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WATER BULLETIN NUMBER 47

Flow of the Rio Grande and Related Data

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

1977

STORAGE IN MAJOR RESERVOIRS
SOURCES OF RIVER FLOW
DIVERSIONS
SUSPENDED SILT
CHEMICAL ANALYSES
SANITARY ASPECTS OF WATER QUALITY
CLIMATOLOGICAL DATA
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FOREWORD

This bulletin presents the forty-seventh 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 1977.

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 1977 the United States Section of the Commission operated the stream-gaging stations on the Rio Grande at El Paso, American Dam, Clint, Acala, Fort Quitman, Above Rio Conchos, Below Rio Conchos, Johnson Ranch, Foster Ranch, Del Rio, El Indio, Rio Grande City, San Benito, and Brownsville. The Mexican Section operated the stream-gaging stations on the Rio Grande at Below Amistad Dam, Jimenez, Piedras Negras, Villa Hidalgo, 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.

Beginning in 1976, the names of several gaging stations have been changed, pursuant to agreement between the two Sections of the Commission. Where it has been decided that some confusion may result from this change, a note, giving the former name, has been added to the descriptive heading of the gaging station.

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 11,487,100 acre-feet, in addition to the International Amistad and Falcon Reservoirs, which have a combined conservation capacity of 6,165,000 acre-feet. In the Rio Grande Basin, a rounded total of 2,258,000 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 1954-1977, this flow has averaged 875,200 acre-feet per year.

The mean sea level datum, referred to as the U. S. C. & G. S. in the description of the stream-gaging stations, is the North American Vertical Datum of 1927.

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 National Weather Service of the U.S. Department of Commerce; the Texas Board of Health; the Texas Department of Water Resources; the Sanchez Ditch and Reservoir Company; the Middle Rio Grande Conservancy District; the Red Bluff Water Power Control District; State of Colorado, Division of Water Resources; 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 El Paso Department of Water and Sewerage; the Maverick County Water Control and Improvement District No. 1; the Ministry of Agriculture and Hydraulic Resources 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 Cd. Acuna, Coahuila.

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, irrigation projects on the Rio Conchos and its tributaries in 1947, International Falcon Dam in 1953, and Amistad Dam and Luis L. Leon Dam in 1968.

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.

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 Inch
1 Meter		3.28084 Feet
1 Kilometer		0.621371 Mile
	AREAS	
1 Square Meter		10.76391 Square Feet
1 Hectare		2.471054 Acres
1 Square Kilometer		0.386102 Square Mile
	VOLUMES	
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 (2,000 lbs.)

Beginning in 1976, as a step toward eventual publication of this bulletin in metric units only, both English and metric units are used to report the figures in the descriptive headings and for the yearly figures of the annual and period summaries of all gaging station pages. The yearly figures for the summaries are obtained by direct conversion, except for those stations operated by the Mexican Section, where the metric system of units is used.

GENERAL HYDROLOGIC CONDITIONS FOR 1977

Along and Adjacent to the International Portion of the Rio Grande

During the year 1977, temperatures were about normal on the watershed of the Rio Grande below El Paso, Texas. Evaporation was normal. Precipitation was 59% of normal from El Paso to Amistad Dam, 66% of normal from Amistad Dam to Falcon Dam, 58% of normal from Falcon Dam to Rio Grande City, and 88% 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 Amistad Reservoir, and above 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 35% of normal, ranging from 58% of normal at El Paso to 6% at Acala; 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 61% of normal; and in the reach between Amistad Dam and Falcon Reservoir, where flows were partly regulated by releases from Amistad Reservoir, the flow averaged 106% of normal. Flows passing Rio Grande stations below Falcon Dam were partly regulated by releases from Falcon Reservoir. Such releases in 1977 amounted to 2,637,800 acre-feet, or 113% of the average for the twenty-four years of operation, 1954 to 1977. The volume of flow wasted to the Gulf of Mexico was 1,490,170 acre-feet, or 170% of the average for this twenty-four year period.

The total annual flow of all measured tributaries below Fort Quitman was 80% of normal. The total flow of these tributaries in the United States was 622,083 acre-feet, or 88% of normal. For Mexico, the measured tributary flow, excluding Rio Alamo and Rio San Juan, was 1,042,808 acre-feet, or 84% of normal. The flow of the Rio Alamo and Rio San Juan was 59% and 65% of their respective normals.

Return flow to the Rio Grande at Maverick Power Plant near Eagle Pass was 499,514 acre-feet, or 90% of the twenty-nine year average. Return flow to the Rio Grande through various drains in the Maverick County irrigation district excluding storm inflow amounted to 145,533 acre-feet, or 77% of the nineeen-year average.

There were no floods of consequence on the Rio Grande in 1977. The highest peak flows recorded on the Rio Grande were, above Falcon Dam, 33,200 second-feet at Laredo; and, below Falcon Dam, 13,800 second-feet at Rio Grande City.

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 1977 was 4,349,700 acre-feet, or 100% of the normal 4,340,200 acre-feet. In the United States, stored water in these reservoirs averaged 53% of normal, while in Mexico the average was 121% of normal.

