1,252.6		1,298.3

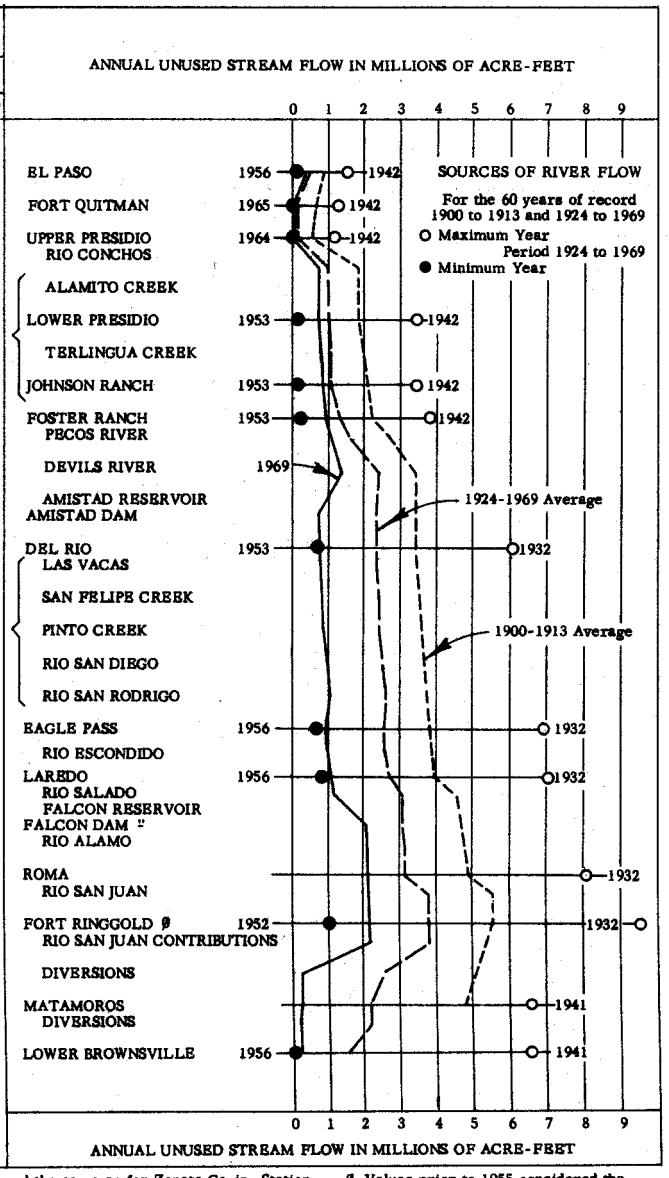
Month	1969							Period		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage		
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum	Minimum
Jan.	1,048.46	754.4	31	1,044.72	687.2	1	722.6			
Feb.	1,052.17	827.5	28	1,048.46	754.4	1	787.7			
Mar.	1,055 17	891.5	31	1,052.17	827.5	1	861.7			
Apr.	1,060.13	1,007.3	28	1,055.17	891.5	1	962.8			
May	1,061.88	1,051.4	29	1,060.12	1,007.1	1	1,038.6			
June	1,063.73	1,100.1	23	1,061.84	1,050.4	2	1,084.8	543.9	1,084.8	3.0
July	1,064.52	1,121.3	29	1,063.09	1,083.0	9	1,101.1	592.0	1,101.1	83.0
Aug.	1,064.50	1,120.8	† 1	1,063.65	1,097.9	25	1,109.4	648.5	1,109.4	176.2
Sept.	1,065.46	1,147.2	† 28	1,064.09	1,109.6	3	1,124.8	740.2	1,124.8	355.7
Oct.	1,069.10	1,252.6	31	1,065.42	1,146.1	3	1,207.2	931.4	1,207.2	661.0
Nov.	1,069.97	1,278.9	30	1,069.10	1,252.6	1	1,263.2	983.0	1,263.2	702.0
Dec.	1,070.63	1,299.2	29	1,069.97	1,278.9	1	1,290.4	998.2	1,290.4	706.1
Yearly	1,070.63	1,299.2		1,044.72	687.2		1,047.6			

† And other days

SOURCES OF RIVER FLOW

The graph and the column of figures on this page represent data on the annual yield of drainage areas tributary to various stream-gaging stations in the Rio Grande watershed. The graphic values are for the entire tributary area, while the column figures are reduced to the yield from one average square mile of the tributary area. There were no reservoirs of consequence on the area from 1900 to 1913; therefore, the figures in the first column correspond to those for that period in the graph. Because about 17,000,000 acre-feet of reservoir capacity have been developed on the watershed since 1913, in which large volumes of unused runoff are stored in some years and released in later years as unused stream flow (thus reducing the unused stream flow in some years and adding thereto in others), it is significant to differentiate between the unused runoff and unused stream flow.

Average Annual Unused Water Acre-Feet per Square Mile			
RUNOFF		STREAM FLOW	
1900-1913	1924-1969	1924-1969	
29.7	14.6	15.2	EL PASO
19.6	4.1	4.7	FORT QUITMAN
16.4	3.5	4.0	UPPER PRESIDIO
42.6	32.0	32.0	RIO CONCHOS
			ALAMITO CREEK
			LOWER PRESIDIO
19.8	18.0	18.0	TERLINGUA CREEK
			JOHNSON RANCH
25.9	16.3	16.5	FOSTER RANCH
12.4	9.0	8.9	PECOS RIVER
104.3	103.7	103.7	DEVILS RIVER
			AMISTAD RESERVOIR
26.9	19.2	19.1	AMISTAD DAM
26.9	19.2	19.1	DEL RIO
			LAS VACAS
			SAN FELIPE CREEK
110.8	52.0	51.9	PINTO CREEK
			RIO SAN DIEGO
			RIO SAN RODRIGO
29.2	20.2	20.1	EAGLE PASS
32.4	34.4	34.4	RIO ESCONDIDO
29.3	20.8	20.7	LAREDO
23.1	13.6	13.5	RIO SALADO
			FALCON RESERVOIR
			FALCON DAM "
			RIO ALAMO
			ROMA
** 48.4	** 49.8	** 48.2	RIO SAN JUAN
			FORT RINGGOLD ø
			RIO SAN JUAN CONTRIBUTIONS
			DIVERSIONS
			MATAMOROS
			DIVERSIONS
			LOWER BROWNSVILLE



" Values prior to 1953 considered the same as for Zapata Gaging Station ø Values prior to 1955 considered the same as for Rio Grande City Gaging Station. ** Includes contributions of the Río San Juan entering the Rio Grande above and below Rio Grande City.

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

The following tables are based on determinations of gravimetric percentages of dry silt in water samples taken at each station by one of the following three methods:

A. By lowering an open small-neck bottle in one or more verticals in the stream cross section, being careful to approach but not strike bottom, thus securing an integrated sample throughout the depth. By taking from each sample an amount of water volumetrically proportional to the river flow represented by that sample, a composite, representative of the monthly river flow, is made and its gravimetric percentage of silt determined.

B. By sampling at the stream surface with a separate bottle at each of three points, spaced, 1/6, 1/2, and 5/6 of the stream width. The gravimetric percentage in each sample is determined, a coefficient of 1.10 is applied to the average of the three, and the product applied to the volume of stream flow represented by that set of samples.

C. By sampling, at 2 hour intervals, the water pumped directly from the river to the Laredo, Texas Water Treatment Plant. From daily composites of these samples, a monthly composite, representative of the river flow, is made as stated in Method A and its gravimetric percentage of silt determined.

For ease of comparison, the assumption is made that one cubic foot of silt weighs 66.7 pounds, or one acre-foot of silt weighs 1,452 tons.

Month	1969						Period of Record			
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum

Rio Grande at El Paso, Texas

Period: Sept. 1947-1969

Jan.	6,370,000	206	30	0.003245			0.14	0.20	1.4	0.00
Feb.	3,494,000	150	26	.004280			.10	.26	2.2	.01
Mar.	57,497,000	15,800	31	.02752			10.9	19.8	52.7	.89
Apr.	45,831,000	7,090	30	.01548			4.9	11.5	45.2	3.0
May	42,059,000	5,840	31	.01388			4.0	8.5	63.3	.03
June	71,746,000	13,800	30	.01924			9.5	22.5	152	2.4
July	92,028,000	20,500	31	.02232			14.1	35.8	124	1.1
Aug.	94,106,000	27,800	31	.02952			19.1	38.1	112	2.0
Sept.	49,751,000	43,000	30	.08644			29.6	24.6	123	1.1
Oct.	14,735,000	1,850	28	.01256			1.3	5.0	51.0	.01
Nov.	9,232,000	462	18	.005000			.32	.31	1.5	.01
Dec.	9,758,000	453	20	.004640			.31	.31	2.1	.01
Yearly	496,607,000	136,951	336	0.02758			94.27	166.88	436.87	34.37

Samples and Analyses by U. S. Section, Method A

Río Conchos near Ojinaga, Chihuahua

Period: 1956-1969

Jan.	178,434,000	0	14	0	0	0	0	0	0	0
Feb.	169,047,000	0	12	0	0	0	0	.32	4.5	0
Mar.	177,082,000	0	13	0	0	0	0	0	0	0
Apr.	103,773,000	0	13	0	0	0	0	.41	5.8	0
May	36,327,000	0	13	0	0	0	0	33.4	145	0
June	64,013,000	310,000	14	.4843	1.7365	0	213	187	688	0
July	105,226,000	966,000	15	.9176	2.4689	0	665	329	1,450	0
Aug.	43,120,000	36,400	13	.0843	1.7268	0	25.1	594	2,650	8.1
Sept.	63,820,000	108,000	13	.1694	1.3478	0	74.4	1,402	9,330	14.4
Oct.	61,887,000	0	14	0	0	0	0	996	12,400	0
Nov.	45,744,000	0	12	0	0	0	0	8.0	70.2	0
Dec.	40,868,000	0	14	0	0	0	0	1.5	14.0	0
Yearly	1,089,341,000	1,420,400	160	0.1304	2.4689	0	977.5	3,551.63	21,903.3	284.7

Samples and Analyses by Mexican Section, Method B

Rio Grande below Rio Conchos near Presidio, Texas

Period: 1955-1969

Jan.	158,937,000	6,190	7	0.003896			4.3	3.6	14.4	0.70
Feb.	150,769,000	5,370	5	.003560			3.7	3.7	22.2	.14
Mar.	158,128,000	5,690	5	.003600			3.9	6.7	70.9	.15
Apr.	97,971,000	3,410	6	.003480			2.3	7.1	95.7	.12
May	38,263,000	1,940	6	.005080			1.3	29.6	161	.21
June	68,651,000	295,000	7	.4294	1.8297	0.02090	203	144	465	.29
July	118,281,000	334,000	8	.2822	.6936	.008200	230	326	1,420	2.0
Aug.	41,268,000	4,280	6	.01036			2.9	410	1,360	2.9
Sept.	62,632,000	292,000	8	.4657	2.1910	.01140	201	648	3,670	14.9
Oct.	55,202,000	3,810	9	.006908			2.6	408	4,770	2.6
Nov.	44,520,000	24,800	9	.05572	.7790	.01040	17.1	11.0	45.2	1.3
Dec.	43,378,000	1,250	8	.002880			.86	3.5	13.7	.86
Yearly	1,038,000,000	977,740	84	0.09419			672.96	2,001.2	8,793.44	172.78

Samples and Analyses by U. S. Section, Method A

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

Rio Grande at Johnson Ranch near Castolon, Texas

Period: Oct. 1951-1969

Month	1969 Tons Water	1969 Tons Silt	1969 No. of Samples	1969 Gravimetric Percentages Average	Maximum Sample	Minimum Sample	1969 Acre-Feet at 1,452 Tons Per Acre Foot	Period of Record Average	Maximum	Minimum
Jan.	160,743,000	14,100	6	0.008760			9.7	3.6	14.4	0.72
Feb.	152,036,000	13,500	5	.008880			9.3	17.0	253	.21
Mar.	157,265,000	10,100	5	.006440			7.0	2.8	9.4	.14
Apr.	100,460,000	5,550	5	.005520			3.8	58.0	692	.01
May	43,378,000	44,300	5	.1022			30.5	134	426	0
June	80,881,000	865,000	6	1.070	1.9031	0.009000	596	451	1,570	2.3
July	121,858,000	846,000	6	.6944	1.6429	.009400	583	844	4,030	51.6
Aug.	41,708,000	30,700	7	.07372	.3596	.005800	21.1	929	3,840	2.8
Sept.	61,410,000	178,000	6	.2896	1.2249	.01950	123	1,029	8,990 *	98.5
Oct.	60,004,000	289,000	8	.4822	2.3983	.01700	199	875	13,500 u	2.4
Nov.	45,937,000	6,280	4	.01368			4.3	15.7	151	.28
Dec.	44,682,000	2,270	8	.005080			1.6	6.8	48.3	.41
Yearly	1,070,362,000	2,304,800	71	0.2153			1,588.3	4,365.9	23,869.62	803.27

Samples and Analyses by U. S. Section, Method A
u Estimated * Partly Estimated

Rio Grande at Foster Ranch near Langtry, Texas

Period: 1969

Month	Tons Water	Tons Silt	No. of Samples	Gravimetric Percentages Average	Maximum Sample	Minimum Sample	Acre-Feet at 1,452 Tons Per Acre Foot
Jan.	165,919,000	21,900	4	0.01320			15.1
Feb.	156,700,000	18,900	4	.01208			13.0
Mar.	171,607,000	13,700	4	.008000			9.4
Apr.	139,898,000	18,500	5	.01320			12.7
May	78,291,000	70,000	4	.08944			48.2
June	117,415,000	608,000	5	.5182	1.2611	0.02570	419
July	130,212,000	984,000	4	.7554	1.6871	.1367	678
Aug.	61,802,000	31,700	4	.05128	.2137	.009400	21.8
Sept.	104,565,000	414,000	3	.3960	1.4663	.1177	285
Oct.	83,860,000	321,000	4	.3826	1.0150	.01370	221
Nov.	63,836,000	19,500	4	.03052			13.4
Dec.	62,213,000	3,960	5	.006360			2.7
Yearly	1,336,318,000	2,525,160	50	0.1890			1,739.3

Samples and Analyses by U. S. Section, Method A

Pecos River near Langtry, Texas

Period: Nov. 1954-1969

Month	Tons Water	Tons Silt	No. of Samples	Gravimetric Percentages Average	Maximum Sample	Minimum Sample	Acre-Feet at 1,452 Tons Per Acre Foot	Period of Record Average	Maximum	Minimum
Jan.	10,508,000	294	3	0.002800			0.20	0.25	0.62	0.05
Feb.	9,758,000	347	4	.003560			.24	.24	.70	.05
Mar.	10,204,000	331	4	.003240			.23	.28	.79	.05
Apr.	35,887,000	11,900	5	.03304			8.2	13.5	167	.06
May	39,096,000	2,360	3	.006040			1.6	27.6	407	.07
June	14,502,000	458	3	.003160			.32	3.3	41.7	.12
July	9,772,000	301	3	.003080			.21	2.4	22.2	.05
Aug.	8,538,000	263	4	.003080			.18	2.0	23.8	.04
Sept.	12,464,000	563	8	.004520			.39	33.4	359	.09
Oct.	12,187,000	278	3	.002280			.19	9.2	59.8	.07
Nov.	15,303,000	502	3	.003280			.35	.33	1.1	.03
Dec.	15,330,000	491	4	.003200			.34	.20	.55	.05
Yearly	193,549,000	18,088	47	0.009345			12.45	92.70	577.44	3.12

Samples and Analyses by U. S. Section, Method A

Rio Grande below Amistad Dam near Del Rio, Texas

Period: July 1968-1969

Month	Tons Water	Tons Silt	No. of Samples	Gravimetric Percentages Average	Maximum Sample	Minimum Sample	Acre-Feet at 1,452 Tons Per Acre Foot	Period of Record Average	Maximum	Minimum
Jan.	95,090,000	1,670	13	0.001760			1.2			
Feb.	73,319,000	1,200	12	.001640			.83			
Mar.	87,310,000	1,640	13	.001880			1.1			
Apr.	74,195,000	1,750	13	.002360			1.2			
May	76,460,000	1,710	13	.002240			1.2			
June	68,378,000	1,640	11	.002400			1.1			
July	87,046,000	2,440	10	.002800			1.7	9.0	16.4	1.7
Aug.	87,685,000	2,910	12	.003320			2.0	2.4	2.9	2.0
Sept.	80,840,000	1,710	13	.002120			1.2	1.4	1.5	1.2
Oct.	87,085,000	2,120	11	.002440			1.5	1.6	1.6	1.5
Nov.	85,161,000	1,670	11	.001960			1.2	1.6	1.9	1.2
Dec.	90,635,000	1,960	12	.002160			1.3	1.5	1.7	1.3
Yearly	993,204,000	22,420	144	.002257			15.53			

Samples and Analyses by U. S. Section, Method A

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

Rio Grande at Laredo, Texas

Period: #1953-1969

Month	1969 Tons Water	1969 Tons Silt	1969 No. of Samples	1969 Gravimetric Percentages Average	Maximum Sample	Minimum Sample	Acre-Feet at 1,452 Tons Per Acre Foot	Period of Record Average	Maximum	Minimum
Jan.	101,002,000	7,310	31	0.007240			5.0	10.6	28.0	2.2
Feb.	81,811,000	10,700	28	.01304			7.4	16.8	95.7	1.7
Mar.	69,102,000	6,410	31	.009280			4.4	11.7	26.8	.78
Apr.	161,556,000	365,000	30	.2258			251	202	1,920	.47
May	122,202,000	57,400	31	.04696			39.5	374	3,540	2.3
June	40,343,000	4,410	30	.01092			3.0	1,117	12,400	.62
July	49,169,000	5,660	31	.01152			3.9	685	3,440	3.9
Aug.	203,651,000	260,000	31	.1279			179	557	1,960	4.2
Sept.	129,094,000	32,400	30	.02512			22.3	1,239	5,010	22.3
Oct.	275,943,000	240,000	31	.08704	0.1445	0.01350	165	933	7,520	29.7
Nov.	138,966,000	17,600	30	.01264			12.1	111	1,190	6.1
Dec.	139,070,000	16,000	31	.01148			11.0	13.6	67.6	2.8
Yearly	1,511,908,000	1,022,890	365	0.06766			703.6	5,270.7	19,257.72	426.1

Samples by Laredo Water Plant and Analyses by U. S. Section, Method C
Some months missing

ø Rio Grande below Falcon Dam, Texas, U. S. Tailrace

Period: July 1955-1969

Jan.	546,388,000	7,870	13	0.001440			5.4	1.8	5.4	0.14
Feb.	293,872,000	8,350	11	.002840			5.8	2.4	9.1	.06
Mar.	141,389,000	2,600	8	.001840			1.8	1.3	4.3	.15
Apr.	279,353,000	7,600	9	.002720			5.2	3.3	12.2	.25
May	438,748,000	11,800	13	.002680			8.1	3.4	8.1	.19
June	488,727,000	6,840	9	.001400			4.7	3.9	18.7	.42
July	220,766,000	3,270	10	.001480			2.3	1.0	2.3	.41
Aug.	153,595,000	1,900	11	.001240			1.3	1.1	2.8	.22
Sept.	47,461,000	1,140	7	.002400			.79	1.3	5.7	0
Oct.	103,020,000	2,430	12	.002360			1.7	3.5	37.5	.18
Nov.	85,232,000	2,390	10	.002800			1.6	1.1	5.5	.02
Dec.	44,263,000	1,330	8	.003000			.92	1.8	14.7	.11
Yearly	2,842,814,000	57,520	121	0.002023			39.61	25.9	92.15	7.24

Samples and Analyses by U. S. Section, Method A
ø Discharge based on record of total releases from Falcon Reservoir

Río Alamo at Cd. Mier, Tamaulipas

Period: 1934-1969

Jan.	2,249,000	0	0	¤ 0			0	1.8	21.8	0
Feb.	1,836,000	0	0	¤ 0			0	3.0	48.6	0
Mar.	2,221,000	0	0	¤ 0			0	6.7	91.2	0
Apr.	1,390,000	0	0	¤ 0			0	29.9	229	0
May	7,286,000	16,100	8	.221	0.3088	0	11.1	48.0	281	0
June	7,801,000	34,900	6	.447	.5000	0	24.0	53.9	471	0
July	45,100	0	0	¤ 0			0	17.6	143	0
Aug.	3,286,000	3,350	9	.102	.2874	0	2.3	134	1,610	0
Sept.	10,588,000	24,100	12	.228	.4030	.022	16.6	229	2,920	0
Oct.	11,722,000	62,600	12	.534	.7500	.001	43.1	86.0	753	0
Nov.	1,191,000	4.8	5	.0004	.0022	0	0	2.3	40.7	0
Dec.	2,033,000	0	0	0			0	1.6	33.7	0
Yearly	51,648,100	141,054.8	52	0.273	0.7500	0	97.1	613.8	3,156.57	54.09

Samples and Analyses by Mexican Section, Method B
¤ Estimated

Rio Grande at Fort Ringgold, Rio Grande City, Texas

Period: May 1959-1969

Jan.	562,669,000	43,900	12	0.007800			30.2	12.8	32.6	0.52
Feb.	318,732,000	10,300	7	.003240			7.1	6.5	13.7	.35
Mar.	141,146,000	4,570	12	.003240			3.1	5.9	26.7	.39
Apr.	270,135,000	8,640	9	.003200			6.0	21.5	51.0	6.0
May	464,493,000	15,600	15	.003360			10.7	59.4	259	4.0
June	539,029,000	103,000	10	.01904			70.9	39.9	94.4	4.7
July	221,202,000	6,110	11	.002760			4.2	22.1	90.9	2.1
Aug.	161,053,000	6,310	9	.003920			4.3	71.9	510	1.2
Sept.	57,655,000	30,300	13	.05252			20.9	137	798	12.3
Oct.	117,394,000	8,640	12	.007360			6.0	40.8	184	2.6
Nov.	91,842,000	5,580	12	.006080			3.8	3.7	9.2	1.3
Dec.	50,608,000	1,400	9	.002760			.96	3.8	12.1	.96
Yearly	2,995,958,000	244,350	131	0.008156			168.16	425.3	1,691.1	160.8

Samples and Analyses by U. S. Section, Method A

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

‡ Rio Grande near Los Ebanos, Texas

Period: May 1956-1969

Month	1969 Tons Water	1969 Tons Silt	1969 No. of Samples	1969 Gravimetric Percentages Average	Maximum Sample	Minimum Sample	Acre-Feet at 1,452 Tons Per Acre Foot	Period of Record Average	Maximum	Minimum
Jan.	562,669,000	56,500	8	0.01004			38.9	22.2	107	0.76
Feb.	318,732,000	14,200	8	.004462			9.8	7.7	16.0	.74
Mar.	141,146,000	5,310	8	.003760			3.7	8.6	40.2	.65
Apr.	270,135,000	16,900	9	.006255			11.6	72.7	635	3.0
May	464,493,000	21,700	9	.004680			14.9	89.4	289	5.3
June	539,029,000	34,200	8	.006345			23.6	63.8	209	3.2
July	221,202,000	8,320	9	.003760			5.7	13.7	79.9	.74
Aug.	161,053,000	9,960	9	.006185			6.9	103	1,150	2.0
Sept.	57,655,000	5,050	9	.008760			3.5	112	459	3.5
Oct.	117,394,000	15,200	11	.01296			10.5	48.3	314	3.2
Nov.	91,842,000	3,990	13	.004343			2.7	8.7	75.1	.62
Dec.	50,608,000	1,520	14	.003012			1.0	4.7	16.3	1.0
Yearly	2,995,958,000	192,850	115	0.006437			132.8	554.8	1,788.7	80.0

Samples and Analyses by U. S. Section, Method A

‡ Discharge based on record of flow at Fort Ringgold

♂ Rio Grande below Anzalduas Dam, Texas

Period: May 1956-1969

Month	Tons Water	Tons Silt	No. of Samples	Gravimetric Percentages Average	Maximum Sample	Minimum Sample	Acre-Feet at 1,452 Tons Per Acre Foot	Period of Record Average	Maximum	Minimum
Jan.	238,406,000	22,900	12	0.009602			15.8	9.8	49.0	0.79
Feb.	131,056,000	6,500	11	.004960			4.5	3.4	11.9	.42
Mar.	62,038,000	1,860	13	.003000			1.3	4.0	27.3	.25
Apr.	137,929,000	6,070	10	.004400			4.2	47.0	279	3.5
May	118,886,000	26,400	5	.02223			18.2	33.2	79.9	1.4
June	307,615,000	24,900	12	.008080			17.1	50.8	414	4.5
July	146,373,000	4,100	11	.002800			2.8	33.0	333	.92
Aug.	71,074,000	2,290	12	.003227			1.6	41.3	502	.73
Sept.	46,550,000	2,560	12	.005502			1.8	167	1,480	.81
Oct.	54,635,000	1,950	14	.003871			1.3	103	676	.71
Nov.	63,776,000	2,370	8	.003720			1.6	21.8	274	.51
Dec.	86,031,000	9,390	11	.01092			6.5	12.3	135	.41
Yearly	1,464,369,000	111,290	131	0.007600			76.7	526.6	2,541.0	57.9

Samples and Analyses by U. S. Section, Method A

Rio Grande near San Benito, Texas

Period: April 1955-1969

Month	Tons Water	Tons Silt	No. of Samples	Gravimetric Percentages Average	Maximum Sample	Minimum Sample	Acre-Feet at 1,452 Tons Per Acre Foot	Period of Record Average	Maximum	Minimum
Jan.	50,636,000	5,290	6	0.01044			3.6	14.2	121	0.13
Feb.	75,465,000	6,550	7	.008680			4.5	10.2	97.8	.15
Mar.	46,757,000	2,210	9	.004720			1.5	5.2	50.6	.11
Apr.	26,905,000	1,330	6	.004940			.92	5.8	17.9	.11
May	49,512,000	6,870	5	.01388			4.7	29.6	265	2.2
June	59,777,000	2,750	2	.004600			1.9	11.7	34.1	1.9
July	41,179,000	1,650	0	ᵘ .004000			1.1	9.8	91.6	.11
Aug.	25,123,000	864	4	.003440			.60	8.1	48.5	.07
Sept.	41,794,000	2,260	7	.005418			1.6	50.4	218	.30
Oct.	13,427,000	428	9	.003187			.29	67.1	636	.29
Nov.	14,252,000	422	4	.002960			.29	19.4	247	.29
Dec.	59,596,000	5,410	5	.009080			3.7	13.0	163	.06
Yearly	504,423,000	36,034	64	0.007144			24.70	244.50	894.82	23.27

Samples and Analyses by U. S. Section, Method A

ᵘ Estimated

Rio Grande near Brownsville, Texas

Period: April 1955-1969

Month	Tons Water	Tons Silt	No. of Samples	Gravimetric Percentages Average	Maximum Sample	Minimum Sample	Acre-Feet at 1,452 Tons Per Acre Foot	Period of Record Average	Maximum	Minimum
Jan.	14,902,000	882	5	0.005920			0.61	6.6	67.4	0.02
Feb.	60,792,000	7,680	7	.01264			5.3	12.3	80.6	.04
Mar.	51,027,000	3,190	9	.006255			2.2	6.3	70.2	.08
Apr.	11,095,000	787	7	.007092			.54	4.0	27.7	.04
May	36,510,000	5,270	4	.01444			3.6	9.7	58.5	.38
June	19,615,000	596	1	.003040			.41	9.0	58.4	.29
July	22,419,000	1,640	2	.007320			1.1	29.8	292	.08
Aug.	15,554,000	1,030	5	.006640			.71	6.1	45.0	.01
Sept.	36,149,000	3,640	7	.01008			2.5	48.6	255	0
Oct.	9,780,000	685	9	.007000			.47	34.7	242	.03
Nov.	7,885,000	263	4	.003333			.18	22.7	283	.12
Dec.	52,773,000	5,740	7	.01088			4.0	11.5	142	.02
Yearly	338,501,000	31,403	67	0.009272			21.62	201.3	1,072.26	1.97

Samples and Analyses by U. S. Section, Method A

♂ Discharge based on record of flow at "Below Anzalduas Dam" plus return flow at "Poniente Drain". There was no flow through this drain in 1969.

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1969

The following tables are based on chemical analyses of composites representative of the river flow at Rio Grande and tributary stations. The monthly composites were made by the United States Section of this Commission by taking from each independent water sample an amount of water volumetrically proportional to the river flow represented by that sample. The chemical analyses were made by the U. S. Department of Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, California. All other data were computed by the United States Section of this Commission.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20; Mg, 12.16; Na, 23; (CO_3 plus HCO_3) expressed as CO_3, 30; SO_4, 48; Cl, 35.5; NO_3, 62. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as ECx10^6 at 25°C, is a relative measure of the total salt concentration.

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	ECx10^6 @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande at El Paso, Texas

Sampling by U. S. Section

Jan.	30	2.25	10,500	2,420	0.44	7.7	62	34	6.97	2.49	15.44	5.08	11.56	8.64	0.04
Feb.	26	2.49	6,400	2,690	.43	7.6	65	35	6.70	2.85	18.12	5.14	12.87	9.91	.06
Mar.	31	1.02	43,200	1,140	.04	7.4	48	27	4.86	1.15	5.47	3.36	5.00	3.16	.01
Apr.	30	1.10	37,100	1,210	.18	7.5	51	25	4.59	1.35	6.25	3.47	5.89	3.06	.01
May	31	1.10	34,000	1,230	.09	8.0	51	24	4.63	1.44	6.20	3.74	5.79	3.08	.01
June	30	.91	48,000	1,020	.14	7.4	47	22	4.20	1.22	4.77	3.40	4.67	2.26	T
July	31	.83	56,200	946	.12	7.9	47	22	3.87	1.06	4.42	3.29	4.10	2.07	.01
Aug.	31	.84	58,200	937	.09	7.6	47	23	3.84	1.08	4.40	3.23	4.08	2.13	T
Sept.	30	1.22	44,700	1,330	.06	7.8	50	26	5.22	1.58	6.87	3.89	6.34	3.52	.02
Oct.	28	1.97	21,400	2,140	.11	7.3	58	31	6.94	2.22	12.83	4.91	10.54	6.94	.01
Nov.	18	2.15	14,600	2,290	.18	7.4	60	32	7.12	2.58	14.58	5.28	11.40	7.69	.02
Dec. ‼	0	2.06	14,800	2,220			59	31	7.03	2.40	13.70	5.10	10.97	7.32	
Mean ⊕	ø316	1.06	ø389,100	1,180			51	25	4.56	1.33	6.01	3.57	5.43	3.05	
Period Avg.		1.10	458,000	1,220			52	29	4.37	1.58	6.56	3.51	5.48	3.67	
Tons of Constituents, 1969									45,400	8,040	68,700	58,200	130,000	53,700	
Avg. Tons, Period 1930-1969									49,600	10,900	85,300	59,600	149,000	73,600	

Rio Grande at Fort Quitman, Texas

Sampling by U. S. Section

Jan.	5	5.99	9,280	6,550	0.48	7.7	65	62	16.47	7.36	45.22	4.89	21.49	42.82	0.10
Feb.	4	11.0	3,020	11,400	.89	7.6	67	68	26.98	14.92	83.64	4.46	36.09	86.93	.02
Mar.	4	11.4	2,430	11,700	.78	7.5	66	69	30.25	14.24	86.50	3.98	36.91	90.91	.02
Apr.	3	9.34	3,910	9,800	.82	7.6	66	68	24.85	11.86	69.76	4.59	30.27	72.58	.02
May	4	8.43	5,350	9,010	.69	7.5	67	66	21.88	10.56	64.96	4.72	28.95	64.10	T
June	4	9.74	4,050	10,400	.94	7.7	67	67	26.63	10.37	73.70	4.00	33.90	75.47	.01
July	7	3.54	14,000	4,030	.38	7.7	63	57	10.68	4.20	25.72	4.36	13.35	23.59	.02
Aug.	4	8.47	15,500	8,970	.79	7.8	67	65	21.39	11.05	65.40	4.44	29.89	64.45	.02
Sept.	4	3.00	43,600	3,350	.32	7.8	60	53	10.12	3.59	20.52	4.28	11.85	18.44	.06
Oct.	6	4.44	24,600	4,880	.39	7.5	63	55	14.07	4.64	31.94	5.15	17.73	28.47	.06
Nov.	4	4.28	25,500	4,640	.33	7.2	63	54	13.14	4.94	30.68	5.53	17.28	26.48	.11
Dec.	5	3.70	28,400	4,030	.40	7.7	64	52	11.41	3.87	26.87	5.01	15.33	22.18	.09
Mean ⊕	ø 54	4.18	ø179,640	4,570	.40	7.6	63	57	12.72	4.85	30.19	4.74	16.16	27.37	0.07
Period Avg.		2.41	316,000	2,730			61	55	7.73	3.14	17.04	3.63	8.90	15.50	
Tons of Constituents, 1969									14,900	3,450	40,600	8,320	45,400	56,800	
Avg. Tons, Period 1930-1969									27,600	6,800	69,800	19,400	76,200	97,900	

ø Total ⊕ Weighted Mean ** Percent of total cations *** Percent of total anions ‼ Estimated T Trace

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1969

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	EC x 10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande above Rio Conchos near Presidio, Texas

Sampling by U. S. Section

Jan.	1	4.65	3.7	5,010	0.57	7.6	63	57	14.58	4.75	33.10	3.08	19.80	30.18	0.01
Feb.	No	Flow													
Mar.	No	Flow													
Apr.	No	Flow													
May "	0	.93	18.6	949			29	8	6.61	.32	2.83	2.83	6.48	.86	.01
June	5	.93	791	949	.04	7.9	29	8	6.61	.32	2.83	2.83	6.48	.86	.01
July	6	.75	646	791	.10	7.4	35	11	4.91	.20	2.79	2.10	4.93	.91	.03
Aug.	1	.84	28.0	869	.03	7.7	32	10	5.52	.48	2.80	2.10	6.04	.87	T
Sept.	6	.93	712	995	.12	7.6	35	22	5.93	.57	3.43	1.88	5.98	2.21	.07
Oct.	1	1.84	2.6	2,150	.21	7.2	59	48	7.18	1.29	12.24	2.51	8.50	10.07	T
Nov.	2	2.92	180	3,270	.38	7.2	65	53	8.95	2.74	21.36	3.09	12.48	17.81	T
Dec.	8	3.57	3,950	4,030	.46	7.3	67	55	11.53	1.65	26.97	3.04	15.56	22.34	.01
Mean ⊕	Ø30	1.71	Ø 6,331.9	1,880			56	41	7.58	0.78	10.48	2.52	8.83	7.86	0.03
Period Avg.		1.88	213,000	2,130					# 8.81		12.65	3.12		10.85	
Tons of Constituents, 1969									765	47.7	1,210	381	2,130	1,400	
Avg. Tons, Period 1935-1969											44,700	14,400		59,100	

Río Conchos near Ojinaga, Chihuahua

Sampling by Mexican Section

Jan.	14	0.73	95,800	767	0.09	7.6	39	11	3.93	0.76	2.96	2.85	3.89	0.85	0.02
Feb.	12	.76	94,500	781			40		# 4.68		3.13	2.87		.92	
Mar.	13	.79	103,000	857			40		# 5.20		3.46	3.12		.95	
Apr.	13	.91	69,500	971			45		# 5.40		4.42	3.06		1.40	
May	13	1.11	29,700	1,190			47		# 6.20		5.59	3.13		1.99	
June	14	1.07	50,400	1,080			37		# 7.10		4.14	2.83		1.24	
July	16	.95	73,600	963	.12	7.6	35	10	5.69	.74	3.50	2.88	6.06	1.01	.07
Aug.	13	1.24	39,300	1,250			48		# 6.70		6.20	2.78		1.92	
Sept.	13	1.06	49,800	1,100			50		# 5.68		5.67	2.83		1.66	
Oct.	14	1.08	49,200	1,140			51		# 5.61		5.90	2.82		1.73	
Nov.	12	1.13	38,000	1,150			48		# 6.27		5.79	3.39		1.82	
Dec.	14	1.18	35,500	1,230			51		# 6.13		6.50	3.18		2.03	
Mean ⊕	Ø161	0.91	Ø 728,300	948			43		# 5.51		4.12	2.96		1.23	
Period Avg.		0.72	545,000	766			41		# 4.64		3.18	2.70		1.12	
Tons of Constituents, 1969											103,000	96,800		47,500	
Avg. Tons, Period 1935-1969											75,100	83,000		40,900	

Rio Grande at Johnson Ranch near Castolon, Texas

Sampling by U. S. Section

Jan.	6	0.75	88,700	785	0.22	7.6	39	11	4.08	0.76	3.12	2.91	4.09	0.91	0.03
Feb.	5	.79	88,400	806			40		# 4.84		3.28	3.07		.98	
Mar.	5	.84	97,200	906			41		# 5.48		3.82	3.20		1.16	
Apr.	5	.95	70,200	1,010			45		# 5.69		4.67	3.04		1.45	
May	5	1.24	39,600	1,300			49		# 6.61		6.36	2.98		2.46	
June	6	1.06	63,100	1,060			39		# 6.74		4.28	3.12		1.04	
July	6	1.05	94,100	1,040	.16	7.9	39	10	5.99	.64	4.27	2.98	6.89	1.11	.07
Aug.	7	1.26	38,700	1,280			52		# 6.34		6.80	2.77		2.34	
Sept.	6	1.07	48,300	1,100			47		# 5.96		5.32	2.85		1.54	
Oct.	8	1.20	53,000	1,200			48		# 6.49		5.91	3.34		1.69	
Nov.	4	1.15	38,900	1,170			48		# 6.43		5.96	3.14		1.87	
Dec.	8	1.18	38,800	1,250			58		# 5.12		7.07	1.81		2.55	
Mean ⊕	Ø71	0.96	Ø 759,000	994			44		# 5.73		4.45	2.99		1.35	
Period Avg.		0.91	609,000	953			44		# 5.53		4.27	2.84		1.60	
Tons of Constituents 1969											110,000	96,100		51,300	
Avg. Tons, Period 1948-1969											89,600	77,800		51,800	

Ø Total ⊕ Weighted Mean ** Percent of total cations *** Percent of total anions " Estimated T Trace
Sum of Calcium and Magnesium

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1969

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	EC x10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande at Foster Ranch near Langtry, Texas

Sampling by U. S. Section

Jan.	4	0.76	92,800	794	0.11	7.6	38	12	4.12	0.86	3.08	3.01	4.05	0.92	0.02
Feb.	4	.77	88,800	802	.12	7.5	40	12	4.04	.92	3.26	3.10	4.03	.97	.02
Mar.	4	.78	98,500	832	.11	7.5	40	12	4.26	.93	3.43	3.19	4.30	.99	.05
Apr.	5	.86	88,600	939	.14	7.5	43	14	4.32	1.08	4.04	2.98	5.22	1.31	.02
May	4	.98	56,500	1,050	.08	7.6	43	16	4.71	1.33	4.52	3.34	5.85	1.72	.01
June	5	.95	82,100	974	.14	7.5	36	11	5.46	.98	3.67	3.12	5.99	1.10	.06
July	4	.98	93,900	966	.10	7.8	33	9	6.01	.74	3.30	2.97	6.19	.94	.10
Aug.	4	.97	44,100	1,010	.14	7.9	47	16	4.19	1.12	4.72	2.83	5.86	1.61	.01
Sept.	3	1.01	77,700	1,040	.24	7.9	40	12	5.56	1.05	4.38	3.62	6.08	1.36	.05
Oct.	4	1.03	63,600	1,030	.20	7.4	46	13	4.67	1.05	4.88	3.11	6.28	1.44	.04
Nov.	4	1.00	47,000	1,030	.30	7.5	45	15	4.50	1.31	4.84	3.06	6.11	1.66	.03
Dec.	5	.99	45,300	1,080	.28	7.1	52	17	4.27	.90	5.49	2.46	6.55	1.91	.01
Mean ⊕	Ø50	0.89	Ø878,900	931	0.15	7.6	41	13	4.66	0.98	3.89	3.09	5.28	1.22	0.04
Period Avg.		.80	905,000	843			39	12	4.42	0.88	3.37	3.10	4.52	1.07	
Tons of Constituents, 1969									125,000	15,900	120,000	124,000	339,000	57,800	
Avg. Tons, Period 1968-1969									137,000	16,500	120,000	144,000	336,000	58,800	

Pecos River near Langtry, Texas

Sampling by U. S. Section

Jan.	3	2.34	18,100	2,730	0.21	7.5	58	62	6.67	4.48	15.36	3.00	7.16	16.77	0.02
Feb.	4	2.67	19,200	3,070	.11	7.4	59	64	7.20	5.14	18.04	2.91	8.02	19.68	.03
Mar.	4	2.72	20,400	3,210	.14	7.4	59	64	7.61	5.11	18.47	2.77	8.49	20.14	.04
Apr.	5	1.69	44,600	2,110	.11	7.5	57	61	5.59	2.93	11.52	2.60	5.26	12.34	.04
May	3	.98	28,200	1,180	.05	7.3	49	42	4.25	1.51	5.51	2.99	3.68	4.80	.01
June	3	2.26	24,100	2,710	.20	7.5	60	62	6.62	3.66	15.30	2.93	6.94	16.44	.03
July	3	1.84	13,200	2,270	.13	7.5	59	62	4.88	3.67	12.55	2.59	5.52	13.19	.03
Aug.	4	1.75	11,000	2,090	.14	7.4	59	61	4.78	3.41	11.86	2.74	5.08	12.32	.02
Sept.	8	1.30	11,900	1,580	.14	7.6	56	58	4.39	2.18	8.34	2.56	3.76	8.81	.04
Oct.	3	1.64	14,700	1,990	.21	7.5	58	59	4.78	3.29	10.94	2.95	4.80	11.41	.04
Nov.	3	2.72	32,600	3,190	.33	7.1	60	64	7.36	5.06	18.84	3.05	8.14	20.21	.04
Dec.	4	2.42	27,300	2,700	.33	7.2	59	63	7.10	4.30	16.71	2.96	7.45	17.69	.03
Mean ⊕	Ø47	1.86	Ø265,300	2,220	.16	7.4	58	60	5.70	3.32	12.31	2.84	5.76	12.95	0.03
Period Avg.		1.97	383,000	2,330			57	61	5.94	3.93	13.09	2.67	6.24	14.22	
Tons of Constituents 1969									22,100	7,820	54,800	16,500	53,600	88,900	
Avg. Tons, Period 1955-1969									31,400	12,600	79,400	21,100	79,100	133,000	