In International Amistad Reservoir there was a net decrease in storage during the year of 437,800 acre-feet. Storage ranged from a high of 3,893,800 acre-feet on April 25 to a low of 3,298,900 acre-feet on October 17 to 20 and averaged 3,559,900 acre-feet during the year, or 131% of the average for the period of operation June 1968 through 1977. In International Falcon Reservoir there was a net decrease in storage during the year of 656,500 acre-feet. The storage varied from a high of 3,021,300 acre-feet on January 24 to a low of 2,292,300 acre-feet on August 28 and averaged 2,647,900 acre-feet during the year, or 133% of the average for the twenty-four years of operation, 1954 through 1977.

Diversions from the Rio Grande in the United States were, on the average, 94% of normal. Diversions into the American Canal were 68% of normal; into the Maverick Canal 92% of normal; and in the United States below Falcon Dam, 103% of the average for the twenty-one years, 1957-1977. In Mexico, diversions averaged 84% of normal. Diversions into the Acequia Madre were 52% of normal, while diversions through the Anzalduas Canal for irrigation in Mexico were 86% of the twenty-four year average.

In 1977, the total reported irrigated acreage from the Rio Grande and its tributaries below El Paso, Texas showed a nonappreciable change from the previous year. On the United States side, there was a decrease of about 5% above and practically no change below Falcon Dam, for an overall average decrease of 1%. On the Mexican side, there was a decrease of 3% above and an increase of 4% below Falcon Dam, for an overall average increase of 1%.

The 1977 investigation of the quality of Rio Grande water extended from El Paso to Brownsville. The annual tonnage of salts carried by the river at Fort Quitman was 22% of the 1938-1977 average; above Amistad Reservoir, at Foster Ranch, 59% of the 1968-1977 average; above Falcon Reservoir, at Laredo, 113% of the 1968-1977 average; and at the station below Anzalduas Dam, 102% of the 1959-1977 average. The volume of suspended silt transported by the Rio Grande in 1977 was 40% of the 1969-1977 average at Foster Ranch above Amistad Reservoir, 21% of the 1968-1977 average at Laredo above Falcon Reservoir, and 173% of the 1955-1977 average at Brownsville.

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

DESCRIPTION: Concrete wall control, bubbler gage, and water-stage recorder located on the left bank 100 feet (30.5 m) upstream from the cableway at latitude 33°08'45", longitude 107°12'20", and river mile 1,399.1 (2,235.5 km); 0.7 river mile (1.1 km) downstream from Elephant Butte Dam, 1.5 river miles (2.4 km) upstream from Cuchillo Negro River, and 135.1 river miles (217.4 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 4,242.09 feet (1,292.99 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 26 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 1977.

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 (Cubic Meters per Second)

Daily:	Max.	8,220 (233)	May 22, 1942	Min.	0	Occasionally
Monthly:	Max.	7,600 (215)	May 1942	Min.	1.2 (0.03)	Nov. 1971
Yearly:	Max.	2,510 (71.1)	1942	Min.	253 (7.16)	1964

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20.0	‡ 253	‡ 224	22.0	18.0	840	1,550	‡ 686	7.3	9.5	9.9	‡ 7.3
2	15.0	226	253	18.0	‡ 562	854	1,540	700	‡ 11.0	7.8	9.7	7.3
3	‡ 470	223	249	18.0	888	833	1,550	703	13.0	‡ 5.6	‡ 9.9	7.3
4	493	217	249	‡ 15.0	894	854	1,550	708	12.0	4.0	10.0	6.6
5	864	15.0	19.0	13.0	912	845	1,560	712	347	1.8	11.0	5.3
6	982	12.0	16.0	14.0	941	850	1,550	715	641	3.6	11.0	3.9
7	860	220	244	13.0	36.0	861	1,570	720	683	3.3	11.0	4.0
8	20.0	218	250	17.0	351	1,520	1,560	724	279	3.4	10.0	3.0
9	15.0	224	250	19.0	911	1,510	1,560	728	8.0	1.8	9.7	3.0
10	‡ 930	219	251	20.0	962	1,510	1,580	735	7.4	2.6	‡ 9.3	3.0
11	897	216	250	20.0	949	1,520	1,590	1,170	8.0	2.8	9.1	3.5
12	884	16.0	16.0	19.0	971	1,510	1,600	1,190	8.1	3.6	9.1	3.8
13	915	13.0	13.0	18.0	967	1,520	1,610	1,210	7.5	4.2	8.5	3.0
14	910	214	248	18.0	40.0	1,510	1,660	1,210	8.7	‡ 8.8	8.5	6.4
15	15.0	‡ 217	‡ 251	18.0	11.0	‡ 1,510	‡ 1,620	1,210	‡ 9.1	8.2	8.5	‡ 8.5
16	10.0	219	266	18.0	‡ 933	1,520	1,620	1,220	10.0	7.9	8.5	8.5
17	780	228	250	18.0	977	1,520	1,620	1,230	11.0	7.1	8.7	7.9
18	‡ 790	239	252	‡ 527	964	1,520	1,620	‡ 1,230	11.0	4.6	8.5	8.2
19	‡ 791	17.0	20.0	531	978	1,520	1,630	1,260	11.0	4.2	10.0	8.0
20	810	14.0	18.0	528	998	1,520	1,620	637	11.0	4.2	9.2	7.1
21	815	217	249	531	41.0	1,510	1,610	631	11.0	4.1	9.0	7.3
22	20.0	274	252	529	11.0	1,520	1,620	636	11.0	3.9	8.9	7.3
23	14.0	222	251	27.0	937	1,530	1,610	636	11.0	3.6	8.5	7.5
24	794	227	252	17.0	955	1,520	1,610	642	12.0	3.1	7.9	7.9
25	798	225	255	521	975	1,560	1,600	645	12.0	3.3	7.9	7.9
26	807	18.0	79.0	530	956	1,550	1,280	649	14.0	10.0	7.9	7.9
27	818	15.0	13.0	529	969	1,560	1,260	652	15.0	12.0	8.0	7.9
28	868	222	250	529	42.0	1,550	678	653	16.0	11.0	8.1	7.9
29	20.0		255	529	11.0	1,560	669	656	16.0	12.0	7.0	7.9
30	14.0		255	24.0	904	‡ 1,560	672	650	13.0	11.0	6.7	7.9
31	891		260		1,220 ‡		676	47.0		11.0		7.9
Sum	4,640.0		5,650.0		41,067			25,195.0		184.0		200.9
	17,330.0		5,960.0		21,284.0		45,045		2,235.1		270.0	