Rio Grande below Amistad Dam near Del Rio, Texas

Sampling by U. S. Section

Jan.	13	0.72	50,400	773	0.08	7.6	41	19	3.70	0.88	3.18	2.78	3.48	1.43	0.01
Feb.	12	.71	38,300	835	.08	7.5	41	20	3.96	1.02	3.44	2.96	3.72	1.70	.02
Mar.	13	.71	45,600	799	.08	7.4	39	18	4.04	.88	3.09	3.07	3.45	1.48	.01
Apr.	13	.72	39,300	812	.12	7.6	40	19	3.96	.96	3.23	3.08	3.56	1.52	.02
May	13	.71	39,900	812	.03	7.7	39	19	3.98	.88	3.16	3.13	3.43	1.52	.02
June	11	.73	36,700	810	.08	7.7	40	20	3.78	.96	3.22	3.02	3.47	1.65	.02
July	10	.75	48,000	846	.09	7.6	41	21	3.97	.93	3.44	3.09	3.44	1.79	.01
Aug.	12	.75	48,400	863	.10	7.6	42	22	3.90	1.02	3.55	3.06	3.51	1.90	T
Sept.	13	.78	46,400	867	.24	7.7	42	23	3.90	1.07	3.60	3.00	3.74	2.00	T
Oct.	11	.76	48,700	864	.21	7.4	43	23	3.97	.90	3.63	2.94	3.71	2.04	T
Nov.	11	.75	47,000	853	.09	7.2	43	24	3.83	1.05	3.65	2.89	3.68	2.04	.02
Dec.	12	.73	48,700	844	.22	7.8	46	25	3.51	.90	3.76	2.52	3.86	2.11	T
Mean ⊕	Ø144	.74	Ø537,400	832	0.12	7.6	42	21	3.87	0.95	3.42	2.95	3.59	1.77	0.01
Period Avg.															
Tons of Constituents 1969									77,100	11,500	78,200	88,000	171,000	62 400	
Avg. Tons, Period															

Ø Total ⊕ Weighted Mean ** Percent of total cations *** Percent of total anions : Estimated T Trace

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1969

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	EC x 10^6 @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande at Laredo, Texas

Sampling by Laredo Water Plant

Jan.	31	0.74	55,000	742	0.15	7.6	42	20	3.60	0.98	3.29	2.68	3.66	1.55	0.02
Feb.	28	.81	48,800	919			44		# 5.08		3.96	2.62		2.18	
Mar.	31	.81	41,200	902			42		# 5.19		3.80	2.85		1.95	
Apr.	30	.51	60,600	593			34		# 3.80		1.98	2.48		1.20	
May	31	.68	61,100	770			39		# 4.52		2.93	2.68		1.70	
June	30	.81	24,000	891			46		# 4.63		3.93	2.41		2.27	
July	31	.88	31,800	967	.19	7.5	48	27	3.59	1.30	4.56	2.45	4.51	2.57	.04
Aug.	31	.58	86,900	625			38		# 3.86		2.32	2.39		1.34	
Sept.	30	.66	62,700	728			39		# 4.36		2.78	2.57		1.70	
Oct.	31	.57	116,000	627			35		# 3.95		2.11	2.51		1.32	
Nov.	31	.71	72,600	792			39		# 4.83		3.06	2.83		1.88	
Dec. ᵘ	0	.79	80,800	883			42		# 5.09		3.66	2.81		2.27	
Mean ⊕	∅334	0.67	∅ 741,500	736			39		# 4.40		2.86	2.59		1.67	
Period Avg.		0.66	1,428,000	754			40		4.48		3.01	2.52		2.06	
Tons of Constituents, 1969											100,000	118,000		89,600	
Avg. Tons, Period 1956-1969											203,000	222,000		214,000	

Río Salado at Las Tortillas, Tamaulipas

Sampling by Mexican Section

Jan.	2	4.27	14,800	4,050	1.09	7.6	47	34	13.54	10.65	21.30	3.19	26.63	15.69	0.42
Feb.	1	4.62	12,400	4,000			48		#26.08		23.70	2.59		17.17	
Mar. ᵘ	0	4.04	9,050	3,700			48		#22.74		20.76	2.41		14.44	
Apr.	1	3.47	16,300	3,390			48		11.35	8.06	17.82	2.23		11.72	
May	2	3.40	54,400	3,280			47		#18.86		17.02	2.20		11.44	
June	2	2.58	20,300	2,510			47		#14.30		12.83	2.48		8.49	
July	2	3.20	12,200	3,120	.98	7.6	49	31	9.72	7.56	16.73	1.85	21.55	10.68	.15
Aug.	2	2.34	10,800	2,360			47		#13.04		11.71	2.13		7.42	
Sept.	1	1.80	17,600	1,850			48		# 9.93		9.26	1.97		6.02	
Oct.	1	1.72	21,600	1,780			44		#10.18		8.14	2.50		5.65	
Nov.	1	2.56	5,420	2,520			48		#14.16		13.25	1.99		8.65	
Dec.	1	4.92	27,300	4,420			48		#26.81		24.79	2.25		14.37	
Mean ⊕	∅16	0.76	∅ 222,170	2,840			48		#16.45		14.82	2.29		9.82	
Period Avg.		0.76	189,000	820			34		# 5.70		2.88	2.56		2.05	
Tons of Constituents, 1969											34,900	7,040		35,700	
Avg. Tons, Period 1955-1969											22,500	26,100		24,700	

Rio Grande below Falcon Dam, Texas, U. S. Tailrace

Sampling by U. S. Section

Jan.	13	0.78	314,000	882	0.14	7.5	46	30	3.27	1.30	3.92	2.10	3.88	2.59	T
Feb.	11	.75	162,000	894	.05	7.5	46	30	3.32	1.30	3.91	2.23	3.93	2.60	T
Mar.	8	.76	79,100	894	.21	7.4	46	29	3.50	1.16	3.98	2.23	3.94	2.55	T
Apr.	9	.79	162,000	912	.16	7.6	46	29	3.49	1.26	3.99	2.28	4.02	2.57	.01
May	13	.78	252,000	901	.18	7.5	46	28	3.43	1.25	3.94	2.28	4.09	2.52	T
June	9	.79	284,000	910	.12	7.5	46	28	3.66	.98	3.99	2.27	4.11	2.53	T
July	10	.80	130,000	926	.10	7.4	48	29	3.51	1.10	4.18	2.18	4.16	2.60	T
Aug.	11	.80	90,410	940	.12	7.4	48	30	3.31	1.28	4.29	2.11	4.21	2.67	.01
Sept.	7	.81	28,300	912	.16	7.8	48	29	3.39	1.18	4.16	2.16	4.30	2.63	T
Oct.	12	.82	62,200	937	.17	7.6	48	29	3.22	1.37	4.24	2.08	4.34	2.69	.01
Nov.	10	.80	50,200	910	.26	7.3	48	29	3.38	1.30	4.26	2.12	4.28	2.65	.01
Dec.	8	.80	26,060	911	.31	7.2	48	29	3.53	1.00	4.18	2.09	4.18	2.58	T
Mean ⊕	∅121	0.78	1,640,270	905	0.14	7.5	46	29	3.43	1.17	4.01	2.20	4.05	2.58	T
Period Avg.		0.68	1,452,000	789			43	29	3.25	1.17	3.28	2.30	3.23	2.28	
Tons of Constituents, 1969									196,000	41,900	262,000	188,000	553,000	260,000	
Avg. Tons, Period 1956-1969									190,000	41,600	220,000	201,000	452,000	236,000	

∅ Total ⊕ Weighted Mean ** Percent of total cations *** Percent of total anions ᵘ Estimated T Trace
‡ Tonnage figures based on total release from Falcon Reservoir

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1969

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1969

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	EC x 10^6 @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande at Fort Ringgold, Rio Grande City, Texas

Sampling by U. S. Section

Jan.	12	0.79	327,000	894	0.13	7.5	46	30	3.33	1.28	3.98	2.17	3.90	2.66	T
Feb.	7	.77	181,000	923	.31	7.4	47	31	3.40	1.36	4.22	2.27	4.01	2.78	T
Mar.	12	.93	96,600	1,090	.29	7.5	50	35	3.74	1.45	5.19	2.40	4.51	3.65	T
Apr.	9	.82	163,000	950	.16	7.8	46	30	3.58	1.27	4.21	2.42	4.11	2.80	T
May	15	.81	277,000	942	.17	7.3	46	29	3.45	1.37	4.11	2.41	4.12	2.70	T
June	10	.83	329,000	935	.14	7.4	47	29	3.77	1.06	4.20	2.44	4.13	2.70	.01
July	11	.85	138,000	962	.18	7.4	48	30	3.45	1.32	4.44	2.26	4.28	2.83	T
Aug.	9	.90	107,000	1,040	.21	7.5	51	33	3.53	1.30	5.03	2.21	4.57	3.33	T
Sept.	13	.92	39,000	1,070	.25	7.6	52	37	3.79	1.03	5.30	2.31	4.22	3.84	.04
Oct.	12	.87	75,100	1,010	.30	7.3	50	33	3.57	1.24	4.84	2.27	4.38	3.24	.01
Nov.	12	.93	62,800	1,080	.26	7.3	51	34	3.73	1.41	5.89	2.27	4.77	3.64	.03
Dec.	9	1.04	38,700	1,200	.60	7.5	58	42	3.17	1.59	6.60	1.56	5.06	4.81	T
Mean @ (15)		0.83	₱1,834,200	958	0.20	7.5	48	31	3.53	1.28	4.38	2.31	4.17	2.91	0
Period Avg.		0.71	1,770,000	753			44	30	3.37	1.16	3.52	2.36	3.32	2.48	
Tons of Constituents, 1969									212,000	46,700	302,000	208,000	600,000	309,000	
Avg. Tons, Period 1959-1969									230,000	48,000	276,000	241,000	544,000	299,000	

Morillo Drain in Mexico, 8.4 River Miles above Anzaldúas Dam

Sampling by Mexican Section

Jan.	3	9.99	19,900*	10,600	5.48	7.6	76	67	16.01	11.43	86.00	2.58	34.92	77.76	0.04
Feb.	6	9.76	47,600*	10,500	5.02	7.5	74	67	17.79	11.66	83.00	3.02	35.28	76.18	.05
Mar.	5	13.1	42,800*	13,400	6.67	7.5	75	69	22.61	15.02	114.3	3.65	43.87	103.8	.07
Apr.	5	11.5	35,200*	12,200	6.18	7.7	75	68	20.00	13.24	98.95	3.98	39.04	89.50	.02
May	4	9.50	63,200*	10,300	4.69	7.5	74	67	17.23	10.92	80.30	3.34	33.36	73.09	.04
June	3	11.2	60,500*	11,700	7.57	7.6	75	67	19.91	11.88	96.10	3.26	38.95	87.04	.04
July	7	13.0	10,300*	13,500	6.65	7.6	76	68	22.98	13.51	112.6	3.80	43.85	103.3	T
Aug.	4	10.4	0*	11,000	5.01	7.6	75	67	17.94	12.48	88.90	3.74	36.28	80.61	.01
Sept.	4	9.76	0*	10,300	5.40	7.9	74	67	18.18	10.66	83.14	3.64	34.26	75.61	.03
Oct.	4	10.3	1,070*	10,900	5.69	7.5	75	66	17.18	12.58	89.10	3.64	37.15	78.61	.02
Nov.	3	10.1	1,800*	10,600	5.30	7.4	74	66	17.82	12.06	85.91	3.46	35.95	76.34	.03
Dec.	7	1.07	35,500*	1,280	.58	7.0	58	46	3.17	1.79	6.78	1.05	5.46	5.52	T
Mean @ (55)		5.34	₱ 317,870*	5,740	2.93	7.2	73	65	10.15	6.38	44.43	2.06	19.54	40.04	0.02
Period Avg.		9.66	352,000	11,500			74	69	18.97	13.71	94.62	2.87	36.39	89.15	
Tons of Constituents, 1969									16,500	6,200	82,700	5,000	76,000	115,000	
Avg. Tons, Period 1962-1969									16,600	7,280	95,000	3,760	76,300	138,000	

Rio Grande below Anzaldúas Dam, Texas

Sampling by U. S. Section

Jan.	31	0.92	161,000	1,050	0.14	7.6	50	37	3.59	1.52	5.15	2.21	4.34	3.78	0.01
Feb.	28	1.16	112,000	1,410	.41	7.5	56	44	4.07	1.87	7.50	2.23	5.38	5.94	.01
Mar.	31	1.53	69,800	1,820	.56	7.4	58	48	4.97	2.22	10.10	2.62	6.56	8.35	.02
Apr.	30	1.18	120,000	1,400	.36	7.7	55	42	4.22	1.82	7.39	2.47	5.42	5.68	T
May	31	1.06	92,700	1,260	.29	7.3	54	40	3.84	1.60	6.44	2.33	4.96	4.79	T
June	30	1.04	235,000	1,190	.23	7.8	53	38	4.05	1.32	6.08	2.42	4.94	4.43	T
July	31	1.09	117,000	1,240	.30	7.5	54	38	3.99	1.57	6.44	2.35	5.15	4.65	.01
Aug.	31	1.05	54,900	1,190	.26	7.6	52	37	3.97	1.50	6.00	2.29	5.06	4.31	.01
Sept.	30	1.49	51,000	1,730	.54	7.7	56	46	5.10	2.22	9.38	2.66	6.47	7.92	.03
Oct.	31	.99	39,800	1,180	.32	7.6	53	39	3.81	1.40	5.82	2.27	4.68	4.37	.03
Nov.	30	1.12	52,600	1,280	.30	7.4	54	39	4.11	1.71	6.78	2.35	5.36	5.02	.03
Dec.	31	1.21	76,600	1,400	.63	8.0	54	44	4.39	1.88	7.30	2.20	5.69	6.11	T
Mean @ (365)		1.10	₱1,182,400	1,280	0.31	7.6	54	40	4.05	1.63	6.61	2.35	5.13	5.02	0.01
Period Avg.		0.94	1,401,000	1,110			51	41	3.80	1.46	5.53	2.41	4.03	4.46	
Tons of Constituents, 1969									119,000	29,000	223,000	103,000	361,000	261,000	
Avg. Tons, Period 1959-1969									154,000	36,000	257,000	146,000	391,000	320,000	

₱ Total @ Weighted Mean ** Percent of total cations *** Percent of total anions ⁼ Estimated T Trace
* To Rio Grande

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

The following tables show electrical conductivity, expressed in mhos per centimeter cube x 10^6 at 25°C, of individual water samples taken at Rio Grande and tributary stations. The determinations were made by the United States Section of this Commission.

Electrical conductivity is a relative indication of the concentration of dissolved solids in the water samples. Though no exact relationship exists between conductivity and dissolved solids in natural waters, a study of recent data pertaining to stations on the Rio Grande watershed indicates that the relationship may be expressed within 10% by the following equations:

Tons per Acre-Foot = .0008878 (EC x 10^6 at 25°C) when conductivity (EC x 10^6 at 25°C) is below 7,520 micromhos.

Tons per Acre-Foot = .001052 (EC x 10^6 at 25°C) - 1.235 when conductivity (EC x 10^6 at 25°C) ranges between 7,520 and 22,000 micromhos.

Rio Grande at El Paso, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		May		June		August		September		October	
2	2,340	13	2,670	29	1,040	9	1,250	20	1,050	1	961	12	1,370	28	2,180
3	2,360	14	2,640	30	1,060	10	1,300	21	1,030	2	888	13	1,250	29	2,180
4	2,380	15	2,660	31	1,130	11	1,340	22	1,020	3	889	14	955	30	2,140
5	2,380	16	2,680	April		12	1,340	23	968	4	904	15	920	31	2,210
6	2,380	17	2,680	1	1,190	13	1,350	24	962	5	880	16	1,110	November	
7	2,380	18	2,740	2	1,190	14	1,350	25	961	6	904	17	1,220	3	2,400
8	2,380	19	2,770	3	1,160	15	1,390	26	984	7	919	18	1,500	4	2,240
9	2,380	20	2,720	4	1,180	16	1,380	27	1,030	8	940	19	1,670	5	2,210
10	2,370	22	2,690	5	1,110	17	1,320	28	1,060	9	932	20	1,840	6	2,230
11	2,400	23	2,730	6	1,070	18	1,300	29	963	10	971	21	1,750	7	2,260
12	2,360	24	2,760	7	1,100	19	1,310	30	923	11	922	22	1,510	10	2,250
13	2,350	25	2,750	8	1,130	20	1,220	July		12	887	23	1,490	12	2,240
14	2,350	26	2,760	9	1,130	21	1,200	1	895	13	881	24	1,500	13	2,250
15	2,310	28	2,840	10	1,080	22	1,210	2	929	14	901	25	1,650	14	2,270
16	2,320	March		11	1,230	23	1,280	3	958	15	950	26	1,810	17	2,260
17	2,380	1	2,820	12	1,260	24	1,150	4	998	16	936	27	1,970	18	2,310
18	2,350	2	2,830	13	1,180	25	1,180	5	987	17	885	28	1,990	19	2,320
19	2,400	3	2,570	14	1,180	26	1,120	6	893	18	870	29	2,000	20	2,310
20	2,410	4	1,270	15	1,180	27	1,120	7	874	19	906	30	2,050	21	2,340
21	2,410	5	1,240	16	1,220	28	1,120	8	879	20	948	October		24	2,300
22	2,520	6	1,190	17	1,280	29	1,070	9	883	21	960	1	2,120	25	2,300
23	2,520	7	1,170	18	1,350	30	1,040	10	841	22	972	2	2,090	26	2,260
24	2,480	8	1,160	19	1,340	31	1,040	11	865	23	965	3	2,130	28	2,210
25	2,480	9	1,140	20	1,340	June		12	866	24	918	4	2,160	December	
26	2,500	10	1,170	21	1,310	1	1,050	13	904	25	881	5	2,160	1	2,230
27	2,510	11	1,180	22	1,320	2	1,040	14	969	26	963	6	2,150	2	2,230
28	2,510	12	1,150	23	1,340	3	1,030	15	1,050	27	997	7	2,210	3	2,220
29	2,500	13	1,130	24	1,340	4	1,050	16	1,100	28	1,100	8	2,200	4	2,060
30	2,520	14	1,120	25	1,340	5	1,040	17	1,060	29	1,070	9	2,180	5	2,130
31	2,510	15	1,090	26	1,190	6	1,070	18	989	30	1,050	10	2,220	8	2,190
February		16	1,070	27	1,160	7	1,050	19	956	31	974	11	2,170	9	2,200
1	2,490	17	1,090	28	1,210	8	1,080	20	920	September		12	2,200	10	2,200
2	2,560	18	1,080	29	1,240	9	1,070	21	932	1	903	13	2,260	11	2,200
3	2,550	19	1,070	30	1,270	10	1,020	22	953	2	947	14	2,220	12	2,210
4	2,570	20	1,090	May		11	1,050	23	1,010	3	1,040	15	2,260	15	2,240
5	2,560	21	1,090	1	1,170	12	1,040	24	1,020	4	1,050	16	2,260	16	2,240
6	2,560	22	1,080	2	1,230	13	1,030	25	1,030	5	1,230	17	2,260	18	2,230
7	2,590	23	1,030	3	1,280	14	1,020	26	1,000	6	1,330	18	2,260	19	2,230
8	2,620	24	1,040	4	1,280	15	1,030	27	979	7	1,440	20	2,210	22	2,260
9	2,640	25	1,140	5	1,300	16	1,010	28	924	8	1,380	21	2,160	23	2,260
10	2,620	26	1,120	6	1,350	17	959	29	873	9	1,390	22	1,430	24	2,280
11	2,630	27	1,000	7	1,310	18	998	30	891	10	1,320	23	2,090	29	2,300
12	2,660	28	1,050	8	1,220	19	1,040	31	933	11	1,390	24	1,690	30	2,280
												27	2,130	31	2,300

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Rio Grande at Fort Quitman, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		June		July		August		October		November	
2	5,930	12	11,290	16	10,800	4	10,860	14	2,980	27	7,960	8	5,150	19	4,340
8	6,940	19	11,650	23	10,370	11	11,390	16	5,610	September		15	6,240	26	4,700
15	5,210	26	11,100	30	6,880	18	7,070	23	5,980	2	1,960	21	4,250	December	
22	8,070	March		May		25	13,410	30	9,300	10	5,680	22	5,740	3	4,060
29	10,650	5	11,460	7	6,330	July		August		17	3,270	29	4,100	10	3,920
February		12	11,950	14	10,630	2	12,000	6	11,170	24	4,720	November		17	4,070
5	11,100	19	11,570	21	10,050	7	1,150	13	10,450	October		5	4,670	24	4,520
		26	11,700	28	11,430	9	1,110	20	11,010	1	4,100	12	4,830	31	3,830

Sampling by U. S. Section

Rio Grande above Rio Conchos near Presidio, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		June		July		July		September		October		December		December	
6	5,010	16	949	14	678	28	789	19	730	1	2,100	1	4,330	15	4,080
June		18	950	18	797	August		19	772	November		4	4,250	18	3,680
3	954	23	741	22	790	1	875	22	1,270	17	3,030	8	4,590	22	3,840
16	988	July		25	783	September		25	1,930	20	3,540	11	4,570	29	4,070
		11	759			15	449	29	1,880						

Sampling by U. S. Section

Rio Conchos near Ojinaga, Chihuahua

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		July		August		October		November	
1	764	19	738	7	903	26	1,240	7	1,120	15	1,230	1	1,180	17	1,120
3	749	21	789	9	900	28	1,230	7	983	18	1,300	3	1,200	19	1,130
6	747	24	769	11	878	30	1,210	8	724	20	1,300	6	1,200	21	1,170
8	742	26	769	14	900	June		9	1,010	22	1,310	8	1,130	24	1,160
10	740	28	772	16	908	2	1,160	10	731	25	1,320	10	1,190	26	1,230
13	754	March		18	965	3	1,100	11	776	27	1,220	13	1,140	28	1,340
15	744	3	836	21	1,080	4	1,050	14	1,080	29	1,270	15	1,150	December	
17	745	5	802	23	1,090	6	990	16	1,080	September		17	1,120	1	1,160
20	747	7	816	25	1,110	9	1,070	18	1,030	1	1,170	20	1,120	3	1,150
22	752	10	817	28	1,150	11	1,050	21	1,020	5	1,190	22	1,100	5	1,160
24	750	12	841	30	1,150	13	1,030	23	1,140	5	1,210	24	1,070	8	1,210
27	745	14	863	May		16	1,080	25	1,140	8	1,220	27	1,110	10	1,240
29	751	17	818	2	1,220	18	815	27	737	10	1,240	29	1,050	12	1,220
31	747	19	834	5	1,180	20	1,100	30	1,040	12	1,250	31	1,060	15	1,250
February		21	847	7	1,200	23	1,410	August		15	1,040	November		17	1,250
3	808	24	881	9	1,210	25	1,510	1	1,540	17	1,210	3	1,140	19	1,240
5	766	26	866	12	1,130	27	1,560	4	1,540	19	785	5	1,140	22	1,330
7	797	28	896	15	1,110	30	1,150	6	1,170	22	925	7	1,120	24	1,340
10	762	31	889	16	1,120	July		8	1,170	24	1,170	10	1,130	26	1,340
12	774	April		19	1,130	2	1,240	11	1,190	26	1,180	12	1,130	29	1,330
14	722	2	902	21	1,150	4	1,230	13	1,220	29	1,190	14	1,150	31	1,330
17	723	4	903	23	1,190										

Sampling by Mexican Section

Rio Grande below Rio Conchos near Presidio, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		June		July		September		October		November	
2	746	24	771	24	1,200	9	1,050	25	1,130	8	1,250	20	1,140	24	1,180
6	733	March		28	1,270	16	797	28	1,230	15	755	23	1,130	25	1,180
13	753	3	798	May		18	842	August		19	1,050	27	1,150	December	
15	749	10	817	1	1,320	23	1,650	1	1,460	22	981	31	1,140	1	1,230
20	748	12	847	5	1,230	27	1,990	4	1,580	25	1,180	November		4	1,200
28	759	17	1,050	11	1,240	July		11	1,210	29	1,190	3	1,110	8	1,230
31	763	24	889	16	1,210	1	1,250	18	1,380	October		6	1,150	11	1,320
February		April		19	1,160	7	1,190	21	1,360	1	1,180	10	1,170	15	1,340
3	769	1	925	26	1,380	11	606	25	1,410	6	1,230	10	923	18	1,350
7	813	7	952	June		14	1,050	September		10	1,230	13	1,120	22	1,470
10	780	14	926	2	1,270	18	932	2	872	14	1,160	17	1,180	29	1,550
17	717	21	1,150	3	1,170	22	992	4	1,200	16	1,170	20	1,180		

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Rio Grande at Johnson Ranch near Castolon, Texas

January		February		April		June		July		August		October		November	
2	771	24	809	8	971	2	1,190	23	1,100	28	1,490	7	1,110	25	1,220
6	770	28	803	15	943	4	1,120	25	1,030	September		13	1,250	December	
13	770	March		22	1,130	10	1,210	28	1,210	2	1,110	16	1,180	1	1,190
20	772	3	812	29	1,300	17	899	August		5	997	21	1,190	5	1,110
27	791	10	866	May		23	1,010	1	833	9	1,260	24	1,150	9	1,180
31	794	13	866	1	1,320	26	1,180	4	957	16	1,390	28	1,170	12	1,180
February		17	952	5	1,340	July		12	1,200	22	833	31	1,150	15	1,280
3	784	26	931	13	1,050	1	1,600	18	1,320	29	1,200	November		19	1,270
10	824	April		20	1,250	8	909	22	1,400	October		3	1,170	23	1,290
18	736	1	968	26	1,360	15	1,100	25	1,450	1	1,210	14	1,140	30	1,480
												17	1,190		

Sampling by U. S. Section

Rio Grande at Foster Ranch near Langtry, Texas

January		February		April		May		July		August		October		November	
6	784	24	768	7	920	26	1,070	7	994	25	1,010	13	901	24	1,060
13	781	March		14	922	June		14	907	September		20	1,100	December	
20	787	3	804	21	913	2	951	22	1,020	9	971	27	1,020	1	1,040
27	796	10	833	28	1,000	9	1,060	28	994	22	1,060	November		8	1,190
February		17	863	May		16	1,100	August		29	1,150	3	1,060	15	1,080
3	798	24	841	5	888	28	901	4	996	October		10	1,020	22	1,150
10	807	April		12	1,090	30	801	11	865	6	1,100	17	1,040	29	1,110
17	814	1	883	19	1,150			18	1,080						

Sampling by U. S. Section

Pecos River near Langtry, Texas

January		February		April		May		July		September		September		November	
6	2,640	24	3,310	7	4,350	26	2,450	22	2,180	2	1,870	26	858	17	3,680
13	2,700	March		14	797	June		28	2,140	9	1,980	October		24	2,990
20	2,770	3	3,070	21	3,000	2	2,860	August		15	1,970	6	1,910	December	
February		10	3,190	28	5,060	23	2,420	6	2,110	22	1,530	20	1,960	1	2,480
3	2,900	17	3,130	May		30	2,430	13	2,060	23	1,840	27	1,990	8	2,780
10	2,980	24	3,180	12	774	July		18	2,060	24	1,060	November		15	2,900
17	3,000	April		19	1,040	14	2,280	25	2,030	25	1,090	3	2,740	29	3,060
		1	3,800												

Sampling by U. S. Section

Devils River at Pafford Crossing near Comstock, Texas

January		February		April		June		July		August		October		November	
6	409	24	410	1	359	9	288	22	357	25	351	6	227	24	400
13	383	March		7	361	16	352	28	335	September		20	368	December	
20	393	3	395	14	354	23	361	August		2	343	November		1	405
27	386	10	417	21	375	30	341	4	359	9	356	3	346	8	412
February		17	386	28	350	July		11	348	15	348	10	391	15	413
3	395	24	355	May		7	374	18	344	22	353	17	401	22	410
17	374			12	356	14	345			29	363			29	404

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

Rio Grande below Amistad Dam near Del Rio, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		May		June		August		September		November	
1	701	14	835	31	778	12	795	27	816	18	855	29	873	14	863
3	697	17	761	April		14	782	July		20	848	October		17	859
6	700	19	755	3	821	16	792	2	842	22	855	3	871	19	824
8	688	21	760	4	803	19	798	4	833	25	851	6	868	21	827
9	697	24	754	7	803	21	798	7	841	27	820	8	868	24	845
14	698	26	762	9	815	23	806	9	827	29	851	10	861	28	828
15	716	28	777	11	805	26	820	11	842	September		13	861	December	
20	809	March		14	796	28	816	17	841	1	853	17	868	1	846
22	838	3	753	16	795	29	842	21	843	3	855	20	874	3	852
24	837	5	807	18	794	June		23	843	5	858	22	884	5	865
27	903	7	738	21	797	2	802	28	848	9	861	24	862	8	831
29	908	10	759	24	798	4	778	30	847	10	857	27	782	10	849
31	896	12	806	25	802	6	810	August		12	859	29	851	12	852
February		14	772	28	810	9	814	4	851	15	862	November		15	856
3	914	17	768	30	797	11	782	6	826	17	867	3	872	18	866
5	899	19	796	May		13	813	8	848	19	862	5	856	19	869
7	909	21	798	2	817	16	815	11	848	22	862	7	866	22	890
10	874	24	763	5	807	18	813	13	847	24	874	10	873	24	919
12	851	26	755	7	798	23	819	15	840	26	868	12	882	26	923
		28	764	9	798	25	823								

Sampling by U. S. Section

Rio Grande below Maverick Dam near Del Rio, Texas

January		February		April		May		July		August		October		November	
1	699	15	788	1	792	16	788	1	815	16	847	1	855	16	840
2	697	16	854	2	806	17	773	2	828	17	846	2	851	17	833
3	698	17	761	3	811	18	778	3	836	18	846	3	850	18	829
4	701	18	770	4	797	19	787	4	828	19	847	4	263	19	823
5	701	19	763	5	808	20	771	5	831	20	861	5	857	20	807
6	701	20	755	6	729	21	783	6	835	21	846	6	481	21	807
7	697	21	768	7	787	22	757	7	835	22	839	7	782	22	813
8	723	22	759	8	790	23	791	8	832	23	846	8	839	23	815
9	700	23	756	9	787	24	795	9	863	24	852	9	841	24	821
10	700	24	757	10	815	25	796	10	833	25	851	10	840	25	818
11	697	25	757	11	779	26	799	11	828	26	847	11	847	26	828
12	706	26	761	12	375	27	789	12	833	27	449	12	834	27	853
13	700	27	760	13	464	28	799	13	828	28	505	13	377	28	822
14	700	28	759	14	710	29	803	14	826	29	631	14	705	29	813
15	702	March		15	771	30	803	15	824	30	770	15	812	30	819
16	718	1	772	16	775	31	786	16	825	31	809	16	826	December	
17	698	2	769	17	776	June		17	825	September		17	841	1	846
18	729	3	777	18	780	1	804	18	828	1	830	18	841	2	837
19	755	4	766	19	791	2	819	19	688	2	838	19	841	3	830
20	784	5	748	20	797	3	803	20	835	3	843	20	845	4	841
21	797	6	759	21	781	4	807	21	833	4	841	21	846	5	835
22	828	7	736	22	770	5	798	22	840	5	840	22	849	6	855
23	846	8	776	23	774	6	801	23	835	6	841	23	852	7	885
24	850	9	765	24	781	7	797	24	834	7	846	24	862	8	821
25	857	10	764	25	785	8	797	25	832	8	843	25	847	9	817
26	886	11	764	26	791	9	785	26	827	9	841	26	841	10	828
27	880	12	764	27	791	10	803	27	837	10	846	27	837	11	837
28	892	13	764	28	795	11	808	28	851	11	850	28	357	12	836
29	891	14	767	29	781	12	801	29	825	12	851	29	719	13	836
30	895	15	769	30	776	13	803	30	835	13	848	30	788	14	833
31	893	16	775	May		14	801	31	843	14	854	31	803	15	837
February		17	766	1	781	15	803	August		15	842	November		16	835
1	935	18	762	2	779	16	810	1	845	16	842	1	839	17	846
2	897	19	761	3	761	17	807	2	842	17	848	2	824	18	845
3	901	20	761	4	695	18	784	3	841	18	824	3	824	19	845
4	894	21	777	5	767	19	792	4	844	19	873	4	830	20	849
5	897	22	765	6	783	20	805	5	844	20	743	5	829	21	857
6	907	23	761	7	771	21	793	6	847	21	849	6	836	22	871
7	897	24	790	8	561	22	807	7	845	22	850	7	838	23	871
8	891	25	767	9	771	23	810	8	859	23	849	8	847	24	870
9	879	26	756	10	790	24	811	9	855	24	858	9	845	25	881
10	876	27	772	11	790	25	797	10	851	25	856	10	839	26	886
11	866	28	764	12	771	26	819	11	844	26	856	11	846	27	897
12	874	29	766	13	787	27	817	12	838	27	862	12	851	28	913
13	879	30	769	14	790	28	819	13	838	28	856	13	847	29	910
14	887	31	771	15	786	29	823	14	843	29	859	14	837	30	868
						30	876	15	846	30	860	15	834	31	806

Sampling by Maverick County Water Control and Improvement - District No. 1

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1969

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Rio Grande at San Antonio Crossing near El Indio, Texas

January		February		April		May		June		August		October		November	
2	721	18	788	2	936	21	812	26	948	13	908	1	868	19	918
6	755	26	915	9	1,030	27	823	July		19	930	8	527	25	927
14	765	March		15	680	June		2	968	28	553	15	479	December	
21	822	4	865	23	876	4	902	8	916	September		22	867	3	901
29	947	7	899	29	884	10	958	23	928	4	861	28	794	9	938
February		12	840	May		13	1,000	30	857	11	867	November		17	926
4	975	18	890	7	1,060	16	971	August		16	872	4	798	23	917
11	980	26	873	12	823	18	958	5	870	24	868	13	880		

Sampling by U. S. Section

Rio Grande at Laredo, Texas

January		February		April		May		July		August		October		November	
1	750	15	912	1	954	17	724	1	1,020	16	946	1	851	16	844
2	789	16	891	2	934	18	714	2	1,000	17	945	2	863	17	839
3	782	17	874	3	935	19	726	3	992	18	958	3	874	18	848
4	752	18	940	4	917	20	793	4	995	19	949	4	863	19	852
5	769	19	988	5	930	21	718	5	995	20	929	5	867	20	872
6	808	20	1,020	6	909	22	621	6	1,010	21	938	6	822	21	891
7	760	21	928	7	878	23	680	7	1,010	22	953	7	401	22	885
8	752	22	826	8	877	24	702	8	1,020	23	967	8	343	23	892
9	755	23	781	9	896	25	773	9	1,020	24	960	9	402	24	886
10	781	24	788	10	948	26	786	10	1,020	25	966	10	402	25	872
11	784	25	825	11	929	27	793	11	1,030	26	963	11	429	26	846
12	776	26	914	12	914	28	833	12	1,040	27	969	12	500	27	819
13	764	27	899	13	646	29	813	13	1,040	28	722	13	653	28	827
14	792	28	856	14	450	30	810	14	1,020	29	358	14	737	29	848
15	767	March		15	378	31	818	15	1,020	30	357	15	628	30	821
16	771	1	892	16	371	June		16	1,010	31	476	16	566	December	
17	786	2	885	17	415	1	833	17	1,010	September		17	581	1	799
18	793	3	896	18	418	2	859	18	1,000	1	482	18	519	2	743
19	776	4	902	19	430	3	863	19	1,010	2	475	19	458	3	700
20	776	5	878	20	477	4	884	20	1,010	3	519	20	541	4	714
21	800	6	868	21	575	5	901	21	997	4	553	21	677	5	810
22	788	7	884	22	677	6	894	22	1,000	5	667	22	748	6	820
23	772	8	877	23	802	7	899	23	987	6	774	23	770	7	850
24	783	9	842	24	867	8	916	24	997	7	807	24	791	8	835
25	803	10	878	25	870	9	923	25	993	8	831	25	791	9	915
26	837	11	904	26	868	10	923	26	999	9	826	26	813	10	1,000
27	834	12	923	27	873	11	923	27	1,000	10	829	27	780	11	977
28	827	13	871	28	915	12	933	28	1,010	11	829	28	760	12	939
29	870	14	901	29	887	13	948	29	830	12	841	29	591	13	947
30	862	15	914	30	889	14	971	30	687	13	831	30	527	14	929
31	853	16	895	May		15	980	31	947	14	775	31	431	15	906
February		17	878	1	900	16	988	August		15	793	November		16	896
1	923	18	893	2	922	17	993	1	897	16	806	1	452	17	910
2	894	19	805	3	920	18	1,010	2	913	17	810	2	420	18	896
3	907	20	882	4	901	19	993	3	904	18	744	3	526	19	910
4	961	21	886	5	899	20	989	4	889	19	806	4	638	20	905
5	882	22	880	6	890	21	993	5	897	20	777	5	747	21	892
6	963	23	874	7	915	22	1,010	6	863	21	770	6	789	22	890
7	968	24	876	8	724	23	1,010	7	900	22	681	7	800	23	908
8	923	25	876	9	530	24	1,030	8	886	23	736	8	817	24	914
9	965	26	878	10	688	25	1,050	9	901	24	697	9	866	25	920
10	921	27	865	11	763	26	977	10	895	25	764	10	863	26	894
11	935	28	899	12	787	27	454	11	891	26	758	11	842	27	917
12	910	29	917	13	741	28	499	12	903	27	753	12	833	28	920
13	914	30	914	14	694	29	766	13	901	28	827	13	838	29	912
14	896	31	934	15	641	30	999	14	919	29	839	14	866	30	920
				16	682			15	937	30	851	15	850	31	932

Sampling by Laredo Water Plant

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1969

Río Salado at Las Tortillas, Tamaulipas

January		February		May		June		July		September		October		December	
6	3,810	6	4,300	3	6,040	5	2,340	3	3,580	2	1,840	2	1,770	11	4,370
16	4,130	April		20	678			August				November			
		15	3,290					2	2,690			1	2,520		

Sampling by Mexican Section

Rio Grande below Falcon Dam, Texas, U. S. Tailrace

January		February		April		May		June		August		October		November	
3	872	10	873	7	938	15	907	30	904	11	921	1	913	10	911
6	870	12	878	10	900	16	899	July		13	922	3	913	12	905
10	875	14	878	11	898	19	902	4	901	15	926	6	911	14	916
13	869	17	878	14	898	21	899	7	905	18	925	10	924	17	902
15	870	20	880	16	896	23	901	9	905	22	926	13	924	19	907
17	871	24	882	18	894	26	905	11	908	25	940	16	924	24	907
20	871	26	876	21	897	29	905	14	908	26	940	17	931	26	905
23	872	28	880	25	899	June		16	916	29	936	20	927	December	
24	870	March		28	898	2	902	18	911	September		22	927	8	924
27	871	3	889	May		6	900	23	919	2	945	24	921	12	910
29	871	5	883	1	908	9	900	28	918	5	924	27	921	19	908
30	873	7	888	2	899	11	899	30	926	10	910	31	931	22	903
31	873	10	886	5	902	13	905	August		12	914	November		24	906
February		14	889	7	903	23	902	1	917	19	910	3	929	26	903
3	878	18	892	9	901	25	902	6	919	22	915	5	939	29	906
6	875	21	882	12	902	27	906	9	922	24	917	7	929	31	904
7	876	24	884												

Sampling by U. S. Section

Rancherías Drain in Mexico, 69.3 River Miles above Anzaldúas Dam

January		February		April		May		July		August		October		November	
8	7,860	19	6,890	2	7,850	21	7,870	3	7,740	15	6,720	2	6,530	13	6,840
15	7,820	26	7,830	10	8,070	29	6,210	10	7,630	28	6,530	9	6,630	19	6,890
22	7,860	March		17	8,370	June		17	7,430	September		15	6,480	December	
29	6,860	5	7,740	24	6,040	5	5,070	24	7,160	3	6,600	23	6,710	3	7,360
February		12	8,240	May		12	7,100	August		12	3,190	29	6,880	10	6,910
5	4,760	19	8,240	7	6,710	18	5,980	1	6,890	18	6,560	November		18	7,000
12	5,790	26	7,840	17	4,810	25	7,280	7	6,980	25	4,140	5	6,650	24	7,130
														30	7,130

Sampling by Mexican Section

Río San Juan at Camargo, Tamaulipas

January		March		April		June		August		September		October		December	
8	1,140	5	2,840	17	5,030	25	2,870	1	3,320	12	1,200	23	2,640	3	1,140
15	1,270	13	*3,000	24	3,860	July		7	3,270	18	2,970	29	1,420	5	*1,250
February		19	3,010	May		3	3,480	15	3,080	25	1,050	November		10	1,160
7	2,030	26	3,690	17	3,010	10	3,460	21	3,230	October		5	1,630	17	1,240
12	2,190	April		21	3,610	17	2,830	28	2,960	2	2,740	13	1,310	24	1,220
19	2,490	2	3,950	29	3,460	24	3,570	September		9	2,940	21	1,230	30	1,060
26	2,820	10	4,270					3	1,720	15	3,380				

Samples collected below Marte R. Gómez Dam except *March 13 and *December 5 which were collected at Camargo.
Sampling by Mexican Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Rio Grande at Fort Ringgold, Rio Grande City, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		July		August		October		November	
3	919	25	971	7	1,060	19	1,250	2	951	25	1,530	2	991	12	958
6	924	28	956	11	972	21	989	7	1,220	27	1,690	6	1,070	14	972
8	891	March		14	1,080	23	931	9	990	29	1,390	8	1,100	17	1,240
10	908	3	942	18	924	26	917	11	963	September		10	1,120	19	977
13	882	6	975	21	918	28	945	14	972	1	2,000	13	1,100	21	944
15	902	7	951	25	917	29	928	16	977	3	1,010	15	989	23	1,190
17	885	10	994	28	917	June		18	979	5	994	17	979	26	1,240
20	880	12	998	May		2	924	21	976	8	1,250	20	827	28	1,310
24	879	17	1,290	2	947	3	840	25	944	10	1,340	24	959	December	
27	876	19	995	5	914	6	921	28	948	12	1,290	27	1,170	1	1,370
29	883	21	1,070	7	919	9	919	30	929	15	1,700	29	944	3	1,600
31	877	24	1,290	9	948	11	935	August		17	1,980	31	1,220	5	1,760
February		26	966	12	922	13	924	4	933	19	1,560	November		8	1,570
3	883	28	1,010	13	908	16	926	7	944	22	1,350	3	1,160	12	1,040
6	907	31	1,260	14	1,020	18	972	8	953	24	584	5	975	15	1,310
7	907	April		16	898	25	927	11	1,170	26	693	7	1,070	17	1,370
10	892	2	969	17	939	30	952	13	956	29	1,120	10	1,150	19	1,440
14	919	4	972					18	1,180					22	1,280

Sampling by U. S. Section

Puertecitos Drain in Mexico, 46.8 River Miles above Anzaldúas Dam

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		July		August		October		November	
3	6,590	12	5,790	2	7,330	21	6,470	5	5,880	16	5,610	2	5,710	19	5,570
8	6,500	20	5,600	10	6,780	30	5,780	10	5,880	21	5,330	9	5,270	December	
15	6,340	March		17	6,740	June		17	5,810	28	5,640	16	5,430	3	5,460
22	6,150	6	6,720	24	6,280	5	5,580	24	5,660	September		28	5,440	10	5,490
29	6,060	12	6,670	30	6,130	12	6,210	August		3	5,400	29	5,480	18	5,360
February		19	6,430	May		18	5,820	1	4,790	12	5,750	November		27	5,410
5	6,240	26	6,870	8	5,750	25	5,950	7	5,790	18	5,850	5	5,640	31	5,200
				15	6,270					25	5,890	13	5,610		

Sampling by Mexican Section

Los Indios Drain in Mexico, 46.8 River Miles above Anzaldúas Dam

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		July		August		October		November	
3	4,040	12	3,760	2	4,100	15	4,090	5	3,840	16	3,850	2	3,820	13	3,780
8	4,060	20	3,980	10	4,230	21	4,050	10	3,980	21	3,670	9	3,930	19	3,750
15	4,070	March		17	4,190	30	4,010	17	3,970	28	3,840	16	3,760	December	
22	4,060	6	4,100	24	4,280	June		24	3,970	September		23	3,760	3	3,740
29	4,210	12	4,030	30	4,210	5	3,790	August		3	3,790	29	3,700	10	3,780
February		19	4,220	May		12	3,970	1	3,930	12	3,740	November		18	3,790
5	3,760	26	4,240	8	4,030	18	3,540	7	3,880	18	3,820	5	3,700	27	3,730
						25	3,960			25	3,450			31	3,710

Sampling by Mexican Section

Huizache Drain in Mexico, 41.8 River Miles above Anzaldúas Dam

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		March		April		May		July		August		October		November	
9	4,730	6	4,710	17	4,240	30	4,430	17	4,860	28	4,010	9	3,830	19	4,060
15	4,250	12	4,700	24	3,930	June		24	4,800	September		16	3,990	December	
22	3,550	19	4,800	30	3,600	5	4,320	August		3	4,520	23	3,910	3	3,780
29	3,580	26	4,820	May		12	4,530	1	4,550	12	4,520	29	3,880	10	3,620
February		April		8	4,190	18	4,420	7	4,310	18	4,350	November		18	3,450
5	4,350	2	4,700	15	3,990	25	4,570	16	3,330	25	4,530	5	4,010	27	4,370
12	4,390	10	4,520	21	4,370	July		21	4,190	October		13	4,470	31	4,490
20	4,150					10	4,820			2	4,130				

Sampling by Mexican Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

Rio Grande near Los Ebanos, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		June		July		September		October		November	
7	956	25	1,110	11	1,310	3	1,000	25	986	12	1,900	27	1,260	28	1,300
10	922	28	1,400	15	1,020	6	977	29	1,210	16	2,210	29	1,720	December	
14	921	March		18	1,010	10	981	August		19	2,460	November		1	1,730
16	925	4	1,150	22	986	13	952	1	972	23	1,150	1	1,510	3	2,110
21	890	7	1,230	25	987	17	965	5	985	26	753	3	1,600	5	2,320
24	895	11	1,270	29	987	20	979	8	1,010	30	1,790	5	1,260	8	1,890
28	889	14	1,200	May		24	1,000	12	1,010	October		7	1,040	10	1,800
31	902	18	1,360	2	995	27	976	15	1,060	3	1,090	10	1,210	12	1,020
February		21	1,340	6	984	July		19	1,030	7	1,180	12	1,070	15	1,330
4	909	25	1,340	9	1,010	1	1,010	22	1,280	10	1,360	14	1,010	17	1,840
6	979	28	1,250	13	998	4	1,040	26	2,740	13	1,160	17	1,140	19	1,830
11	948	April		16	954	8	1,280	29	2,040	15	1,060	19	1,250	22	1,760
14	1,000	1	1,290	20	1,310	11	1,040	September		17	1,010	21	1,030	24	1,660
18	1,340	4	1,130	23	989	16	1,060	3	2,000	20	1,060	24	1,240	26	1,680
21	1,310	8	1,130	27	1,100	19	1,020	6	1,020	22	1,040	26	1,260	29	1,340
				30	958	23	1,060	9	1,680	24	1,110			31	1,420

Sampling by U. S. Section

Rio Grande at Penitas, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		May		July		August		September		November	
3	1,020	14	926	26	1,370	19	1,180	7	1,100	15	1,010	29	855	7	1,090
6	1,080	17	1,060	28	1,350	21	1,240	9	1,240	18	1,170	October		10	1,180
8	1,070	19	1,380	31	1,290	28	1,110	11	1,130	20	1,180	1	1,130	12	1,170
10	1,010	24	1,850	April		June		14	1,090	25	1,310	3	1,100	14	1,170
13	984	26	1,100	4	1,290	2	967	16	1,070	27	1,880	6	1,110	17	1,170
15	930	28	1,360	7	1,240	4	979	18	1,090	29	2,610	8	1,190	21	1,350
17	929	March		11	1,140	6	972	23	1,090	September		10	1,250	December	
20	912	3	1,380	14	1,210	9	987	25	1,040	3	2,310	13	1,280	1	1,360
22	907	5	1,150	16	1,160	11	980	28	1,020	5	1,120	15	1,170	3	1,660
27	1,020	7	1,190	18	1,030	13	972	30	1,080	8	1,130	17	1,050	5	2,260
29	902	10	1,270	21	1,020	16	953	August		10	1,240	20	891	8	2,500
31	904	12	1,140	23	985	20	982	1	1,000	12	1,410	22	1,120	10	1,910
February		14	1,170	28	957	23	990	4	1,030	15	1,720	24	919	12	1,120
3	962	17	1,340	30	983	25	1,000	6	1,000	17	1,930	27	1,080	17	1,030
5	909	19	1,320	May		27	990	8	1,010	19	1,990	29	1,350	22	1,630
7	929	21	1,360	14	1,040	30	982	11	1,050	22	1,970	November		24	1,960
10	940	24	1,320	16	1,220	July		13	1,180	24	1,590	3	1,600	29	1,700
12	946					2	1,150			26	1,040	5	1,620	31	1,560

Sampling by U. S. Section

Rio Grande above Anzaldúas Dam, South of Abram, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		June		July		August		October		November	
3	952	19	1,320	4	1,330	4	975	16	1,070	27	1,360	3	1,240	10	1,110
6	1,060	24	1,360	7	1,140	6	975	18	1,110	29	2,690	6	1,100	12	1,200
8	1,010	26	1,240	11	1,210	9	974	23	1,040	September		8	1,170	14	1,110
10	1,010	28	1,260	14	1,220	11	972	25	1,040	3	2,340	10	1,200	17	1,080
13	952	March		16	1,280	13	981	28	996	5	1,090	13	1,390	21	1,200
15	958	5	1,220	18	1,010	16	951	30	1,060	8	1,010	15	1,220	December	
17	930	7	1,210	21	1,010	20	979	August		10	1,080	17	1,120	1	1,400
27	916	10	1,220	23	1,070	23	1,060	1	1,050	12	1,190	20	995	3	1,480
29	891	12	1,250	28	959	25	1,040	4	1,020	15	1,380	22	1,020	5	2,040
31	893	13	1,290	30	960	27	1,030	6	1,020	17	1,610	24	1,040	8	2,630
February		14	1,270	May		30	987	8	979	19	1,910	27	1,060	10	2,010
3	953	17	1,170	14	974	July		11	1,100	22	2,530	29	1,240	12	1,220
5	907	19	1,300	16	1,230	2	1,020	13	1,370	24	1,480	31	1,340	17	981
7	920	21	1,220	19	1,030	7	1,110	15	988	26	1,050	November		22	1,190
10	937	24	1,390	21	1,150	9	1,320	18	1,060	29	684	3	1,260	24	1,430
12	952	26	1,250	28	1,090	11	1,110	20	1,290	October		5	1,640	29	1,720
14	933	28	1,200	June		14	1,120	25	1,240	1	856	7	1,190	31	1,690
17	1,030	31	1,320	2	958										

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Morillo Drain in Mexico, 8.4 River Miles above Anzaldúas Dam

January		February		April		May		July		August		September		November	
6 ø	11,160	24 ø	10,810	9 ø	11,960	22 *	15,380	9 *	16,670	13 ø	11,040	26 *	16,130	13 *	12,680
6 *	14,930	24 *	13,350	9 *	16,210	28 ø	10,420	12 ø	11,450	13 *	17,170	October		21 ø	10,380
17 ø	11,660	24	11,100	16 ø	11,790	28 *	11,090	12 *	17,740	20 ø	10,020	2 ø	9,960	21 *	11,280
17 *	13,150	March		16 *	15,720	June		16 ø	11,450	20 *	16,150	2 *	16,970	December	
23 ø	9,210	1	12,780	23 ø	11,070	11 ø	9,540	16 *	18,030	27 ø	8,010	10 ø	10,030	1 ø	9,420
23 *	9,760	5	13,570	23 *	11,190	11 *	10,450	21 ø	11,330	27 *	14,050	10 *	12,380	1 *	9,570
February		12	13,740	30 ø	9,300	19 ø	10,650	21 *	18,330	September		18 ø	10,210	5	1,290
1 ø	8,700	19 ø	11,920	30 *	11,080	19 *	15,240	22 ø	11,100	4 ø	8,980	18 *	11,590	6	1,210
1 *	10,200	19 *	15,670	May		26 ø	11,430	22 *	16,670	4 *	13,360	24 ø	10,500	10	1,160
7 ø	8,480	24 ø	11,800	7 ø	8,830	26 *	15,900	30 ø	11,330	10 ø	10,090	24 *	12,160	13	1,160
7 *	9,130	24 *	15,450	7 *	10,040	July		30 *	19,300	10 *	15,830	November		26 ø	9,820
14 ø	9,200	April		19 ø	6,110	2 ø	11,210	August		18 ø	10,460	6 ø	9,340	26 *	3,600
14 *	11,200	2 ø	11,800	19 *	13,950	2 *	15,710	6 ø	11,390	18 *	16,760	6 *	12,410	31 ø	9,980
20 ø	10,700	2 *	16,210	22 ø	10,240	9 ø	11,330	6 *	18,030	26 ø	8,020	13 ø	10,090	31 *	9,950
20 *	12,360														

ø Samples collected from Esterito Drain which flows into Morillo Drain upstream from the flow measuring station.
* Samples collected upstream from the Esterito Drain confluence.
Sampling by Mexican Section

Rio Grande below Anzalduas Dam, Texas

January		February		April		May		July		August		October		Novmeber	
1	1,630	15	1,230	1	1,740	16	1,380	1	1,210	16	1,030	1	845	16	1,230
2	1,420	16	1,220	2	1,660	17	1,520	2	1,230	17	1,010	2	697	17	1,190
3	1,220	17	1,210	3	1,670	18	1,230	3	1,270	18	1,020	3	849	18	1,140
4	1,060	18	1,370	4	1,770	19	1,320	4	1,410	19	1,100	4	970	19	1,130
5	1,110	19	1,380	5	1,760	20	1,330	5	1,390	20	1,210	5	1,530	20	1,190
6	1,110	20	1,500	6	1,740	21	1,590	6	1,410	21	1,350	6	1,450	21	1,250
7	1,200	21	2,100	7	1,720	22	1,950	7	1,400	22	1,310	7	1,210	22	1,280
8	1,210	22	2,370	8	1,630	23	1,780	8	1,370	23	1,230	8	1,210	23	1,260
9	1,170	23	1,920	9	1,590	24	1,520	9	1,540	24	1,160	9	1,170	24	1,270
10	1,050	24	1,920	10	1,630	25	1,340	10	1,830	25	1,100	10	1,140	25	1,260
11	1,020	25	1,820	11	1,580	26	1,270	11	1,430	26	1,130	11	1,150	26	1,210
12	1,040	26	1,680	12	1,580	27	1,290	12	1,230	27	1,150	12	1,180	27	1,200
13	1,080	27	1,640	13	1,570	28	1,790	13	1,140	28	1,200	13	1,220	28	1,150
14	1,050	28	1,760	14	1,630	29	1,220	14	1,120	29	1,350	14	1,340	29	1,130
15	1,030	March		15	1,640	30	1,190	15	1,110	30	1,830	15	1,460	30	1,210
16	1,070	1	1,920	16	1,620	31	1,130	16	1,100	31	2,520	16	1,240	December	
17	1,000	2	1,940	18	1,660	June		17	1,090	September		17	1,220	1	1,320
18	981	3	1,940	18	1,350	1	1,130	18	1,120	1	2,260	18	1,160	2	1,310
19	969	4	1,780	19	1,230	2	1,180	19	1,110	2	2,090	19	1,110	3	1,360
20	959	5	1,660	20	1,300	3	1,190	20	1,110	3	2,130	20	1,060	4	1,580
21	986	6	1,640	21	1,310	4	1,140	21	1,100	4	2,330	21	1,030	5	1,540
22	963	7	1,640	22	1,260	5	1,210	22	1,120	5	2,220	22	1,010	6	1,700
23	974	8	1,640	23	1,200	6	1,270	23	1,280	6	1,680	23	742	7	1,700
24	976	9	1,670	24	1,170	7	1,190	24	1,150	7	1,510	24	1,010	8	1,690
25	948	10	1,730	25	1,140	8	1,170	25	1,100	8	1,400	25	1,080	9	1,780
26	955	11	1,600	26	1,170	9	1,230	26	1,070	9	1,280	26	1,090	10	1,680
27	965	12	1,620	27	1,170	10	1,260	27	1,050	10	1,180	27	1,030	11	1,640
28	996	13	1,650	28	1,100	11	1,280	28	1,030	11	1,130	28	1,020	12	1,630
29	979	14	1,660	29	1,150	12	1,270	29	1,040	12	1,100	29	1,060	13	1,490
30	992	15	1,630	30	1,160	13	1,250	30	1,030	13	1,120	30	1,380	14	1,270
31	980	16	1,630	May		14	1,170	31	1,020	14	1,110	31	1,350	15	1,160
February		17	1,590	1	1,160	15	1,130	August		15	1,120	November		16	1,130
1	982	18	1,540	2	1,140	16	1,110	1	1,020	16	1,090	1	1,270	17	1,140
2	1,010	19	1,540	3	1,130	17	1,170	2	999	17	1,070	2	1,250	18	1,140
3	1,060	20	1,670	4	1,240	18	1,190	3	995	18	1,090	3	1,390	19	1,110
4	1,040	21	1,910	5	1,320	19	1,210	4	1,010	19	1,160	4	1,570	20	1,100
5	1,020	22	1,890	6	1,350	20	1,210	5	1,050	20	1,260	5	1,520	21	1,120
6	1,050	23	1,690	7	1,280	21	1,160	6	992	21	1,450	6	1,500	22	1,110
7	1,070	24	1,750	8	1,180	22	1,160	7	1,000	22	1,800	7	1,700	23	1,130
8	1,080	25	1,780	9	1,120	23	1,190	8	994	23	1,950	8	1,610	24	1,150
9	1,050	26	1,870	10	1,120	24	1,250	9	980	24	2,250	9	1,400	25	1,150
10	1,120	27	1,700	11	1,140	25	1,290	10	994	25	2,280	10	1,230	26	1,160
11	1,180	28	1,710	12	1,130	26	1,240	12	1,050	26	1,560	11	1,120	27	1,210
12	1,190	29	1,700	13	1,270	27	1,250	13	1,080	27	1,290	12	1,110	28	1,320
13	1,090	30	1,780	14	1,190	28	1,220	14	1,280	28	1,250	13	1,210	29	1,470
14	1,170	31	1,730	15	1,220	29	1,160	15	1,060	29	1,150	14	1,250	30	1,720
						30	1,110			30	1,030	15	1,240	31	1,920

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

Arroyo Colorado South of Harlingen, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
October		October		November		November		December		December					
13	5,560	27	5,500	3	4,970	17	5,230	1	4,670	15	5,560				
20	5,530			10	5,190	24	5,250	8	5,210	29	5,840				

Sampling by U. S. Section

North Floodway near Sebastian, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		April		June		September		October		November	
7	4,490	11	5,220	18	6,680	22	5,060	2	5,190	15	3,820	20	4,270	24	3,860
14	4,180	18	5,590	25	6,580	May		July		22	3,500	27	3,950	December	
21	3,940	25	6,580	April		6	5,890	27	3,480	29	4,110	November		1	4,210
28	4,560	March		1	6,240	13	2,750	August		October		3	3,990	8	4,970
February		4	5,970	8	5,870	19	4,880	11	3,470	6	4,030	10	4,110	15	5,140
4	4,640	13	6,330	15	5,700	26	6,420	September		13	3,930	17	3,590	29	4,540
								8	4,280						

Sampling by U. S. Section

Rio Grande at Mercedes, Texas, Pumps

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		July		August		October		November	
1	1,570	15	1,090	1	1,800	17	1,200	1	1,180	16	1,140	1	1,560	16	1,250
2	1,560	16	1,210	2	1,750	18	1,230	2	1,070	17	1,330	2	1,570	17	1,210
3	1,610	17	1,240	3	1,790	19	1,490	3	1,160	18	1,210	3	1,580	18	1,240
4	1,630	18	1,280	4	1,800	20	1,480	4	1,200	19	1,190	4	1,210	19	1,240
5	1,320	19	1,310	5	1,710	21	1,560	5	1,250	20	1,080	5	1,060	20	1,210
6	1,160	20	1,350	6	1,710	22	1,530	6	1,340	21	1,010	6	958	21	1,170
7	1,140	21	1,470	7	1,760	23	1,520	7	1,380	22	1,150	7	953	22	1,170
8	1,090	22	1,460	8	1,780	24	1,580	8	1,360	23	1,270	8	1,120	23	1,230
9	1,150	23	2,060	9	1,870	25	1,610	9	1,450	24	1,300	9	1,600	24	1,310
10	1,260	24	2,470	10	1,760	26	1,960	10	1,370	25	1,430	10	1,330	25	1,280
11	1,210	25	1,960	11	1,600	27	1,820	11	1,360	26	1,400	11	1,270	26	1,330
12	1,090	26	1,950	12	1,600	28	1,410	12	1,700	27	1,290	12	1,280	27	1,300
13	1,060	27	1,860	13	1,660	29	1,410	13	1,590	28	1,240	13	1,270	28	1,340
14	1,030	28	1,870	14	1,730	30	1,410	14	1,360	29	1,180	14	1,300	29	1,340
15	1,060	March		15	1,580	31	1,400	15	1,190	30	1,200	15	1,250	30	1,340
16	1,070	1	1,720	16	1,520	June		16	1,110	31	1,190	16	1,260	December	
17	1,040	2	1,780	17	1,560	1	1,300	17	1,100	September		17	1,320	1	1,290
18	1,040	3	1,810	18	1,590	2	1,210	18	1,110	1	1,250	18	1,490	2	1,250
19	996	4	1,900	19	1,800	3	1,130	19	1,110	2	2,350	19	1,340	3	1,270
20	996	5	1,990	20	1,570	4	1,160	20	1,110	3	2,450	20	1,300	4	1,320
21	983	6	1,930	21	1,420	5	1,300	21	1,160	4	2,240	21	1,300	5	1,330
22	965	7	1,850	22	1,360	6	1,130	22	1,160	5	2,070	22	1,220	6	1,410
23	1,010	8	1,710	23	1,340	7	1,240	23	1,160	6	2,190	23	1,140	7	1,530
24	968	9	1,750	24	1,270	8	1,300	24	1,130	7	2,400	24	1,130	8	1,640
25	960	10	1,770	25	1,160	9	1,200	25	1,170	8	2,220	25	1,120	9	1,830
26	980	11	1,740	26	1,160	10	1,190	26	1,320	9	2,130	26	1,130	10	1,630
27	983	12	1,710	27	1,130	11	1,230	27	1,190	10	1,820	27	1,160	11	1,870
28	969	13	1,730	28	1,150	12	1,250	28	1,200	11	1,630	28	1,020	12	1,770
29	967	14	1,830	29	1,130	13	1,310	29	1,090	12	1,500	29	1,140	13	1,700
30	976	15	1,770	30	1,090	14	1,340	30	1,050	13	1,380	30	1,060	14	1,670
31	991	16	1,720	May		15	1,280	31	1,040	14	1,340	31	1,070	15	1,630
February		17	1,750	1	1,130	16	1,180	August		15	1,360	November		16	1,350
1	1,030	18	1,830	2	1,200	17	1,120	1	1,060	16	1,360	1	1,060	17	1,250
2	1,060	19	1,820	3	1,170	18	1,150	2	1,060	17	1,380	2	1,280	18	1,190
3	982	20	1,810	4	1,150	19	1,180	3	1,140	18	1,390	3	1,460	19	1,210
4	1,020	21	1,750	5	1,070	20	1,210	4	1,110	19	1,420	4	1,380	20	1,180
5	1,060	22	1,650	6	1,230	21	1,250	5	1,070	20	1,310	5	1,270	21	1,220
6	1,100	23	1,640	7	1,260	22	1,260	6	1,030	21	1,170	6	1,430	22	1,180
7	1,060	24	1,750	8	1,230	23	1,180	7	1,040	22	1,140	7	1,510	23	1,130
8	1,050	25	2,000	9	1,230	24	1,150	8	1,070	23	1,220	8	1,590	24	1,180
9	1,110	26	1,990	10	1,190	25	1,170	9	1,060	24	1,320	9	1,450	25	1,230
10	1,100	27	1,880	11	1,140	26	1,230	10	1,070	25	1,490	10	1,650	26	1,250
11	1,130	28	1,820	12	1,130	27	1,220	11	1,070	26	1,840	11	1,620	27	1,390
12	1,120	29	1,850	13	1,130	28	1,190	12	1,120	27	2,440	12	1,430	28	1,360
13	1,170	30	1,950	14	1,130	29	1,240	13	1,130	28	1,830	13	1,240	29	1,330
14	1,180	31	1,830	15	1,160	30	1,240	14	1,100	29	1,610	14	1,140	30	1,380
				16	1,310			15	1,160	30	1,540	15	1,180	31	1,350

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1969

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Rio Grande near San Benito, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		April		May		September		October		November	
6	1,270	10	1,120	14	1,670	14	1,710	28	1,860	3	2,460	7	1,330	6	1,460
10	1,230	14	1,140	17	1,770	16	1,600	June		9	2,350	10	1,040	12	1,630
13	1,080	18	1,250	20	1,660	21	1,650	3	1,230	16	1,460	14	1,300	25	1,240
17	1,040	24	2,460	24	1,670	24	1,390	5	1,170	19	1,410	16	1,320	December	
20	995	26	1,940	28	1,940	May		August		23	1,190	21	1,480	2	1,340
29	962	March		31	1,870	7	1,190	6	1,050	26	1,320	24	1,350	8	1,560
February		3	1,820	April		14	1,180	12	1,110	30	1,650	28	1,210	16	1,590
3	984	7	1,760	3	1,790	16	1,390	19	1,340	October		31	1,200	29	1,410
7	1,120	10	1,710	9	1,750	20	1,500	26	1,360	3	1,570	November		31	1,350
												4	1,170		

Sampling by U. S. Section

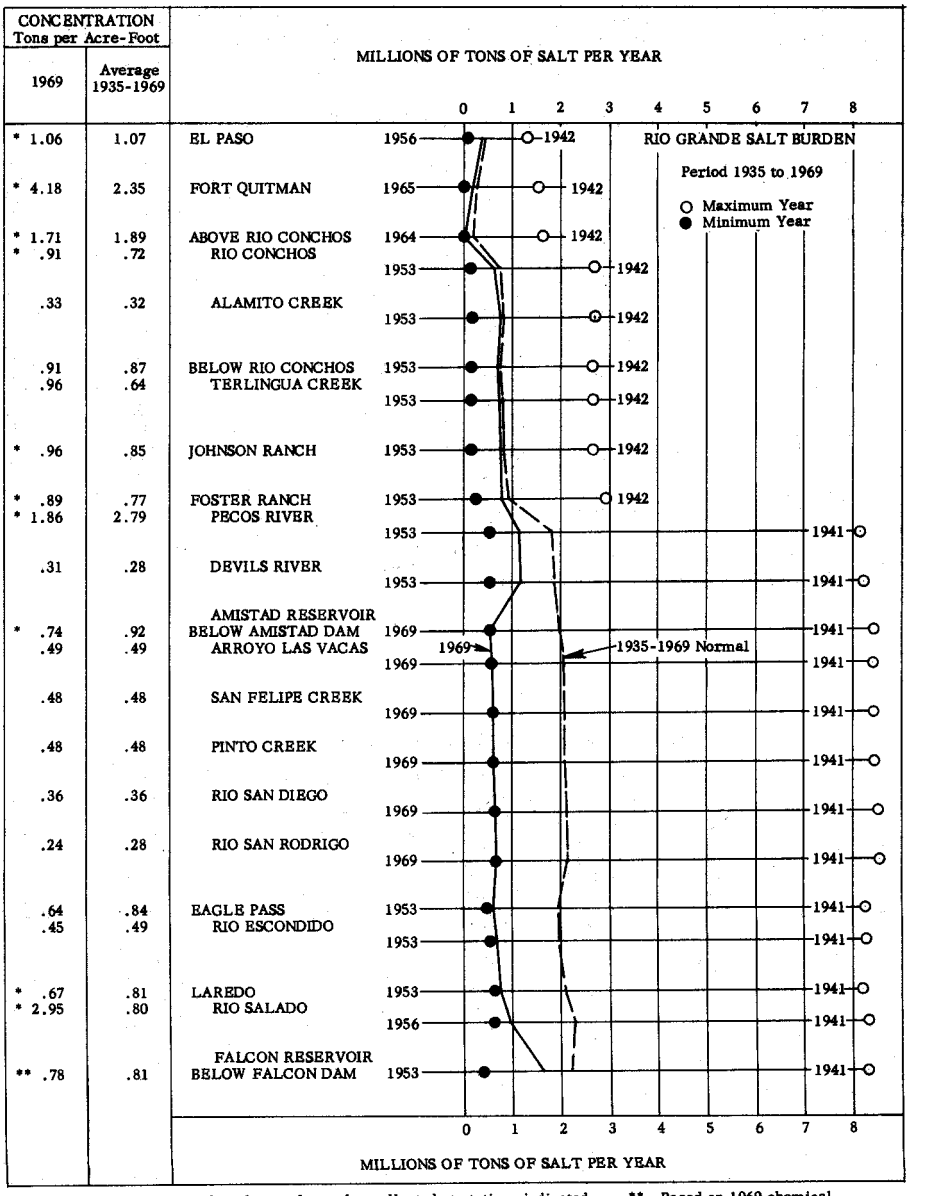
Rio Grande near Brownsville, Texas

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		March		April		July		September		October		November	
6	1,580	18	1,140	24	1,820	21	1,860	8	1,270	9	2,010	14	1,490	25	1,420
9	1,470	24	1,450	27	1,950	23	1,940	14	1,450	16	2,100	17	1,370	December	
13	1,390	27	1,990	31	1,830	May		August		19	1,880	21	1,460	4	1,370
20	1,270	March		April		8	1,290	6	1,200	23	1,610	24	1,550	9	1,530
27	1,040	3	1,770	3	1,970	14	1,080	12	1,120	26	1,530	28	1,620	16	1,710
February		7	1,970	7	1,960	20	1,260	15	1,280	30	2,420	31	1,710	18	1,650
3	1,000	10	1,820	9	1,920	28	1,560	19	1,330	October		November		19	1,570
6	1,160	14	1,770	14	1,840	June		26	1,490	3	1,940	4	1,590	29	1,360
10	1,150	17	1,780	16	1,830	3	1,830	September		7	1,860	7	1,580	31	1,390
14	1,090	20	1,830					4	1,310	10	1,870	12	1,470		

Sampling by U. S. Section

RIO GRANDE SALT BURDEN

The term "salt", as used herein, means total dissolved solids. The 1969 concentrations which are marked by an asterisk (*) are based on the chemical analyses shown on preceding pages of this bulletin. Those without asterisks are based on chemical analyses reported in previous water bulletins or have been developed by deduction. Average concentrations shown for the period 1935 to 1969 are the weighted means of the values determined for the 35-year period indicated.



* Based on 1969 chemical analyses of samples collected at stations indicated

** Based on 1969 chemical analyses of samples collected at Falcon Dam - U. S. Tailrace

SANITARY ASPECTS OF WATER QUALITY

The United States and Mexican Sections of this Commission and the Texas State Department of Health cooperate in the joint sanitary water-sampling program along the Rio Grande. All analyses below have been made under the "Rules of Laboratory Procedure," as approved by the participating agencies and which conform with the procedures set out in the manual "Standard Methods for the Examination of Water and Wastewater", Twelfth Edition (1965), prepared jointly by the American Public Health Association, the American Water Works Association and the Water Pollution Control Federation. These analyses were made in the laboratories of the El Paso Water Plant, the Cameron County Health Unit, and the United States Section of the International Boundary and Water Commission. The percentages of dissolved oxygen (D. O.) shown below are the percent saturation at the elevation of the sampling stations.

Franklin Canal at El Paso, Texas, Water Plant

Date 1969	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 7	109	4.5		95	July 8	116	1.5	21,000	7,170
14	156	6.2	36,000	2,830	15	123	2.1	260	1,030
21	132	7.0	3,600	1,130	29	123	4.6		430
28	154	6.6	36,000	5,530	Aug. 5	114	1.9	38,000	895
Feb. 4	134	9.0	6,200	13,840	12	124	2.9	23,000	4,900
* 11	102	7.6	16,000	18,150	19	115	2.9	3,600	4,895
* 18	134	9.2	9,300	855	26	136	2.8	1,400,000	9,350
* 25	171	7.3	36,000	465	Sept. 9	131	3.0	55,000	15,045
Mar. 4	114	8.8	62,000	4,050	16	117	1.2	62,000	26,825
11	116	4.6	6,200	3,350	23	108	3.6	240,000	23,280
18	122	5.3	11,000	750	30	149	3.2	9,300	6,880
25	127	4.7	23,000	2,940	Oct. 7	123	1.9	16,000	7,190
Apr. 1	92.9	4.0	6,200	1,300	14	129	1.8	2,300	10,500
8	126	5.2	260	1,970	21	133	2.0	110,000	114,500
15	126	5.2	110,000	31,350	28	131	2.3	23,000	38,000
22	137	5.5	2,300	1,750	Nov. 4	139	2.2	6,200	1,920
29	136	7.0	9,300	10,700	18	140	3.0	1,600	4,920
May 6	114	2.9	110,000	17,400	25	155	2.9	1,100	13,500
13	151	4.8	240,000	2,750	Dec. 2	157	3.3	3,600	9,000
20	128	3.2		1,330	9	113	2.5	62,000	38,400
27	125	3.5	3,600	1,550	16	138	4.3	110,000	536,500
June 3	116	6.4	3,600	250					
10	130	3.0	6,200	720					
24		2.5	11,000	2,970	Total	5,783.9	191.7	2,946,720	1,003,155
July 1	117	1.8	11,000		Average	129	4.2	68,500	22,300

* Samples taken from the Rio Grande at the Water Plant

Rio Grande at Ysleta, Texas-Zaragoza, Chih. Bridge

Jan. 7	0	186.0	24,000,000	945,000	July 8	31.2	31.7	1,100,000	908,000
14	38.6	32.5	16,000,000	1,035,000	15	92.6	10.7	620,000	85,000
21	47.5	28.2	22,000,000	670,000	29	84.7	4.5	230,000	47,000
28	0	84.6	9,400,000	517,500	Aug. 5	79.4	4.0	620,000	63,000
Feb. 4	0	158.3	140,000,000	1,179,000	12	58.1	6.9	1,100,000	470,000
11	29.1	81.9	6,200,000	690,000	19	85.1	4.6	230,000	465,000
18	0	60.1	9,400,000	790,000	26	75.0	8.2	5,500,000	837,500
25	.02	180.2	38,000,000	536,000	Sept. 9	86.6	8.3	3,600,000	471,000
Mar. 4	71.3	74.4	5,500,000	84,500	16	98.7	7.0	1,100,000	202,000
11	64.6	124.7	160,000	30,000	23	82.1	20.1	6,200,000	1,343,000
18	10.4	3.4	620,000	44,000	30	79.0	14.1	6,200,000	1,310,000
25	100	12.6	1,100,000	91,500	Oct. 7	72.0	17.2	3,600,000	1,423,000
Apr. 1	61.0	20.0	230,000	261,700	14	.09	37.9	38,000,000	3,140,000
8	75.7	12.1	23,000	17,100	21	36.0	17.3	2,300,000	797,000
15	57.3	9.0	2,400,000	479,000	28	40.5	23.7	3,600,000	1,058,000
22	31.2	22.7	230,000	95,000	Nov. 4	75.1	12.4	6,200,000	2,623,000
29	79.8	11.6	1,100,000	407,000	18	70.3	10.8	1,600,000	1,059,000
May 6	41.4	12.6	3,600,000	1,365,000	25	.09	41.0	38,000,000	14,800,000
13	33.9	16.0	6,200,000	1,988,000	Dec. 2	49.2	15.7	3,600,000	991,000
20	.05	12.3	6,200,000	545,000	9	54.4	38.7	3,600,000	502,000
27	73.3	6.4	360,000	107,000	16	53.0	26.2	11,000,000	837,000
June 3	75.6	11.6	160,000	42,000					
10	78.4	11.0	2,300,000	162,500					
24	91.5	9.0	360,000	49,000	Total	2,457.45	1,552.2	433,753,000	45,562,300
July 1	93.6	10.0	210,000		Average	53.4	33.7	9,429,000	1,012,000

SANITARY ASPECTS OF WATER QUALITY

Rio Grande at Laredo, Texas, Water Plant

Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 6	230	550	May 19	3,600	7,500	Sept. 29	280	4,500
13	26	215	26	2,300	2,500	Oct. 6	6,200	65,000
20	230	315	June 2	93	5,000	13	1,100	2,500
27	160	300	9	60	3,000	20	3,600	2,000
Feb. 3	360	285	16	60	2,500	27	24,000	28,000
10	60	305	23	60	3,000	Nov. 3	2,300	11,000
17	1,100	1,050	30	360	9,000	10	620	1,500
24	93	710	July 7	60	4,000	17	1,100	3,500
Mar. 3	110	200	14	360	6,000	24	230	3,000
10	60	135	22	230	2,500	Dec. 1	3,400	11,000
17	230	410	28	620	4,000	8	360	1,500
24	360	415	Aug. 4	360	5,500	15	160	1,000
Apr. 1	620	490	11	360	2,500	22	230	1,000
7	9,400	1,750	18	360	2,500	29	360	1,500
14	140,000	2,750	25	230	2,000			
21	2,300	640	Sept. 2	2,300	25,500			
28	360	2,000	8	1,100	3,500			
May 5	360	2,000	15	620	4,500	Total	220,432	308,020
12	6,200	18,000	22	1,100	43,500	Average	4,240	5,920

ß Rio Grande at 8.6 Miles below Laredo, Texas, R. R. Bridge

Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 6	36,000	30,000	Apr. 28	380,000	62,500	Aug. 25	110,000	194,500
13	62,000	200,000	May 6	62,000		Sept. 8	110,000	137,500
20	36,000	48,000	12	380,000	65,000	29	110,000	65,000
27	380,000	102,500	19	160,000	31,500	Oct. 6	380,000	
Feb. 3	23,000	36,500	26	55,000	137,500	27	62,000	77,500
10	36,000	40,000	June 2	110,000	39,000	Nov. 3	23,000	31,000
17	36,000	42,500	9	62,000	137,500	10	62,000	20,500
24	40,500	36,000	16	2,300	22,500	17	110,000	100,000
Mar. 4	36,000		23	16,000	37,500	24	380,000	37,500
10	110,000	9,000	30	110,000	41,500	Dec. 8	110,000	27,500
17	36,000	13,000	July 7	240,000	77,500	15	21,000	20,500
24	220,000	30,500	28	700,000		23	700,000	
Apr. 7	220,000	23,500	Aug. 4	36,000	65,000			
14	62,000	14,500	11	110,000	137,500	Total	6,210,800	2,296,500
21	240,000	39,500	18	36,000	65,000	Average	148,000	62,100

Rio Grande below Falcon Dam, Texas–U. S. Tailrace

Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 6	0	25	Apr. 28	0	40	Sept. 22	36	280
13	0	5	May 12	0	15	Oct. 6	2.6	10
20	0	5	June 2	11	80	20	11	4,125
27	0	0	9	0	30	27	0	55
Feb. 3	0	15	16	2.6	40	Nov. 3	0	40
10	0	10	23	0	15	17	6	80
17	0	15	30	6	45	24	23	75
24	0	15	July 7	0	60	Dec. 1	0	25
Mar. 3	2.6	100	14	11	35	8	230	35
17	6.0	50	28	0	15	15	0	15
24	6.0	35	Aug. 11	0	20			
Apr. 7	2.6	15	25	0	30			
14	13	130	Sept. 8	110	625	Total	482.0	6,270
21	2.6	45	15	0	15	Average	12.7	165

θ Rio Grande at Mercedes, Texas, Pumps

Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1969	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 7	3,600		Apr. 15	1,600		Oct. 13	9,400	
14	340		22	1,100		20	620	
21	620		May 6	6,200		26	2,300	
28	2,300		13	2,300		Nov. 3	910	
Feb. 4	2,300		19	3,600		10	1,100	
11	5,000		26	5,500		17	280	
18	230		June 2	1,600		24	910	
25	540		9	13,000		Dec. 1	3,400	
Mar. 4	620		Aug. 11	2,300		8	1,100	
11	110		18	3,600		15	1,100	
18	160		Sept. 8	1,600		29	3,400	
25	93		15	2,300				
Apr. 1	1,100		22	2,300		Total	90,753	
8	1,600		29	620		Average	2,330	

Samples and Analyses by U. S. Section ß Samples by Mexican Section and Analyses by U. S. Section
θ Samples by U. S. Section and Analyses by Cameron County Health Unit

RAINFALL ON THE RIO GRANDE WATERSHED
IN THE UNITED STATES
In Inches

Tabulated below, in approximate downstream order, are monthly records of United States rainfall stations located in Texas with averages for their periods of record. For location, elevation, period of record, type of gage in use, watershed subdivision in which the station is located, and the observer, see alphabetical listing of these stations shown on pages 133 through 136 in this bulletin. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the office of the United States Section of this Commission. Daily records for years prior to 1953 may also be found in corresponding water bulletins.

Detailed listings of the months and years for which records are available through 1956 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 22 and 26.