Month	Current Year 1977								Period 1938-1977		
	Extreme Gage Feet		∅ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			6	982	16	10.0	559	34,374	24,697	86,500	200
Feb.			22	274	6	12.0	166	9,203	37,866	88,861	188
Mar.			16	266	†13	13.0	192	11,821	71,497	128,925	1,520
Apr.			†19	531	† 5	13.0	188	11,207	77,304	162,000	11,207
May			31	1,220	†15	11.0	687	42,216	79,953	467,000	512
June			†25	1,560	3	833	1,370	81,455	90,523	363,000	16,913
July			14	1,660	29	669	1,450	89,345	92,614	211,000	41,352
Aug.			19	1,260	31	47.0	813	49,974	74,847	134,000	9,530
Sept.			7	683	1	7.3	74.5	4,433	33,050	129,000	163
Oct.			†27	12.0	† 5	1.8	5.9	365	17,046	72,100	166
Nov.			† 5	11.0	30	6.7	9.0	536	17,109	158,000	74.2
Dec.			†15	8.5	† 8	3.0	6.5	398	18,875	87,300	179
				1,660		1.8	463	335,327	635,381	1,818,800	183,415
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				47.0		0.05	13.1	413,626	783,742	2,243,490	226,242

‡ Discharge measurement made on this day ∅ 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 1,360.8 (2,190.0); 0.8 river mile (1.3 km) downstream from Caballo Dam, about 3 miles (5 km) northeast of Arrey, New Mexico, 5 miles (8.0 km) south of Caballo, New Mexico, and 106.8 river miles (171.9 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 4,140.90 feet (1,262.15 m) 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 El Paso office of the United States Bureau of Reclamation. Records available: 1938 through 1977.

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 (701,000 m^3) of water were diverted in 1977 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 (2.4 km) 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 (Cubic Meters per Second)

Daily:	Max. 7,650 (217)	May 20, 1942	Min. 0.1 (0.003)	Several days	1954, 1955 and 1972
Monthly:	Max. 6,710 (190)	May 1942	Min. 0.1 (0.003)	Nov. & Dec.	1955
Yearly:	Max. 2,480 (70.2)	1942	Min. 284 (8.04)		1964