Month	American Dam		Island Station		County Line Station		Fort Hancock Bridge		Guayuco Arroyo	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.01	0.38	0.02	0.32	0.01	0.34	0	0.35	0	0.31
Feb.	.12	.34	.04	.27	.13	.22	.17	.27	.10	.20
Mar.	.15	.35	.13	.25	0	.27	.05	.23	.05	.17
Apr.	T	.21	T	.17	0	.22	.01	.27	0	.19
May	.27	.22	.06	.31	.04	.35	.11	.51		.35
June	.01	.59	.05	.54	.31	.57	.74	.83	.70	.57
July	1.77	1.45	.92	1.08	2.56	1.20	.84	1.26	1.47	1.39
Aug.	.07	1.32	1.11	1.24	1.54	1.36	1.37	1.66	1.63	1.68
Sept.	.18	1.01	.35	.84	.45	.94	.42	.92	.75	1.03
Oct.	.57	.59	.43	.72	.59	.88	.49	.98	.73	1.08
Nov.	.65	.26	.52	.26	.61	.29	.88	.31	.65	.24
Dec.	.61	.42	.56	.39	.27	.34	.74	.43	.55	.37
Yearly	4.41	7.14	4.19	6.39	6.51	6.98	5.82	8.02		7.58

Month	Fort Quitman		Neely Ranch		La Nutria Station		Bill Shannon Ranch		Adobes Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.39	0	0.32	0	T	0.10	0.56	0	0.37
Feb.	.13	.24	.23	.19	0	T	.10	.35	0	.20
Mar.	.06	.23	.02	.18	0	.23	0	.45	0	.20
Apr.	.02	.25	0	.13	0	.07	.35	.20	0	.16
May	.08	.41	.09	.36	0	.03	.20	.98	.23	.60
June	.16	.84	.34	.78	T	1.00	4.50	1.36	1.12	1.22
July	1.11	1.50	1.16	1.70	T	1.41	3.00	1.99	3.76	2.04
Aug.	1.58	1.73	3.26	1.75	0.50	2.00	1.50	1.95	1.23	1.62
Sept.	.76	.94	.83	1.26	.10	.65	.95	1.63	.93	1.69
Oct.	.28	.83	.86	1.00	.25	.09	.15	1.07	0	.57
Nov.	.43	.30	.63	.26	.80	.70	1.00	.33	.73	.30
Dec.	.34	.35	.57	.40	.20	.07	.25	.55	0	.28
Yearly	4.95	8.01	7.99	8.33	1.85	6.25	12.10	11.42	8.00	9.25

Month	Shafter		Livingston Ranch		Presidio (IB&WC Gage)		Quebec Ranch		Bloys Camp	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	T		0	0.52	0	0.31	0.60	0.55	0.07	0.71
Feb.	.30		0	.37	0	.20	.40	.26	.26	.64
Mar.	0		0	.23	0	.14	0	.30	.09	.50
Apr.	0		0	.49	T	.20	0	.25	.22	.47
May	.40		0	.34	.10	.44	.70	.97	.86	1.50
June	2.60		3.20	1.76	2.50	1.17	1.10	1.91	2.10	2.59
July	2.95	7.45	2.63	1.72	1.30	1.24	4.90	2.35	5.01	3.43
Aug.	.70	2.32	0	1.70	.20	1.15	.60	2.18	2.81	3.84
Sept.	.90	2.55	1.70	1.52	.40	1.02	1.10	1.77	.79	2.46
Oct.	0	.90	0	.85	.25	.50	0	.72	.72	1.48
Nov.	1.30	1.90	0	.44	.70	.29	0	.35	1.42	.68
Dec.	0	0	.30	.28	.15	.23	0	.34	.49	.62
Yearly	9.15		7.83	10.22	5.60	6.89	9.40	11.95	14.84	18.92

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Kerr Mitchell Ranch		Loma Vista Ranch		H. T. Fletcher Ranch		L. T. Van Eman Ranch		Casa Piedra	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.53	0.02	0.73	0	0.80	0.10	0.59	0	0.33
Feb.	0	.36	0	.32	0	.30	.10	.26	0	.21
Mar.	0	.19	0	.18	0	.37	0	.22	0	.35
Apr.	0.40	.46	.45	.55	0	.46	.30	.52	0	.36
May	1.07	1.13	2.55	.97	.80	1.10	1.25	.91	1.60	.51
June	2.53	1.86	2.75	1.94	2.85	1.65	2.98	1.97	2.50	1.71
July	4.25	1.99	4.00	2.21	3.10	2.85	4.70	2.43	1.20	1.96
Aug.	1.41	1.94	.70	1.80	1.55	2.84	1.50	1.94	.75	2.42
Sept.	.15	1.47	0	1.39	.45	1.82	1.50	2.36	1.30	.99
Oct.	.65	1.29	.25	1.03	1.15	1.37	1.10	.93	.30	.59
Nov.	.86	.37	0	.27	1.50	.50	1.00	.66	1.20	.81
Dec.	0	.39	.64	.47	0	.42	1.23	.41	0	.26
Yearly	11.32	11.98	11.36	11.86	11.40	14.48	15.76	13.20	8.85	10.50

Month	H. M. Greenwood (Cienega Ranch)		Reford		02 Ranch		Earl Hammond Ranch		Big Bend Chevron Station	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.65	0	0.36	0.12	0.53	0.05	0.23	0.25	0.34
Feb.	.10	.30	0	.20	.17	.39	0	.44	.55	.55
Mar.	0	.29	0	.17	0	.31	0	.26	0	.32
Apr.	.10	.54	T	.32	.23	.40	.85	.56	0	.66
May	.10	.82	.25	.45	.37	1.04	0	.49	.25	.45
June	1.95	2.05	.65	.86	1.85	1.45	1.81	1.66	.20	.16
July	3.20	2.36	1.00	1.26	2.44	1.86	2.80	2.02	.19	1.84
Aug.	.30	2.03	.25	1.05	1.17	2.19	1.25	1.71	1.30	1.60
Sept.	1.80	2.44	.55	1.54	0	1.61	0	1.14	0	1.25
Oct.	.80	1.27	.40	.79	.97	1.43	1.02	1.19	.05	.32
Nov.	1.40	.50	.70	.37	1.84	.66	0	.50	.40	.41
Dec.	.36	.60	.10	.18	.16	.38	1.02	.48	.20	.14
Yearly	10.11	13.85	3.90	7.55	9.32	12.25	8.80	10.68	3.39	8.04

Month	Maverick Ranger Station		Terlingua Creek Station		Castolon		Johnson Ranch		Ray Willoughby Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.01	0.46	0	0.28	0.35	0.29	0.15	0.37	0	0.56
Feb.	.14	.26	0	.14	.04	.19	0	.19	0	.49
Mar.	0	.09	0	.16	0	.31	0	.16	0	.24
Apr.	0	.18	0	.40	.38	.44	.15	.42	.70	.43
May	.21	.86	T	.52	.59	.94	1.55	1.06	.82	1.54
June	1.86	1.43	T	.93	.52	1.39	1.10	1.04	1.68	2.08
July	1.15	1.70	.40	.90	.34	1.46	T	1.02	3.30	2.95
Aug.	.23	1.54	1.10	.86	1.04	1.55	.75	.90	0	2.15
Sept.	0	1.25	.50	.91	.52	1.39	.85	1.21	1.37	2.38
Oct.	1.04	.93	.40	.57	.14	.54	.20	.60	1.20	1.08
Nov.	.11	.23	.20	.16	.24	.14	.35	.20	1.42	.53
Dec.	.15	.34	.10	.26	.16	.26	.25	.31	.35	.42
Yearly	4.90	9.27	2.70	6.09	4.32	8.90	5.35	7.48	10.84	14.85

Month	J. G. Woodward Ranch		Yarborough Ranch		Kokernot Ranch Headquarters		Buttrill Ranch		A. M. Potter Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.58	0.06	0.30	0.03	0.57	0	0.61	0	0.38
Feb.	.15	.40	.20	.36	0	.28	.25	.18	0	.50
Mar.	0	.16	0	.39	0	.15	0	.20	.58	.22
Apr.	.68	.52	0	.50	0	.62	1.72	.57	.13	.26
May	.52	1.10	0	.65	.29	.74	0	.99	.59	1.01
June	1.15	1.86	2.00	2.04	2.33	1.32	1.20	1.39	1.21	1.10
July	1.94	2.07	3.12	2.67	2.22	1.58	0	1.61	.97	1.22
Aug.	.18	2.54	0	3.18	.48	1.09	0	.78	.58	1.29
Sept.	.96	1.70	1.66	2.30	.47	1.04	.80	1.34	.11	1.53
Oct.	.38	.97	1.20	1.19	1.77	.88	.70	.73	0	.19
Nov.	1.21	.63	1.11	1.30	.52	.35	.60	.32	.16	.47
Dec.	0	.25	1.45	.42	1.39	.40	0	.25	0	.53
Yearly	7.17	12.78	10.80	15.30	9.50	9.02	5.27	8.97	4.33	8.70

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED
IN THE UNITED STATES
In Inches

Month	Black Gap Game Refuge		Stillwell Crossing		Persimmon Gap Ranger Station		Sheep Pasture		Mouth of Maravillas Creek	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.49	0.27	0.52		0.51	0	0.36	0	0.17
Feb.	0	.50	0	.37	0.20	.46	0	.49	0	.08
Mar.	0	.25	0	.31		.21	0	.45	0	.35
Apr.	.23	.44	.37	.28	.09	.50	.24	.40	0	.52
May	2.43	1.37	1.10	.76	.39	.91	2.75	1.07	2.08	.81
June	3.12	1.28	.35	1.04	1.67	1.19	2.81	1.81		1.64
July	.90	1.51	0	2.04	.50	1.37	.92	1.01		.90
Aug.	0	.99	1.46	.99	.70	.77	0	.90		1.95
Sept.	0	1.46	.42	2.14		1.01	.91	2.15		1.06
Oct.	1.12	.88	.29	.71		1.14	.91	1.10		.64
Nov.	.02	.35	.22	.34		.26	.20	.80		.43
Dec.	.50	.30	.64	.40		.33	.50	.28		.10
Yearly	8.32	9.82	5.12	9.90		8.66	9.24	10.82		8.65

Month	Heath Crossing		Dove Mountain Ranch		Slaughter Ranch		McGonagill Ranch Headquarters		McGonagill Ranch East Mill	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.22	0.56	0	0.57	0.20	0.56	0	0.42	0	0.42
Feb.	.12	.48	.84	.34	.30	.75	0	.59	0	.19
Mar.	0	.33	0	.25	0	.72	0	.41	0	.50
Apr.	.34	.34	.55	.48	2.00	.78	.95	.51	1.50	.67
May	1.32	.52	2.32	.99	1.00	.84	.40	.95	1.30	.95
June	.62	1.00	.55	1.31	.50	.90	0	1.94	0	1.75
July	1.10	1.16	0	1.99	0	1.17	.35	2.24	1.05	1.35
Aug.	.33	1.16	0	.97	.30	1.69	.80	1.37	0	1.14
Sept.	.50	2.12	.40	1.04	.20	1.39	.90	1.67	.40	1.72
Oct.	.52	.90	3.15	1.36	.80	1.27	.60	.90	1.90	1.08
Nov.	.29	.46	.60	.35	.90	.82	1.50	.28	.60	.22
Dec.	.70	.33	.80	.41	1.40	.44	0	.16	0	.23
Yearly	6.06	9.36	9.21	10.06	7.60	11.33	5.50	11.44	6.75	10.22

Month	E. W. Hardgrave Ranch		Lewis James Ranch		Dryden		Bricker Ranch		Ross Foster Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.07	0.57	0.20	0.52	0.14	0.55	0.25	0.45	0.15	0.57
Feb.	.29	.72	.40	.77	.63	.52	1.11	.67	.20	.65
Mar.	.64	.37	.60	.44	.15	.43	.20	.38	.20	.17
Apr.	4.70	1.42	1.40	1.05	2.47	.91	2.03	.98	1.80	.88
May	1.15	1.34	1.60	1.32	.90	1.73	1.50	1.11	.35	1.48
June	.67	1.68	.50	1.18	.34	1.08	2.81	1.50	.95	1.28
July	.29	1.18	0	2.23	.28	1.07	0	.72	0	.51
Aug.	2.13	.97	0	1.58	1.28	1.24	1.20	.85	2.90	.76
Sept.	1.24	2.38	1.20	2.70	.68	1.72	2.19	1.89	.50	2.24
Oct.	1.75	1.64	.90	1.14	1.94	1.20	.91	1.05	.28	.89
Nov.	1.62	.61	1.40	.97	1.35	.44	2.05	.44	1.60	.30
Dec.	1.36	.41	1.20	.52	1.04	.46	.91	.39	.75	.30
Yearly	15.91	13.29	9.40	14.42	11.20	11.35	15.16	10.43	9.68	10.03

Month	Billings Ranch		W. A. Arledge Ranch		Hoffman Ranch		Owens Ranch		Todd Field	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.01	0.24	0.15	0.73	0	0.40	T	0.32	0	0.44
Feb.	.51	.50	.50	.51	0	.45	.62	.55	.51	.77
Mar.	.40	.68	.43	.49	.13	.32	2.02	1.36	1.67	1.14
Apr.	3.70	1.76	2.11	1.22	.53	.37	4.11	1.69	4.91	2.44
May	5.10	2.09	3.75	1.89	.82	1.08	3.22	1.74	4.78	1.83
June	1.30	.65	1.62	1.70	2.36	2.10	1.40	1.47	2.42	2.37
July	1.50	2.15	0	1.07	2.46	1.87	0	.49	0	.56
Aug.	2.00	2.10	1.20	1.16	.37	2.23	1.50	1.37	2.94	1.99
Sept.	2.70	4.08	2.29	1.92	.88	1.74	.91	2.19	.77	2.74
Oct.		.87	1.46	1.49	.87	1.19	5.31	1.48	3.09	1.44
Nov.		.99	1.97	.50	.70	.51	3.08	1.54	1.63	.88
Dec.		1.08	.91	.54	.45	.40	2.30	.76	1.05	.42
Yearly		17.19	16.39	13.22	9.57	12.66	24.47	14.96	23.77	17.02

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED
IN THE UNITED STATES
In Inches

Month	Wills Ranch		Terrell Plant (E. P. N. G. Co.)		† Latham Ranch		Cash Ranch		Prosser Ranch No. 3	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.02	0.41	0	0.40	0	0.82	0.09	0.45	T	0.52
Feb.	1.90	1.03	.53	.64	.42	1.32	.32	.77	1.40	1.08
Mar.	.83	.60	2.07	.76	1.00	.97	.53	.46	.40	.41
Apr.	3.02	2.13	3.23	2.35	3.60	2.52	2.40	1.51	3.00	1.59
May	3.82	2.18	2.02	1.20	3.79	4.39	3.02	1.94	3.10	2.52
June	.73	1.44	.71	1.92	1.30	2.15	1.30	.70	1.00	.96
July	.70	1.18	.11	.88	0	2.50	1.57	1.74	.10	1.32
Aug.	1.15	1.53	1.34	.66	2.90	3.50	2.12	2.19	1.80	1.63
Sept.	1.71	2.97	.54	2.02	1.15	4.02	.61	2.56	2.50	2.61
Oct.	4.63	1.52	2.58	1.26	4.49	1.62	1.99	1.10	3.60	1.62
Nov.	2.50	1.08	1.73	.86	2.58	1.48	2.05	.98	2.50	.86
Dec.	.90	.42	1.40	.46	3.20	1.10	2.28	.99		.28
Yearly	21.91	16.49	16.26	13.41	24.43	26.39	18.28	15.39		15.40

Month	Ranchita (Continental)		Pecos River Near Langtry Station		Deadmans Canyon Near Comstock		Prosser Ranch No. 1		Continental Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.20		0.20	0.47	0.30	0.57	0.10	0.41	0.20	0.84
Feb.	1.10		.50	1.11	.30	.82	.50	.90	.85	1.07
Mar.	.20		.35	.52	.15	.32	.20	.31	.20	.45
Apr.	3.17		2.90	2.08	2.30	2.20	3.90	1.94	3.95	1.81
May	2.00		1.62	1.76	1.70	1.60	1.80	1.77	2.50	2.27
June	1.00		1.60	1.30	1.00	1.45	.70	.83	1.00	1.24
July	0		.75	1.88	.10	2.05	.30	2.07	0	2.28
Aug.	.71		1.05	.97	1.20	1.25	3.20	2.16	1.00	1.48
Sept.	.80		1.00	1.70	2.11	1.68	.80	2.23	2.25	2.83
Oct.	3.13		1.75	1.44	3.65	2.18	3.50	1.74	4.30	2.04
Nov.	3.70		2.16	1.20	1.99	1.19	2.90	.94	3.50	1.14
Dec.	1.16		.97	.42	1.12	.59	1.10	.43	1.40	.47
Yearly	17.17		14.85	14.85	15.92	15.90	19.00	15.73	21.15	17.92

Month	Martin King Ranch		Brotherton Ranch		Walker Ranch		P. W. Kelly Ranch		Haby Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.51	0.64	0.50	1.04			0.45	0.56	0.26	0.53
Feb.	.38	.83	.89	1.02			.61	.96	.50	.94
Mar.	.06	.22	.24	.31			.25	.78	0	.46
Apr.	1.21	.94	1.65	1.09			2.51	1.46	1.85	1.35
May	1.46	1.53	1.97	1.34			3.05	2.04		1.02
June	1.27	1.52	1.10	2.02			1.02	1.86		2.27
July	.13	1.15	0	.71			0	1.46		1.11
Aug.	1.48	1.00	1.55	1.42	1.90		1.50	1.31		1.32
Sept.	2.69	2.53	3.07	2.50	1.80		2.59	2.05		1.87
Oct.	3.32	2.20	3.83	1.91	3.00		4.59	2.35		1.25
Nov.	2.39	.58	2.22	.65	2.60		2.12	.73		.43
Dec.	1.18	.48	.76	.24	1.00		.77	.45		.24
Yearly	16.08	13.62	17.78	14.25			19.46	16.01		12.79

Month	Comstock		Cow Creek Near Comstock		* Goodenough Spring Raft		Feely		Lock Store	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.28	0.65	0.15	0.44	0.59	0.39	0.20	0.70	0	0.50
Feb.	.59	.88	.60	.76	.84	.64	.60	.92	0	.95
Mar.	.29	.58	.20	.34	.31	.24	.30	.69	0.80	.82
Apr.	2.47	1.40	3.00	1.54	5.05	1.45	2.10	1.80	4.46	1.73
May	1.70	1.88	1.00	.87	1.83	1.12	1.90	2.12	2.16	2.34
June	.57	2.18	0	1.13	0	1.99	.60	1.85	.87	1.18
July	.03	.97	.40	.54	0	.58	.80	.86	.72	1.11
Aug.	1.86	1.61	1.50	1.22	1.10	.86	2.30	1.03	1.99	1.39
Sept.	1.02	2.09	2.50	1.98	1.80	3.05	2.10	2.15	2.58	3.01
Oct.	4.13	1.89	4.20	1.79	4.20	2.19	6.90	2.74	2.49	1.10
Nov.	2.39	.61	2.80	.75	2.00	.48		.59	2.45	.95
Dec.	.70	.72	.50	.40	.55	.42	.80	.53	.63	.32
Yearly	16.03	15.46	16.85	11.76	18.27	13.41		15.98	19.15	15.40

T Trace † Formerly Oberkampf Ranch * Formerly Goodenough Spring

RAINFALL ON THE RIO GRANDE WATERSHED
IN THE UNITED STATES
In Inches

Month	W. E. Sawyer Ranch		Sub-Station 14		L. D. Whitehead Ranch		Whitehead Brothers Ranch		Prosser Ranch No. 2	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.57	0	1.06		0.40	T	0.49	T	0.49
Feb.	1.15	1.03	1.00	1.09		.66	1.20	1.15	1.50	1.31
Mar.	1.70	1.56	1.07	.97		.36	0	.47	.50	.47
Apr.	4.20	2.53	3.64	1.75	2.77	3.84	2.36	1.47	3.20	1.70
May	1.80	1.91	1.60	2.90	2.26	3.16	4.33	2.30	1.50	1.91
June	.45	.74	4.58	2.93		2.40	1.18	1.22	.80	1.18
July	1.90	2.16	2.42	2.12		.56	.35	.95	.60	1.86
Aug.	3.77	1.88	1.29	1.77		1.34	3.90	1.67	1.30	1.73
Sept.	1.75	2.89	2.16	3.07		4.51	0	2.74	2.60	2.80
Oct.	6.60	2.41	5.55	2.28		1.33	11.95	4.05	3.20	1.48
Nov.	2.60	1.58	2.02	.97		.03	2.25	1.38	2.30	.88
Dec.	1.75	.88	.87	1.16		.40	1.00	.45	1.00	.40
Yearly	27.67	20.14	26.20	22.07		18.99	28.52	18.34	18.50	16.21

Month	Bakers Crossing		Allen Dunbar Ranch		Erekson Ranch		Vinegarone		Loma Alta	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.10	0.94	0.30	0.84	0.10	1.01	T	0.30	0.32	0.80
Feb.	.61	1.17	1.50	1.43	1.46	1.37	1.20	1.17	1.38	1.23
Mar.	.72	.66	1.50	.79	1.12	.73	.65	.50	.80	.81
Apr.	3.33	1.15	4.00	2.51	3.62	2.27	3.18	1.74	3.79	2.33
May	2.54	2.35	3.60	2.66	3.31	2.56	4.33	1.84	2.90	2.11
June	1.01	1.84	1.70	3.37	1.65	3.31	1.06	1.68	1.61	1.69
July	.97	1.36	0	1.74	.40	1.73	2.15	1.12	2.49	1.57
Aug.	1.46	1.24	2.45	2.08	2.26	1.58	2.70	1.86	2.74	1.50
Sept.	1.24	2.99	2.00	3.70	2.21	3.33	0	2.45	2.11	2.73
Oct.	4.86	1.57	11.30	3.21	8.66	2.71	10.25	3.54	8.40	3.91
Nov.	2.70	.74	2.20	.87	2.10	1.04	2.25	1.49	.15	1.31
Dec.	1.65	.73	2.60	.78	2.00	.49	1.10	.49	.61	.56
Yearly	21.19	16.74	33.15	23.98	28.83	22.13	28.87	18.18	27.30	20.55

Month	Dolan Springs		H. K. Fawcett Ranch		Hinds "AT" Ranch		H. T. Miers Ranch Headquarters		H. T. Miers Ranch No. 2	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.02	0.47		.80	0.91	0.65	0.40	0.76	0.72	0.65
Feb.	.85	1.08	1.20	.88	1.10	1.10	1.25	1.40	1.26	1.21
Mar.	.80	.82	.52	.84	.52	.59	1.00	.81	.77	.90
Apr.	2.29	2.44	4.15	1.75	2.43	1.36	1.75	1.96	2.38	1.94
May	3.14	1.77	4.47	2.44	2.45	1.75	2.85	2.67	3.52	2.24
June	1.21	1.20	1.60	1.78	.53	2.03	.72	3.38	.47	2.35
July	0	.90	0	.71	3.20	1.21	1.80	1.44	2.76	1.37
Aug.	4.20	2.73	3.27	1.70	1.72	1.19	3.90	1.44	2.28	1.38
Sept.	0	3.10	1.62	3.73	.81	2.65	1.25	3.05	2.43	3.59
Oct.	8.00	2.92	8.00	2.54	5.74	2.62	7.30	3.50	6.32	2.57
Nov.	2.35	1.05		.76	2.64	.72	2.30	.95	2.38	1.07
Dec.	.80	.48		.49	.95	.58	1.60	.64	1.54	.63
Yearly	23.66	18.96		18.42	23.00	16.45	26.12	22.00	26.83	19.90

Month	A. A. Baker Ranch		Harlow Ranch		Gillis Ranch		Goldwire Ranch		Pafford Crossing	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.47	0.45			0.27	0.47	0.50		0.15	0.52
Feb.	.70	.96			.81	1.08	1.25		.70	.93
Mar.	.50	.53	0.20		.47	.84	.80		.75	.29
Apr.	2.42	1.44	3.20		2.45	1.90	2.65		2.00	1.40
May	1.14	1.73	2.10		2.76	1.98	2.97		1.60	1.73
June	1.17	1.15	.60		.85	2.08	.37		.27	2.19
July	.33	.75	.30		.48	1.14	3.48		2.80	1.16
Aug.	1.79	1.15	1.60		2.48	1.58	2.40		2.30	1.14
Sept.	.68	2.83	1.90		1.82	2.51	1.60		.85	3.11
Oct.	4.49	1.86	4.30		6.12	2.76	6.15		6.60	2.50
Nov.	2.38	.78	2.80		2.59	1.06	2.45	1.76	2.15	.64
Dec.	.54	.42	.50		1.12	.64	.80	.40	.95	.52
Yearly	16.61	14.05			22.22	18.04	25.42		21.12	16.13

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED
IN THE UNITED STATES
In Inches

Month	Big Satan Creek Station		Cliff Lowry Ranch		Lowry Ranch No. 2		Tuffy Whitehead Ranch		Stewart Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.25		0.37	0.51	0.32	0.50	0.11	0.38	0.29	0.49
Feb.	1.15		1.16	1.25	1.12	1.12	.62	.93	1.07	1.07
Mar.	1.45		.39	.61	.41	1.00	.49	.54	.60	.43
Apr.	2.35		1.73	1.95	1.74	2.44	2.16	1.49	1.56	1.71
May	1.32		2.90	2.55	2.26	2.26	2.12	1.49	1.94	1.64
June	.50		.94	1.55	.34	1.71	.56	1.40	.70	2.19
July	1.80		1.38	.70	2.16	.92	.46	.75	1.27	1.18
Aug.	2.50		3.14	1.28	1.43	.95	1.48	.77	1.64	.75
Sept.	.45		1.71	4.51	1.83	3.21	1.94	3.12	1.62	3.37
Oct.	7.80		9.94	2.60	6.23	2.41	5.53	2.01	11.20	2.63
Nov.	2.15	1.72	2.91	.99	3.23	1.35	2.38	.74	3.33	.89
Dec.	1.40	.70	1.63	.58	1.38	.65	.88	.46	1.23	.59
Yearly	23.12		28.20	19.08	22.45	18.52	18.73	14.08	26.45	16.94

Month	Rough Canyon Near Del Rio		Devils Lake		Sellers Ranch		Evans Creek Near Comstock		J. G. Brite Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.				0.70	0.10	0.47			0.19	0.42
Feb.			1.07	.89	.52	.83			.78	1.15
Mar.			.54	.59	.40	.44			.35	.72
Apr.			2.53	1.71	2.20	1.63			2.41	2.25
May			2.19	1.86	2.15	1.66			2.29	2.49
June	0.65		.69	2.34	.50	2.48			.73	1.67
July	2.05		.53	.87	.10	.72	0.15		.48	.75
Aug.	1.50		2.01	1.31	1.65	1.00	2.55		1.62	1.15
Sept.	1.68		2.66	2.20	1.36	2.06	1.25		1.20	3.57
Oct.	6.79		6.70	1.97	7.40	2.27	7.13		7.08	2.55
Nov.	3.05		3.71	.70	2.80	.68	3.05		3.19	.91
Dec.	1.13		1.25	.78	1.22	.50	.99		1.55	.53
Yearly				15.92	20.40	14.74			21.87	18.16

Month	Longley Ranch		Hutto Ranch No. 1		Hutto Ranch No. 2		Middle Fork San Pedro		North Fork San Pedro	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.			0.81	0.64	0.84	0.58				
Feb.			1.65	1.34	1.78	1.32				
Mar.			.73	.58	.49	.53				
Apr.			3.38	2.45	4.23	2.81				
May			2.76	1.34	3.09	1.90				
June			1.35	1.59	1.06	1.86	1.35		0.90	
July	0.10		.17	.85	1.09	.88	1.70		1.25	
Aug.	2.00		4.99	1.96	4.04	1.71	3.40		1.70	
Sept.	1.14		.92	4.10	1.35	5.20	1.10		1.25	
Oct.	6.05		10.95	2.80	8.40	2.31	12.40		11.57	
Nov.	3.11		2.22	1.16	3.34	1.19	3.36		3.53	
Dec.	1.15		1.14	.61	1.07	.52	1.30		1.18	
Yearly			31.07	19.42	30.78	20.81				

Month	Wardlaw Ranch		Buoy No. 11		Amistad Raft		Amistad Dam		Below Amistad Dam Station	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.50	0.59			0.27		0.44	0.48	0.60	0.49
Feb.	.65	1.02			.61		.74	.99	1.07	.79
Mar.	.17	.36			.28		.28	.62	.15	.36
Apr.	4.43	2.07			2.96		4.06	2.37	4.96	1.54
May	2.26	2.01			2.68		2.40	2.25	1.90	1.88
June	.55	2.00			0		.19	1.18	.15	1.88
July	.37	1.36			.25		.28	.62	.60	.81
Aug.	1.74	1.26			2.70		2.94	1.15	3.20	1.06
Sept.	.81	3.14			1.00		2.56	4.22	.40	2.54
Oct.	6.95	2.19			7.20		6.17	1.74	8.10	2.24
Nov.	2.87	.72			2.50		2.65	.78	2.55	.63
Dec.	1.08	.47	0.30		1.15	0.61	1.16	.56	.94	.38
Yearly	22.38	17.19			21.60		23.87	16.96	24.62	14.60

RAINFALL ON THE RIO GRANDE WATERSHED
IN THE UNITED STATES
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Month	Laughlin Air Force Base		Doak Ranch		Gillis Headquarters Ranch		Lewis Ranch		Maverick County Canal Headgate	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.53	0.56	0.32		0.34	0.87	0.41	0.74	0.45	0.55
Feb.	1.74	1.06	1.30		1.94	1.87	.82	1.17	.99	1.09
Mar.	.72	.46	.65		.60	.90	.71	.66	.76	.66
Apr.	7.87	2.49	3.87		3.12	3.11	3.29	2.72	3.24	1.82
May	2.88	1.62	2.46		2.48	2.99	2.31	2.31	1.15	2.08
June	.33	2.91	1.27		.72	1.56	1.22	2.10	.09	2.11
July	3.23	1.60	1.21		2.31	1.90	.26	.34	.14	1.47
Aug.	4.04	1.76	6.85		5.20	3.05	3.26	1.75	3.10	1.36
Sept.	1.49	3.14	.89		1.15	1.28	1.22	5.37	1.25	2.99
Oct.	8.37	2.92			10.94	6.07	10.40	3.31	3.95	2.04
Nov.	3.34	1.01			4.04	3.12	2.62	1.24	3.05	.77
Dec.	1.03	.61			1.33	.66	1.20	.76	.78	.57
Yearly	35.57	20.14			34.17	27.38	27.72	22.47	18.95	17.51

Month	Sultenfuss Ranch		Pinto Creek Station		Las Moras Creek		Wipff Ranch		Lateral No. 2 Spill	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.60	1.01	0.50	0.45	0.48	0.76	0.10	0.75	0.40	0.66
Feb.	1.00	1.63	1.25	.91	1.13	1.27	.60	.98	.55	.88
Mar.	1.00	1.21	.70	.59	.48	.67	0	.67	.30	.65
Apr.	5.03	3.75	2.55	1.59	1.86	1.55	1.20	1.73	3.80	1.86
May	4.11	2.15	2.25	1.75	1.96	2.17	2.30	1.91	3.05	2.39
June	.10	2.02	.20	2.68	.05	2.73	.10	1.74	.15	1.49
July	0	.13	.30	1.02	1.38	1.17	.90	1.48	.70	1.73
Aug.	6.71	2.42	3.80	1.20	5.52	1.74	6.70	1.68	5.40	1.91
Sept.	.52	4.39	.60	3.11	.86	4.01	1.05	2.96	3.00	3.05
Oct.	9.76	3.23	2.60	2.18	8.05	2.80	5.80	2.00	3.20	2.11
Nov.	3.57	1.77	4.00	.99	2.92	1.30	4.00	1.30	1.90	1.15
Dec.	1.63	1.04	1.10	.58	.77	.72	.60	.64	.65	.59
Yearly	34.03	24.75	19.85	17.05	25.46	20.89	23.35	17.84	23.10	18.47

Month	Normandy		Lateral No. 12 Headgate		Lateral No. 15 Spill		Maverick Power Plant		Cooper Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.18	0.79	0.20	0.65	0.10	0.68	0.27	0.75	0.05	0.40
Feb.	.69	.82	.45	.67	.65	.74	.88	.83	.40	.75
Mar.	.26	.90	.40	.65	.15	.54	.21	.88	.15	.55
Apr.	3.79	1.95	1.95	1.89	1.40	1.60	1.78	1.93	1.25	1.75
May	2.86	2.52	3.35	2.58	2.70	2.61	4.48	2.93	1.60	2.20
June	.21	1.38	.10	1.40	0	1.09	.37	1.85	.15	1.36
July	.91	1.81	.75	1.47	.60	1.59	1.63	1.38	2.10	2.08
Aug.	5.22	1.96	4.70	1.38	4.50	1.34	7.22	1.76	5.20	1.59
Sept.	2.89	3.33	3.05	2.93	1.35	2.20	.97	2.67	4.20	3.25
Oct.	3.71	2.18	3.55	2.38	2.45	2.34	2.76	2.28	2.90	2.22
Nov.	3.04	1.09	1.70	.85	1.50	.76	2.35	.78	3.10	.89
Dec.	1.03	.85	.85	.63	.40	.61	.65	.64	.45	.56
Yearly	24.79	19.58	21.05	17.48	15.80	16.10	23.57	18.68	21.55	17.55

Month	Coal Mine		Elm Creek Station		Chittim Ranch		Eagle Pass		Cañon Diablo	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.29	0.51	0.20	0.42	0.30	0.42	0.37	0.59	0.40	0.48
Feb.	.81	.87	.70	.73	.75	.80	.89	.99	.85	.82
Mar.	.10	.71	.15	.56	.25	.66	.20	1.12	.30	1.25
Apr.	1.82	1.96	2.20	1.92	3.00	2.11	3.18	2.09	5.60	3.01
May	4.18	2.82	4.75	3.17	3.20	3.11	3.48	4.26	4.60	5.33
June	.41	1.21	.45	.98	.10	.90	.58	.82	.30	.47
July	2.53	2.46	2.25	2.08	1.80	2.01	1.55	1.30	2.05	.71
Aug.		1.22	8.05	1.75	7.50	1.74	8.72	2.93	6.95	2.10
Sept.		3.49	.05	2.59	T	3.02	.18	4.41	1.90	4.39
Oct.	2.85	2.36	2.55	2.36	3.60	2.61	3.83	1.74	4.15	1.75
Nov.	2.29	.75	1.50	.69	2.05	.67	2.04	.77	2.00	.96
Dec.	.60	.50	.70	.60	.95	.64	1.09	1.06	.85	.71
Yearly		18.86	23.55	17.85	23.50	18.69	26.11	22.08	29.95	21.98

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED
IN THE UNITED STATES
In Inches

Month	Rosita Creek Siphon		Weyrich Farm		Trees Farm		Rosita Creek Station		Farias Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.15	0.39	0	0.40	0.44	0.41	0.35	0.37	0.37	0.47
Feb.	.45	.83	.50	.99	.70	.84	.90	.76	.87	1.20
Mar.	.40	.66	0	.82	.30	.62	.20	.73	.27	.68
Apr.	3.25	2.06	3.60	2.75	5.59	2.27	2.05	2.44	1.23	2.58
May	5.30	3.14	6.80	4.21	6.39	3.21	5.10	2.79	3.68	3.27
June	.80	.93	.20	.46	.28	1.01	T	.88	.02	1.38
July	3.35	2.04	2.50	.69	2.16	1.94	1.35	1.03	3.11	2.49
Aug.	7.60	1.44	5.70	1.36	6.68	1.43	6.35	1.50	5.01	1.73
Sept.	1.50	2.96	.30	3.34	.98	2.55	.75	2.66	2.42	3.79
Oct.	4.00	2.40	4.90	1.49	5.62	3.20	5.75	2.78	6.92	2.97
Nov.	1.90	.85	1.60	.91	1.79	.78	2.00	.80	2.26	1.02
Dec.	.95	.72	1.30	.77	.74	.63	1.05	.66	1.36	.89
Yearly	29.65	18.42	27.40	18.19	31.67	18.89	25.85	17.40	27.52	22.47

Month	Indio Ranch		El Indio		Van Dalsem Farm		Wuensche Farm		Keisling Farm	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.34	0.49	0.32	0.75	0.30	0.39	0.27	0.59	0.21	0.43
Feb.	.62	.96	.60	.94	.50	.99	.76	1.08	.65	1.01
Mar.	.15	.70	.15	.65	.10	.65	.12	.76	.08	.93
Apr.	1.28	2.76	1.13	1.79	.80	2.51	.95	2.03	1.19	2.48
May	1.87	2.77	3.05	3.33	2.80	2.85	2.94	2.86	2.91	2.83
June	0	1.13	.03	1.45	.05	1.11	0	1.14	0	1.09
July	2.04	2.31	1.85	1.12	1.00	1.65	1.07	1.32	.86	1.51
Aug.	3.42	1.41	3.13	1.93	2.65	1.07	6.38	1.52	7.27	1.58
Sept.	1.60	3.10	.62	3.08	.55	3.52	.33	3.24	.27	2.86
Oct.	6.17	2.65	7.05	1.87	4.55	2.29	4.85	1.99	6.34	2.27
Nov.	1.67	1.00	2.15	.72	1.80	.83	2.02	.80	1.69	.73
Dec.	1.13	.73	.80	.67	.65	.70	.78	.62	.85	.96
Yearly	20.29	20.61	20.88	18.30	15.75	18.56	20.47	17.95	22.32	18.68

Month	Cuervo Creek Station		Apache Ranch		La Mesa Ranch		Laredo Water Plant		Fort McIntosh (Laredo)	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.20	0.58	0.50	0.75	0	T	0.14	0.77	0.20	0.72
Feb.	.55	.78	.50	1.02	1.50	1.67	.14	.79	.29	.86
Mar.	.05	.55	0	.33	0	1.17	0	.55	.19	.70
Apr.	.80	1.93	4.00	1.82	3.00	2.57	2.48	1.13	2.31	1.29
May	2.40	2.39	0	2.21	2.00	1.50	1.24	2.28	1.53	2.55
June	.05	1.10	0	1.28	1.00	1.33	3.50	1.96	4.94	2.09
July	.75	1.27	.50	1.47	0	.67	.38	1.16	.45	1.40
Aug.	4.55	1.46	3.30	2.26		3.35	3.94	1.61	4.06	1.81
Sept.	.30	3.09		3.38		10.30	1.00	2.99	1.21	2.80
Oct.	6.90	2.22		2.35	1.50	1.33	2.92	1.57	3.39	1.65
Nov.	1.90	.80		.86	2.00	3.50	2.36	.89	2.40	1.16
Dec.	.70	.59		.90	0	0	.50	.90	.88	.88
Yearly	19.15	16.76		18.63		27.39	18.60	16.60	21.85	17.91

Month	Los Isauros Ranch		Corralitos Ranch		Huisache Ranch		Zapata Water Plant		El Peyote Ranch	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.80	0.10	0.63	0	0.76	0	0.86	0.20	1.25
Feb.	2.26	1.41	.65	.71	.50	.87	.58	.76	1.20	1.11
Mar.	0	.48	0	.25	0	.38	.06	.45	0	.45
Apr.	2.12	.78	.25	1.14	.30	1.47	.21	1.65	1.65	1.46
May	4.05	2.58	2.10	1.50	4.45	2.18	6.27	2.92	3.30	3.56
June	0	2.01	.55	2.13	.80	1.88	1.25	1.47	2.10	3.16
July		.74	.40	.82	.20	.95	T	.85	0	1.62
Aug.		2.02	3.30	1.83	4.00	1.51	1.62	1.66	1.25	1.61
Sept.		5.65	1.15	2.76	5.00	3.47	3.91	3.95	2.80	5.85
Oct.		1.58	2.15	1.51	2.30	1.87	1.00	1.38	3.00	2.06
Nov.		.50	3.60	.96	3.20	1.03	2.50	1.14	2.30	1.15
Dec.		1.56	.30	.52	.30	.72		.65	1.72	.77
Yearly		20.11	14.55	14.76	21.05	17.09		17.74	19.52	24.05

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED
IN THE UNITED STATES
In Inches

Month	Arroyo Tigre Chiquito		Falcon Dam		Roma (International Bridge)		Garciasville		Los Ebanos	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.89	0.24	0.82	0	0.90	0	0.92	0	1.10
Feb.	1.00	.91	1.05	.83	.79	1.01	.58	.86	.62	.70
Mar.	.10	.33	.12	.74	0	.78	.32	.42	.40	.45
Apr.	1.25	1.16	.59	1.24	.50	1.44	.83	1.22	0	1.65
May	3.90	2.45	2.84	2.42	1.55	1.94	2.02	2.01	1.20	1.81
June	2.20	2.04	3.49	2.48	2.50	1.98	3.48	2.16	1.40	1.85
July	.40	.74	1.64	.74	0	.75	0	.96	.93	5.55
Aug.	2.20	2.44	2.86	2.59	2.87	2.27	2.05	1.58	3.45	2.15
Sept.	1.00	4.41	1.01	3.99	1.66	4.19	2.30	3.81	.55	2.58
Oct.	2.20	2.09	1.21	2.26	.56	2.21	.63	2.00	1.47	1.89
Nov.	1.47	1.25	2.76	1.29	2.56	.84	1.42	1.17	1.13	.82
Dec.	.40	.65	.63	.69	.53	.54	.52	.77	.20	.67
Yearly	16.12	19.36	18.44	20.09	13.52	18.85	14.15	17.88	11.35	21.22

Month	La Joya		HCWCID #6, Goodwin Pump No. 4B		HCWCID #6, Goodwin Pump No. 3		HCWCID #6, Goodwin Pump No. 5		HCWCID #6, Goodwin Pump No. 3A	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	1.11	0.77	1.04	0.40	1.16	0.95	1.14	0.20	1.08
Feb.	.83	.90	.83	.94	.96	1.08	.78	1.00	.91	1.11
Mar.	.92	.47	.82	.59	.74	.66	.57	.61	.25	.62
Apr.	.24	1.08	0	1.14	0	1.28	0	1.25	0	1.47
May	1.22	1.93	1.28	1.88	1.71	2.04	1.66	2.59	1.98	1.90
June	.90	2.33	0	2.12	.46	2.08	.91	2.07	0	2.34
July	1.80	.73	1.88	.67	2.35	.77	1.40	.64	.62	.67
Aug.	5.43	2.01	2.06	1.39	3.05	1.51	4.51	2.03	4.72	1.50
Sept.	1.27	3.10	3.40	3.20	1.93	2.99	2.02	3.51	2.03	3.05
Oct.	3.42	1.94	1.25	2.83	2.55	3.04	.73	2.80	2.03	2.96
Nov.	1.64	1.18	1.64	1.17	2.00	1.09	2.10	1.13	1.91	1.17
Dec.	.48	1.03	0	.97	.31	1.11	0	1.07	0	1.01
Yearly	18.15	17.81	13.93	17.94	16.46	18.81	15.63	19.84	14.65	18.88

Month	HCWCID #6, Goodwin Pump No. 4		Penitas (Edinburg Pumping Plant)		New Mission Pumping Plant		O. C. Dale Farm		HCWCID #15 (Edinburg Office)	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.23	1.65	0.12	1.24	0	0.64	0.36	1.43	.13	1.20
Feb.	1.06	1.02	.82	1.00	0	.61	1.34	1.15	1.32	1.04
Mar.	.63	.57	.72	.55	0	.53	.91	.72	.64	.66
Apr.	0	1.22	.28	.95	0	1.27	.29	1.74	0	1.42
May	1.01	2.09	1.53	2.00	0	2.64	1.83	1.91	2.81	2.05
June	0	2.36	.73	2.65	0	2.24	.34	2.50	.36	2.15
July	1.82	.80	1.73	.83	.60	.56	.20	.90	2.03	.85
Aug.	3.05	1.36	4.82	1.65	1.50	1.34	3.68	1.85	2.20	1.61
Sept.	1.80	3.80	2.90	3.61	1.10	2.15	4.20	3.41	6.56	3.53
Oct.	1.56	3.27	4.52	2.92	4.90	2.45	1.00	3.23	.73	2.71
Nov.	2.15	1.27	1.93	1.23	.80	.76	2.38	1.43	1.20	1.12
Dec.	.34	1.26	.23	1.23	0	.96	.20	1.19	.50	1.07
Yearly	13.65	20.67	20.33	19.86	8.90	16.15	16.73	21.46	18.48	19.41

Month	Edinburg Filtration Plant		La Feria Pumping Plant		La Feria Materials Yard		CCWCID # 19 (Adams Gardens)		San Benito Pump	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.21	1.27	0.60	1.48	0.53	1.09	0.52	0.91	0.35	1.23
Feb.	1.50	1.08	5.20	1.72	1.21	1.14	2.15	1.16	2.31	.95
Mar.	.49	.78	.97	.79	.31	.64	.66	.63	.75	.86
Apr.	.17	1.54	.65	1.87	0	1.24	.10	1.34	0	1.25
May	1.63	2.09	3.30	3.32	.82	3.68	1.75	2.59	2.38	2.38
June	2.38	2.36	.77	2.78	.84	2.81	1.33	2.36	0	2.09
July	.01	.68	0	1.55	.22	1.09	.06	.72	2.72	1.47
Aug.	4.00	1.41	7.60	2.91	5.84	2.56	4.83	2.11	2.93	1.92
Sept.	3.42	3.32	9.00	6.18	2.81	4.21	5.37	3.24	9.24	4.01
Oct.	1.01	2.39	0	3.84	1.02	2.85	.56	2.56	1.26	2.27
Nov.	2.07	1.32	0	2.25	1.12	1.97	1.93	1.55	1.72	1.04
Dec.	.02	1.14	.40	1.51	0	2.25	.30	1.17	.20	1.36
Yearly	16.91	19.38	28.49	30.20	14.72	25.53	19.56	20.34	23.86	20.83

RAINFALL ON THE RIO GRANDE WATERSHED

IN THE UNITED STATES

In Inches

Month	Whipple Farm		⊕ CCWCID #11 (Bayview Dist. Office)		Los Fresnos Pumping Plant					
	1969	Average	1969	Average	1969	Average				
Jan.	0.77	1.57	0.25	1.41	0.90	1.34				
Feb.	7.60	2.06	6.33	1.88	5.55	1.79				
Mar.	1.55	.70	.97	.85	1.50	.57				
Apr.	.25	1.81	0	1.63	0	1.67				
May	4.60	3.23	3.55	2.83	6.50	2.56				
June	0	2.70	0	2.01	0	3.35				
July	.10	1.66	0	1.24	0	1.36				
Aug.	5.10	2.65	1.49	2.70	5.02	2.44				
Sept.	4.10	5.87	4.56	5.45	2.50	4.99				
Oct.	2.11	3.23	3.12	2.27	2.10	4.05				
Nov.	2.30	1.60	3.70	1.52	3.40	1.78				
Dec.		1.64	0	1.47	0	1.41				
Yearly		28.72	23.97	25.26	27.47	27.31				

⊕ Average of 18 gages

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Tabulated below, in approximate downstream order, are monthly records of Mexican rainfall stations with averages for their periods of record. For location, elevation, period of record, type of gage in use, watershed subdivision in which the station is located, and the observer, see alphabetical listing of these stations shown on pages 137 through 141 in this bulletin. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the office of the Mexican Section.

Detailed listings of the months and years for which records are available through 1956 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 22 and 26.

Month	Juárez, Chihuahua		Zaragoza, Chihuahua		Garita Km. 28, Chihuahua		Samalayuca, Chihuahua		San Agustín, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.04	0.38	0.12	0.47	0.04	0.32	0.08	0.34	T	0.35
Feb.	.08	.43	.16	.44	.08	.31	.20	.46	.04	.29
Mar.	.16	.40	.08	.53	.16	.33	.16	.41	T	.35
Apr.	0	.32	0	.16	0	.11	0	.15	0	.15
May	.43	.35	.39	.18	.47	.13	.20	.14	0	.23
June	0	.64		.79	.04	.67	.63	.80	0	.66
July	1.97	1.46		1.70	.47	1.50	3.23	1.75	.59	1.46
Aug.	.67	1.47		1.00	.47	1.54	1.18	1.93	1.02	1.03
Sept.	.47	1.28		1.65	.16	1.36	.43	1.62	.12	1.13
Oct.	.71	.96		.38	.31	.62	.35	.54	.67	.56
Nov.	.75	.55		.42	.71	.38	.67	.41	.59	.35
Dec.	1.10	.55		.54	.87	.56	.35	.50	.67	.58
Yearly	6.38	8.79		8.26	3.78	7.83	7.48	9.05	3.70	7.14

Month	Guadalupe, Chihuahua		Tinajas, Chihuahua		Praxedis G. Guerrero, Chihuahua		San Antonio, Chihuahua		Porvenir, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.04	0.30	T	0.25	0	0.27	0	0.30	T	0.30
Feb.	.16	.35	.08	.29	.04	.26	0	.24	T	.33
Mar.	.16	.43	.04	.32	0	.36	0	.29	.12	.26
Apr.	0	.07	0	.09	0	.06	0	.07	0	.12
May	T	.20	.24	.23	0	.20	.28	.17	.12	.42
June	.63	.75	.43	.73	.04	.76	.94	1.21	.20	.89
July	1.14	1.26	2.20	1.65	2.80	1.88	1.97	2.15	.51	1.47
Aug.	2.13	1.48	1.54	1.74	2.01	1.46	1.50	2.32	.91	1.70
Sept.	1.42	1.11	2.05	1.28	.39	.83	.51	1.32	.12	.90
Oct.	.35	.92	1.02	.86	.28	.83	.47	.81	.55	.84
Nov.	.71	.46	.71	.43	.75	.46	.67	.54	.91	.53
Dec.	.31	.37	.55	.38	.28	.35	.35	.47	1.10	.45
Yearly	7.05	7.70	8.86	8.25	6.59	7.72	6.69	9.89	4.54	8.21

Month	Vado de Cedillos, Chihuahua		Los Barriles, Chihuahua		Banderas, Chihuahua		Luis L. León Chihuahua		El Cuarenta, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.27	T	0.51	0	0.08	T	0.31	0	0.17
Feb.	.24	.25	T	.28	.20	.20	.04	.22	.28	.28
Mar.	.08	.17	.04	.23	0	.21	0	.19	T	.28
Apr.	T	.16	0	.19	.55	.12	T	.16	T	.10
May	.16	.32	.71	.38	.16	.16	.08	.28	.43	.19
June	.71	1.24	.83	1.33	.31	1.00	.04	1.22	.24	.88
July	.94	1.58	3.19	2.21	1.34	1.26	1.81	1.72	1.89	1.69
Aug.	1.93	2.00	1.50	2.52	2.28	2.89	1.77	2.08	1.18	2.34
Sept.	.55	1.03	2.17	1.89	.79	1.09	.94	1.02	.63	1.34
Oct.	.43	.97	1.42	1.27	.75	.60	.35	.99	.55	.65
Nov.	.98	.45	.79	.76	.75	.45	.43	.52	.47	.55
Dec.	.79	.48	.51	.48	.39	.23	.39	.39	.71	.45
Yearly	6.81	8.92	11.16	12.05	7.52	8.29	5.85	9.10	6.38	8.92

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RAINFALL ON THE RIO GRANDE WATERSHED
IN MEXICO
In Inches

Month	El Cuervo, Chihuahua		El Llano, Chihuahua		Carichic, Chihuahua		Siquírichic, Chihuahua		El Vergel, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.39	0.28	T	0.19		0.58	0.28	1.08	0.47	1.76
Feb.	.08	.26	T	.14		.68	0	.56	1.73	.89
Mar.	0	.17	T	.25	0.12	.21	T	.32	.08	.63
Apr.	0	.25	T	.18	0	.15	0	.27	T	.60
May	T	.34	.12	.19	.08	.32	0	.38	.08	.73
June	1.46	1.39		1.31	.08	1.76	.16	1.73	.67	2.88
July	1.93	1.87		1.30	9.72	6.53	7.56	5.41	6.18	6.90
Aug.	.20	2.70		2.82	1.69	4.70	1.85	5.31	3.39	6.64
Sept.	1.85	1.95		2.90	1.57	2.82	1.14	2.93	2.91	5.06
Oct.	.04	.57		.81	.24	1.08	.39	1.05	.75	1.63
Nov.	.43	.16		.38	.16	.62	T	.32	T	.55
Dec.	.04	.07		.27	1.14	.96		1.13	1.57	1.82
Yearly	6.42	10.01		10.74		20.41		20.49	17.83	30.09

Month	Balleza, Chihuahua		El Sitio, Chihuahua		La Boquilla, Chihuahua		San Antonio, Durango		Estación Rosario, Durango	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.38	0.08	0.26	0.35	0.31	0.55	0.35	0.28	0.38
Feb.	.83	.34	.20	.37	.51	.16	T	.11	.12	.33
Mar.	.12	.14	0	.14	0	.17	0	.10	0	.26
Apr.	.16	.23	.04	.22	T	.19	0	.25	0	.27
May	T	.21	0	.49	T	.54	.24	.54	T	.95
June	.39	1.52	0	1.79	.04	1.40	.71	1.75	.28	2.41
July	9.53	4.67	3.50	4.13	3.27	2.92	6.06	4.36	4.84	4.83
Aug.	2.32	4.75	4.76	4.93	1.22	2.92	1.65	3.66	3.31	4.85
Sept.	.08	3.30	1.38	3.49	.31	2.89	1.89	3.97	.98	4.73
Oct.	.28	.84	.24	.73	1.02	.90	.83	1.00	.63	1.25
Nov.	.08	.48	.83	.44	.28	.32	.12	.21	.12	.34
Dec.	.67	.54	.12	.38	.39	.38	.51	.27	.83	.60
Yearly	14.46	17.40	11.15	17.37	7.39	13.10	12.56	16.57	11.39	21.20

Month	Ojo Caliente, Chihuahua		Villa Coronado, Chihuahua		Santa Bárbara, Chihuahua		Valle Allende, Chihuahua		Escalón, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.08	0.20	0.04	0.38	0	0.44	0.20	0.27		0.45
Feb.	.59	.18	T	.14	.16	.49	.16	.19	T	.19
Mar.	0	.17	0	.31	.08	.34	0	.09	0	.09
Apr.	.12	.19	0	.40	0	.23	0	.28	0	.34
May	T	.52	T	.46	.08	.97	.20	.66	.39	.59
June	.79	1.70		1.76	0	2.26	.24	1.92	1.02	1.51
July	5.20	3.28	1.18	3.73	4.72	4.03	2.76	3.36	1.57	2.31
Aug.	1.85	2.66	0	3.22	.79	4.56	3.98	4.65	.47	2.52
Sept.	1.02	2.48	2.01	3.79	1.10	4.85	.39	3.99	.98	2.82
Oct.	.31	1.16		1.09	.39	.61		.99	1.18	1.03
Nov.	.12	.13	.75	.42	.24	.28	T	.10	.24	.20
Dec.	.31	.28	.59	.46	.63	.59	.16	.29	.31	.30
Yearly	10.39	12.95		16.16	8.19	19.65		16.79		12.35

Month	Jiménez, Chihuahua		Parral, Chihuahua		Camargo, Chihuahua		Santa Rita, Chihuahua		Victoria, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	T	0.25	0.08	0.21	0.08	0.43	0.79	0.46	0.98	0.32
Feb.	.12	.12	T	.17	.79	.29	.31	.34	.35	.39
Mar.	0	.09	0	.11	0	.15	0	.18	0	.18
Apr.	T	.14	0	.21	0	.22	.08	.30	.87	.34
May	T	.42	.12	.44	T	.63	.35	.57	.20	.96
June	.55	1.06	.31	1.76	.63	1.65	.63	1.66	1.14	2.35
July	5.67	3.39	5.83	4.31	2.95	3.23	1.73	2.30	4.65	2.76
Aug.	.47	2.13	1.50	4.20	.43	2.52	2.56	2.49	.20	3.15
Sept.	1.65	2.24	.94	4.26	1.42	2.86	.79	2.08	2.01	2.48
Oct.	1.34	1.41	.28	1.17	.55	1.07	.20	.80	.59	.46
Nov.	.31	.16	.12	.47	.31	.33	.24	.19	.55	.10
Dec.	.20	.24	1.06	.40	.24	.43	0	.40	.04	.29
Yearly	10.31	11.65	10.24	17.71	7.40	13.81	7.68	11.77	11.58	13.78

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Tacubaya, Chihuahua		Rosetilla, Chihuahua		Nonoava, Chihuahua		La Cieneguilla, Chihuahua		El Maguey, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.		0.16	0.20	0.42	0.04	0.08	0	T	0.08	0.29
Feb.	T	.40	.12	.13	.47	.37	.31	.27	.28	.26
Mar.	0	.13	0	.12	0	.40	0	.14	0	.14
Apr.	0	.24	T	.29	0	.30	0	.08	0	.14
May	.20	1.00	.24	.27	0	.05	0	.30	0	.43
June	.75	1.75	.71	1.12	.24	1.19	0	2.33	0	1.72
July	2.68	3.88	2.20	2.60	5.98	7.19	4.13	3.89	3.11	3.92
Aug.	.47	2.04	.43	2.60	.67	2.80	.43	3.30	2.91	3.92
Sept.	2.83	3.14	2.56	2.01	.67	1.27	.75	3.03	.12	3.38
Oct.	.47	.62	.47	.76	.16	.84	.24	.40	.12	.79
Nov.	.98	.17	.20	.19	.20	.31		.18	.43	.18
Dec.	.75	.62	.08	.37	.94	.71		.43	.16	.36
Yearly		14.15	7.21	10.88	9.37	15.51		14.35	7.21	15.53

Month	Villalba, Chihuahua		Las Virgenes, Chihuahua		Km. 135, Chihuahua		Km. 99, Chihuahua		Delicias, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.28	0.34	0.08	0.27	0.08	0.08	0.08	0.11	0.08	0.35
Feb.	.08	.13	.12	.10	.16	.16	0	.22	.20	.13
Mar.	0	.05	0	.04	0	.08	0	.10	0	.11
Apr.	0	.18	T	.22	0	.36	T	.26	.04	.27
May	0	.35	.08	.27	.08	.41	T	.39	.24	.28
June	.04	1.08	.28	1.10	.43	1.42	.31	1.60	.59	1.15
July	4.17	3.42	2.99	2.40	2.20	2.43		2.78	2.87	2.48
Aug.	2.20	2.95	1.73	2.46	1.65	2.93	1.26	2.52	1.34	2.53
Sept.	1.81	2.47	1.54	1.96	1.26	2.40	1.42	2.42	1.81	2.07
Oct.	.43	.95	1.50	.76	.67	.51	.94	.67	.31	.80
Nov.	.08	.25	.04	.22	.16	.17	T	.20	.08	.25
Dec.	.35	.40	.20	.37	.04	.26	T	.42	.04	.40
Yearly	9.44	12.57	8.56	10.17	6.73	11.21		11.69	7.60	10.82

Month	Lázaro Cárdenas, Chihuahua		Meoqui, Chihuahua		Las Burras, Chihuahua		Cd. Guerrero, Chihuahua		Bachiniva, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.35	0.28	0.04	0.16	0.04	0.25	0.20	0.61	0	0.42
Feb.	.20	.19	.12	.16	.16	.16	.59	.43	T	.16
Mar.	0	.10	0	.07	0	.12	.24	.21	.31	.33
Apr.	.04	.33	T	.55	0	.21	T	.20	0	.09
May	.16	.47	.04	.41	.24	.32	.16	.27	0	.16
June	.94	1.76	.55	1.23	.67	1.10	.20	1.53	.47	1.62
July	2.60	2.85	3.43	2.60	3.39	2.61	10.35	4.81	2.68	6.30
Aug.	1.69	2.46	1.81	2.34	1.61	2.46	2.01	5.25	1.46	4.55
Sept.	1.73	2.33	1.18	1.47	1.77	1.95	.55	3.01	0	2.26
Oct.	1.02	.60	.24	.60	.31	.51	1.02	1.16	0	1.07
Nov.	.31	.25	.16	.10	.28	.15	.08	.51	.16	.32
Dec.	.08	.22	.04	.41	.12	.38	1.34	.73		.47
Yearly	9.12	11.84	7.61	10.10	8.59	10.22	16.74	18.72		17.75

Month	Cuauhtémoc, Chihuahua		La Trasquila, Chihuahua		Colonia Anáhuac, Chihuahua		Presa Chihuahua, Chihuahua		Chihuahua, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.75	0.29	0	0.14	0.31	0.29	0.04	0.10	0.08	0.28
Feb.	1.22	.18	0	.34	1.18	.36	.08	.17	T	.20
Mar.	.08	.13	0	.11	.04	.18	.04	.18	T	.21
Apr.	0	.22	0	.22	T	.32	0	.24	T	.19
May	.08	.34	0	.30	.04	.42	.43	.67	1.02	.38
June	.08	1.51	.55	1.28	.39	1.45	1.34	2.69	1.54	1.49
July	5.67	4.80	4.49	3.79	5.00	5.44	5.98	4.98	6.10	3.48
Aug.	2.83	4.08	1.42	2.87	1.06	4.70	2.36	4.35	2.91	3.37
Sept.	1.10	2.65	1.22	2.73	1.54	3.22	.51	2.53	1.38	2.76
Oct.	.98	1.07	.63	.62	1.26	1.03	.83	.79	.79	.81
Nov.	.16	.27	.16	.36	.08	.31	.20	.24	.28	.42
Dec.	.16	.43	.39	.32	.04	.27	.20	.40	.20	.36
Yearly	13.11	15.97	8.86	13.08	10.94	17.99	12.01	17.34	14.30	13.95

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Majalca, Chihuahua		Planta Zootécnica, Chihuahua		Los Ojos Chihuahua		Los Pozos, Chihuahua		Villa Aldama, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.16	0.28	T	0.25	0	0.42	0	0.32	0.08	0.28
Feb.	.16	.26	.08	.17	.31	.23	.12	.22	.08	.11
Mar.	T	.34	0	.18	0	.17	0	.15	0	.26
Apr.	0	.52	T	.30		.33	0	.24	0	.21
May	.16	.81	.20	.33		.61	T	.50	T	.39
June	1.77	2.72	.71	1.74		1.19	1.77	1.37	1.02	1.99
July	8.11	6.22	5.31	3.88		3.77	5.35	2.43	4.37	3.60
Aug.	2.64	4.97	3.43	4.07		2.88	.55	2.34	.71	2.84
Sept.	1.34	3.04	1.38	2.21		2.90	2.40	2.18	.67	2.48
Oct.	.79	.61	.71	.87		.93		.83	1.06	.52
Nov.	.20	.24	.39	.29		.28		.48	.12	.22
Dec.	.31	.25	.28	.39		.24		.24	.12	.33
Yearly	15.64	20.26	12.49	14.68		13.95		11.25	8.23	13.18

Month	La Campana, Chihuahua		Presa El Granero, Chihuahua		El Anteojo, Chihuahua		Maijoma, Chihuahua		Cuchillo Parado, Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.25	0.04	0.10	0	0.01	0.12	0.50	0.04	0.12
Feb.	.24	.30	T	.20	.08	.17	.12	.34	.47	.12
Mar.		.18	T	.17	0	.06	0	.14	0	.12
Apr.	0	.25	.20	.39	.08	.40	T	.24	0	.08
May	.04	.24	T	.11	.16	.50	1.38	.71	0	.55
June	.59	1.72	.59	1.51	.31	2.17	.59	1.44	.24	1.10
July	4.33	3.24	2.24	1.68	2.32	2.36	3.82	2.81	5.98	2.63
Aug.	.87	3.20	.35	2.23	1.30	2.36	.63	3.12	.67	2.05
Sept.	2.24	2.89	2.09	2.26	.59	1.47	1.14	2.51	.67	.83
Oct.	.75	.92	.59	.35	T	.34	.51	.99	.16	.28
Nov.	.83	.31	.28	.17	.20	.11	.04	.36	.20	.24
Dec.	.20	.32	.12	.24	.20	.37	.35	.38	.94	.22
Yearly		13.82	6.50	9.41	5.24	10.32	8.70	13.54	9.37	8.34

Month	Coyame, Chihuahua		Las Varas, Chihuahua		Gallego, Chihuahua		El Sueco, Chihuahua		Ojinaga (IB&WC), Chihuahua	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.13	T	0.30	0.04	0.21	0.04	0.41	T	0.42
Feb.	.67	.32	.08	.53	.12	.45	.04	.48	.08	.25
Mar.	0	.09	0	.18	0	.14	0	.24	0	.13
Apr.	T	.33	0	.21	0	.21	0	.24	T	.27
May	.98	.54	T	.22	.08	.17	.20	.11	.28	.38
June	2.52	1.54	T	.97	1.34	1.06	.59	.73	1.38	1.27
July	4.13	2.17	2.05	3.16	8.94	3.15	3.46	2.78	1.93	1.32
Aug.	.04	1.62	.31	3.37	.91	3.45	1.42	3.71	1.38	1.49
Sept.	3.35	2.43	.43	2.40	.87	2.09	2.32	2.24	.67	1.18
Oct.	.39	.73	1.61	1.26	.91	1.15	.98	.88	.87	.84
Nov.	.79	.36	.59	.50	.31	.30	.47	.48	.75	.41
Dec.	.12	.17	.24	.28	.35	.22	.55	.23	0	.26
Yearly	12.99	10.43	5.31	13.38	13.87	12.60	10.07	12.53	7.34	8.22

Month	Ojinaga (M. S. of Mexico), Chihuahua		Potrero del Llano, Chihuahua		Manuel Benavides Chihuahua		Sierra Mojada Coahuila		Mina La Borrada, Coahuila	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	T	0.33	0.16	0.13	0.28	0.16	0.91	0.57	0.04	0.27
Feb.	.16	.22	.08	.25	T	.19	.20	.27	.08	.37
Mar.	0	.18	0	.60	0	.27	0	.31	0	.18
Apr.	0	.26	T	.24	T	.28	0	.29	.12	.38
May	T	.54	.28	.28	.47	.94	1.14	1.03	1.10	.93
June	1.50	1.01	1.81	1.60	.59	1.44	.12	2.26	1.69	1.90
July	1.85	1.31	2.91	2.23	1.93	2.28	3.43	2.82	.16	.99
Aug.	2.24	1.48	1.42	2.33	1.22	2.51	.20	2.74	.31	1.81
Sept.	.87	1.41	.67	1.30	1.10	1.70	.63	2.91	1.02	1.71
Oct.	.98	.93	.08	.35	.79	.65	1.57	1.29	.94	1.12
Nov.	.35	.39	.20	.16	.16	.15	.59	.51	.59	.41
Dec.	T	.40	.08	.39	T	.21	.12	.62	.71	.90
Yearly	7.95	8.46	7.69	9.86	6.54	10.78	8.91	15.62	6.76	10.37

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Las Norias, Coahuila		Santa Rosa, Coahuila		San Fernando, Coahuila		El Cedrito, Coahuila		Hacienda San Miguel, Coahuila	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.04	0.40		0.93	0.04	0.27	0	0.15	T	0.25
Feb.	.04	.47	0.98	.81	.12	.64	0	.70	.20	.59
Mar.	0	.24	.98	.52	0	.22	0	.13	0	.70
Apr.	.04	.62	2.13	1.09	3.15	1.39	.75	1.12	3.58	1.86
May	.04	1.18	2.32	1.00	1.02	.92	1.02	1.22	4.17	2.15
June	.08	2.12	.91	1.58	.12	.63	.55	.92	0	2.25
July	0	1.63	0	1.31	.04	.60	0	1.02	.87	1.21
Aug.	.16	1.70	1.81	.95	1.97	1.40	1.14	1.51	1.54	1.06
Sept.	.24	1.96	5.00	2.23	.39	2.89	2.24	2.94	1.50	3.24
Oct.	.08	1.22	2.48	2.33	4.72	1.69	1.18	1.26	2.24	1.83
Nov.	.12	.35	2.52	1.14	1.97	.55	1.26	.36	1.18	.45
Dec.	.08	.42	1.30	.48	1.22	.44	.98	.29	.31	.35
Yearly	0.92	12.31		14.37	14.76	11.64	9.12	11.62	15.59	15.94

Month	Presa Centenario, Coahuila		Ciudad Acuña, Coahuila		Presa Cabeceras, Coahuila		Presa San Miguel, Coahuila		Palestina, Coahuila	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.91	0.52	0.43	0.57	0.39	0.46	0.31	0.51	0.71	0.93
Feb.	.91	1.05	1.34	.88	.91	.82	.87	1.04	1.18	1.02
Mar.	.28	.59	.55	.80	0	.62	.39	.75	.51	.67
Apr.	2.44	1.65	4.33	1.75	2.09	1.76	1.30	1.14	1.85	1.68
May	1.50	1.45	3.31	2.47	2.05	2.17	1.57	1.86	3.19	2.50
June	0	1.77	.08	2.34	0	.96	0	1.41	0	2.28
July	1.42	1.05	.31	1.02	2.36	1.48	.35	.75	1.97	1.78
Aug.	4.49	2.10	4.96	1.59	8.78	2.02	3.46	1.46	6.18	2.00
Sept.	1.57	5.58	.79	3.19	.39	6.12	1.10	4.28	1.61	3.17
Oct.	9.25	2.54	11.30	2.56	7.56	2.52	4.68	1.94	9.37	1.91
Nov.	2.64	1.28	2.52	.65	2.09	1.00	2.20	1.04	2.99	.79
Dec.	1.02	.56	1.42	.56	.79	.45	.94	.71	1.34	.85
Yearly	26.43	20.14	31.34	18.38	27.41	20.38	17.17	16.89	30.90	19.58

Month	Chupadero, Coahuila		Jiménez, Coahuila		El Remolino, Coahuila		Piedras Negras, Coahuila		Villa Guerrero, Coahuila	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.31	0.53	0.51	0.68	0.75	0.44	0.43	0.65	0.24	0.43
Feb.	1.61	1.02	1.26	1.00	1.57	.73	1.14	.99	.47	.79
Mar.	.55	.57	.47	.82	0	.54	.24	.74	0	.52
Apr.	2.05	2.00	2.20	1.88	2.13	2.03	3.78	2.25	1.02	1.96
May	2.20	1.64	1.73	2.66	2.36	2.25	5.04	3.20	3.86	2.76
June	0	1.96	0	2.65	0	2.83	.71	1.57	.08	1.27
July	.47	.95	.31	1.36	1.97	1.68	1.34	2.09	1.30	1.22
Aug.	2.68	1.37	3.78	1.62	1.73	1.06	8.98	2.23	6.14	1.87
Sept.	1.69	4.25	2.91	3.27	0	4.43	1.30	3.24	.47	4.36
Oct.	2.99	2.27	5.12	2.39	2.56	2.72	4.06	2.81	6.02	2.66
Nov.	3.46	.97	4.72	.99	2.76	.70	2.44	.77	2.60	.72
Dec.	.71	.51	.83	.73	0	.49	1.10	.71	.79	.68
Yearly	18.72	18.04	23.84	20.05	15.83	19.90	30.56	21.25	22.99	19.24

Month	Rancho San Diego, Coahuila		Rancho Mercedes, Coahuila		Villa Hidalgo, Coahuila		Colombia, Nuevo León		Rancho Los Vidrios, Tamaulipas	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.10	0.39	0.35	0.28	0.74	T	0.08	T	0.87
Feb.	.59	.48	1.42	.84	1.97	1.03	0.39	.70	.39	1.00
Mar.	0	.52	.08	.85	0	.58	0	.72	0	.37
Apr.	1.18	1.72	2.52	2.54	2.56	1.77	2.68	1.84	1.77	1.60
May	.59	2.87	2.52	2.89	2.32	2.44	2.36	2.94	2.36	2.55
June	0	1.34	.24	1.20	1.30	1.46	1.57	1.50	3.94	1.78
July	2.44	1.66	.39	.72	2.91	.93	1.18	.88	0	1.15
Aug.	4.53	1.78	5.12	1.76	4.57	2.09	4.72	3.98	2.36	2.13
Sept.	1.93	3.65	4.25	2.39	1.30	3.27	1.18	5.54	.79	2.85
Oct.	5.39	1.40	1.57	1.09	1.81	1.76	2.17	1.94	1.97	2.33
Nov.	5.39	1.03	3.54	1.24	1.89	1.06	3.54	1.66	5.04	1.43
Dec.	2.44	.76	0	.79	3.07	.85		.79	3.54	1.10
Yearly	24.48	17.31	22.04	16.66	23.98	17.98		22.57	22.16	19.16

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Nuevo Laredo (M. S. of Mexico), Tamps.		Nuevo Laredo (IB&WC), Tamps.		El Llano, Tamaulipas		Ejido Progreso, Tamaulipas		Jarita, Nuevo León	
	1969	Average	1969	Average	# 1969	Average	1969	Average	1969	Average
Jan.	0.28	0.76	0.24	0.57	0.16		T		0.20	0.26
Feb.	.39	.91	.43	.91	.20		.20		.20	.78
Mar.	.16	.65	.31	.43	.12		0		0	.52
Apr.	1.22	1.21	2.99	1.17	.75		2.36		3.54	1.53
May	1.81	2.24	2.01	2.07	2.28		3.07		2.76	2.30
June	5.59	1.96	7.56	2.03	.08		7.87		3.94	1.61
July	.35	1.32	.39	1.01	0		.39		.47	.67
Aug.	4.02	1.58	2.44	1.92	4.88		4.68		3.54	2.31
Sept.	.98	2.74	2.80	2.85	1.30		.79		1.10	3.94
Oct.	2.60	1.44	3.39	1.46	.98		.71			1.42
Nov.	1.89	1.00	2.80	1.06	3.23	1.66	3.74		5.71	1.65
Dec.	1.10	.92	1.34	.77	1.26	1.02	1.61			.72
Yearly	20.39	16.73	26.70	16.25	15.24		25.42			17.71

Month	Nuevo Laredo Km. 26 SSW. Tamps.		♣Nuevo Laredo Km. 52 SSW, N. León		San Ignacio, Tamaulipas		Rancho San Juan de la Palma, Tamps.		Santo Domingo, Coahuila	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.20	0.54	0.20	0.32	0.20	0.52	0	0.72	0.87	0.74
Feb.	.79	1.02	.59	.85	.79	1.01	.55	.95	0	.57
Mar.	0	.39	0	.41	0	.55	0	.56	0	.22
Apr.	1.18	1.71	1.10	1.60	.39	1.93		2.10	T	.84
May	3.54	1.88	3.74	2.27	3.94	3.65	4.25	2.16	3.50	2.45
June	.59	1.17	.39	1.29	1.18	.90	.39	1.69	.47	3.72
July	T	.63	T	.90	0	.53	0	.72	T	2.67
Aug.	7.87	2.65	2.40	1.93	6.30	2.98	2.20	1.74	T	3.18
Sept.	.79	3.43	2.95	4.63	.79	4.38	6.42	4.11	3.62	3.92
Oct.	1.57	1.52	1.18	1.88	2.36	1.78	3.90	1.58	1.02	1.87
Nov.	1.10	1.15	1.38	.92	4.33	1.59	2.76	1.24	T	.52
Dec.	.47	.80	.59	.83	1.38	.91	1.18	.88	0	.54
Yearly	18.10	16.89	14.52	17.83	21.66	20.73		18.45	9.48	21.24

Month	La Babia, Coahuila		El Treinta, Coahuila		Conchos, Coahuila		Nueva Rosita, Coahuila		Sabinas, Coahuila	
	1969	Average	1969	Average	1969	Average	1969	Average	1965	1966
Jan.	0.63	0.37	0.51	0.49		0.32	0.28	0.61	0.12	0.83
Feb.	.16	.23	1.97	.44	0	.63	.12	.50	.39	.39
Mar.	0	.35	0	.64	0	.32	0	.38	.20	.55
Apr.	.08	.71	.51	1.50	5.55	1.88	1.02	1.31	.12	2.28
May	1.46	1.40	4.96	2.20	4.84	2.50	2.60	2.60	3.27	3.54
June	.28	1.69	.79	2.20	.98	1.79	.43	2.00	.04	2.36
July	2.52	1.98	1.02	1.70	1.57	1.96	2.44	1.53	.39	
Aug.	.71	1.37	3.23	2.35	1.61	2.10	1.69	1.86	.24	4.72
Sept.	2.52	2.87	3.78	3.97	1.69	3.17	2.20	2.72	4.88	
Oct.	.79	1.03	2.36	1.66	2.95	2.08	3.46	1.64	.20	.91
Nov.	.20	.15	.94	.50	1.02	.57	1.50	.56	3.35	.08
Dec.		.24	.12	.26	.24	.53	.59	.65	2.13	
Yearly		12.39	20.19	17.91		17.85	16.33	16.36	15.33	

Month	Sabinas, Coahuila				Villa Juárez, Coahuila		Cuatro Ciénegas, Coahuila		Ocampo, Coahuila	
	1967	1968	1969	Average	1969	Average	1969	Average	1969	Average
Jan.		0.35	0.20	0.61	0	0.56	0.08	0.32	0.63	0.51
Feb.		1.38	.04	.79	.08	.46	.12	.35	.20	.16
Mar.		.71	0	.41	0	.28	0	.13	0	.16
Apr.		3.03		1.30	1.97	1.30	.16	.30	.08	.85
May		.83		2.49	.31	1.96	.20	.78	1.81	1.11
June		.87	.04	1.99	0	.97	.63	.61	.20	1.21
July		2.87	.91	1.22	.79	.82	.94	.80	.08	2.15
Aug.		2.36	1.10	2.23	1.46	1.51	.12	.94	2.83	1.83
Sept.		3.86	1.77	3.39	1.69	3.13	.91	1.43	.39	2.38
Oct.		1.02	1.97	1.78	2.60	1.75	.12	.74	.35	1.05
Nov.		.71	1.46	.59	1.57	.56	.47	.38	.39	.21
Dec.		.11	.24	.57	.43	.38	.63	.44	.47	.44
Yearly		18.10		17.37	10.90	13.68	4.38	7.22	7.43	12.06

T Trace ♣ Formerly published as Nuevo Laredo Km. 50 SSW, Tamaulipas

Record began Nov. 1968 .08, Dec. 1968 .79

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Monclova, Coahuila		Progreso, Coahuila		Don Martín, Coahuila		Laguna de Salinillas, Nuevo León		Lampazos, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.08	0.48	0.12	0.45	0.16	0.73	0.20	0.63	0.12	0.62
Feb.	.28	.48	.12	.51	.31	.65	.28	.64	.20	.88
Mar.	.04	.32	0	.36	.08	.47	.24	.50	.04	.63
Apr.	1.22	.62	1.50	1.35	2.83	1.29	1.22	1.10	1.26	1.38
May	.31	1.45	.79	2.21	.67	2.14	.20	2.28	.98	2.39
June	1.02	1.19	.59	1.20	.71	1.54	.71	1.37	1.18	1.94
July	1.42	1.48	.51	.74	1.14	.96	1.42	.72	2.44	1.71
Aug.	1.81	1.62	1.81	1.97	2.60	2.05	.91	2.31	3.43	2.07
Sept.	.08	2.98	1.65	3.04	1.46	2.88	.63	3.12	1.22	4.92
Oct.	.63	1.20	1.89	1.80	2.64	1.69	3.15	1.76	.98	1.37
Nov.	1.50	.59	1.73	.55	2.24	.62	3.90	.70	3.15	.86
Dec.	1.06	.55	.94	.56	.79	.68	.63	.60	1.18	.52
Yearly	9.45	12.96	11.65	14.74	15.63	15.70	13.49	15.73	16.18	19.29

Month	Anáhuac, Nuevo León		Rancho Pascualitos, Nuevo León		La Gloria, Nuevo León		Nueva Hacienda Golondrinas, N. León		Bustamente, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.16	0.71	0	0	0	0.40	0	0	0	0.57
Feb.	.24	.63	0	0.59	.51	.79	0	.31	.51	.78
Mar.	.31	.52			.67	.33	0	.98	0	.64
Apr.	.43	1.20			1.34	1.45	.31	.76	.31	1.20
May	1.61	2.42			5.24	2.86	2.28	1.50	1.61	1.56
June	1.97	1.39			1.89	1.75	.24	1.40	.59	2.28
July	2.60	1.28			0	1.64	1.26	3.84	.16	1.17
Aug.	2.28	2.10			1.02	1.70	1.57	2.26	3.94	3.61
Sept.	1.46	3.18			3.11	4.96	3.74	2.94	2.76	5.92
Oct.	.59	1.51			.31	1.38	.55	.28	3.19	1.90
Nov.	2.83	.65			2.87	.94	1.57	1.12	2.01	1.01
Dec.	1.02	.76			.79	.77	.79	.40	1.34	.71
Yearly	15.50	16.35			17.75	18.97	12.31	15.79	16.42	21.35

Month	Rancho Palo Blanco, Nuevo León		Rancho Santa Ana, Nuevo León		Sabinas Hidalgo, Nuevo León		Vallecillo, Nuevo León		Las Tortillas, Tamaulipas	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.24	0.12	0	0.59	0.04	0.49	0.24	0.45	T	0.38
Feb.	.20	.32	.75	.85	.43	1.07	.98	.95	1.14	1.01
Mar.	0	.61	.39	.55	.28	.77	.63	.51	0	.56
Apr.	0	1.99	.75	1.34	.59	1.36	.79	1.08	1.18	1.69
May	2.17	1.54	5.75	3.03	4.41	2.51	2.87	1.81	6.30	3.62
June	.12	2.58		2.98	2.91	3.22	1.69	1.97	T	1.56
July	4.92	5.61		1.69	0	2.16	0	1.13	0	.67
Aug.	.94	1.94		1.57	1.50	2.71	2.91	1.82	3.35	1.17
Sept.	4.53	4.41		6.62	4.92	7.44	2.52	5.00	2.40	4.18
Oct.	1.96	1.36		1.88	.94	2.76	1.77	2.41	2.76	1.23
Nov.	2.17	1.38		.50	2.56	1.30	2.13	.83	3.94	1.52
Dec.	0	0		.50	.67	.77	.71	.72	1.57	1.01
Yearly	17.25	21.86		22.10	19.25	26.56	17.24	18.68	22.64	18.60

Month	Rancho San Rafael Bustamante, Tamps.		Rio Salado Riberena, Tamaulipas		Aniego 166, Tamaulipas		La Bandera, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.20	0.63	T	0.45	0.20	0.64	0.20	0.68	0.16	1.00
Feb.	1.38	1.78	.79	1.11	.71	.99	.59	.80	.71	.90
Mar.	0	.40	0	.57	0	.58	.20	.91	.16	.57
Apr.	.75	1.36	.39	1.68	.20	.92	.39	1.32	.71	1.45
May	6.30	4.31	4.92	3.87	2.17	3.77	3.46	3.55	3.62	2.18
June	T	.98	.79	1.58	.20	1.16	1.10	2.73	3.15	2.35
July	0	1.58	T	.39	0	.30	0	.71	.04	.76
Aug.	3.74	2.34	2.95	3.15	1.57	2.86	2.36	2.80	3.15	1.96
Sept.	1.77	5.89	1.50	5.03	1.97	7.58	1.57	5.40	1.30	3.70
Oct.	4.53	2.82	3.54	1.88	1.97	1.23	1.18	1.38	.63	2.14
Nov.	3.94	2.74	3.54	1.52	1.57	1.40	1.97	1.14	2.24	1.06
Dec.	1.57	.79	1.57	1.22	.59	.75	.39	.78	.55	.59
Yearly	24.18	25.62	19.99	22.45	11.15	22.18	13.41	22.20	16.42	18.66

RAINFALL ON THE RIO GRANDE WATERSHED
IN MEXICO
In Inches

Month	Hacienda El Alamo, Nuevo León		San Javier, Nuevo León		Cd. Mier, Km. 8 SW, Tamaulipas		Cd. Mier, Tamaulipas		Miguel Alemán, Tamaulipas	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.			0	0.73	0	0.70	0.16	1.13	0.43	0.84
Feb.			.98	.97	1.18	1.13	.94	1.24	.79	1.16
Mar.	0.98	0.78	0	.96	.20	1.00	.12	.82	.20	.24
Apr.	.43	.82	.20	2.04	.20	1.41	.16	1.50	.35	2.30
May	3.15	2.48	6.02	4.79	4.33	4.14	2.20	3.31	1.57	3.00
June	.71	.79	1.57	2.83	2.52	2.36	2.60	2.09	2.68	1.88
July	0	3.13	0	.94	0	.94	.43	.59	0	.79
Aug.	4.09	2.58	4.33	3.23	2.36	3.20	1.42	2.91	4.09	2.97
Sept.	7.83	6.16	2.28	5.63	1.65	5.36	2.68	4.56	1.81	6.86
Oct.	1.89	2.18	3.94	2.07	.98	1.81	1.73	2.36	.94	1.21
Nov.	3.03		2.17	1.42	2.36	1.33	2.52	1.32	1.93	1.39
Dec.	1.18		.59	.90	.39	.93	.79	.77	.43	.75
Yearly			22.08	26.51	16.17	24.31	15.75	22.60	15.22	23.39

Month	Parras, Coahuila		Gral. Cepeda, Coahuila		Reata, Coahuila		San Antonio de las Alazanas, Coahuila		Saltillo, Coahuila	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.08	0.43	0.04	0.50	0	0.34	0.16	0.93	0.24	0.59
Feb.	.24	.41	.12	.50	0	.20	1.02	.94	.12	.56
Mar.	0	.51	0	.33	0	.33	.08	.50	0	.42
Apr.	0	.28	0	.42	.51	.34	.16	1.02	.12	.82
May	.24	.95	.35	.84	1.50	.84	1.73	1.81	.16	1.16
June	1.30	1.83	2.17	2.15	1.06	.87	.47	2.21	3.43	2.20
July	1.93	2.52	3.31	3.27	1.10	.66	2.83	3.34	2.28	2.57
Aug.	.47	2.95	2.91	3.05	.98	1.78	1.38	2.87	1.73	2.42
Sept.	.79	2.69	.12	2.84	.75	1.36	2.72	2.57	1.50	2.75
Oct.	1.14	1.23	.16	1.27	.12	.76	0	2.10	.47	1.28
Nov.	.94	.50	1.22	.52	.47	.44	2.87	1.49	1.73	.85
Dec.	.43	.98	1.18	.56	.39	.33	1.26	1.14	1.18	.65
Yearly	7.56	15.28	11.58	16.25	6.88	8.25	14.68	20.92	12.96	16.27

Month	Ramos Arizpe, Coahuila		Carbonera, Nuevo León		Icamole, Nuevo León		Mina, Nuevo León		La Popa, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.16	0.48	0.63	0.98	0.04	0.33	0	0.45	0.16	0.50
Feb.	.12	.38	.43	1.01	.16	.31	.47	.48	7.05	1.05
Mar.	0	.21	.04	.90	0	.15	0	.16	.12	.29
Apr.	.31	.48	.16	1.15	.39	.38	.67	.62	0	.61
May	.24	.85	.39	2.05	.16	.75	.12	.55	0	1.12
June	.63	1.03	1.61	1.34	.55	.73	1.65	1.11	.12	.78
July	1.14	1.39	1.46	2.67	0	.45	.04	.57	1.38	1.01
Aug.	.28	1.35	1.97	3.12	.79	1.20	2.80	1.63	2.68	2.24
Sept.	.12	1.76	1.77	3.32	.43	2.19	1.34	3.06	3.98	3.35
Oct.	.08	.75	.79	1.67	.24	.97	0	1.24	.55	.93
Nov.	1.42	.48	.16	.87	1.02	.52	.98	.72	1.26	.69
Dec.	1.22	.54	.39	1.12	.28	.50	1.34	.57	1.61	.76
Yearly	5.72	9.70	9.80	20.20	4.06	8.48	9.41	11.16	18.91	13.33

Month	Ciénega de Flores, Nuevo León		Topo Chico, Nuevo León		Higueras, Nuevo León		Los Ramones, Nuevo León		Rinconada, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.63	1.25	0.08	0.39	0.24	0.66	0	0.60	0.12	0.29
Feb.	1.57	.93	.28	.58	.91	.54	.16	.74	0	.29
Mar.	1.93	1.15	0	.49	1.54	.64	1.26	.66	0	.22
Apr.	2.20	1.66	.39	1.05	.91	1.31	.98	1.86	0	.51
May	1.50	2.47	1.06	1.26	2.83	1.93	.59	2.32	.63	.53
June	2.44	2.78	3.74	2.04	2.20	2.30	2.64	2.98	.51	.76
July	1.14	1.75	.91	1.20	1.26	1.90	1.06	1.68	.79	.36
Aug.	7.52	4.45	3.86	3.08	4.92	3.08	3.50	3.72	.83	1.25
Sept.	8.74	5.67	4.33	4.22	2.36	4.67	4.68	5.06	0	1.63
Oct.	3.62	2.78	3.46	2.59	1.89	1.75	3.74	2.99	0	.89
Nov.	1.81	1.13	1.77	.72	1.18	.81	3.03	.73	.63	.30
Dec.	.98	1.05	.59	.44	.51	.65	.59	.48	.79	.35
Yearly	34.08	27.07	20.47	18.06	20.75	20.24	22.23	23.82	4.30	7.38

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Santa Catarina, Nuevo León		Monterrey, Nuevo León		Apodaca, Nuevo León		Agua Blanca Canoas, Nuevo León		Pajonal, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.66	0	0.62	0.12	0.84	0	0.71	0	0.61
Feb.	.39	.46	.28	.65	.71	.98	.08	.68	.55	.79
Mar.	0	.30	.39	.76	.55	.90	0	.23	0	.26
Apr.	0	.70	.35	1.17	.79	1.08	0	.54	0	.71
May	.31	.83	1.46	1.58	2.36	2.32	.63	1.79	.55	1.61
June	1.34	1.84	4.09	2.68	2.17	2.34	2.72	1.91	0	2.00
July	.28	1.13	1.54	2.30	1.18	1.12	5.63	1.82	2.01	2.58
Aug.	4.09	3.06	5.24	3.22	3.66	4.84	4.57	2.88	3.46	4.13
Sept.	3.98	3.94	5.87	5.88	3.31	6.55	4.02	4.92	4.33	5.59
Oct.	.24	1.78	3.82	3.24	3.74	2.39	.75	2.24	.55	2.46
Nov.	.16	.51	2.09	1.27	1.10	1.07	1.38	.86	1.46	.73
Dec.	.08	.55	.43	.71	.67	.81	.24	.47	1.97	.75
Yearly	10.87	15.76	25.56	24.08	20.36	25.24	20.02	19.05	14.88	22.22