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0	3.1	3.0	1,050	885	1,050	1,540	1,420	1,390	2.5	1.0	0.8
2	3.0	3.1	3.0	965	862	‡ 972	1,470	1,720	1,210	2.4	1.0	.8
3	3.0	3.1	179	954	777	1,010	1,120	1,950	1,110	2.4	1.0	.8
4	2.9	3.1	717	964	693	990	874	‡ 2,040	1,090	2.3	1.0	.8
5	2.9	3.1	673	872	643	946	846	1,960	1,150	2.3	1.0	.8
6	2.9	3.1	671	858	667	917	891	1,980	1,420	2.2	1.0	.8
7	2.9	3.1	672	907	696	867	800	1,850	1,170	2.2	1.0	.8
8	2.9	3.1	672	906	608	841	696	1,700	908	2.1	1.0	.8
9	2.9	3.1	889	915	589	844	596	1,720	863	2.1	1.0	.8
10	2.9	3.1	1,300	941	568	‡ 878	700	1,870	494	2.0	.9	.8
11	2.9	3.1	1,340	940	481	896	700	‡ 1,790	56.0	2.0	.9	.8
12	2.9	3.1	1,370	‡ 930	‡ 437	915	‡ 843	1,510	5.0	1.9	.9	.8
13	2.9	3.1	1,370	929	519	893	1,070	1,280	3.0	1.9	.9	.8
14	2.8	3.0	1,370	936	549	945	1,090	1,160	3.0	1.9	.9	.8
15	2.8	3.0	‡1,500	888	537	1,030	1,190	1,040	3.0	1.8	.9	.7
16	2.8	3.0	1,520	813	577	1,070	1,220	1,040	3.0	1.8	.9	.7
17	2.8	3.0	1,410	789	699	1,340	1,190	1,040	3.0	1.7	.9	.7
18	2.8	3.0	1,450	725	787	‡ 1,490	1,240	1,040	2.8	1.7	.9	.7
19	2.8	‡ 3.0	1,480	‡ 783	820	1,520	1,370	1,050	2.8	1.6	.9	.7
20	2.8	3.0	1,470	811	882	1,510	927	1,050	2.7	1.6	.9	.7
21	2.8	3.0	1,450	761	925	1,560	1,330	990	2.7	1.5	.9	.7
22	2.8	3.0	1,390	762	903	‡ 1,620	‡ 1,240	919	2.6	1.5	.9	.7
23	2.8	3.0	1,340	802	889	1,650	1,100	1,040	2.6	1.4	.9	‡ .7
24	2.9	3.0	1,340	851	970	1,710	873	1,160	2.5	1.4	.9	.7
25	2.9	3.0	1,470	864	1,110	1,800	840	1,130	2.5	1.4	.9	.7
26	2.9	3.0	1,430	856	‡1,130	1,750	943	1,230	5.9	1.3	.9	.7
27	3.0	3.0	1,280	801	992	1,720	1,020	1,300	‡ 4.0	1.3	.8	.7
28	3.0	3.0	1,280	759	851	1,820	1,070	1,290	3.0	1.2	.8	.7
29	‡ 3.0		1,240	818	891	1,920	1,350	1,280	2.5	1.1	.8	.7
30	3.0		1,190	887	983	1,700	1,490	1,340	2.5	1.0	.8	.7
31	3.0		1,230		1,040		1,480	1,410		1.0		.7
Sum	89.7	85.3	34,699.0	26,037	23,960	38,174	33,109	43,299	10,920.1	54.5	27.5	23.1

Month	Extreme Gage Feet		∅ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1938-1977 Acre-Feet		
			High		Low						
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.			† 1	3.0	†14	2.8	2.9	178	1,120	21,032	19.2
Feb.			† 1	3.1	†14	3.0	3.0	169	7,513	64,300	11.7
Mar.			16	1,520	† 1	3.0	1,120	68,824	84,462	135,000	24,900
Apr.			1	1,050	18	725	868	51,644	80,023	212,000	25,470
May			26	1,130	12	437	773	47,524	74,912	412,000	75.2
June			29	1,920	8	841	1,270	75,717	103,342	354,000	25,289
July			1	1,540	9	596	1,070	65,671	109,023	234,000	28,200
Aug.			4	2,040	22	919	1,400	85,882	106,310	179,000	20,500
Sept.			6	1,420	†24	2.5	364	21,660	48,039	181,000	6,757
Oct.			1	2.5	†30	1.0	1.8	108	4,210	35,400	15.5
Nov.			† 1	1.0	†27	.8	.9	54.5	2,257	14,400	7.0
Dec.			† 1	.8	†15	.7	.7	45.8	2,339	19,100	6.0
				2,040		0.7	577	417,477.3	623,550	1,795,670	206,084.6
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				57.8		0.02	16.3	514,958	769,149	2,214,959	254,205

‡ 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 1,255.7 (2,020.8 km); 5.5 river miles (8.9 km) upstream from the Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua and 1.7 miles (2.7 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 3,722.30 feet (1,134.56 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily discharges in 1977 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 1977.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 24,000 second-feet (680 m^3/sec) 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 (382 m^3/sec) on September 3, 1925.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	23,680 (671)	June 12, 1905	Min.	0	Occasionally
Monthly:	Max.	14,300 (405)	June 1905	Min.	0	Occasionally
Yearly:	Max.	2,780 (78.7)	1905	Min.	70.1 (1.99)	1902