Month	Cadereyta, Nuevo León		La Cruz, Nuevo León		Túnel San Francisco, Nuevo León		Las Comitas, Nuevo León		Villa de Santiago, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.16	0.74	0	0.63	0.24	0.62	0	0.34	0.31	0.90
Feb.	.47	.95	.08	.63	1.42	1.31	.31	.38	.24	1.02
Mar.	.67	1.16	0	.24	.47	1.72	0	.28	.35	1.15
Apr.	2.28	2.12	0	.42		2.29	.75	.79	2.20	1.72
May	3.27	2.31	.91	1.52	.94	2.56	.67	1.00	1.61	2.63
June	4.25	3.46	3.11	2.00	2.44	5.61	1.26	2.32	2.48	5.26
July	.08	2.34	3.94	2.35	1.06	2.97	1.34	1.71	.59	3.13
Aug.	5.91	3.60	6.22	3.63	11.26	7.58	4.09	3.52	8.98	6.23
Sept.	9.25	5.02	6.06	4.70	12.17	10.70	7.32	4.58	9.09	9.03
Oct.	6.50	3.26	.98	2.33	8.74	6.06	.51	2.00	9.68	5.19
Nov.	2.44	1.19	1.57	.80	2.64	1.85	1.61	.53	2.68	1.47
Dec.	.63	.73	.31	.29	2.05	1.05	.71	.39	1.38	.92
Yearly	35.91	26.88	23.18	19.54		44.32	18.57	17.84	39.59	38.65

Month	Villa Allende, Nuevo León		San Juan, Nuevo León		Laguna de Sánchez, Nuevo León		Casillas, Nuevo León		Ciénega Del Toro, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	1.81	0.92	0.16	0.43	0.16	0.53	0.16	0.44	0.67	1.31
Feb.	1.22	1.19	.59	.74	.47	.62	.87	.98	.16	.81
Mar.	2.09	1.31	0	.73	.12	.48	.08	.47	.20	.96
Apr.	2.87	2.59	0	2.11	.94	1.21	.31	.90	.51	1.11
May	1.42	3.26	1.57	2.10	.51	1.90	1.46	1.87	.16	2.30
June	5.08	4.65	6.30	2.52	1.97	3.20	2.87	3.42	1.89	2.00
July	1.89	2.75	0	1.57	2.13	2.54	3.27	2.00	1.38	2.09
Aug.	7.95	5.52	11.30	4.02	6.73	4.44	6.97	3.33	2.44	2.89
Sept.	12.83	7.92	10.55	5.13	4.61	5.42	2.48	3.51	2.72	4.25
Oct.	11.54	5.86	4.21	3.12	.79	2.97	.47	2.73	.79	3.14
Nov.	3.27	1.65	1.50	.97	1.85	.60	.75	.61	.67	.80
Dec.	.71	.98	.24	.49	1.81	.62	.79	.87	.31	1.04
Yearly	52.68	38.60	36.42	23.93	22.09	24.53	20.48	21.13	11.90	22.70

Month	Potrero Redondo, Nuevo León		Mimbres, Nuevo León		Rayones, Nuevo León		Rusio, Nuevo León		Potosí, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	1.02	0.69	0.20	0.89	0	0.30	0.20	0.75	0.67	1.04
Feb.	1.06	1.89	.71	1.16	0	.34	.79	.81	.51	.91
Mar.	1.38	1.34	1.73	1.28	.51	.33	0	.79	0	.45
Apr.	2.99	2.87	0	1.21	1.26	1.05	.87	1.41	.28	1.62
May	3.74	3.30	.94	2.03	.39	1.30	1.46	2.17	.24	1.17
June	3.78	7.69	1.77	2.27	1.38	2.00	3.15	1.50	1.14	.93
July	4.68	4.59	1.69	2.22	1.14	.90	.31	.94	.39	.90
Aug.	15.00	6.80	.94	3.12	4.68	2.89	.24	1.19		1.94
Sept.	22.95	14.55	1.73	2.87	2.95	3.01	1.18	1.78		1.36
Oct.	6.50	6.03	.79	1.94	0	1.49	.79	1.52		1.58
Nov.	5.35	1.89	.20	.72	2.05	.40	1.85	.84	1.54	1.74
Dec.	1.50	.96	1.73	1.55	.55	.31	1.18	1.11	.55	2.38
Yearly	69.95	52.60	12.43	21.26	14.91	14.32	12.02	14.81		16.02

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Iturbide, Nuevo León		Cabezones, Nuevo León		Linares, Nuevo León		Montemorelos, Nuevo León		Gral. Terán(Expermt. Station), Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	1.10	0.56	0.43	0.88	0.63	0.91	0.28	0.79	0.08	0.60
Feb.	.87	.66	.67	.80	.98	.90	.83	.98	.63	.90
Mar.	.08	.52	2.20	1.33	.83	1.13	2.32	1.20	1.54	1.55
Apr.	1.61	1.18	3.39	2.98	4.02	2.39	3.94	2.37	.79	1.55
May	1.57	1.89	1.97	3.08	1.85	3.56	1.50	3.06	2.36	2.87
June	3.07	3.22	3.50	4.04	3.94	3.57	10.79	3.77	6.57	3.44
July	2.09	2.32	1.26	2.04	1.34	2.46	1.22	1.89	.47	1.45
Aug.	8.35	4.19	7.32	6.12	5.39	3.73	7.36	4.34	5.28	3.52
Sept.	5.00	5.35	15.39	8.21	9.02	6.26	11.06	5.66	9.17	6.59
Oct.	1.50	2.68	5.98	3.45	7.28	3.42	10.00	3.84	2.60	4.61
Nov.	2.20	.62	2.99	1.46	2.68	1.22	2.72	1.70	1.61	1.38
Dec.	.51	.51	.55	.77	9.65	1.08	.71	.90	1.46	.75
Yearly	27.95	23.70	45.65	35.16	47.61	30.63	52.73	30.50	32.56	29.21

Month	San Rafael, Nuevo León		El Cuchillo, Nuevo León		Gral. Bravo, Nuevo León		Las Enramadas, Nuevo León		Cerralvo, Nuevo León	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.		1.23	0.08	0.62	0.16	0.75	0.20	0.90	0	0.64
Feb.	0.71	1.46	.39	.54	.47	.51	.59	.72	.12	.61
Mar.		.74	.83	.54	.79	.57	2.68	.80	.43	.60
Apr.	.43	.82	.63	1.35	.28	1.52	2.87	1.92	.51	2.05
May	.79	1.74	.98	2.08	2.60	2.85	1.10	2.98	3.43	2.94
June	.94	1.84	2.40	2.35	3.11	2.49	2.40	3.33	.67	2.39
July	1.10	2.54	.47	1.50	0	2.07	2.95	2.14	0	1.32
Aug.	3.39	1.98	3.03	2.73	3.50	2.64	7.09	3.76	3.86	3.77
Sept.	1.42	2.45	6.61	4.08	7.36	4.23	9.41	6.17	2.80	5.05
Oct.	.63	1.32	1.57	2.10	3.78	2.11	4.96	2.67	3.58	2.72
Nov.	2.99	1.02	1.73	.58	1.97	.91	3.35	.79	.83	.73
Dec.	.39	1.03	0	.48	.43	.75	.39	.75	.16	.46
Yearly		18.17	18.72	18.95	24.45	21.40	37.99	26.93	16.39	23.28

Month	Comales, Tamaulipas		Camargo, Tamaulipas		Valadeces, Tamaulipas		Reynosa Km. 40 SW, Nuevo León		Bajo Río San Juan, Tamaulipas, No. 2-29	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.67	0.81	0.79	0.99	0.16	1.13	0	0.67	0.04	0.92
Feb.	.87	.72	1.18	.95	.75	1.00	.59	.82	.75	.95
Mar.	.43	.63	.31	.54	.51	.64	.39	.34	.55	.52
Apr.	.35	1.60	.83	1.92	0	1.85	.71	1.46	.20	1.50
May	.47	2.16	1.69	2.13	2.44	3.80	6.14	3.30	2.64	4.19
June	2.68	1.89	4.21	1.97	4.06	2.76	.79	1.41	2.68	2.32
July	0	1.03	.12	1.07	0	1.32	0	.93	0	.68
Aug.	4.09	2.56	4.09	1.88	4.53	1.95	2.91	2.51	4.88	2.86
Sept.	1.81	3.96	2.52	4.13	1.65	4.87	2.17	5.80	.63	5.22
Oct.	1.06	2.28	.47	1.69	1.97	2.38	3.07	2.05	1.46	1.86
Nov.	1.81	.76	2.13	1.33	1.97	1.46	2.60	.76	2.13	1.50
Dec.	.24	.72	.16	.75	.43	1.04	.31	1.11	.35	.96
Yearly	14.48	19.12	18.50	19.35	18.47	24.20	19.68	21.16	16.31	23.48

Month	♦ Cd. Díaz Ordaz, Tamaulipas		Reynosa Km. 22 SW, Tamaulipas		Bajo Río San Juan, Tamaulipas, No. 2-38		Bajo Río San Juan, Tamaulipas, No. 2-33		Argüelles, Tamaulipas	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.24	0.67	0	0.90	0.43	1.08	0.16	1.02	0	0.97
Feb.	.94	.87	.98	.66	.79	.88	.87	.89	.98	1.09
Mar.	.67	.51	.79	.37	.20	.47	.67	.51	.79	.65
Apr.	.63	1.76	0	1.06	.35	1.39	.39	1.52	.39	1.04
May	2.32	2.20	2.17	3.04	1.57	4.22	1.73	3.51	.98	2.77
June	2.36	1.81	.98	2.53	2.68	3.09	.94	2.86	.79	2.32
July	1.46	.75	.20	1.13	0	.92	1.14	.66	.28	.61
Aug.	5.04	2.05	.47	2.31	4.09	3.28	6.69	3.02	.47	1.45
Sept.	.67	3.63	2.44	5.28	1.81	4.47	1.97	6.00	1.97	4.80
Oct.	1.54	2.41	2.44	2.22	.94	1.70	1.85	2.26	3.43	1.45
Nov.	2.17	1.17	1.65	1.05	1.93	1.76	2.20	1.55	1.97	1.11
Dec.	.55	.86	0	1.25	.43	1.17	.12	1.54	0	1.50
Yearly	18.59	18.69	12.12	21.80	15.22	24.43	18.73	25.34	12.05	19.76

♦ Formerly published as San Miguel de Camargo, Tamaulipas

RAINFALL ON THE RIO GRANDE WATERSHED

IN MEXICO

In Inches

Month	Presa Anzaldías, Tamaulipas		Reynosa, Tamaulipas		Méndez, Tamaulipas		Bajo Río San Juan, Tamaulipas, No. 3-55		Bajo Río San Juan, Tamaulipas, No. 3-58	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0	0.60	0.08	0.96	1.42	0.94	0.20	1.50	0.28	1.44
Feb.	.55	.40	1.26	.85	1.02	.89	1.85	1.33	1.73	1.16
Mar.	.43	.32	.51	.70	.75	.87	.91	.70	.71	.58
Apr.	.08	1.42	.51	1.14	4.53	1.87	2.52	1.55	0	1.38
May	1.73	2.48	1.46	2.22	1.69	2.57	2.36	3.43	1.85	3.54
June	1.06	2.01	.79	1.98	1.46	2.50	.71	1.81	.31	1.64
July	1.06	.67	0	.94	T	1.01	0	1.60	0	1.84
Aug.	2.72	1.65	4.06	1.50	6.50	3.18	9.49	3.02	8.19	2.78
Sept.	1.81	3.45	2.83	3.12	3.11	4.47	3.03	3.77	2.20	4.97
Oct.	2.95	2.35	1.93	2.09	3.82	2.35	1.93	3.81	1.73	3.72
Nov.	.91	.86	1.93	1.02	2.17	.76	1.85	.95	1.93	1.56
Dec.	.08	.85	.08	.84	T	.47	0	1.00	0	1.04
Yearly	13.38	17.06	15.44	17.36	26.47	21.88	24.85	24.47	18.93	25.65

Month	Bajo Río San Juan, Tamaulipas, No. 3-60		Bajo Río San Juan, Tamaulipas, No. 3-47		Bajo Río San Juan, Tamaulipas, No. 3-63		Río Bravo, Tamaulipas		Retamal, Tamaulipas	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.16	1.19	0	1.50	0	1.19	0.12	0.91	0.79	0.86
Feb.	1.77	1.08	2.01	1.34	2.87	1.64	1.38	1.15	1.69	.97
Mar.	.59	.47	.51	.66	.75	.57	.87	.66	.94	.67
Apr.	2.72	1.71	.20	1.42	.39	.98	.35	1.45	.04	1.25
May	1.06	3.18	2.36	4.54	.43	2.62	2.72	2.34	2.13	2.44
June	.28	1.98	.59	2.58	.43	2.08	.24	2.35	.83	2.16
July	0	1.04	0	1.35	0	1.10	0	1.35	0	.95
Aug.	9.25	2.79	5.79	2.84	12.40	4.31	6.26	2.46	5.43	2.32
Sept.	1.65	4.42	1.30	3.91	2.60	5.28	2.95	4.22	2.64	2.76
Oct.	1.02	3.59	.59	2.54	.79	2.04	.79	2.51	.79	2.36
Nov.	1.73	1.52	1.46	1.58	2.44	1.48	1.61	1.22	1.89	1.34
Dec.	0	.90	0	1.29	0	1.04	0	.95	0	.92
Yearly	20.23	23.87	14.81	25.55	23.10	24.33	17.29	21.57	17.17	19.00

Month	Bajo Río Bravo, Tamaulipas, No. 3-15		Bajo Río Bravo, Tamaulipas, No. 4-16		Bajo Río Bravo, Tamaulipas, No. 3-14		Bajo Río Bravo, Tamaulipas, No. 3-17		Bajo Río Bravo, Tamaulipas, No. 2-8	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.31	1.29	0.12	1.66	0.43	1.33	0.24	1.47	0.39	1.45
Feb.	3.78	1.48	3.50	1.61	1.30	.64	3.31	1.60	3.94	1.69
Mar.	1.10	.80	.87	.87	.59	.51	.98	.85	.79	1.08
Apr.	.67	1.20	.63	1.12	.12	.97	.12	1.05	.24	1.20
May	3.43	3.55	1.14	2.85	3.35	3.72	3.15	3.95	2.52	3.19
June	0	3.18	.08	2.97	.24	2.16	.63	2.71	.16	1.71
July	.12	1.62	0	1.20	.12	1.35	.28	1.82	.43	1.92
Aug.	6.85	3.43	10.94	3.95	6.61	2.02	5.35	2.50	9.37	4.17
Sept.	2.17	3.24	4.61	4.76	5.00	3.52	4.92	4.40	7.05	5.24
Oct.	1.65	2.58	2.72	2.56	.75	1.75	.94	1.68	1.30	2.34
Nov.	1.57	1.53	1.06	2.33	1.06	1.12	1.50	1.79	.91	2.96
Dec.	.24	1.22	.28	1.14	.24	1.11	.39	1.31	.28	1.14
Yearly	21.89	25.12	25.95	27.02	19.81	20.20	21.81	25.13	27.38	28.09

Month	Bajo Río Bravo, Tamaulipas, No. 2-6		Bajo Río Bravo, Tamaulipas, No. 2-10		Valle Hermoso, Tamaulipas		Control, Tamaulipas		Bajo Río Bravo, Tamaulipas, No. 2-5	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.35	1.86	0.28	1.50	0.28	0.94	0.28	1.23	0.39	2.04
Feb.	3.70	1.56	2.24	2.77	2.95	1.33	2.64	1.03	2.83	1.54
Mar.	.91	1.42	.98	1.30	.79	.56	.75	.67	.71	.83
Apr.	.51	.97	.24	.88	.51	1.41	.28	1.42	.31	1.02
May	3.19	3.09	1.73	2.30	3.58	2.48	3.19	2.75	1.57	2.98
June	.94	1.98	.12	1.94	.28	2.71	.39	2.74	.71	2.02
July	.59	1.18	0	.96	.51	1.41	.35	1.21	.20	.65
Aug.	7.36	3.33	7.28	2.89	5.28	1.80	6.50	2.82	5.24	2.93
Sept.	3.74	4.27	4.29	4.42	8.19	5.28	12.05	5.04	6.85	5.36
Oct.	.75	1.98	.24	1.55	.75	2.25	.83	2.34	0	1.67
Nov.	1.22	1.94	1.57	1.99	1.57	1.68	1.46	1.29	1.50	1.87
Dec.	.20	1.46	.20	1.01	.24	.91	.12	.96	.35	1.32
Yearly	23.46	25.04	19.17	23.51	24.93	22.76	28.84	23.50	20.66	24.23

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED
IN MEXICO
In Inches

Month	Bajo Río Bravo, Tamaulipas, No. 2-11		Bajo Río Bravo, Tamaulipas, No. 1-2		Bajo Río Bravo, Tamaulipas, No. 2-7		Bajo Río Bravo, Tamaulipas, No. 1-4		Bajo Río Bravo, Tamaulipas, No. 1-18	
	1969	Average	1969	Average	1969	Average	1969	Average	1969	Average
Jan.	0.63	1.46	0	1.83	0.51	1.66	0.24	1.90	0.31	1.59
Feb.	2.99	1.26	3.31	1.50	3.15	1.54	.94	1.09	2.91	1.42
Mar.	1.34	.90	1.14	.70	1.10	.95	.98	.71	.87	.48
Apr.	.20	.94	0	.80	.24	.94	.28	1.16	.28	.66
May	1.06	3.65	2.52	3.49	6.18	3.54	1.54	3.46	2.99	2.78
June	.28	2.55	.47	2.59	.28	2.47	.91	2.33	.20	2.04
July	0	1.42	.39	1.00	1.10	1.26	.28	.50	.08	.75
Aug.	4.29	3.27	3.23	3.22	7.24	3.98	5.55	2.64	5.47	2.76
Sept.	4.09	2.62	11.06	5.96	5.31	4.31	5.55	5.45	4.21	2.55
Oct.	5.55	2.54	2.01	2.52	2.68	2.02	1.54	2.00	3.27	2.36
Nov.	1.46	1.74	2.20	1.71	2.20	2.38	1.73	1.34	3.90	1.68
Dec.	.16	1.35	.12	1.13	.28	1.32	.20	1.32	.16	1.58
Yearly	22.05	23.70	26.45	26.45	30.27	26.37	19.74	23.90	24.65	20.65

Month	Bajo Río Bravo, Tamaulipas, No. 1-3		Bajo Río Bravo, Tamaulipas, No. 1-13		Bajo Río Bravo, Tamaulipas, No. 1-12		Matamoros, Tamaulipas			
	1969	Average	1969	Average	1969	Average	1969	Average		
Jan.	0.55	1.78	0.35	1.69	0.51	1.89	0.12	1.71		
Feb.	2.17	1.44	2.99	1.45	4.09	1.53	4.09	2.03		
Mar.	.47	.60	1.06	.84	1.10	.56	1.10	.60		
Apr.	.31	1.04	.24	.59	.20	.77	.31	1.41		
May	1.34	3.39	2.13	2.11	4.96	3.43	2.40	2.29		
June	.12	2.27	.24	1.92	.55	2.17	.16	2.43		
July	.31	.94	.08	.80	.63	1.14	.31	1.19		
Aug.	5.20	2.53	5.67	2.92	3.03	1.63	6.61	2.65		
Sept.	6.81	4.86	6.65	4.87	3.54	4.66	2.64	5.97		
Oct.	1.10	2.08	3.78	2.23	3.43	3.23	5.83	3.34		
Nov.	2.80	2.52	1.89	2.06	2.44	1.66	4.29	1.66		
Dec.	0	1.32	.24	1.20	.24	1.32	T	1.81		
Yearly	21.18	24.77	25.32	22.68	24.72	23.99	27.86	27.09		

T Trace

AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED

With Averages for the 99 Years 1871 - 1969, Inclusive

In Inches

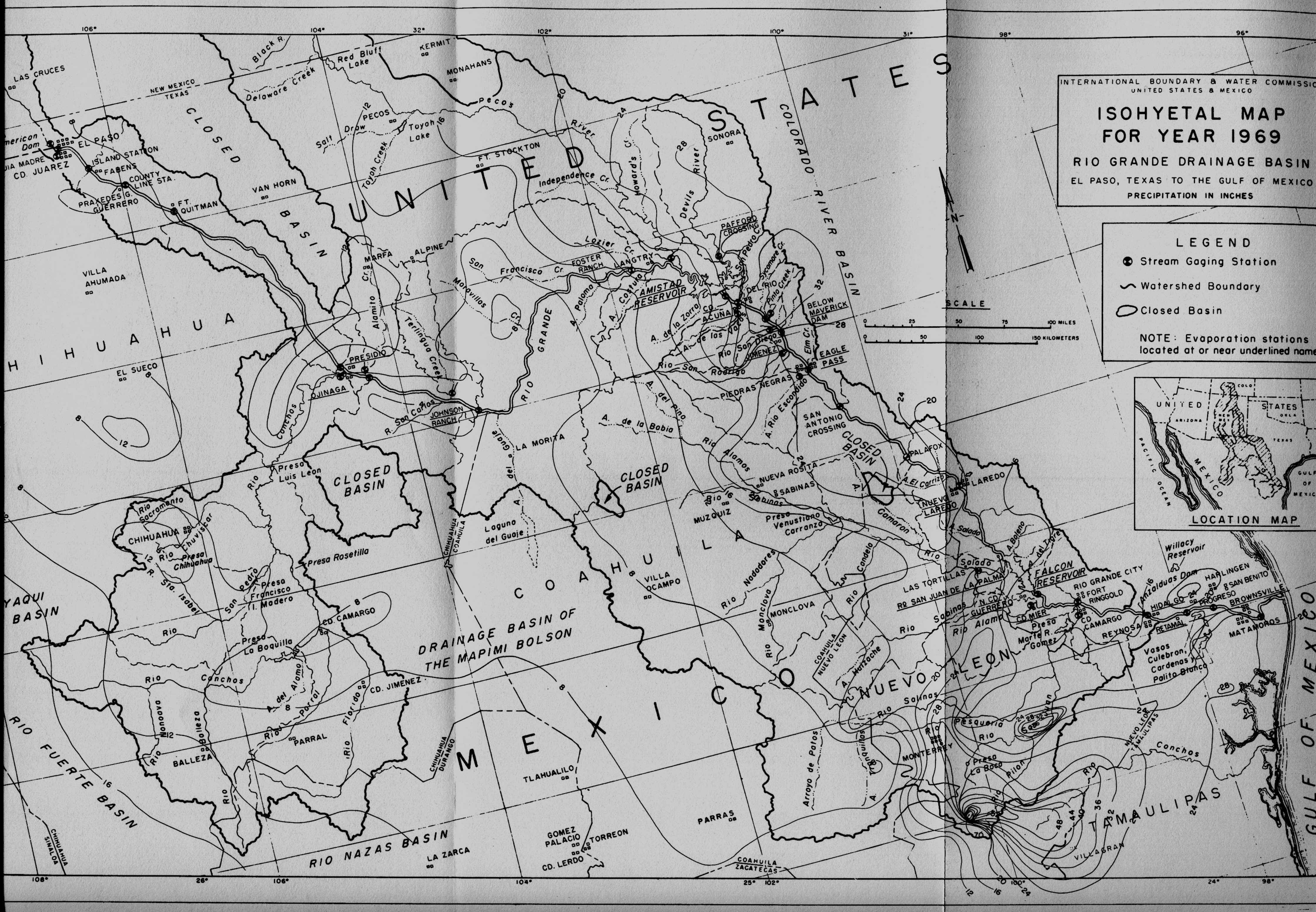
The precipitation records of all stations on or adjacent to the watershed subdivisions listed below have been used, with proper weighting for area, in calculating the average rainfalls shown here. The drainage area for each subdivision is shown in parentheses. The hundreds of individual records are delineated in the various "Indexes to Precipitation Records" shown in Water Bulletins Nos. 10, 14, 22, and 26.

Month	El Paso to Fort Quitman (2,677 Square Miles)		Fort Quitman to Above Río Conchos (3,022 Square Miles)		* Above Río Conchos to Johnson Ranch (3,815 Square Miles)		Johnson Ranch to Langtry (13,669 Square Miles)	
	1969	Period Average	1969	Period Average	1969	Period Average	1969	Period Average
Jan.	0.03	0.44	0.02	0.39	0.14	0.36	0.20	0.51
Feb.	.14	.37	.12	.26	.04	.28	.18	.37
Mar.	.08	.34	.04	.25	0	.19	.08	.42
Apr.	T	.27	.06	.36	.06	.40	.92	.83
May	.20	.40	.41	.60	.61	.77	1.34	1.52
June	.40	.81	1.14	1.20	1.12	1.10	1.08	1.74
July	1.58	2.31	1.91	3.04	2.08	1.83	.49	1.89
Aug.	1.24	1.94	1.72	2.41	.89	1.85	.62	2.11
Sept.	.88	1.35	1.55	1.86	.88	1.46	1.05	2.17
Oct.	.54	.90	.67	1.01	.45	.83	.98	1.21
Nov.	.67	.44	1.55	.42	.29	.34	.70	.60
Dec.	.63	.60	.92	.55	.18	.41	.56	.56
Total	6.39	10.17	10.11	12.35	6.74	9.82	8.20	13.93

Month	Pecos River below Sheffield (3,390 Square Miles)		# Langtry to Amistad Dam (2,091 Square Miles)		Devils River (4,305 Square Miles)		‡ Amistad Dam to Eagle Pass (1,625 Square Miles)	
	1969	Period Average	1969	Period Average	1969	Period Average	1969	Period Average
Jan.	0.03	0.72	0.15	0.52	0.10	0.69	0.44	0.76
Feb.	.68	.89	.36	.64	1.12	.72	.93	.92
Mar.	1.10	.79	.17	.78	1.00	1.08	.46	1.02
Apr.	3.30	1.91	2.65	1.35	3.79	1.79	3.19	1.72
May	2.64	1.80	2.19	1.96	2.65	2.59	2.77	2.94
June	1.29	2.51	.41	2.23	1.46	2.70	.52	2.45
July	.72	1.86	.30	1.18	1.20	1.72	.94	1.84
Aug.	1.78	1.95	1.61	1.59	2.77	2.02	4.59	1.89
Sept.	1.05	2.32	1.89	2.31	1.60	2.92	1.47	3.11
Oct.	3.14	1.81	2.99	1.43	6.23	2.18	5.98	2.02
Nov.	2.10	.95	1.76	.77	2.44	1.58	2.85	1.05
Dec.	1.39	.76	.82	.64	1.38	1.03	1.04	.89
Total	19.22	18.27	15.30	15.40	25.74	21.02	25.18	20.61

Month	⊕ Eagle Pass to Laredo (3,795 Square Miles)		ð Laredo to Falcon Dam (3,369 Square Miles)		† Falcon Dam to Río Grande City (468 Square Miles)		United States Side below Río Grande City (986 Square Miles)	
	1969	Period Average	1969	Period Average	1969	Period Average	1969	Period Average
Jan.	0.20	0.73	0.14	0.75	0.23	0.91	0.43	1.23
Feb.	.86	.82	.82	.78	1.06	.82	2.13	1.08
Mar.	.05	.96	.05	.81	.20	.98	.72	1.07
Apr.	2.11	1.63	1.19	1.42	.90	1.21	.16	1.35
May	2.46	3.14	3.50	3.21	2.97	2.46	2.49	2.82
June	.74	2.35	1.76	1.84	2.60	2.04	.75	2.44
July	1.29	1.43	.22	2.09	.38	1.88	.52	1.69
Aug.	4.85	2.30	3.12	1.83	2.53	2.17	4.11	2.27
Sept.	1.61	3.02	1.78	2.96	1.75	3.42	3.88	4.31
Oct.	3.78	1.82	2.15	1.57	1.69	1.94	1.71	2.51
Nov.	3.24	1.00	2.54	1.60	2.04	.80	1.91	1.41
Dec.	1.55	1.02	.99	.84	.67	.68	.18	1.28
Total	22.74	20.22	18.26	19.70	17.02	19.31	18.99	23.46

* Excluding Río Conchos, Alamito, and Terlingua Creeks # Excluding Pecos and Devils Rivers
‡ Excluding Arroyo Las Vacas, San Felipe Creek, Pinto Creek, Río San Diego, and Río San Rodrigo
⊕ Excuding Río Excondido ð Excluding Río Salado above Old Cd. Guerrero
† Excluding Río Alamo and Río San Juan T Trace


INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
ISOHYETAL MAP
FOR YEAR 1969
RIO GRANDE DRAINAGE BASIN
EL PASO, TEXAS TO THE GULF OF MEXICO
PRECIPITATION IN INCHES
LEGEND
Stream Gaging Station
Watershed Boundary
Closed Basin
NOTE: Evaporation stations located at or near underlined name
SCALE
100 MILES
150 KILOMETERS
LOCATION MAP
UNITED STATES
MEXICO
PACIFIC OCEAN
GULF OF MEXICO
UNITED STATES
MEXICO
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMAULIPAS
GULF OF MEXICO
CLOSED BASIN
COLORADO RIVER BASIN
DRAINAGE BASIN OF THE MAPIMI BOLSON
RIO NAZAS BASIN
RIO FUERTE BASIN
YAQUI BASIN
LAS CRUCES
NEW MEXICO
TEXAS
EL PASO
CD. JUAREZ
ISLAND STATION
FABENS
COUNTY LINE STA.
PRAXEDES G. GUERRERO
FT. QUITMAN
VAN HORN
Black R.
Delaware Creek
Red Bluff Lake
KERMIT
MONAHANS
Pecos
PECOS
Toyah Lake
Toyah Creek
Salt Draw
FT. STOCKTON
River
Independence Cr.
Howard's Cr.
Devils River
SONORA
PAFFORD CROSSING
ALPINE
MARFA
San Francisco Cr.
FOSTER RANCH
LANGTRY
AMISTAD RESERVOIR
DEL RIO
CD. ACUÑA
BELOW MAVERICK DAM
EAGLE PASS
PIEDRAS NEGRAS
JIMENEZ
Rio San Rodrigo
Rio San Diego
Elm Cr.
Pinto Creek
Sycamore Cr.
San Pedro Cr.
PRESIDIO
OJINAGA
JOHNSON RANCH
Terlingua Creek
Maravillos Cr.
RIO GRANDE
R. San Carlos
Conchos
VILLA AHUMADA
EL SUECO
LA MORITA
A. de la Bobia
A. del Pino
Rio Alamos
NUEVA ROSITA
SABINAS
MUZQUIZ
Presa Venustiano Carranza
SAN ANTONIO CROSSING
PALAFOX
LAREDO
NUEVO LAREDO
A. El Carrizo
Camaron
Candela
Salado
LAS TORTILLAS
Ro SAN JUAN DE LA PALMA
N. CD. GUERRERO
FALCON RESERVOIR
CD. MIER
Presa Marte R. Gomez
RIO GRANDE CITY
FORT RINGGOLD
CD. CAMARGO
REYNOSA
Anzalduas Dam
HIDALGO
RETAMAL
PROGRESO
HARLINGEN
SAN BENITO
BROWNSVILLE
MATAMOROS
Willacy Reservoir
Vasos Culebron, Cardenas y Palito Blanco
Presa Luis Leon
CHIHUAHUA
Rio Sacramento
Rio Chuviscar
Presa Chihuahua
R. Sta. Isabel
San Pedro
Presa Francisco I. Madero
Presa Rosetilla
CD. CAMARGO
Presa La Boquilla
CD. JIMENEZ
Rio Florido
PARRAL
BALLEZA
Rio Nonoava
Rio Balleza
Laguna del Guaje
VILLA OCAMPO
MONCLOVA
Rio Nadadores
Rio Monclova
A. Huizache
Rio Sabinas
MONTERREY
Rio Pesqueria
Presa La Boca
Rio Pilon
Conchos
Arroyo de Patos
TLAHUALILO
GOMEZ PALACIO
TORREON
CD. LERDO
PARRAS
LA ZARCA
VILLAGRAN
CHIHUAHUA COAHUILA
CHIHUAHUA DURANGO
COAHUILA ZACATECAS
COAHUILA NUEVO LEON
NUEVO LEON TAMAULIPAS
CHIHUAHUA SINALOA
106°
104°
102°
100°
98°
96°
108°
32°
31°
26°
25°
24°

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

The precipitation records of stations listed below began on the date shown and extend through 1969. For detailed information regarding sources of data, specific periods of record, and other pertinent matters relative to these and additional rainfall stations on the Rio Grande watershed see "Index to Precipitation Records" in Water Bulletins Nos. 10, 14, 22, and 26. All United States precipitation stations listed below are in Texas, while those in Mexico are in the indicated state as shown.

In United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Adobes Ranch	S	29° 46'	104° 34'	2,550	1950	Fort Quitman - Above Río Conchos	T. C. Davis
American Dam	S	31° 47'	106° 32'	3,730	1938	El Paso - Fort Quitman	I. B. & W. C.
Amistad Dam	R	29° 28'	101° 02'	1,150	July 1962	Langtry - Below Amistad Dam	I. B. & W. C.
Amistad Raft	C	29° 27'	101° 03'	‡‡	Dec. 1968	Langtry - Amistad Dam	I. B. & W. C.
Apache Ranch	C	27° 56'	99° 56'	500	# 1953	Eagle Pass - Laredo	Leroy Tibiletti
Arledge, W. A. Ranch	S	29° 58'	101° 38'	1,950	June 1933	Johnson Ranch - Langtry	W. A. Arledge
Arroyo Tigre Chiquito	C	26° 41'	99° 07'	314	Apr. 1954	Laredo - Falcon Dam	I. B. & W. C.
Arthur, C. L. Ranch	S	30° 23'	103° 45'	4,900	# 1946	Pecos River Above Sheffield	C. L. Arthur
Baker, A. A. Ranch	R	29° 44'	101° 09'	1,720	July 1962	Devils River	I. B. & W. C.
Bakers Crossing	S	29° 58'	101° 09'	1,520	#Apr. 1955	Devils River	James Baker
Below Amistad Dam Station	C	29° 25'	101° 02'	980	Oct. 1954	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Big Bend Chevron Station	S	29° 19'	103° 32'	2,550	Aug. 1967	Terlingua Creek	Howard Gibson
Big Satan Creek Station	C	29° 40'	100° 58'	1,150	Nov. 1968	Devils River	I. B. & W. C.
Billings Ranch	S	30° 02'	101° 38'	1,970	Mar. 1966	Johnson Ranch - Langtry	Newman Billings
Black Gap Game Refuge	S	29° 34'	102° 57'	2,325	# 1952	Johnson Ranch - Langtry	Ben Martin
Bloys Camp	V	30° 33'	104° 07'	5,650	# 1941	Alamito Creek	George Knight
Bricker Ranch	S	29° 59'	101° 52'	1,680	May 1952	Johnson Ranch - Langtry	Lena Mae Bricker
Brite, J. G. Ranch	R	29° 33'	101° 01'	1,150	Sept. 1962	Devils River	I. B. & W. C.
Brotherton Ranch	V	29° 42'	101° 19'	1,400	1961	Langtry - Below Amistad Dam	Perry Calk
Buoy No. 11	C	29° 31'	101° 10'	‡‡	Dec. 1969	Langtry - Amistad Dam	I. B. & W. C.
Buttrill Ranch	S	30° 00'	103° 16'	3,500	Mar. 1952	Johnson Ranch - Langtry	Tom B. Leary
Cañon Diablo	C	28° 39'	100° 27'	700	1964	Eagle Pass - Laredo	I. B. & W. C.
Casa Piedra	V	29° 44'	104° 04'	3,430	# 1960	Alamito Creek	C. L. Vasquez
Cash Ranch	S	30° 05'	101° 35'	1,910	Mar. 1965	Pecos River	Roy Cash
Castolon	S	29° 08'	103° 31'	2,100	#Mar. 1953	Above Río Conchos - Johnson Ranch	National Park Service
CCWID #11 (Bayview Dist. Off.) Avg. 18 Gages	S	26° 08'	97° 21'	25	1952	Lower Rio Grande Valley	CCWID #11
CCWCID #19 (Adams Gardens)	S	26° 10'	97° 47'	50	1952	Lower Rio Grande Valley	CCWCID #19
Chittim Ranch	C	28° 44'	100° 28'	810	Mar. 1959	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Coal Mine	R	28° 48'	100° 28'	770	Mar. 1959	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Comstock	S	29° 41'	101° 10'	1,530	May 1939	Langtry - Below Amistad Dam	George Humphries
Continental Ranch	S	29° 51'	101° 18'	1,560	Mar. 1965	Pecos River Below Sheffield	Julio Crowder
Cooper Ranch	C	28° 50'	100° 27'	800	Mar. 1959	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Corralitos Ranch	C	27° 07'	99° 25'	346	1953	Laredo - Falcon Dam	I. B. & W. C.
County Line Station	R	31° 23'	105° 59'	3,550	1938	El Paso - Fort Quitman	I. B. & W. C.
Cow Creek near Comstock	R	29° 36'	101° 12'	1,210	Apr. 1965	Langtry - Below Amistad Dam	I. B. & W. C.
Cuervo Creek Station	C	28° 21'	100° 19'	620	1954	Eagle Pass - Laredo	I. B. & W. C.
Dale, O. C. Farm	S	26° 15'	98° 16'	130	1952	Lower Rio Grande Valley	O. C. Dale
Dead Mans Canyon near Comstock	C	29° 47'	101° 19'	1,320	Sept. 1967	Pecos River below Sheffield	I. B. & W. C.
Devils Lake	R	29° 34'	100° 59'	1,146	May 1939	Devils River	I. B. & W. C.
Doak Ranch	S	29° 34'	100° 47'	1,350	Nov. 1968	Amistad Dam - Eagle Pass	Sparks Rust, Jr.
Dolan Springs	C	29° 54'	100° 59'	1,360	Feb. 1966	Devils River	I. B. & W. C.
Dove Mountain Ranch	S	29° 48'	102° 54'	2,880	#Mar. 1952	Johnson Ranch - Langtry	Sam Cavness
Dryden	S	30° 03'	102° 07'	2,130	# 1931	Johnson Ranch - Langtry	Lewis Cash
Dunbar, Allen Ranch	V	29° 57'	100° 32'	2,200	1955	Devils River	Allen Dunbar
Eagle Pass	S	28° 42'	100° 30'	815	1964	Eagle Pass - Laredo	I. B. & W. C.
Edinburg Filtration Plant	S	26° 18'	98° 10'	100	1952	Lower Rio Grande Valley	City of Edinburg
El Indio	S	28° 31'	100° 19'	725	# 1941	Eagle Pass - Laredo	Glen Stidham
Elm Creek Station	C	28° 46'	100° 30'	720	1959	Below Amistad Dam - Eagle Pass	I. B. & W. C.
El Peyote Ranch	C	27° 07'	98° 58'	650	1966	Laredo - Falcon Dam	F. J. Saldana

S Standard R Recording C Cumulative V Visual ‡‡ Reservoir Surface
Some months or years missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Erekson Ranch	S	29° 56'	100° 34'	2,330	1955	Devils River	Bob Erekson
Evans Creek near Comstock	C	29° 32'	101° 06'	1,180	July 1969	Devils River	I. B. & W. C.
Falcon Dam	S	26° 33'	99° 08'	323	Apr. 1950	Laredo - Falcon Dam	I. B. & W. C.
Farias Ranch	R	28° 36'	100° 20'	720	Mar. 1959	Eagle Pass - Laredo	I. B. & W. C.
Fawcett, H. K. Ranch	S	29° 52'	100° 54'	1,550	# 1941	Devils River	H. K. Fawcett
Feely	C	29° 34'	101° 07'	1,250	Apr. 1965	Langtry - Below Amistad Dam	I. B. & W. C.
Fletcher, H. T. Ranch	S	30° 12'	104° 16'	5,100	# 1939	Alamito Creek	Hayes Mitchell, Jr.
Fort Hancock Bridge	S	31° 16'	105° 51'	3,500	Apr. 1940	El Paso - Fort Quitman	I. B. & W. C.
Fort McIntosh (Laredo)	V	27° 30'	99° 31'	410	# 1850	Eagle Pass - Laredo	I. B. & W. C.
Fort Quitman	R	31° 06'	105° 36'	3,430	# 1937	Fort Quitman - Above Río Conchos	I. B. & W. C.
Foster, Ross Ranch	C	29° 47'	101° 45'	1,230	May 1961	Johnson Ranch - Langtry	I. B. & W. C.
Garciasville	R	26° 20'	98° 41'	200	Apr. 1957	Lower Rio Grande Valley	I. B. & W. C.
Gillis Headquarters Ranch	S	29° 37'	100° 47'	1,410	1968	Amistad Dam - Eagle Pass	Jake Schiller
Gillis Ranch	S	29° 41'	101° 03'	1,440	Apr. 1965	Devils River	Walter Gillis
Goldwire Ranch	C	29° 44'	100° 57'	1,685	Nov. 1968	Devils River	Jake Schiller
Goodenough Spring Raft	C	29° 32'	101° 16'	‡‡	Aug. 1958	Langtry - Amistad Dam	I. B. & W. C.
Greenwood, H. M. (Ciénega Ranch)	S	29° 48'	104° 13'	4,000	Mar. 1941	Alamito Creek	H. M. Greenwood
Guayuco Arroyo	R	31° 10'	105° 40'	3,600	# May 1940	El Paso - Fort Quitman	I. B. & W. C.
Haby Ranch	S	29° 43'	101° 14'	1,660	1965	Langtry - Below Amistad Dam	R. R. Williams
Hammond, Earl Ranch	S	29° 41'	103° 51'	3,700	Apr. 1963	Terlingua Creek	Earl Hammond
Hardgrave, E. W. Ranch	S	30° 18'	102° 09'	2,650	Apr. 1952	Johnson Ranch - Langtry	Jack Hardgrave
Harlow Ranch	C	29° 50'	101° 11'	1,695	Mar. 1969	Devils River	I. B. & W. C.
HCWCID #6 Goodwin Pump No. 3	S	26° 16'	98° 24'	175	# 1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #6 Goodwin Pump No. 3A	S	26° 14'	98° 22'	130	# 1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #6 Goodwin Pump No. 4	S	26° 16'	98° 21'	185	1958	Lower Rio Grande Valley	HCWCID #6
HCWCID #6 Goodwin Pump No. 4B	S	26° 18'	98° 23'	210	# 1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #6 Goodwin Pump No. 5	S	26° 22'	98° 21'	225	# 1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #15 (Edinburg Office)	S	26° 23'	98° 09'	85	1952	Lower Rio Grande Valley	HCWCID #15
Heath Crossing	S	29° 27'	102° 50'	1,775	July 1966	Johnson Ranch - Langtry	Dow Chemical Co.
Hinds "AT" Ranch	S	29° 46'	101° 03'	1,690	Sept. 1954	Devils River	Lucious Hinds
Hoffman Ranch	S	30° 38'	103° 51'	4,650	June 1955	Pecos River Above Sheffield	Dr. A. J. Hoffman
Huisache Ranch	C	26° 57'	99° 21'	383	Aug. 1953	Laredo - Falcon Dam	I. B. & W. C.
Hutto Ranch No. 1	R	29° 30'	100° 50'	1,240	Jan. 1964	Devils River	I. B. & W. C.
Hutto Ranch No. 2	R	29° 29'	100° 54'	1,210	Jan. 1964	Devils River	I. B. & W. C.
Indio Ranch	S	28° 31'	100° 22'	700	1959	Eagle Pass - Laredo	Earnest Scales
Island Station	R	31° 32'	106° 14'	3,630	1939	El Paso - Fort Quitman	I. B. & W. C.
James, Lewis Ranch	S	30° 11'	102° 07'	2,275	1966	Johnson Ranch - Langtry	Lewis James
Johnson Ranch	C	29° 01'	103° 23'	2,050	# July 1933	Johnson Ranch - Langtry	I. B. & W. C.
Keisling Farm	S	28° 23'	100° 17'	740	Dec. 1958	Eagle Pass - Laredo	Robert Smith
Kelly, P. W. Ranch	S	29° 46'	101° 12'	1,750	1965	Langtry - Below Amistad Dam	Bobby Kelly
King, Martin Ranch	R	29° 44'	101° 22'	1,460	Nov. 1954	Langtry - Below Amistad Dam	I. B. & W. C.
Kokernot Ranch - Hqtrs.	S	29° 59'	103° 34'	4,140	# 1952	Johnson Ranch - Langtry	David Kokernot
La Feria Materials Yard	V	26° 10'	97° 50'	60	1960	Lower Rio Grande Valley	CCWCID #3
La Feria Pumping Plant	S	26° 03'	97° 50'	60	1952	Lower Rio Grande Valley	CCWCID #3
La Joya	R	26° 15'	98° 29'	150	Apr. 1957	Lower Rio Grande Valley	I. B. & W. C.
La Mesa Ranch	C	27° 54'	99° 44'	790	1967	Eagle Pass - Laredo	Joe Nieto
La Nutria Station	C	30° 14'	104° 43'	2,880	Mar. 1967	Fort Quitman - Above Río Conchos	I. B. & W. C.
Laredo Water Plant	S	27° 33'	99° 31'	410	# 1930	Eagle Pass - Laredo	Laredo Water Plant
Las Moras Creek	S	29° 00'	100° 38'	800	1958	Below Amistad Dam - Eagle Pass	Lou McGee
Lateral No. 2 Spill	C	28° 56'	100° 38'	760	Mar. 1959	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Lateral No. 12 Headgate	C	28° 54'	100° 34'	800	1959	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Lateral No. 15 Spill	C	28° 51'	100° 34'	740	1959	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Latham Ranch ‡	S	30° 13'	101° 22'	2,120	1965	Pecos River Below Sheffield	John & Bob Latham
Laughlin Air Force Base	S	29° 22'	100° 47'	1,080	Dec. 1958	Below Amistad Dam - Eagle Pass	U. S. A. F.
Lewis, Billie C. Jr. Ranch	S	29° 33'	100° 40'	1,400	1967	Below Amistad Dam - Eagle Pass	Billie C. Lewis, Jr.

S Standard C Cumulative V Visual R Recording # Some months or years missing
‡ Formerly Oberkampf Ranch ‡‡ Reservoir Surface

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Livingston Ranch	S	29° 49'	104° 22'	4,150	# 1951	Above Río Conchos - Johnson Ranch	J. S. Livingston
Lock Store	S	30° 40'	100° 57'	2,400	Oct. 1962	Devils River	Claud Ward
Loma Alta	S	29° 55'	100° 46'	2,050	Feb. 1967	Devils River	Luther Wilson
Loma Vista Ranch	S	30° 13'	103° 47'	5,050	# 1941	Alamito Creek	Hayes Mitchell
Longley Ranch	C	29° 30'	100° 57'	1,180	July 1969	Devils River	I. B. & W. C.
Los Ebanos	C	26° 16'	98° 33'	150	Apr. 1957	Lower Rio Grande Valley	I. B. & W. C.
Los Fresnos Pumping Plant	S	25° 57'	97° 34'	30	1952	Lower Rio Grande Valley	CCWCID #6
Los Isauros Ranch	V	27° 24'	99° 24'	490	1964	Laredo - Falcon Dam	I. Martinez
Lowry, Cliff Ranch	R	29° 39'	100° 52'	1,490	June 1962	Devils River	I. B. & W. C.
Lowry Ranch No. 2	R	29° 37'	100° 56'	1,160	May 1965	Devils River	I. B. & W. C.
Maverick County Canal Headgate	S	29° 10'	100° 46'	870	Mar. 1948	Below Amistad Dam - Eagle Pass	MCWCID #1
Maverick Power Plant	S	28° 50'	100° 33'	800	June 1952	Below Amistad Dam - Eagle Pass	C. P. & L. Co.
Maverick Ranger Station	S	29° 18'	103° 30'	2,780	1955	Terlingua Creek	Park Ranger
McGonagill Ranch - East Mill	V	30° 21'	102° 55'	4,050	# May 1952	Johnson Ranch - Langtry	W. E. McGonagill
McGonagill Ranch - Headquarters	S	30° 20'	102° 58'	4,150	Apr. 1952	Johnson Ranch - Langtry	W. E. McGonagill
Middle Fork San Pedro	C	29° 30'	100° 53'	1,170	June 1969	Devils River	I. B. & W. C.
Miers, H. T. Ranch - Headquarters	C	29° 44'	100° 51'	1,760	1957	Devils River	I. B. & W. C.
Miers, H. T. Ranch No. 2	R	29° 44'	100° 53'	1,600	Apr. 1964	Devils River	I. B. & W. C.
Mitchell, Kerr Ranch	S	30° 13'	104° 00'	4,450	# 1941	Alamito Creek	Mrs. K. Mitchell
Mouth of Maravillas Creek	S	29° 34'	102° 47'	1,650	Apr. 1965	Johnson Ranch - Langtry	Black Gap Game Refuge
Neely Ranch	S	30° 59'	105° 32'	3,350	Aug. 1941	Fort Quitman - Above Río Conchos	Mrs. Tom Neely
New Mission Pumping Plant	S	26° 11'	98° 24'		Aug. 1961	Lower Rio Grande Valley	HCWCID #14
Normandy	S	28° 55'	100° 36'	780	Dec. 1958	Below Amistad Dam - Eagle Pass	Fannin G. Lowe
North Fork San Pedro	C	29° 31'	100° 53'	1,144	June 1969	Devils River	I. B. & W. C.
02 Ranch	S	29° 51'	103° 45'	3,780	# 1914	Terlingua Creek	Calvin Woodward
Owens Ranch	S	30° 45'	101° 40'	2,170	July 1963	Pecos River Below Sheffield	*Jeff Owens*
Pafford Crossing	C	29° 41'	101° 00'	1,180	Feb. 1960	Devils River	I. B. & W. C.
Pecos River near Langtry Station	C	29° 48'	101° 27'	1,260	July 1967	Pecos River Below Sheffield	I. B. & W. C.
Penitas (Edinburg Pumping Plant)	S	26° 14'	98° 27'	100	July 1957	Lower Rio Grande Valley	B. Leadbetter
Persimmon Gap Ranger Station	S	29° 40'	103° 10'	2,900	# 1948	Johnson Ranch - Langtry	Park Ranger
Pinto Creek Station	C	29° 09'	100° 43'	870	Dec.1958	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Potter, A. M. Ranch	S	29° 46'	103° 25'	3,440	1952	Johnson Ranch - Langtry	A. M. Potter
Presidio (IB&WC Gage)	C	29° 34'	104° 23'	2,550	Oct. 1949	Above Río Conchos - Johnson Ranch	I. B. & W. C.
Prosser Ranch No. 1	C	29° 54'	101° 14'	1,710	Mar. 1965	Pecos River Below Sheffield	I. B. & W. C.
Prosser Ranch No. 2	C	29° 59'	101° 16'	1,850	Mar. 1965	Devils River	I. B. & W. C.
Prosser Ranch No. 3	C	30° 02'	101° 16'	2,020	Mar. 1965	Pecos River Below Sheffield	I. B. & W. C.
Quebec Ranch	V	30° 31'	104° 25'	4,600	1949	Adjacent to Alamito Creek	George Jones
Ranchita (Continental)	S	29° 50'	101° 20'	1,540	1969	Pecos River	Julio Crowder
Redford	C	29° 29'	104° 13'	2,500	July 1954	Above Río Conchos - Johnson Ranch	I. B. & W. C.
Roma (Internat'l Bridge)	S	26° 24'	99° 01'	230	1941	Falcon Dam - Rio Grande City	Starr County Bridge Co.
Rosita Creek Siphon	C	28° 41'	100° 24'	760	# 1959	Eagle Pass - Laredo	I. B. & W. C.
Rosita Creek Station	C	28° 36'	100° 24'	700	# 1959	Eagle Pass - Laredo	I. B. & W. C.
Rough Canyon near Del Rio	C	29° 35'	100° 56'	1,147	June 1969	Devils River	I. B. & W. C.
San Benito Pump	S	26° 03'	97° 45'	50	Oct. 1953	Lower Rio Grande Valley	I. B. & W. C.
Sawyer, W. E. Ranch	S	30° 28'	100° 47'	2,100	June 1966	Devils River	Geo. Powell
Sellers Ranch	C	29° 34'	101° 02'	1,190	# Feb. 1960	Devils River	I. B. & W. C.
Shafter	V	29° 49'	104° 19'	3,800	July 1968	Above Río Conchos - Johnson Ranch	Rosa Munoz
Shannon, Bill Ranch	C	29° 57'	104° 40'	2,680	# 1956	Fort Quitman - Above Río Conchos	Bill Shannon
Sheep Pasture	S	29° 33'	102° 55'	2,210	May 1965	Johnson Ranch - Langtry	Black Gap Game Refuge
Slaughter Ranch	V	29° 57'	102° 41'	2,560	1965	Johnson Ranch - Langtry	Mrs. J. Garner
Stewart Ranch	R	29° 35'	100° 52'	1,330	Feb. 1960	Devils River	I. B. & W. C.
Stillwell Crossing	S	29° 24'	102° 50'	1,750	# 1960	Johnson Ranch - Langtry	Ulice Adams
Sub-Station 14	R	30° 16'	100° 35'	2,300	# 1922	Devils River	Texas A&M Experiment Station
Sultenfuss Ranch	S	29° 21'	100° 37'	1,110	1965	Pinto Creek	Udo Sultenfuss

S Standard C Cumulative V Visual R Recording # Some months or years missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Terlingua Creek Station	C	29° 12'	103° 36'	2,215	Mar. 1952	Above Río Conchos - Johnson Ranch	I. B. & W. C.
Terrell Plant (El Paso Nat. Gas Co.)	R	30° 22'	101° 50'	2,510	July 1962	Pecos River Below Sheffield	Bob Norred
Todd Field	S	30° 51'	101° 27'	2,650	Sept. 1964	Pecos River Below Sheffield	R. B. Stephens
Trees Farm	R	28° 38'	100° 25'	720	Mar. 1959	Eagle Pass - Laredo	I. B. & W. C.
Van Dalsem Farm	C	28° 27'	100° 19'	700	1959	Eagle Pass - Laredo	I. B. & W. C.
Van Eman, L. T. Ranch	S	29° 52'	103° 59'	3,890	# 1947	Alamito Creek	L. T. Van Eman
Vinegarone	C	29° 57'	100° 46'	1,780	May 1966	Devils River	I. B. & W. C.
Walker Ranch	C	29° 49'	101° 14'	1,530	July 1969	Devils River	I. B. & W. C.
Wardlaw Ranch	R	29° 28'	100° 58'	1,110	Aug. 1955	Devils River	I. B. & W. C.
Weyrich Farm	C	28° 40'	100° 24'	760	Sept. 1962	Eagle Pass - Laredo	I. B. & W. C.
Whipple Farm	S	26° 04'	97° 29'	25	1952	Lower Rio Grande Valley	Harry Whipple
Whitehead Bros. Ranch	S	30° 02'	100° 52'	1,900	May 1966	Devils River	I. B. & W. C.
Whitehead, L. D. Ranch	S	30° 10'	100° 46'	2,110	May 1965	Devils River	L. D. Whitehead, Jr.
Whitehead, Tuffy Ranch	R	29° 38'	101° 07'	1,420	July 1962	Devils River	I. B. & W. C.
Willoughby, Ray Ranch	V	30° 12'	103° 33'	5,225	1952	Johnson Ranch - Langtry	O. W. Roberts
Wills Ranch	S	30° 26'	101° 36'	2,450	Sept. 1964	Pecos River Below Sheffield	Sam Wills
Wipff Ranch	C	29° 00'	100° 35'	840	Mar. 1959	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Woodward, J. F. Ranch	S	30° 08'	103° 36'	4,750	1954	Johnson Ranch - Langtry	J. F. Woodward
Wuensche Farm	S	28° 24'	100° 19'	670	# 1952	Eagle Pass - Laredo	I. B. & W. C.
Yarborough Ranch	S	30° 06'	103° 36'	4,550	1966	Johnson Ranch - Langtry	Venancio Victorino
Zapata Water Plant	S	26° 54'	99° 16'	380	May 1953	Laredo - Falcon Dam	Zapata Water Plant

S Standard R Recording C Cumulative V Visual # Some months or years missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
A. Blanca Canoas, Nuevo León	S	25° 32'	100° 30'	†	# 1958	Río San Juan	Hydr. Resources
Anáhuac, Nuevo León	S	27° 15'	100° 08'	656	#June 1933	Río Salado	Hydr. Resources
Aniego 166, Tamaulipas	C	26° 46'	99° 15'	308	Jan. 1964	Laredo - Falcon Dam	I. B. & W. C.
Apodaca, Nuevo León	S	25° 46'	100° 11'	1,330	Feb. 1964	Río San Juan	Hydr. Resources
Argüelles, Tamaulipas	C	26° 11'	98° 28'	†	1962	Lower Rio Grande Valley	I. B. & W. C.
Bachiniva, Chihuahua	S	28° 46'	107° 15'	6,250	# 1952	Adjacent to Río Conchos	Meteor. Service of Mexico
Bajo Río Bravo, Tamaulipas							
No. 1-2	S	25° 56'	97° 46'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 1-3	S	25° 50'	97° 42'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 1-4	S	25° 51'	97° 45'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 1-12	S	25° 56'	97° 38'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 1-13	S	25° 44'	97° 40'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 1-18	S	25° 49'	97° 42'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 2-5	S	25° 48'	97° 49'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 2-6	S	25° 44'	97° 53'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 2-7	S	25° 39'	97° 42'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 2-8	S	25° 40'	97° 55'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 2-10	S	25° 36'	97° 52'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 2-11	S	25° 35'	97° 46'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 3-14	S	25° 56'	97° 59'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 3-15	S	25° 46'	98° 01'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 3-17	S	25° 49'	97° 58'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 4-16	S	25° 35'	98° 00'	†	1964	Lower Rio Grande Valley	Hydr. Resources
Bajo Río San Juan, Tamaulipas							
No. 2-29	S	26° 10'	98° 38'	†	1964	Lower Río Grande Valley	Hydr. Resources
No. 2-33	S	26° 10'	98° 28'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 2-38	S	26° 06'	98° 34'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 3-47	S	25° 58'	98° 07'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 3-55	S	25° 52'	98° 12'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 3-58	S	25° 50'	98° 11'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 3-60	S	25° 46'	98° 10'	†	1964	Lower Rio Grande Valley	Hydr. Resources
No. 3-63	S	25° 41'	98° 06'	†	1964	Lower Rio Grande Valley	Hydr. Resources
Balleza, Chihuahua	S	26° 57'	106° 21'	5,870	# 1903	Río Conchos	Meteor. Service of Mexico
Banderas, Chihuahua	S	31° 00'	105° 39'	†	1963	Fort Quitman - Above Río Conchos	Hydr. Resources
Bustamante, Nuevo León	S	26° 32'	100° 31'	1,450	# 1958	Río Salado	Hydr. Resources
Cabezones, Nuevo León	S	24° 59'	99° 45'	†	1962	Adjacent to Río San Juan	Hydr. Resources
Cadereyta, Nuevo León	S	25° 35'	100° 00'	1,180	#Sept. 1904	Río San Juan	Hydr. Resources
Camargo, Chihuahua	S	27° 42'	105° 10'	5,420	Oct. 1956	Río Conchos	Hydr. Resources
Camargo, Tamaulipas	S	26° 19'	98° 50'	223	# 1953	Falcon Dam - Rio Grande City	Hydr. Resources
Carbonera, Nuevo León	S	24° 49'	100° 47'	†	# 1958	Río San Juan	Hydr. Resources
Carichic, Chihuahua	S	27° 55'	107° 04'		May 1961	Río Conchos	Meteor. Service of Chihuahua
Casillas, Nuevo León	S	25° 12'	100° 12'	4,060	# 1958	Río San Juan	Hydr. Resources
Cd. Acuna, Coahuila	S	29° 20'	100° 57'	900	1951	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Cd. Díaz Ordáz	S	26° 14'	98° 36'	130	# 1953	Lower Rio Grande Valley	Hydr. Resources
Cd. Guerrero, Chihuahua	S	28° 33'	107° 29'	6,560	#May 1903	Adjacent to Río Conchos	Meteor. Service of Mexico
Cd. Mier, Tamaulipas	S	26° 26'	99° 09'	260	Oct. 1955	Falcon Dam - Rio Grande City	I. B. & W. C.
Cd. Mier Km. 8, SW., Tamaulipas	C	26° 23'	99° 14'	†	1962	Río Alamo	I. B. & W. C.
Cerralvo, Nuevo León	R	26° 05'	99° 37'	1,130	#Nov. 1938	Río San Juan	Hydr. Resources
Chihuahua, Chihuahua	S	28° 38'	106° 04'	4,690	# 1900	Río Conchos	Meteor. Service of Mexico
Chupadero, Coahuila	S	29° 05'	100° 51'	980	1961	Río San Diego	F. Jakubesch
Ciénega de Flores, Nuevo León	R	25° 57'	100° 57'	1,770	Apr. 1938	Río San Juan	Hydr. Resources
Ciénega del Toro, Nuevo León	S	25° 05'	100° 20'	7,010	# 1958	Río San Juan	Hydr. Resources
Colombia, Nuevo León	C	27° 42'	99° 46'	†	Jan. 1964	Eagle Pass - Laredo	I. B. & W. C.
Colonia Anáhuac Chihuahua	S	28° 29'	106° 44'	6,550	1961	Río Conchos	Celulosa de Chihuahua, S.A.
Comales, Tamaulipas	R	26° 11'	98° 55'	260	#Mar. 1938	Río San Juan	Hydr. Resources
Conchos, Coahuila	S	28° 01'	101° 20'	†	#Oct. 1950	Río Salado	Hydr. Resources
Control, Tamaulipas	S	25° 58'	97° 49'	59	#June 1942	Lower Rio Grande Valley	Hydr. Resources
Coyame, Chihuahua	S	29° 28'	105° 06'	†	Nov. 1961	Río Conchos	Meteor. Service of Chihuahua
Cuatro Ciénegas, Coahuila	S	26° 59'	102° 04'	2,430	# 1923	Río Salado	Hydr. Resources
Cuauhtémoc, Chihuahua	S	28° 24'	106° 52'	7,250	#June 1923	Adjacent to Río Conchos	Meteor. Service of Mexico

S Standard C Cumulative R Recording † Not available # Some months or years missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Cuchillo Parado, Chihuahua	S	29° 26'	104° 53'	2,982	# 1951	Río Conchos	Hydr. Resources
Delicias, Chihuahua	S	28° 11'	105° 28	3,710	#Aug. 1933	Río Conchos	Hydr. Resources
Don Martín, Coahuila	S	27° 31'	100° 37'	790	#June 1927	Río Salado	Hydr. Resources
Ejido Progreso, Tamaulipas	C	27° 27'	99° 39'	†	1969	Laredo - Falcon Dam	I. B. & W. C.
El Anteojo, Chihuahua	S	28° 29'	104° 48'	4,130	1963	Adjacent to Río Conchos	Meteor. Service of Mexico
El Cedrito, Coahuila	S	29° 13'	101° 53'	†	Aug. 1961	Langtry - Below Amistad Dam	I. B. & W. C.
El Cuarenta, Chihuahua	S	30° 33'	105° 50'	†	1965	Adjacent to Ft. Quitman Above Río Conchos	Meteor, Service of Mexico
El Cuchillo, Nuevo León	S	25° 43'	99° 16'	590	June 1938	Río San Juan	Hydr. Resources
El Cuervo, Chihuahua	S	30° 15'	105° 08'	3,840	# 1961	Adjacent to Ft. Quitman Above Río Conchos	Hydr. Resources
El Llano, Chihuahua	S	30° 02'	105° 05'	4,000	1965	Adjacent to Ft. Quitman Above Río Conchos	I. B. & W. C.
El Llano, Tamaulipas	S	27° 24'	99° 31'	†	Nov. 1968	Laredo - Falcon Dam	I. B. & W. C.
El Maguey, Chihuahua	S	27° 37'	106° 09'	4,380	July 1955	Río Conchos	Meteor. Service of Chihuahua
El Remolino, Coahuila	S	28° 45'	101° 05'	1,310	June 1958	Río San Rodrigo	I. B. & W. C.
El Sitio, Chihuahua	S	27° 31'	106° 16'	†	July 1955	Río Conchos	Meteor. Service of Chihuahua
El Sueco, Chihuahua	S	29° 54'	106° 24'	5,090	1958	Adjacent to Río Conchos	Meteor. Service of Chihuahua
El Treinta, Coahuila	S	28° 20'	101° 24'	†	1961	Río Salado	I. B. & W. C.
El Vergel, Chihuahua	S	26° 22'	106° 30'	7,350	# 1957	Río Conchos	Meteor. Service of Mexico
Escalón, Chihuahua	S	26° 45'	104° 21'	4,144	# 1957	Adjacent to Río Conchos	Meteor. Service of Mexico
Escuela Ganaderia, Chihuahua	S	28° 42'	106° 04'	4,680	1961	Río Conchos	Meteor. Service of Chihuahua
Estación Rosario, Durango	S	26° 30'	105° 38'	†	July 1962	Río Conchos	Hydr. Resources
Gallego, Chihuahua	S	29° 50'	106° 23'	5,100	1958	Adjacent to Río Conchos	Meteor. Service of Chihuahua
Garita Km. 28 Chihuahua	S	31° 33'	106° 28'	3,990	May 1958	El Paso - Ft. Quitman	I. B. & W. C.
Gral. Bravo, Nuevo León	S	25° 48'	99° 11'	590	#Sept. 1906	Río San Juan	Hydr. Resources
Gral. Cepeda, Coahuila	S	25° 23'	101° 29'	4,920	#Aug. 1926	Río San Juan	Hydr. Resources
Gral. Teran (Experiment Station) Nuevo León	S	25° 16'	99° 38'	1,090	# 1958	Río San Juan	Agriculture and Livestock Dept.
Guadalupe, Chihuahua	S	31° 23'	106° 06'	3,650	1958	El Paso - Ft. Quitman	I. B. & W. C.
Hacienda El Alamo, Nuevo León	S	26° 29'	99° 47'	†	1968	Río Alamo	I. B. & W. C.
Hacienda San Miguel, Coahuila	S	29° 13'	101° 30'	†	1961	Langtry - Below Amistad Dam	I. B. & W. C.
Higueras, Nuevo León	S	25° 58'	100° 01'	1,640	#Sept. 1906	Río San Juan	Meteor. Service of Mexico
Icamole, Nuevo León	S	25° 55'	100° 43'	4,900	# 1958	Río San Juan	Hydr. Resources
Iturbide, Nuevo León	S	24° 44'	99° 54'	†	1941	Adjacent to Río San Juan	Hydr. Resources
Jarita, Nuevo León	C	27° 26'	99° 48'	680	#Mar. 1961	Laredo - Falcon Dam	I. B. & W. C.
Jiménez, Chihuahua	S	27° 08'	104° 55'	4,490	# 1951	Río Conchos	Hydr. Resources
Jiménez, Coahuila	S	29° 04'	100° 40'	810	# 1951	Below Amistad Dam - Eagle Pass	I. B. & W. C.
Juárez, Chihuahua	S	31° 44'	106° 29'	3,740	# 1903	El Paso - Ft. Quitman	Hydr. Resources
Km. 99, Chihuahua	S	28° 08'	105° 35'	†	# 1962	Río Conchos	Hydr. Resources
Km. 135, Chihuahua	S	28° 13'	105° 37'	†	# 1962	Río Conchos	Hydr. Resources
La Babia, Coahuila	S	28° 33'	102° 04'	†	1961	Río Salado	I. B. & W. C.
La Bandera, Tamaulipas	C	26° 42'	99° 22'	†	1962	Laredo - Falcon Dam	I. B. & W. C.
La Boquilla, Chihuahua	S	27° 32'	105° 25'	4,330	# 1910	Río Conchos	Electric Industry of Mexico
La Campana, Chihuahua	S	29° 20'	106° 20'	4,820	1958	Adjacent to Río Conchos	Metor. Service of Mexico
La Cieneguilla, Chihuahua	S	27° 40'	106° 21'	†	# 1963	Río Conchos	Meteor. Service of Mexico
La Cruz, Nuevo León	S	25° 28'	100° 26'	†	1958	Río San Juan	Hydr. Resources
La Gloria, Nuevo León	S	26° 53'	99° 49'	390	#May 1958	Río Salado	I. B. & W. C.
La Popa, Nuevo León	S	26° 10'	100° 50'	3,230	# 1958	Río San Juan	Hydr. Resources
La Trasquila, Chihuahua	S	29° 08'	107° 08'	†	# 1962	Río Conchos	Hydr. Resources
Laguna de Salinillas, Nuevo León	S	27° 26'	100° 23'	750	# 1940	Río Salado	Hydr. Resources
Laguna de Sánchez, Nuevo León	R	25° 22'	100° 17'	6,500	Apr. 1941	Río San Juan	Hydr. Resources
Lampazos, Nuevo León	S	27° 02'	100° 30'	1,120	# 1958	Río Salado	Meteor. Service of Mexico
Las Burras, Chihuahua	S	28° 31'	105° 26'	3,590	July 1949	Río Conchos	Hydr. Resources
Las Comitas, Nuevo León	S	25° 26'	100° 09'	1,670	# 1940	Río San Juan	Hydr. Resources

S Standard C Cumulative R Recording # Some months or years missing † Not available

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Las Enramadas, Nuevo León	S	25° 30'	99° 31'	730	#Sept. 1926	Río San Juan	Hydr. Resources
Las Norias, Coahuila	S	29° 14'	102° 22'	†	#May 1959	Johnson Ranch - Langtry	I. B. & W. C.
Las Tortillas, Tamaulipas	C	26° 50'	99° 34'	360	May 1961	Laredo - Falcon Dam	I. B. & W. C.
Las Varas, Chihuahua	S	29° 48'	106° 42'	†	1958	Adjacent to Río Conchos	Meteor. Service of Mexico
Las Vírgenes, Chihuahua	S	28° 10'	105° 38'	4,070	# 1943	Río Conchos	Hydr. Resources
Lázaro Cárdenas, Chihuahua	S	28° 23'	105° 37'	3,940	# 1961	Río Conchos	Meteor. Service of Mexico
Linares, Nuevo León	R	24° 52'	99° 34'	1,180	# 1900	Adjacent to Río San Juan	Hydr. Resources
Los Barriles, Chihuahua	S	30° 55'	105° 45'	4,860	July 1958	El Paso - Ft. Quitman	I. B. & W. C.
Los Ojos, Chihuahua	S	29° 10'	106° 21'	4,990	1957	Adjacent to Río Conchos	Meteor. Service of Chihuahua
Los Pozos, Chihuahua	S	28° 53'	106° 02'	3,940	# 1956	Río Conchos	Meteor. Service of Chihuahua
Los Ramones, Nuevo León	R	25° 42'	99° 38'	260	#Sept. 1939	Río San Juan	Hydr. Resources
Luis L. León, Chihuahua	S	31° 05'	105° 38'	3,460	Apr. 1958	El Paso - Ft. Quitman	I. B. & W. C.
Maijoma, Chihuahua	S	28° 55'	104° 21'	4,270	Aug. 1955	Río Conchos	Meteor. Service of Chihuahua
Majalca, Chihuahua	S	28° 53'	106° 21'	6,860	June 1963	Río Conchos	Meteor. Service of Mexico
Manuel Benavides, Chihuahua	S	29° 06'	103° 54'	†	Oct. 1961	Above Río Conchos - Johnson Ranch	Meteor. Service of Mexico
Matamoros, Tamaulipas	S	25° 52'	97° 30'	33	# 1958	Lower Rio Grande Valley	Hydr. Resources
Méndez, Tamaulipas	S	25° 07'	98° 35'	430	#Sept. 1939	Adjacent to Lower Rio Grande Valley	Hydr. Resources
Meoqui, Chihuahua	S	28° 16'	105° 29'	3,790	1961	Río Conchos	Meteor. Service of Mexico
Miguel Alemán, Tamaulipas	S	26° 24'	99° 02'	180	1964	Falcon Dam - Rio Grande City	Hydr. Resources
Mimbres, Nuevo León	S	24° 58'	100° 16'	†	# 1958	Río Salado	Hydr. Resources
Mina, Nuevo León	S	26° 00'	100° 32'	†	# 1958	Río San Juan	Hydr. Resources
Mina La Borrada, Coahuila	S	29° 21'	102° 36'	†	Aug. 1961	Johnson Ranch - Langtry	I. B. & W. C.
Monclova, Coahuila	S	26° 54'	101° 25'	1,920	# 1897	Río Salado	Hydr. Resources
Montemorelos, Nuevo León	S	25° 12'	99° 50'	1,420	#Aug. 1904	Río San Juan	Hydr. Resources
Monterrey, Nuevo León	S	25° 40'	100° 18'	1,740	# 1896	Río San Juan	Hydr. Resources
Nonoava, Chihuahua	S	27° 29'	106° 44'	†	# 1963	Río Conchos	Meteor. Service of Chihuahua
Nueva Cd. Guerrero, Tamaulipas	S	26° 34'	99° 14'	350	#May 1954	Laredo - Falcon Dam	I. B. & W. C.
Nueva Hacienda Golondrinas, Nuevo León	S	26° 43'	100° 30'	†	1968	Río Salado	I. B. & W. C.
Nueva Rosita, Coahuila	S	27° 56'	101° 13'	1,410	#Aug. 1925	Río Salado	Meteor. Service of Mexico
Nuevo Laredo, Tamaulipas	V	27° 30'	99° 30'	430	1950	Laredo - Falcon Dam	I. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 30'	99° 30'	430	# 1909	Laredo - Falcon Dam	Meteor. Service of Mexico
Nuevo Laredo Km. 26, SSW, Tamaulipas	C	27° 17'	99° 37'	†	Apr. 1961	Laredo - Falcon Dam	I. B. & W. C.
Nuevo Laredo Km. 52, SSW, Nuevo León θ	C	27° 04'	99° 44'	†	Apr. 1961	Laredo - Falcon Dam	I. B. & W. C.
Ocampo, Coahuila	S	27° 19'	102° 24'	3,770	# 1960	Adjacent Río Salado	Hydr. Resources
Ojinaga, Chihuahua	S	29° 34'	104° 24'	2,590	#Apr. 1954	Río Conchos	I. B. & W. C.
Ojinaga, Chihuahua	S	29° 34'	104° 25'	2,620	#Nov. 1906	Río Conchos	Meteor. Service of Mexico
Ojo Caliente, Chihuahua	S	27° 41'	105° 12'	4,010	1942	Río Conchos	Hydr. Resources
Pajonal, Nuevo León	S	25° 29'	100° 23'	†	1958	Río San Juan	Hydr. Resources
Palestina, Coahuila	S	29° 09'	100° 59'	1,080	# 1931	Río San Diego	Hydr. Resources
Parral, Chihuahua	S	26° 56'	105° 39'	5,450	# 1903	Río Conchos	Meteor. Service of Mexico
Parras, Coahuila	S	25° 27'	102° 10'	5,510	1958	Adjacent to Río San Juan	Hydr. Resources
Piedras Negras, Coahuila	S	28° 43'	100° 31'	820	# 1951	Below Amistad Dam - Eagle Pass	Meteor. Service of Mexico
Planta Zootécnica, Chihuahua	S	28° 41'	106° 04'	4,770	# 1957	Río Conchos	Meteor. Service of Mexico
Porvenir, Chihuahua	S	31° 14'	105° 52'	3,530	1958	El Paso - Ft. Quitman	I. B. & W. C.
Potosí, Nuevo León	S	24° 51'	100° 19'	6,260	# 1958	Adjacent to Río San Juan	Hydr. Resources
Potrero del Llano, Chihuahua	S	29° 13'	104° 26'	3,540	June 1964	Above Río Conchos - Johnson Ranch	I. B. & W. C.
Potrero Redondo, Nuevo León	S	25° 16'	100° 10'	†	# 1958	Río San Juan	Hydr. Resources
Praxedis G. Guerrero, Chihuahua	S	31° 22'	106° 00'	3,560	1958	El Paso - Ft. Quitman	I. B. & W. C.
Presa Anzaldúas, Tamaulipas	V	26° 08'	98° 20'	105	Apr. 1960	Lower Rio Grande Valley	I. B. & W. C.
Presa Cabeceras, Coahuila	S	29° 02'	101° 05'	†	1964	Below Amistad Dam - Eagle Pass	Hydr. Resources

\# Some months or years missing S Standard C Cumulative R Recording V Visual
† Not available θ Data for this station previously published under "Nuevo Laredo, Km. 50, SSW, Tamaulipas"

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Presa Centenario, Coahuila	S	29° 13'	100° 57'	†	1964	Arroyo Las Vacas	Hydr. Resources
Presa Chihuahua, Chihuahua	S	28° 34'	106° 10'	5,230	Oct. 1961	Río Conchos	Hydr. Resources
Presa El Granero, Chihuahua	S	28° 57'	105° 17'	†	Oct. 1964	Río Conchos	Hydr. Resources
Presa San Miguel, Coahuila	S	29° 02'	100° 57'	1,000	1964	Río San Diego	Hydr. Resources
Progreso, Coahuila	S	27° 25'	101° 00'	1,210	#Feb. 1943	Río Salado	Hydr. Resources
Ramos Arizpe, Coahuila	S	25° 32'	100° 57'	4,590	#Apr. 1907	Río San Juan	Meteor. Service of Mexico
Rancho Los Vidrios, Tamaulipas	C	27° 35'	99° 37'	450	Sept. 1956	Eagle Pass - Laredo	I. B. & W. C.
Rancho Mercedes, Coahuila	S	28° 02'	100° 01'	540	May 1959	Eagle Pass - Laredo	I. B. & W. C.
Rancho Palo Blanco, Nuevo León	S	26° 39'	100° 12'	1,020	1968	Río Salado	I. B. & W. C.
Rancho Pascualito, Nuevo León	S	26° 50'	100° 15'	980	1968	Río Salado	I. B. & W. C.
Rancho San Diego, Coahuila	S	27° 59'	100° 35'	†	May 1959	Eagle Pass - Laredo	I. B. & W. C.
Rancho San Juan de la Palma, Tamaulipas	S	26° 54'	99° 20'	350	Apr. 1955	Laredo - Falcon Dam	I. B. & W. C.
Rancho San Rafael Bustamante, Tamps.	C	26° 54'	99° 30'	†	Nov. 1967	Río Salado	I. B. & W. C.
Rancho Santa Ana, Nuevo León	S	26° 34'	100° 10'	970	1961	Río Salado	Manuel Ancira
Rayones, Nuevo León	S	25° 01'	100° 05'	1,970	#Oct. 1926	Río San Juan	Hydr. Resources
Resta, Coahuila	S	26° 07'	101° 04'	3,070	#July 1944	Río San Juan	Hydr. Resources
Retamal, Tamaulipas	S	26° 02'	98° 03'	82	Oct. 1949	Lower Rio Grande Valley	I. B. & W. C.
Reynosa, Tamaulipas	R	26° 06'	98° 17'	130	# 1941	Lower Rio Grande Valley	Hydr. Resources
Reynosa Km. 22, SW, Tamaulipas	C	26° 00'	98° 30'	†	# 1962	Lower Rio Grande Valley	I. B. & W. C.
Reynosa Km. 40, SW, Nuevo León	S	25° 56'	98° 39'	492	#Feb. 1959	Lower Rio Grande Valley	I. B. & W. C.
Rinconada, Nuevo León	S	25° 41'	100° 42'	4,790	#Apr. 1944	Río San Juan	Hydr. Resources
Río Bravo, Tamaulipas	S	25° 59'	98° 06'	85	#Sept. 1950	Lower Rio Grande Valley	Hydr. Resources
Río Salado Riberena, Tamaulipas	S	26° 48'	99° 24'	330	July 1964	Laredo - Falcon Dam	I. B. & W. C.
Rosetilla, Chihuahua	S	28° 15'	105° 18'	3,780	1940	Río Conchos	Electric Industry of Mexico
Ruslo, Nuevo León	S	24° 42'	100° 26'	6,570	#June 1956	Adjacent to Río San Juan	Hydr. Resources
Sabinas, Coahuila	S	27° 51'	101° 07'	1,120	#May 1922	Río Salado	Hydr. Resources
Sabinas Hidalgo, Nuevo León	S	26° 30'	100° 10'	1,030	May 1958	Río Salado	I. B. & W. C.
Saltillo, Coahuila	S	25° 26'	101° 00'	5,280	# 1886	Río San Juan	Hydr. Resources
Samalayuca, Chihuahua	S	31° 21'	106° 28'	4,180	1958	El Paso - Ft. Quitman	Meteor. Service of Mexico
San Agustín, Chihuahua	S	31° 31'	106° 15'	3,650	1958	El Paso - Ft. Quitman	I. B. & W. C.
San Antonio de las Alazanas, Coahuila	S	25° 16'	100° 35'	†	1958	Río San Juan	Hydr. Resources
San Antonio, Chihuahua	S	31° 01'	106° 00'	4,490	July 1958	El Paso - Ft. Quitman	I. B. & W. C.
San Antonio, Durango	S	26° 25'	105° 21'	5,430	# 1943	Río Conchos	Hydr. Resources
San Fernando, Coahuila	S	29° 25'	101° 43'	†	Aug. 1961	Langtry - Below Amistad Dam	I. B. & W. C.
San Ignacio, Tamaulipas	C	27° 04'	99° 28'	†	1964	Laredo - Falcon Dam	I. B. & W. C.
San Javier, Nuevo León	C	26° 16'	99° 25'	†	1962	Río Alamo	I. B. & W. C.
San Juan, Nuevo León	S	25° 33'	99° 50'	880	#Nov. 1943	Río San Juan	Hydr. Resources
San Rafael, Nuevo León	S	25° 02'	100° 33'	†	# 1958	Adjacent to Río San Juan	Hydr. Resources
Santa Bárbara, Chihuahua	S	26° 48'	105° 49'	6,460	1964	Río Conchos	Hydr. Resources
Santa Catarina, Nuevo León	R	25° 40'	100° 29'	2,230	Oct. 1937	Río San Juan	Hydr. Resources
Santa Rita, Chihuahua	S	27° 49'	104° 31'	3,950	1956	Adjacent to Río Conchos	Meteor. Service of Chihuahua
Santa Rosa, Coahuila	V	29° 38'	101° 28'	†	# 1958	Langtry - Below Amistad Dam	Ind. Co-operator
Santo Domingo, Coahuila	S	28° 57'	102° 24'	†	July 1960	Río Salado	I. B. & W. C.
Sierra Mojada, Coahuila	S	27° 17'	103° 42'	4,120	# 1897	Adjacent to Johnson Ranch - Langtry	Hydr. Resources
Siquírichic, Chihuahua	S	27° 16'	107° 13'	7,610	July 1956	Adjacent to Río Conchos	Meteor. Service of Mexico
Tacubaya, Chihuahua	S	28° 08'	104° 23'	5,150	July 1962	Adjacent to Río Conchos	Meteor. Service of Mexico
Tinajas, Chihuahua	S	31° 08'	106° 05'	4,320	1958	El Paso - Ft. Quitman	I. B. & W. C.
Topo Chico, Nuevo León	R	25° 44'	100° 20'	1,640	#Aug. 1939	Río San Juan	Hydr. Resources
Túnel San Francisco, Nuevo León	S	25° 25'	100° 10'	4,300	# 1958	Río San Juan	Hydr. Resources

S Standard C Cumulative R Recording V Visual

\# Some months or years missing

† Not available

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Vado de Cedillos, Chihuahua	S	31° 13'	105° 48'	3,500	Apr. 1958	El Paso - Ft. Quitman	I. B. & W. C.
Valadeces, Tamaulipas	S	26° 14'	98° 40'	†	1964	Lower Rio Grande Valley	Hydr. Resources
Vallecillo, Nuevo León	S	26° 40'	99° 59'	900	#June 1958	Río Salado	Hydr. Resources
Valle Allende, Chihuahua	S	26° 56'	105° 23'	†	Mar. 1962	Río Conchos	Meteor. Service of Chihuahua
Valle Hermoso, Tamaulipas	S	25° 41'	97° 48'	52	#June 1949	Lower Rio Grande Valley	Hydr. Resources
Victoria, Chihuahua	S	27° 58'	104° 33'	4,810	June 1963	Adjacent to Río Conchos	Meteor. Service of Mexico
Villa Aldama, Chihuahua	S	28° 50'	105° 55'	4,140	1961	Río Conchos	Meteor. Service of Mexico
Villa Allende, Nuevo León	S	25° 17'	100° 01'	2,210	#Nov. 1938	Río San Juan	Hydr. Resources
Villa Coronado, Chihuahua	S	26° 44'	105° 08'	4,790	Aug. 1964	Río Conchos	Hydr. Resources
Villa de Santiago, Nuevo León	S	25° 25'	100° 09'	1,460	# 1923	Río San Juan	Hydr. Resources
Villa Guerrero, Coahuila	S	28° 19'	100° 23'	690	#June 1958	Eagle Pass - Laredo	I. B. & W. C.
Villa Hidalgo, Coahuila	S	27° 47'	99° 52'	660	1951	Eagle Pass - Laredo	I. B. & W. C.
Villa Juárez, Coahuila	S	27° 37'	100° 44'	1,000	# 1943	Río Salado	Hydr. Resources
Villalba, Chihuahua	S	28° 10'	105° 46'	3,940	Oct. 1940	Río Conchos	Hydr. Resources
Zaragoza, Chihuahua	S	31° 39'	106° 21'	3,750	Feb. 1958	El Paso - Ft. Quitman	Hydr. Resources

\# Some months or years missing S Standard † Not available

EVAPORATION IN THE RIO GRANDE BASIN IN THE UNITED STATES

In Inches

Tabulated below are records of evaporation observed at eight stations in Texas operated by the United States Section of this Commission from Presidio to Brownsville. At all stations, the exposure to wind was uniform and relatively unimpeded. The sites were kept cleared of all high brush and trees within 150 feet, and all brush, tall weeds, and other obstructions within 100 feet of the fenced enclosures. Within the enclosures, all vegetation has been eradicated or kept trimmed to within 3 inches of the ground surface. For specific location of these stations refer to data opposite same station name shown in "Location of Rainfall Stations on the Rio Grande Watershed," pages 133 through 136 in this bulletin.

Records were obtained by means of:

1. U. S. Weather Bureau Standard Pan. A circular pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, is set on a wooden platform with the rim of the pan 16 inches above the ground. The water level is maintained between 2 and 3 inches below the rim of the pan and is measured with a micrometer gage. This type of pan was in operation at Amistad Dam and Falcon Dam.