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	146	98.0	48.8	540	355	401	717	704	490	41.7	43.9	39.1
2	147	98.2	51.0	522	366	454	761	764	587	43 0	38.8	41.7
3	143	101	51.7	502	359	420	714	712	642	50.7	39.4	43.1
4	142	96.8	52.4	452	310	358	608	733	721	80.1	39.4	42.9
5	142	96.1	51.7	438	299	402	864	641	570	59.7	39.5	43.8
6	140	96.4	53.8	371	285	443	648	661	641	55.7	40.4	43.1
7	139	91.4	193	308	253	461	391	804	437	80.4	39.0	43.9
8	145	88.6	440	269	250	418	492	1,076	434	60.3	36.0	47.8
9	153	88.5	457	244	329	323	505	979	228	62.5	29.1	38.8
10	142	88.8	492	237	329	360	493	733	142	67.3	27.2	37.1
11	134	87.2	501	282	288	361	432	623	225	62.2	37.3	40.5
12	131	82.5	522	364	247	396	405	727	394	53.1	37.4	45.0
13	134	78.0	535	329	231	444	347	996	344	52.6	37.3	45.9
14	132	78.8	624	327	216	462	295	934	294	54.3	37.9	48.0
15	129	81.2	686	380	153	419	354	838	170	54.5	38.8	48.1
16	127	78.9	663	367	170	397	305	740	139	56.3	40.1	47.9
17	126	80.5	650	407	207	408	341	636	131	54.8	38.2	45.2
18	119	80.9	711	412	173	421	528	559	114	53.4	36.8	45.0
19	107	79.1	739	398	219	524	557	659	97.1	54.4	36.4	41.9
20	108	76.5	789	362	242	687	496	579	82.5	53.8	36.2	38.9
21	114	76.5	799	336	282	763	524	508	78.5	50.5	38.9	22.2
22	117	72.7	734	457	324	798	588	571	78.1	47.4	40.0	28.2
23	113	60.3	694	350	400	759	581	648	79.8	49.4	36.5	38.9
24	109	56.8	495	320	396	646	802	544	70.9	48.5	33.9	40.9
25	109	62.8	600	347	354	632	845	480	67.7	42.5	33.8	40.9
26	107	60.5	664	436	366	687	819	473	62.4	40.0	39.9	40.7
27	104	58.7	799	460	396	755	550	510	48.2	41.4	42.0	45.4
28	98.2	56.7	745	427	470	874	540	502	64.7	43.4	44.7	51.8
29	95.4		599	417	427	684	540	584	58.2	43.4	43.1	53.9
30	99.7		563	362	360	601	643	505	46.6	50.2	40.2	42.0
31	95.5		560		373		706	442		44.7		36.2
Sum	3,847.8	2,252.4	15,563.4	11,423	9,429	15,758	17,391	20,865	7,537.7	1,652.2	1,142.1	1,308.8

Month	Current Year 1977 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 1938-1977 Acre-Feet Average	Maximum	Minimum
Jan.	2.27	2.15	8	158	29	94.6	124	7,632	6,418	15,594	220
Feb.	2.18	2.02	3	107	24	45.4	80.4	4,468	7,320	52,200	136
Mar.	4.04	2.02	†21	Ø 799	1	Ø 48.8	502	30,870	34,406	62,500	1,790
Apr.	3.48	2.75	1	Ø 540	10	200	381	22,657	41,778	139,000	6,820
May	3.45	2.56	28	507	15	128	304	18,702	44,674	357,000	522
June	4.34	3.06	28	937	9	182	525	31,256	52,310	304,000	6,020
July	4.50	2.84	26	987	14	Ø295	561	34,494	58,146	198,000	9,652
Aug.	4.48	3.35	8	1,130	25	375	673	41,385	56,678	158,000	4,870
Sept.	4.12		4	900	30	Ø 46.6	251	14,951	38,693	171,000	2,430
Oct.			7	146	25	19.8	53.3	3,277	13,919	57,900	151
Nov.			28	45.8	10	11.4	38.1	2,265	8,309	21,300	229
Dec.			28	61.7	21	Ø 22.2	42.2	2,596	7,929	25,600	206
Yearly	4.50			1,130		11.4	296	214,553	370,580	1,559,200	57,481
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.37			32.0		0.32	8.38	264,651	457,110	1,923,273	70,903

Ø Mean daily † And other days

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°31'35", and about 2,400 feet (700 m) downstream from the headgates of the American Dam which are located at river mile 1,254.0 (2,018.0 km). The zero of the gage is 3,712.09 feet (1,131.45 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 15 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 1977.

REMARKS: This canal diverts water from the Rio Grande at the American Dam at El Paso, Texas, 2.1 river miles (3.4 km) upstream from the International Dam at Juarez, Chihuahua. Water from this canal discharges into the Franklin Canal from which water is frequently returned to the Rio Grande at spillways 2.2 (3.5), 2.7 (4.3), and 3.6 (5.8) river miles (km) 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 (52.1 m^3/sec) on March 27, 1944. Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	1,510 (42.8)	Aug. 13, 1945	Min.	0	Frequently
Monthly:	Max.	1,210 (34.3)	Aug. 1943	Min.	0	Frequently since 1952
Yearly:	Max.	748 (21.2)	1943	Min.	65.6 (1.86)	1956