2. A circular pan, 2 feet in diameter and 36 inches deep, made of 22-gage galvanized iron, is set in the ground with the rim of the pan 3 inches above the ground surface and the top covered with a circular screen of No. 4 (1/4" mesh) galvanized hardware cloth. The water level is maintained between 2.5 and 3.5 inches below the rim of the pan. This type of pan was in operation at Falcon Dam. This same type of pan, equipped with an automatic feed tank that maintains the water at a level 3 inches below the rim of the pan, was in operation at Martin King Ranch, Wardlaw Ranch, and Eagle Pass.

3. An evaporometer, developed by the United States Section of this Commission and calibrated against a 2-foot pan described above, was in operation at Presidio, Johnson Ranch, and at a site 7 miles east of Brownsville.

Month	Presidio		Johnson Ranch		Martin King Ranch		Wardlaw Ranch	
	1969	Average 1950-1969	1969	Average 1950-1969	1969	# Average 1950-1969	1969	# Average 1950-1969
Jan.	3.47	3.61	1.80	3.51	2.84	3.09	2.80	3.02
Feb.	5.00	5.20	4.59	5.15	3.45	3.64	3.03	3.58
Mar.	8.09	8.33	6.61	8.39	7.02	6.25	6.69	6.00
Apr.	9.40	10.20	9.34	10.66	6.53	7.31	7.09	6.78
May	11.90	12.31	10.29	12.29	8.76	8.58	7.12	7.90
June	12.33	13.29	11.65	12.83	9.72	10.62	9.79	10.48
July	11.74	12.52	10.72	12.97	13.41	11.82	13.34	12.15
Aug.	10.65	11.78	12.39	11.87	11.76	11.06	11.35	10.79
Sept.	9.99	9.99	8.82	9.56	6.56	7.69	6.39	7.86
Oct.	8.85	7.85	7.10	7.54	4.64	5.84	5.80	5.70
Nov.	5.12	4.96	3.54	4.82	2.92	3.91	2.71	3.82
Dec.	6.24	3.57	3.12	3.44	1.95	3.12	1.52	2.84
Total	102.78	103.61	89.97	103.03	79.56	82.93	77.63	80.92

Month	Amistad Dam		Eagle Pass		Falcon Dam				Brownsville	
					2-Foot Pan		4-Foot Pan			
	1969	Average March 1964-1969	1969	# Average 1964-1969	1969	# Average 1950-1969	1969	# Average 1956-1969	1969	# Average 1958-1969
Jan.	3.70	4.11	3.33	3.06	3.10	3.49	3.96	4.06	5.38	2.57
Feb.	4.73	4.53	3.29	3.32	3.34	4.44	4.00	5.30	4.69	3.16
Mar.	9.00	8.61	5.06	5.06	6.17	6.58	8.20	8.46	5.58	4.43
Apr.	10.40	10.27	6.20	6.66	7.35	7.88	9.69	10.59	8.30	5.52
May	10.15	10.87	7.11	6.41	8.01	9.62	11.75	12.63	5.41	5.64
June	14.56	13.99	10.69	10.46	9.71	11.13	12.99	13.84	6.83	6.22
July	17.57	17.28	14.01	12.32	13.28	13.37	17.36	16.60	8.17	7.15
Aug.	16.19	15.36	13.81	10.86	10.17	11.87	13.30	15.16	7.18	6.63
Sept.	9.47	10.21	7.34	6.42	7.09	8.26	8.93	10.28	3.32	4.87
Oct.	6.00	7.85	5.61	5.90	7.01	6.71	8.08	7.87	5.08	4.36
Nov.	3.50	4.91	2.81	3.55	5.16	4.78	5.28	5.48	3.72	3.71
Dec.	2.84	3.63	2.46	3.57	3.04	3.74	3.65	3.99	1.67	2.84
Total	108.11	111.62	81.72	77.59	83.43	91.87	107.19	114.26	65.33	57.10

Some months missing

EVAPORATION IN THE RIO GRANDE BASIN IN MEXICO

In Inches

Tabulated below are records of evaporation observed at nine stations operated and maintained by the Mexican Section of this Commission. Eight stations are along the Rio Grande from Cd. Acuña, Coahuila to Retamal, Tamaulipas and one is located on the Río Conchos near Ojinaga, Chihuahua. At all stations, except Ojinaga, the sites were kept cleared of all high brush and trees within 150 feet, and of all brush and tall weeds within 100 feet of the fenced enclosures. There are several large trees at the Ojinaga station. The corrugated iron gage well, 42 inches in diameter, and one A-frame of the cableway of the Río Conchos stream gaging station are in the north end of the enclosure. Inside the enclosures, all vegetation had been eradicated or was kept trimmed to within 3 inches of the ground surface. Except for a water barrel and a thermometer shelter in the northeast and northwest corners of the enclosures, the exposure to wind was uniform and relatively unimpeded. For specific location of these stations refer to data opposite same station name shown in "Location of Rainfall Stations on the Rio Grande Watershed," *pages 137 through 141 in this bulletin.*

The type of pan used at all these stations was a U. S. Weather Bureau Standard Pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, set on a wooden platform with the rim of the pan 16 inches above the ground. The water level was maintained between 2 and 3 inches below the rim of the pan and was measured with a micrometer gage.

Data for other evaporation stations in the Rio Grande Basin in Mexico, which were operated by various Mexican agencies, are available in Water Bulletin Number 39 published by the Mexican Section of this Commission.

Month	Ojinaga, Chihuahua		Cd. Acuña Coahuila		Jimenez, Coahuila		Hidalgo, Coahuila	
	1969	# Average April 1954-1969	1969	# Average 1951-1969	1969	# Average 1951-1969	1969	Average Feb. 1951-1969
Jan.	4.88	3.60	3.37	3.50	3.03	3.41	3.31	4.10
Feb.	5.83	5.14	4.25	4.74	3.70	4.29	4.49	5.34
Mar.	9.88	8.51	7.91	7.91	6.18	6.64	8.50	8.14
Apr.	13.46	11.05	7.95	8.99	6.14	7.47	9.09	10.52
May	14.84	13.58	9.29	10.12	6.65	8.64	12.48	12.46
June	15.75	13.82	12.56	12.07	13.39	10.69	13.62	14.39
July	12.99	13.28	15.67	13.85	16.26	12.34	15.55	16.24
Aug.	15.35	11.60	13.58	12.56	14.84	11.10	14.33	14.78
Sept.	10.79	9.26	8.58	9.05	7.99	7.62	8.11	10.20
Oct.	9.06	7.41	5.28	6.35	5.35	5.24	7.28	7.54
Nov.	4.09	4.42	4.41	3.97	3.27	3.29	4.13	4.93
Dec.	3.66	3.25	2.56	3.15	.83	2.78	4.65	3.94
Total	120.58	104.92	95.31	96.26	87.63	83.51	105.54	112.58

Month	Nuevo Laredo, Tamaulipas		Rancho San Juan de la Palma, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas		Cd. Mier, Tamaulipas		Retamal, Tamaulipas	
	1969	Average Aug. 1964-1969	1969	# Average April 1955-1969	1969	# Average June 1954-1969	1969	# Average Oct. 1955-1969	1969	# Average 1951-1968
Jan.	4.17	4.19	4.29	3.81	3.35	3.59	3.46	3.66	3.62	4.01
Feb.	4.57	4.71	4.72	5.01	3.78	4.36	3.54	4.73	2.99	4.64
Mar.	8.58	7.77	8.11	7.60	7.56	7.23	8.19	7.65	5.31	6.55
Apr.	10.08	10.10	9.49	9.84	8.54	9.09	10.59	9.52	7.44	8.15
May	11.81	10.96	11.38	11.89	10.31	10.89	11.69	11.23	7.72	8.80
June	14.88	13.57	10.63	12.57	11.50	11.80	12.28	12.58	9.29	9.22
July	15.83	14.82	13.82	14.30	15.16	14.08	15.83	15.18	10.98	10.16
Aug.	13.35	13.42	11.81	13.73	11.69	12.87	12.56	13.73	8.39	9.93
Sept.	9.45	9.68	9.96	10.06	8.07	9.28	9.65	10.08	5.28	7.33
Oct.	7.91	7.56	7.64	7.57	6.93	6.99	8.19	7.80	5.08	6.09
Nov.	4.61	4.99	4.57	5.11	4.53	4.86	4.96	4.91	4.17	4.36
Dec.	3.58	3.97	2.60	3.63	3.15	3.53	3.66	3.73	3.58	3.70
Total	108.82	105.74	99.02	105.12	94.57	98.57	104.60	104.80	73.85	82.94

Some months missing

TEMPERATURE, HUMIDITY AND WIND

The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations. The mean monthly temperatures are averages of these daily maximum and minimum temperatures.

The mean monthly temperatures and relative humidities shown for stations in the United States were integrated from continuous records of hygrothermographs, housed in louvered shelters, with the sensing elements of the instruments 16 inches above the ground and 9 feet southwest of either a 2 or 4-foot diameter evaporation pan. The maximum and minimum temperatures shown below are the extreme temperatures for the month as recorded on the charts except for Falcon Dam and Amistad Dam where the readings are based on daily maximum and minimum thermometer observations.

Monthly mean wind velocities are based on the total miles of wind movement indicated by a standard 3-cup anemometer installed and operated according to specifications for a Class A Weather Bureau evaporation station.

Temperature - Degrees Fahrenheit
In the United States

Month	Amistad Dam, Texas				Eagle Pass, Texas				Falcon Dam, Texas			
	Mean 1969	#Average March 1963-1969	1969 Max.	1969 Min.	Mean 1969	#Average 1964-1969	1969 Max.	1969 Min.	Mean 1969	#Average July 1950-1969	1969 Max.	1969 Min.
Jan.	53.1	51.1	84	30	53.9	51.8	85	28	60.9	56.8	92	33
Feb.	55.4	52.2	83	38	56.7	53.3	88	42	63.0	60.6	88	43
Mar.	56.5	61.6	90	33	58.1	61.5	96	34	63.7	64.7	94	37
Apr.	69.9	72.8	89	53	71.6	73.4	93	52	79.2	75.9	97	51
May	74.6	76.8	98	55	75.7	77.0	100	58	83.7	80.8	102	52
June	83.2	83.2	105	63	83.1	83.6	106	61	88.2	84.9	108	65
July	88.0	86.7	103	72	88.8	87.6	105	71	92.4	87.1	108	72
Aug.	85.2	85.3	109	68	86.7	85.8	108	72	90.4	86.7	105	71
Sep.	78.1	79.3	94	62	79.1	78.6	96	63	86.7	82.0	100	60
Oct.	66.5	70.1	89	47	69.7	69.4	94	50	76.1	74.3	101	50
Nov.	56.8	61.3	88	32	58.0	61.5	88	28	61.9	64.6	99	33
Dec.	52.6	51.3	72	32	54.6	53.6	76	34	57.9	57.9	80	39
Yearly	68.3	69.3	109	30	69.7	69.8	108	28	75.3	73.2	108	33

Temperature - Degrees Fahrenheit
In Mexico

Month	Cd. Juárez, Chihuahua				Ojinaga, Chihuahua				Cd. Acuña, Coahuila			
	Mean 1969	#Average July 1960-1969	1969 Max.	1969 Min.	Mean	#Average April 1954-1969	1969 Max.	1969 Min.	Mean 1969	#Average April 1951-1969	1969 Max.	1969 Min.
Jan.	50.0	44.9	77	21	55.4	49.9	82	25	51.8	49.4	90	25
Feb.	50.0	49.5	73	25	55.4	53.6	81	32	53.6	54.6	91	36
Mar.	48.2	55.7	88	25	57.2	60.5	93	30	55.4	62.6	95	28
Apr.	66.2	64.7	90	41	75.2	70.9	99	52	69.8	72.4	91	48
May	71.6	74.9	100	37	80.6	79.0	106	55	75.2	78.8	100	54
June	80.6	80.6	102	57	87.8	85.1	111	63	84.2	85.3	108	63
July	84.2	83.1	104	66	87.8	85.7	108	70	89.6	88.0	106	72
Aug.	86.0	80.7	104	68	87.8	84.2	108	70	86.0	87.9	111	68
Sep.	77.0	75.2	99	54	82.4	79.6	100	64	80.6	82.0	100	55
Oct.	66.2	65.2	91	32	75.2	70.2	99	46	68.0	71.8	93	43
Nov.	51.8	52.5	81	23	57.2	57.9	97	27	53.6	59.2	93	23
Dec.	48.2	46.4	73	21	53.6	50.0	81	21	53.6	51.2	77	30
Yearly	65.0	64.4	104	21	71.3	68.8	111	21	68.4	70.3	111	23

Month	Chupadero, Coahuila				Jiménez, Coahuila				El Remolino, Coahuila			
	Mean 1969	#Average 1961-1969	1969 Max.	1969 Min.	Mean 1969	#Average March 1951-1969	1969 Max.	1969 Min.	Mean 1969	Average June 1958-1969	1969 Max.	1969 Min.
Jan.	51.8	49.6	81	18	53.6	51.9	86	27	62.6	55.4	102	28
Feb.	53.6	54.6	86	39	57.2	56.4	82	39	60.8	59.5	99	34
Mar.	55.4	63.0	90	32	59.0	62.7	93	32	68.0	66.4	104	34
Apr.	69.8	73.6	90	52	73.4	72.0	99	50	77.0	75.2	108	48
May	73.4	77.8	97	52	78.8	77.8	99	55	78.8	79.1	111	48
June	84.2	84.0	102	63	86.0	84.2	104	64	84.2	84.4	115	59
July	87.8	87.4	100	73	87.8	86.1	99	70	87.8	86.6	113	66
Aug.	86.0	85.6	104	68	86.0	85.9	109	70	87.8	86.2	115	61
Sep.	78.8	80.8	91	59	80.6	80.5	93	63	80.6	82.4	109	50
Oct.	68.0	71.2	90	45	69.8	71.8	91	48	77.0	73.4	100	46
Nov.	55.4	61.0	86	25	60.8	61.0	95	34	69.8	65.6	99	48
Dec.	51.8	51.6	72	32	55.4	53.5	75	34	60.8	58.2	106	30
Yearly	68.0	70.0	104	18	70.7	70.3	109	27	74.6	72.7	115	28

Some months missing

TEMPERATURE, HUMIDITY AND WIND

Temperature - Degrees Fahrenheit

In Mexico

Month	Piedras Negras, Coahuila				Rancho Mercedes, Coahuila				Nuevo Laredo, Tamaulipas CILA			
	Mean 1969	#Average April 1951 - 1969	1969 Max.	1969 Min.	Mean 1969	#Average June 1959 -1969	1969 Max.	1969 Min.	Mean 1969	Average August 1964 - 1969	1969 Max.	1969 Min.
Jan.	55.4	50.9	86	27	55.4	55.8	97	27	59.0	56.8	91	30
Feb.	57.2	55.2	88	41	53.6	58.7	86	34	60.8	57.2	88	41
Mar.	59.0	61.7	95	30	53.6	63.4	84	34	62.6	65.5	95	39
Apr.	73.4	71.5	93	52	66.2	71.1	86	39	75.2	77.7	93	54
May	75.2	77.4	100	57	77.0	76.0	97	50	80.6	81.3	99	61
June	86.0	84.2	108	63	82.4	83.3	100	66	86.0	85.3	106	64
July	89.6	86.9	106	72	87.8	86.2	106	66	89.6	88.5	109	68
Aug.	86.0	86.3	109	68	89.6	85.8	115	66	87.8	87.2	109	68
Sept.	80.6	80.1	95	63	82.4	81.9	100	61	84.2	83.3	102	64
Oct.	69.8	70.2	93	46	71.6	74.9	95	45	73.4	74.0	99	50
Nov.	57.2	58.8	88	27	60.8	65.7	84	27	62.6	67.1	99	32
Dec.	55.4	51.9	75	28	59.0	59.1	82	32	59.0	58.4	82	36
Yearly	70.4	69.6	109	27	70.0	71.8	115	27	73.4	73.5	109	30

Month	Nuevo Laredo, Tamaulipas MS of M				Rancho San Juan De La Palma, Tamps.				El Treinta, Coahuila			
	Mean 1969	Average 1945 - 1969	1969 Max.	1969 Min.	Mean 1969	#Average April 1955 - 1969	1969 Max.	1969 Min.	Mean 1969	Average 1961 - 1969	1969 Max.	1969 Min.
Jan.	57.2	56.1	86	25	60.8	56.2	88	28	53.6	50.2	90	23
Feb.	60.8	60.5	82	41	60.8	60.4	81	39	55.4	55.0	90	34
Mar.	60.8	67.1	91	39	60.8	66.2	88	43	55.4	63.8	97	28
Apr.	75.2	75.3	93	59	75.2	76.0	93	54	73.4	73.8	99	50
May	78.8	80.8	99	59	78.8	81.3	100	61	75.2	78.2	100	55
June	86.0	84.8	104	68	86.0	85.9	104	68	84.2	82.4	111	61
July	91.4	88.1	106	75	89.6	89.0	106	75	86.0	84.8	106	68
Aug.	89.6	87.8	108	72	86.0	88.2	106	70	84.2	84.2	109	66
Sept.	82.4	82.0	97	68	80.6	83.2	97	66	77.0	78.8	99	57
Oct.	73.4	73.5	95	52	75.2	76.1	99	52	69.8	70.2	95	41
Nov.	60.8	64.5	86	30	62.6	66.5	86	32	57.2	60.8	90	28
Dec.	57.2	56.8	72	56	59.0	58.3	77	37	57.2	52.8	84	23
Yearly	72.8	73.1	108	25	73.0	73.9	106	28	69.0	69.6	111	23

Month	Sabinas Hidalgo, Nuevo León				Nueva Cd. Guerrero, Tamaulipas				Cd. Mier, Tamaulipas			
	Mean 1969	Average October 1961 - 1969	1969 Max.	1969 Min.	Mean 1969	Average 1958 -1969	1969 Max.	1969 Min.	Mean 1969	#Average October 1955 - 1969	1969 Max.	1969 Min.
Jan.	59.0	56.8	88	28	60.8	54.0	93	28	57.2	54.9	95	27
Feb.	62.6	60.4	86	43	62.6	58.1	88	43	60.8	59.1	86	41
Mar.	62.6	65.3	100	37	62.6	65.4	93	39	60.8	66.0	91	34
Apr.	77.0	77.2	100	46	77.0	75.8	95	57	77.0	76.0	95	54
May	80.6	80.6	106	54	78.8	80.8	100	63	80.6	80.7	104	59
June	86.0	84.6	109	66	86.0	85.1	108	66	84.2	84.7	108	64
July	89.6	86.7	109	68	89.6	87.0	108	73	89.6	86.6	106	72
Aug.	86.0	86.0	109	61	86.0	86.5	106	72	87.8	86.3	106	72
Sept.	80.6	81.3	102	63	82.4	82.1	99	68	82.4	82.0	99	61
Oct.	73.4	74.6	99	52	77.0	74.2	100	54	75.2	74.5	100	52
Nov.	60.8	65.6	88	39	64.4	65.2	90	36	60.8	64.6	91	23
Dec.	60.8	59.4	86	36	60.8	56.8	81	36	60.8	57.8	81	36
Yearly	73.2	73.2	109	28	74.0	72.6	108	28	73.1	72.8	108	23

Month	Reynosa 40 Km. S. W., Nuevo León				Retamal, Tamaulipas							
	Mean 1969	Average March 1959 - 1969	1969 Max.	1969 Min.	Mean 1969	#Average 1951 - 1969	1969 Max.	1969 Min.				
Jan.	66.2	58.8	99	28	64.4	60.5	100	25				
Feb.	66.2	62.5	100	43	64.4	63.1	99	41				
Mar.	64.4	67.7	97	34	60.8	69.3	86	37				
Apr.	77.0	75.8	100	52	75.2	77.2	93	54				
May	78.8	80.5	102	55	77.0	80.6	99	54				
June	80.6	83.3	104	59	84.2	84.4	99	63				
July	82.4	84.4	104	59	87.8	86.2	102	72				
Aug.	80.6	84.0	102	55	86.0	86.9	104	70				
Sept.	77.0	80.5	100	55	82.4	83.5	100	61				
Oct.	73.4	74.4	99	46	78.8	77.1	106	39				
Nov.	62.6	67.8	91	28	66.2	68.6	102	28				
Dec.	64.4	60.9	88	27	64.4	62.0	91	30				
Yearly	72.8	73.4	104	27	74.3	75.0	106	25				

Some months missing

TEMPERATURE, HUMIDITY AND WIND

Mean Wind Speed - Miles Per Hour
In the United States

Month	Martin King Ranch, Texas		Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1969	Average 1957-1969	1969	#Average March 1963-1969	1969	#Average December 1963-1969	1969	#Average July 1950-1969
Jan.	3.6	4.1	3.1	3.5	2.1	2.6	3.1	3.9
Feb.	4.5	4.9	4.0	4.3	2.4	3.4	3.1	4.6
Mar.	6.6	6.6	5.7	5.3	4.3	4.0	4.7	5.1
Apr.	6.8	6.5	5.6	4.8	4.3	3.8	4.8	5.7
May	6.5	7.0	4.8	5.0	3.5	3.8	4.1	5.9
June	7.2	7.5	5.9	5.6	3.8	4.1	5.1	6.2
July	6.7	7.1	5.3	5.3	3.9	4.0	5.5	6.6
Aug.	6.1	6.3	4.7	4.8	3.3	3.6	4.1	5.5
Sept.	5.2	5.3	3.7	3.9	2.5	2.9	3.9	4.2
Oct.	5.2	4.9	4.0	3.8	2.9	2.5	4.3	3.7
Nov.	3.3	4.1	2.9	3.2	2.0	2.3	3.8	4.0
Dec.	3.2	3.7	2.9	3.3	2.0	2.3	3.0	3.6
Yearly	5.4	5.7	4.4	4.4	3.1	3.3	4.1	4.9

Mean Relative Humidity-Percent
In the United States

Month	Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1969	Average March 1963-1969	1969	#Average 1964-1969	1969	Average July 1950 1969
Jan.	65.1	58.8	54.3	63.3	70.0	66.3
Feb.	62.7	59.9	51.6	63.3	71.5	64.8
Mar.	48.0	53.7	38.7	58.4	69.8	62.4
Apr.	65.6	58.8	53.3	62.9	65.7	62.8
May	68.8	64.5	56.4	70.7	68.3	65.5
June	61.2	59.4	55.5	63.3	66.8	64.6
July	57.1	54.3	58.0	59.6	62.3	60.2
Aug.	56.9	56.0	61.4	61.9	63.3	61.8
Sept.	70.4	64.6	68.5	72.0	70.2	66.2
Oct.	77.9	63.2	76.9	69.2	72.0	67.2
Nov.	73.4	62.8	74.0	69.0	70.4	67.8
Dec.	75.0	62.5	77.3	66.1	76.6	65.3
Yearly	65.2	59.9	60.5	65.0	68.9	64.6

Some months missing

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries – 1969

The total area within the outer rim of the Rio Grande Basin is about 335,500 square miles but it contains large areas, especially along its southwestern boundary, that contribute no surface run-off to the Rio Grande. Such noncontributing areas constitute about 47% of the total area, leaving 176,333 square miles of productive watershed which is the only one included in the list below.

The irrigated areas shown below are listed in accordance with the location of their diversion points and are all within the Rio Grande basin, except in the Lower Rio Grande Valley where large portions of irrigated lands in both countries lie outside the basin boundary line.

Only areas irrigated in 1969 are shown except that, in the United States below Falcon Dam, the figures shown represent acreages which were subject to irrigation in 1969 but for which data on the portion actually irrigated is not known. On the Mexican side part of the data may have been gathered previous to 1969.

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Above Elephant Butte Dam	25,923	0	25,923			
Elephant Butte Dam to Caballo Dam	1,295	0	1,295	0	0	0
Above Caballo Dam	27,218	0	27,218	0	0	0
Caballo Dam to El Paso Station	2,049	0	2,049	92,553	0	92,553
Above El Paso Gaging Station	29,267	0	29,267	92,553	0	92,553
El Paso Station to American Dam	4	0	4	14,069	0	14,069
Above American Dam	29,271	0	29,271	106,622	0	106,622
American Dam to Island Station	187	285	472	34,444	24,041	58,485
Above Island Gaging Station	29,458	285	29,743	141,066	24,041	165,107
Island Station to County Line Station	485	259	744	0	0	0
American Dam to County Line Station - Total	672	544	1,216	34,444	24,041	58,485
Above County Line Gaging Station	29,943	544	30,487	141,066	24,041	165,107
County Line Station to Fort Quitman Station	663	794	1,457	18,769	0	18,769
Above Fort Quitman Gaging Station	30,606	1,338	31,944	159,835	24,041	183,876
Fort Quitman Station to Above Presidio Station	1,621	1,401	3,022	1,239	489	1,728
Above Presidio Station above Río Conchos	32,227	2,739	34,966	161,074	24,530	185,604
Río Conchos above Boquilla Dam	0	8,131	8,131	0	a) 5,832	5,832
Río Conchos above Granero Dam	0	22,992	22,992	0		
Río Conchos - Total	0	26,404	26,404	0	384,408	384,408
Alamito Creek above Gaging Station	1,504	0	1,504	0	0	0
Presidio Station above Río Conchos to Presidio Station below Río Conchos - excluding above tributaries	367	98	465	3,978	227	4,205
Presidio Station above Río Conchos to Presidio Station below Río Conchos - Total	1,871	26,502	28,373	3,978	384,635	388,613
Above Presidio Station below Río Conchos	34,098	29,241	63,339	165,052	409,165	574,217
Terlingua Creek above Gaging Station	1,070	0	1,070	b) 2,400	0	2,400
Presidio Station below Río Conchos to Johnson Ranch Station - excluding Terlingua Creek	1,093	2,258	3,351	1,043	1,631	2,674
Presidio Station below Río Conchos to Johnson Ranch Station - Total	2,163	2,258	4,421	c) 3,443	1,631	5,074
Above Johnson Ranch Gaging Station	36,261	31,499	67,760	168,495	410,796	579,291
Johnson Ranch Station to Foster Ranch Station	6,412	6,570	12,982	d) 2,635	0	2,635
Above Foster Ranch Gaging Station	42,673	38,069	80,742	171,130	410,796	581,926
Foster Ranch Station to Langtry Station	182	505	687	0	0	0
Above Langtry Gaging Station	42,855	38,574	81,429	171,130	410,796	581,926
Pecos River above Girvin	29,562	0	29,562		0	
Pecos River, Girvin to Station near Langtry	5,617	0	5,617	0	0	0
Pecos River above Station at Mouth (Discontinued)	35,308	0	35,308	0	0	0
Devils River above Pafford Crossing Station	3,961	0	3,961	0	0	0
Devils River above Station near Mouth (Discontinued)	4,305	0	4,305	0	0	0
Langtry Station to Amistad Dam - excluding above tributaries	217	1,875	2,092	0	0	0
Langtry Station to Amistad Dam - Total	39,830	1,875	41,705	0	0	0

a) Includes area above Madero Reservoir b) Irrigated by spreader dams c) Includes 2,400 acres irrigated by spreader dams
d) Includes 1,650 acres irrigated by spreader dams

DRAINAGE BASIN AND IRRIGATED AREAS

Along the Rio Grande and Tributaries – 1969

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Above Amistad Dam	82,685	40,449	123,134	171,130	410,796	581,926
Amistad Dam to Below Amistad Dam Gaging Station	5	4	9	0	0	0
Above the Below Amistad Dam Gaging Station	82,690	40,453	123,143	171,130	410,796	581,926
Below Amistad Dam Station to Del Rio Station	60	100	160	270	0	270
Above Del Rio Gaging Station	82,750	40,553	123,303	171,400	410,796	582,196
Arroyo Las Vacas above Gaging Station	0	350	350	0	717	717
San Felipe Creek above Gaging Station	46	0	46	2,300	0	2,300
Pinto Creek above Gaging Station	249	0	249	100	0	100
Río San Diego above Gaging Station	0	853	853	0	12,293	12,293
Río San Diego - Total	0	859	859	0	13,731	13,731
Del Rio Station to Below Maverick Dam Station near Quemado - excluding above tributaries	669	110	779	44,902	1,008	45,910
Del Rio Station to Below Maverick Dam Station near Quemado - Total	964	1,319	2,283	47,302	15,456	62,758
Above the Below Maverick Dam Gaging Station near Quemado	83,714	41,872	125,586	218,702	426,252	644,954
Río San Rodrigo near Mouth above Gaging Station	0	1,049	1,049	0	5,313	5,313
Río San Rodrigo - Total	0	1,049	1,049	0	6,408	6,408
Below Maverick Dam Station near Quemado to Maverick Power Plant - excluding Río San Rodrigo	287	114	401	10	0	10
Below Maverick Dam Station near Quemado to Maverick Power Plant - Total	287	1,163	1,450	10	6,408	6,418
Above Maverick Power Plant	84,001	43,035	127,036	218,712	432,660	651,372
Maverick Power Plant to Eagle Pass Station	244	32	276	45	2,011	2,056
Above Eagle Pass Gaging Station	84,245	43,067	127,312	218,757	434,671	653,428
Río Escondido above Gaging Station	0	1,459	1,459	0	10,116	10,116
Río Escondido - Total	0	1,471	1,471	0	10,116	10,116
Eagle Pass Station to San Antonio Crossing Station - excluding Río Escondido	237	206	443	250	801	1,051
Eagle Pass Station to San Antonio Crossing Station - Total	237	1,677	1,914	250	10,917	11,167
Above San Antonio Crossing Gaging Station	84,482	44,744	129,226	219,007	445,588	664,595
San Antonio Crossing Station to Palafox Station	629	1,683	2,312	1,000	1,653	2,653
Above Palafox Gaging Station	85,111	46,427	131,538	220,007	447,241	667,248
Palafox Station to Laredo Station	607	433	1,040	4,472	3,156	7,628
Above Laredo Gaging Station	85,718	46,860	132,578	224,479	450,397	674,876
Río Salado above Venustiano Carranza Dam	0	15,831	15,831	0	63,639	63,639
Río Salado above Las Tortillas Gaging Station	0	23,155	23,155	0	105,745	105,745
Río Salado above River Road Crossing	0	23,323	23,323	0	105,745	105,745
Laredo Station to Falcon Dam - excluding Río Salado	2,042	1,327	3,369	e) 8,540	4,663	13,203
Laredo Station to Falcon Dam - Total	2,042	24,650	26,692	8,540	110,408	118,948
Amistad Dam to Falcon Dam - excluding above tributaries	4,780	4,009	8,789	59,489	13,292	72,781
Above Falcon Dam	87,760	71,510	159,270	233,019	560,805	793,824
Río Alamo above Gaging Station	0	1,675	1,675	0	7,660	7,660
Río San Juan above Marte Gómez Dam	0	12,745	12,745	0	102,548	102,548
Río San Juan - Marte Gómez Dam to Camargo Gaging Station	0	195	195	0	171,465	171,465
Río San Juan - Total	0	12,949	12,949	0	274,013	274,013
Falcon Dam to Ft. Ringgold Station - excluding above tributaries	222	246	468	8,955	2,224	11,179
Falcon Dam to Ft. Ringgold Station - Total	222	14,870	15,092	8,955	283,897	292,852
Above Fort Ringgold Gaging Station	87,982	86,380	174,362	241,974	844,702	1,086,676
Fort Ringgold Station to Anzaldúas Dam	952	798	1,750	186,372	496,511	682,883
Above Anzaldúas Dam	88,934	87,178	176,112	428,346	1,341,213	1,769,559
Anzaldúas Dam to Progreso Station	13	163	176	145,638	5,244	150,882
Above Progreso Gaging Station	88,947	87,341	176,288	573,984	1,346,457	1,920,441
Progreso Station to San Benito Station	7	9	16	313,361	8,468	321,829
Above San Benito Gaging Station	88,954	87,350	176,304	887,345	1,354,925	2,242,270
San Benito Station to Brownsville Station	14	15	29	116,559	1,522	118,081
Falcon Dam to Brownsville Station - excluding Río Alamo and Río San Juan	1,208	1,231	2,439	770,885	513,969	1,284,854
Above Brownsville Gaging Station	88,968	87,365	176,333	1,003,904	1,356,447	2,360,351

e) Includes 45 acres irrigated from small reservoirs

DRAINAGE BASIN AND IRRIGATED AREAS

Along the Rio Grande and Tributaries – 1969

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Brownsville Station to Gulf of Mexico				6,400	932	7,332
Falcon Dam to Gulf of Mexico - excluding Río Alamo and Río San Juan				777,285	514,901	1,292,186
Amistad Dam to Gulf of Mexico - excluding above tributaries				836,774	528,193	1,364,967
Above Gulf of Mexico				1,010,304	1,357,379	2,367,683

SUPPLEMENTARY DATA–INTERNATIONAL FALCON RESERVOIR

Deduced Inflows

Considering that a knowledge of the mean daily inflows reaching the International Falcon Reservoir would serve a useful purpose, such data have been deduced for 1969 showing the flows as close as they can be approximated. These data are based on the daily operation of the *International* Falcon Reservoir, taking into account: a) record of gage heights at the dam; b) releases as measured at both hydroelectric plants and outlet works; c) elevation-area-capacity tables based on 1956 surveys; and d) rate of evaporation measured at the dam and at Nueva Cd. *Guerrero* applied to an area one foot higher than the average area of two consecutive days.

Flow contributions from different sources, irrigation diversion between Laredo and Falcon, river channel losses, reservoir evaporation, accuracy of gage-height records, displacement due to wind action on the reservoir, and bank storage and return incident to changes in *reservoir level*, all tend to cause variations in the deduced determinations and the inflows shown below should not necessarily be in agreement with the combined flow of the Rio Grande at Laredo and the Rfo Salado at Las Tortillas.

In spite of the deficiencies noted above and others that may occur, the data shown below represent *a reasonable approximation of the* flows entering the International Falcon Reservoir.

Mean Daily Discharge in Second-Feet 1969 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,020	117	639	925	1,720	777	308	1,230	7,130	1,070	2,180	2,370
2	406	593	1,280	777	136	4,560	83.3	1,280	4,340	427	2,970	2,520
3	512	1,330	717	1,110	279	2,540	162	1,350	3,480	360	1,420	1,920
4	357	378	172	1,970	961	2,620	274	752	664	410	1,820	2,340
5	122	2,040	339	1,360	1,500	590	174	219	1,930	2,400	1,410	3,250
6	1,510	1,950	364	1,790	3,420	288	124	267	1,820	2,040	1,550	2,220
7	1,450	1,110	1,120	1,220	2,260	289	229	590	1,680	12,600	1,640	1,550
8	2,280	1,170	975	826	5,190	484	263	297	1,520	9,220	1,820	1,470
9	1,730	893	1,030	1,400	2,960	302	309	154	2,030	4,410	1,870	2,080
10	107	403	431	1,510	1,730	360	345	228	1,830	3,230	2,060	3,380
11	285	1,560	452	512	2,950	306	275	667	1,920	2,800	2,020	191
12	1,730	1,520	38.8	5,580	3,960	296	600	703	1,830	3,460	1,920	1,590
13	745	2,380	118	7,950	3,780	219	579	671	1,590	3,280	1,960	2,110
14	1,270	1,760	1,020	13,300	7,980	262	509	484	1,420	4,480	438	1,900
15	1,610	1,440	1,660	6,110	4,240	280	752	466	1,480	5,230	773	1,390
16	1,700	1,290	1,830	3,670	12,500	150	523	537	2,050	4,410	646	1,500
17	1,470	2,220	689	3,020	5,300	302	345	911	1,800	2,740	2,160	1,590
18	1,360	2,760	381	378	696	228	86.5	823	2,450	2,210	2,430	1,740
19	530	77.3	1,090	533	3,030	271	246	579	2,340	2,280	706	1,680
20	1,440	735	1,470	1,060	1,340	54.0	420	1,450	2,050	2,910	101	805
21	1,730	1,340	1,380	1,480	2,060	43.1	1,165	1,260	2,270	1,860	161	2,250
22	1,660	650	1,070	544	1,860	148	936	371	2,060	1,670	660	1,310
23	1,180	1,890	1,850	1,550	1,050	293	886	795	4,030	1,140	1,650	2,040
24	2,280	367	1,060	434	660	269	600	724	4,030	1,420	1,970	1,110
25	70.3	360	406	321	950	185	420	463	3,350	1,120	2,570	1,050
26	1,280	1,320	646	1,270	713	107	350	388	1,900	1,530	2,500	1,040
27	893	1,390	313	3,920	1,110	2,980	759	929	1,580	4,310	4,240	2,070
28	1,540	224	96.1	67.4	653	2,680	1,330	5,930	1,590	4,630	2,110	2,480
29	1,830		1,210	109	452	975	1,410	28,500	1,670	7,420	1,830	2,450
30	2,800		1,500	618	343	646	1,730	15,800	1,450	11,800	2,290	1,390
31	971		1,420		198		685	9,390		3,140		614
Sum	33,267.3		65,314.4		23,504.1		78,208		110,007		55,400	
	38,868.3		26,766.9		75,981		16,877.8		69,284		51,875	

Month	Current Year 1969 Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1968-1969 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			30	2,800	25	70.3	1,250	77,110	100,587	124,065	77,110
Feb.			18	2,760	19	77.3	1,190	65,950	82,248	98,547	65,950
Mar.			23	1,850	12	38.8	862	53,064	75,412	97,759	53,064
Apr.			14	13,300	28	67.5	2,180	129,549	133,835	138,122	129,549
May			16	12,500	2	136	2,450	150,658	161,972	173,285	150,658
June			2	4,560	21	43.1	784	46,609	69,663	92,717	46,609
July			30	1,730	2	83.3	544	33,481	84,372	135,265	33,481
Aug.			29	28,500	9	154	2,520	155,225	122,103	155,225	88,980
Sept.			1	7,130	4	664	2,310	137,408	190,541	243,673	137,408
Oct.			7	12,600	3	360	3,530	218,205	184,670	218,205	151,137
Nov.			27	4,240	20	101	1,740	102,912	98,870	102,912	88,829
Dec.			10	3,380	11	191	1,790	109,896	109,762	109,896	109,628
Yearly				28,500		38.8	1,770	1,280,067	1,411,035	1,542,007	1,280,067

Ø Mean daily

CORRECTIONS TO PREVIOUS WATER BULLETINS

Water Bulletin and Page Numbers	Heading	Reference	Published As		Correction
32-99	Electrical Conductivity of Water Samples	Rio Grande below Anzalduas Dam	June 11	11,090	1,090
33-14 34-14 35-14 36-14 37-14 38-15	Rio Grande at Fort Quitman, Texas	DESCRIPTION	10 miles northwest of Esperanza, Texas		9 miles south-east of Esperanza, Texas
34-42 35-44 36-44 37-49 38-46	Rio San Diego at Jimenez, Coahuila	DESCRIPTION Line 6-river miles		6.3	11.0
35-45 36-45 37-50 38-47	Rio Grande below Maverick Dam near Quemado, Texas	DESCRIPTION Line 2-river mile		523.4	523.3
37-102	Rainfall on and adjacent to the Rio Grande Watershed	Longitude for San Bias, Coahuila		100° 43'	101° 43'
38-20	Terlingua Creek near Terlingua, Texas	EXTREME FLOWS FROM RECORDS	Min. .01 (Two places)		Min. 0.1
38-41	Rio Grande at Del Rio, Texas	EXTREME FLOWS FROM RECORDS-Line 4		94.2	176
		Mean Daily Discharges	July 13	243	316
			Sum	38,077	38,150
		Annual and Period Summary Extreme Second-Feet	July	94.2	176
			Yearly	94.2	176
		Total Acre-Feet	July	75,526	75,671
			Yearly	1,027,481	1,027,626
		Period Average	July	133,006	133,024
			Yearly	1,651,934	1,651,952
		Period Minimum	July	75,526	75,671
			Yearly	1,027,481	1,027,626
38-50	Diversion from the Rio Grande Maverick Canal Extension below the Power Plant near Eagle Pass, Texas	REMARKS Line 5		127,957	133,997
38-87	Sources of River Flow	Textual heading, Line 5	more than 10,000,000		about 17,000,000
38-118	Rainfall on the Rio Grande Watershed	For Laredo Water Plant, June 1968		.56	1.56
		1968 Yearly Rainfall - Inches		18.34	19.34
38-119	Rainfall on the Rio Grande Watershed	For HCWCID #6 Goodwin Pump No. 48			
		Average Dec. 1968		.97	1.03
		Average Yearly 1968		18.12	18.18
38-137	Location of Rainfall Stations on the Rio Grande Watershed	Goldwire Ranch, Longitude		57° 27'	100° 57'

Flow of the Rio Grande and Related Data

1969

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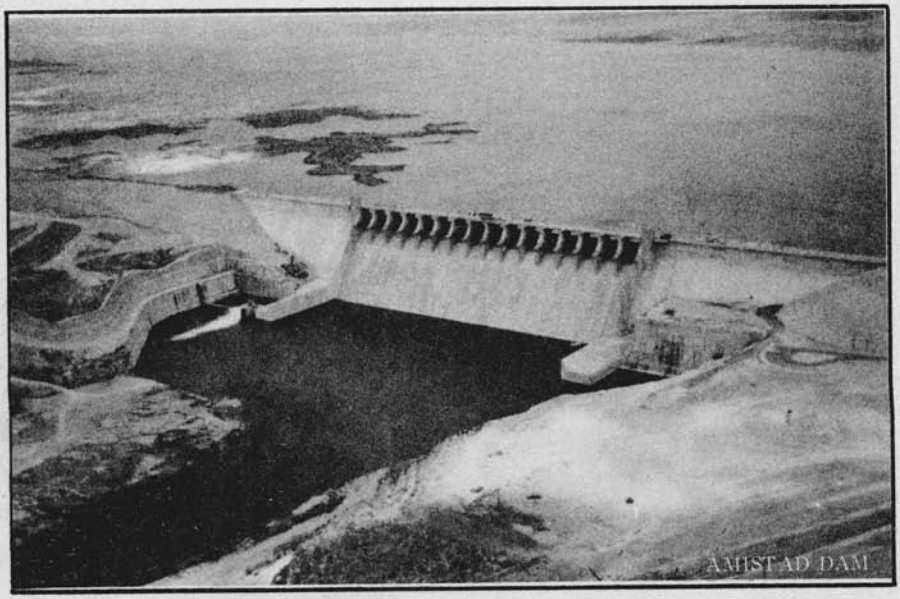

UNITED STATES OF AMERICA
DEPARTMENT OF STATE

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

WATER BULLETIN NUMBER 39

GE28

COVER PHOTOGRAPH

Amistad Dam is the second major international storage dam to be constructed on the Rio Grande pursuant to the 1944 Water Treaty between the United States and Mexico. It is located 12.8 miles upstream from Del Rio, Texas and Cd. Acuña, Coahuila. The principal purposes and benefits are flood control and water conservation, but penstocks were included to make possible later installation of hydroelectric power generating facilities.

Amistad Reservoir, with a gross capacity of 5,660,000 acre-feet, is the eleventh largest reservoir in the United States and the third largest international reservoir in the world. Permanent storage began July 12, 1968.