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	146	98.0	‡ 48.8	371	343	398	606	596	486	33.4	‡ 43.9	39.1
2	147	98.2	51.0	344	355	451	648	656	583	35.2	38.8	41.7
3	143	101	51.7	325	‡ 349	417	603	609	638	43.3	39.4	43.1
4	142	96.8	52.4	275	300	355	497	628	718	‡ 73.2	39.4	42.9
5	142	96.1	51.7	262	289	399	753	539	567	53.7	39.5	43.8
6	140	96.4	53.8	195	276	440	539	559	638	49.7	40.4	43.1
7	139	91.4	193	129	244	457	278	701	434	74.4	39.0	43.9
8	145	88.6	440	89.2	241	414	378	971	431	54.3	36.0	47.8
9	153	88.5	457	60.4	320	250	392	879	226	56.5	29.1	38.8
10	142	88.8	492	51.7	321	243	380	630	140	61.3	27.2	37.1
11	133	87.2	501	94.1	280	245	340	520	223	‡ 56.2	37.3	40.5
12	131	82.5	522	172	‡ 239	282	399	623	392	47.1	37.4	45.0
13	134	78.0	535	141	223	‡ 333	341	892	342	46.9	37.3	45.9
14	132	78.8	624	147	208	350	233	832	292	48.9	37.9	48.0
15	129	81.2	686	199	146	311	239	734	168	49.4	38.8	48.1
16	127	78.9	663	181	163	292	190	634	137	51.5	40.1	47.9
17	126	80.5	‡ 650	211	200	304	226	527	70.0	50.3	38.2	45.2
18	119	80.9	711	215	166	314	412	465	‡ 4.0	49.2	36.8	45.0
19	107	79.1	739	203	213	413	443	649	4.0	50.5	36.4	41.9
20	108	76.5	789	172	236	574	380	571	3.5	50.2	36.2	38.9
21	114	76.5	799	142	276	651	408	501	3.0	47.2	38.9	22.2
22	117	72.7	734	263	318	686	474	565	2.5	44.4	40.0	28.2
23	113	‡ 60.3	694	162	395	647	469	642	2.0	46.7	36.5	38.9
24	109	56.8	495	134	391	535	694	539	1.5	46.1	33.9	40.9
25	109	62.8	600	163	349	520	737	475	1.0	40.4	33.8	40.9
26	107	60.5	664	256	‡ 361	575	716	468	‡ .5	‡ 38.2	39.9	40.7
27	104	58.7	799	278	392	643	443	505	28.0	39.9	42.0	45.4
28	98.2	56.7	617	245	466	761	433	497	55.8	42.2	44.7	51.8
29	95.4		443	235	423	‡ 571	434	579	49.5	42.5	43.1	53.9
30	99.7		426	228	356	488	537	501	‡ 37.9	49.6	40.2	32.7
31	95.5		416		370		600	438		44.4		26.2
Sum	3,846.8	2,252.4	14,998.4	5,943.4	9,209	13,319	14,222	18,925	6,678.2	1,516.8	1,142.1	1,289.5

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1939-1977 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	4.42	3.78	8	158	†29	94.6	124	7,630	2,275	15,594	0
Feb.	4.00	3.50	3	107	24	45.4	80.4	4,468	4,821	19,500	0
Mar.			†21	∅ 799	1	∅ 48.8	484	29,749	30,870	50,100	1,700
Apr.		3.25	1	∅ 371	10	38.6	198	11,788	30,842	70,900	4,560
May	6.79	4.33	28	503	15	121	297	18,266	27,549	69,000	392
June	8.34	4.91	28	823	9	178	444	26,418	36,013	65,700	5,990
July			5	∅ 753	16	190 ∅	459	28,209	42,865	70,700	8,673
Aug.	8.92	5.96	8	1,020	11	370	610	37,537	42,661	74,600	4,840
Sept.	8.47		4	897	26	∅ .5	223	13,246	28,008	63,100	2,230
Oct.	4.30	2.76	7	140	25	17.7	48.9	3,009	11,654	39,000	0
Nov.	3.24	2.64	28	45.8	10	11.4	38.1	2,265	6,873	21,000	0
Dec.	3.57	2.46	28	61.7	30	11.1	41.6	2,558	6,848	25,500	0
	8.92			1,020		∅ 0.5	256	185,143	271,279	541,610	47,397.4
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.72			28.9		0.01	7.25	228,374	334,623	668,076	58,465

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

RIO GRANDE BELOW AMERICAN DAM AT EL PASO, TEXAS AND CD. JUAREZ, CHIHUAHUA

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 1,253.4 (2,017.1 km); 1.5 river miles (2.4 km) upstream from the International Dam, 3.1 river miles (5.0 km) upstream from the Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua, and 0.6 river mile (1.0 km) downstream from the American Dam. The zero of the gage is 3,712.30 feet (1,131.51 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 39 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: June 1938 through 1977.

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 (320 m^3/sec) on September 14, 1958 with a gage height of 14.50 feet (4.42 m). Min. occasionally no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 6,040 (171)	May 20, 1942	Min. 0	Occasionally
Monthly:	Max. 4,880 (138)	May 1942	Min. 0	Occasionally
Yearly:	Max. 1,510 (42.8)	1942	Min. 13.8 (0.39)	1956

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	‡ 0	‡ 0	‡ 169	12.0	‡ 3.2	111	‡ 108	3.9	8.3	‡ 0	0
2	0	0	0	178	11.0	3.2	113	108	3.7	7.8	0	0
3	0	0	0	177	‡ 10.1	3.3	111	103	3.5	7.4	0	0
4	‡ 0	0	0	‡ 177	9.9	3.3	111	105	3.3	‡ 6.9	0	0
5	0	0	0	176	9.6	3.4	111	102	3.1	6.0	0	‡ 0
6	0	0	0	‡ 176	9.4	3.4	109	102	2.9	6.0	0	0
7	0	0	0	179	9.1	3.5	113	103	2.7	6.0	0	0
8	0	0	0	180	8.9	‡ 3.5	114	‡ 105	2.6	6.0	0	0
9	0	0	0	184	8.7	‡ 72.5	113	100	2.4	6.0	0	0
10	.1	0	0	185	8.4	117	113	103	2.2	6.0	0	0
11	.6	0	0	‡ 188	8.2	116	92.0	103	2.0	‡ 6.0	0	0
12	.4	0	0	192	8.0	114	‡ 6.2	104	1.8	6.0	0	0
13	.2	0	0	188	7.7	‡ 111	6.2	104	‡ 1.6	5.7	0	0
14	.3	0	0	180	7.5	112	61.7	102	1.6	5.4	0	0
15	.1	0	0	‡ 181	7.2	108	‡ 115	‡ 104	1.6	5.1	0	0
16	0	0	0	186	7.0	105	115	106	1.6	4.8	0	0
17	0	0	0	196	6.8	‡ 104	115	‡ 109	61.3	4.5	0	0
18	0	0	0	‡ 197	6.5	107	116	94.0	110	4.2	0	0
19	0	0	0	195	6.3	111	114	10.1	93.1	3.9	0	0
20	0	0	0	190	6.1	113	‡ 116	7.8	79.0	3.6	0	0
21	0	0	0	‡ 194	5.8	112	116	7.0	75.5	3.3	0	0
22	0	0	0	194	5.6	‡ 112	114	6.3	75.6	3.0	0	0
23	0	0	0	188	5.3	112	112	‡ 5.6	‡ 77.8	2.7	0	0
24	0	0	0	186	5.1	‡ 111	108	5.4	69.4	2.4	0	0
25	0	0	0	184	4.9	112	108	5.2	66.7	2.1	0	0
26	0	0	0	180	4.6	112	‡ 103	5.0	61.9	1.8	0	0
27	0	0	0	‡ 182	4.4	112	107	4.8	20.2	1.5	0	0
28	0	0	‡ 128	182	4.2	‡ 113	107	4.6	8.9	1.2	0	0
29	0		156	182	3.9	113	106	4.5	8.7	.9	0	0
30	0		‡ 137	134	3.7	113	106	4.3	‡ 8.7	.6	0	9.3
31	0		144		3.4		106	4.1		.3		10.0
Sum	0		5,480		2,439.3			1,939.7		135.4		19.3
	1.7		565		219.3		3,169.1		857.3		0	

Month	Current Year 1977 Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1939-1977 Acre-Feet Average	Maximum	Minimum
Jan.	3.98		14	4.0	† 1	0	0.1	3.4	4,033	12,000	0
Feb.				0		0	0	0	2,229	32,800	0
Mar.	4.70	3.72	28	178	† 1	0	18.2	1,121	3,294	22,801	81.9
Apr.	5.01		18	213	30	ø134	183	10,869	10,312	74,500	2,230
May			1	ø 12.0	31	ø 3.4	7.1	435	16,444	300,000	25.2
June	4.87		12	148	† 1	ø 3.2	81.3	4,838	15,619	250,000	0
July	4.88	3.87	25	150	†12	ø 6.2	102	6,286	14,757	155,000	967
Aug.	5.05		13	175	31	ø 4.1	62.6	3,847	13,694	114,000	37.5
Sept.	4.80		18	126	†13	ø 1.6	28.6	1,700	10,130	124,000	53.8
Oct.			1	ø 8.3	31	.3	4.4	269	1,921	19,000	18.0
Nov.				0		0	0	0	1,219	8,700	0
Dec.	3.98		30	36.6	† 1	0	.6	38.2	886	7,760	0
Yearly	5.05			213		0	40.6	29,406.6	94,538	1,093,553	10,001.1
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.54			6.03		0	1.15	36,273	116,613	1,348,898	12,336

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

DIVERSIONS FROM THE RIO GRANDE
ACEQUIA MADRE AT CD. JUAREZ, CHIHUAHUA

DESCRIPTION: Bridge for making discharge measurements, gravity well, and water-stage recorder located on the right bank of the canal at Juarez, Chihuahua, latitude 31°45'40", longitude 106°30'30", about 260 feet (80 m) downstream from the canal intake at the International Dam at Juarez, Chihuahua, which is located at river mile 1,251.8 (2,014.7 km) and 2.1 river miles (3.4 km) downstream from the American Dam at El Paso, Texas.

RECORDS: Based on 58 discharge measurements during the year, 33 by the Mexican Section and 25 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1977. 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 1977 all of the 24,824 acre-feet (30,620,000 m^3) tabulated below were distributed to land irrigated in the first unit under the canal.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 480 second-feet (13.6 m^3/sec) on July 21, 1944 with a gage height of 6.00 feet (1.83 m). Min. no flow during several months throughout the year.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 339 (9.61)	May 10, 1942	Min. 0		Several months each year
Monthly:	Max. 283 (8.00)	May 1938	Min. 0		Several months each year
Yearly:	Max. 116 (3.28)	1942	Min. 9.2 (0.26)		1964

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	‡ 147	30.0	0	‡ 105	104	0	0	0	0
2	0	0	0	155	11.7	0	107	‡ 103	0	0	0	0
3	0	0	0	156	0	0	106	101	0	0	0	0
4	0	0	0	‡ 155	0	0	‡ 105	104	0	0	0	0
5	0	0	0	‡ 155	0	0	108	‡ 106	0	0	0	0
6	0	0	0	158	0	0	106	107	0	0	0	0
7	0	0	0	163	0	0	‡ 107	107	0	0	0	0
8	0	0	0	165	0	0	107	107	0	0	0	0
9	0	0	0	167	0	‡ 57.6	109	‡ 101	0	0	0	0
10	0	0	0	168	0	‡ 102	106	‡ 99.6	0	0	0	0
11	0	0	0	‡ 171	0	103	‡ 87.9	101	0	0	0	0
12	0	0	0	‡ 171	0	101	0	‡ 101	0	0	0	0
13	0	0	0	‡ 174	0	‡ 101	0	104	0	0	0	0
14	0	0	0	170	0	‡ 98.2	39.6	102	0	0	0	0
15	0	0	0	‡ 163	0	96.4	‡ 102	‡ 102	0	0	0	0
16	0	0	0	161	0	95.0	108	‡ 104	0	0	0	0
17	0	0	0	166	0	‡ 97.1	‡ 106	‡ 107	0	0	0	0
18	0	0	0	‡ 176	0	100	107	101	0	0	0	0
19	0	0	0	‡ 178	0	104	108	8.8	0	0	0	0
20	0	0	0	‡ 179	0	‡ 109	‡ 109	0	0	0	0	0
21	0	0	0	179	0	‡ 105	‡ 110	0	0	0	0	0
22	0	0	0	‡ 180	0	102	108	0	0	0	0	0
23	0	0	0	169	0	103	106	0	0	0	0	0
24	0	0	0	168	0	‡ 103	‡ 106	0	0	0	0	0
25	0	0	0	166	0	104	104	0	0	0	0	0
26	0	0	0	165	0	103	101	0	0	0	0	0
27	0	0	0	‡ 164	0	‡ 107	‡ 103	0	0	0	0	0
28	0	0	‡ 81.6	160	0	‡ 108	103	0	0	0	0	0
29	0		‡135	156	0	106	‡ 103	0	0	0	0	0
30	0		‡127	124	0	107	104	0	0	0	0	0
31	0		‡129		0		104	0		0		0
Sum	0	0	472.6	4,929	41.7	2,212.3	2,985.5	1,870.4	0	0	0	0

Month	Average Rainfall Inches**		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1938-1977 Acre-Feet		
			High		Low						
	1938-1977	1977	Day		Day				Average	Maximum	Minimum
Jan.	0.39	0.56		0		0	0	0	0	0	0
Feb.	.35	0		0		0	0	0	0	0	0
Mar.	.26	.17	†29	145	† 1	0	15.2	938	1,206	6,482	0
Apr.	.17	.10	22	191	30	31.1	164	9,777	7,904	12,383	2,020
May	.32	.02	1	30.4	† 3	0	1.4	82.7	9,006	17,380	0
June	.67	.17	19	116	† 1	0	73.8	4,393	8,333	15,700	0
July	1.62	1.04	4	112	†12	0	96.4	5,926	8,437	15,170	0
Aug.	1.29	1.02	18	110	†20	0	60.4	3,707	8,105	12,620	0
Sept.	1.19	.61		0		0	0	0	4,460	12,380	0
Oct.	.76	1.88		0		0	0	0	38.9	328	0
Nov.	.31	.04		0		0	0	0	0	0	0
Dec.	.46	.18		0		0	0	0	0	0	0
	7.79	5.79		191		0	34.3	24,823.7	47,489.9	83,930	6,653
Yearly	Millimeters			Cubic Meters per Second				Thousands of Cubic Meters			
	198	147		5.40		0	0.97	30,620	58,580	103,511	8,207

‡ Discharge measurement made on this day † And other days

** Average for valley floor in United States and Mexico from El Paso to Clint Station

RIO GRANDE NEAR CLINT, TEXAS AND SAN AGUSTIN, CHIHUAHUA

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 1,226.9 (1,974.5 km), 0.7 river mile (1.1 km) downstream from the Riverside Canal Wasteway No. 2, about 4 miles (6.4 km) south southwest of Clint, Texas, and 27.1 river miles (43.5 km) downstream from the American Dam at El Paso, Texas. The zero of the gage is 3,608.99 feet (1,100.02 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 19 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: August 17, 1938 through 1977. Records prior to 1976 were published under the title "Rio Grande - Island Station near Clint, Texas."

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 7,050 second-feet (200 m^3/sec) on September 14, 1958 with a gage height of 15.80 feet (4.82 m). Min frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 6,140 (174)	May 19, 1942	Min. 0		Frequently
Monthly:	Max. 4,880 (138)	May 1942	Min. 0		Frequently
Yearly:	Max. 1,490 (42.2)	1942	Min. 0.3 (0.01)		1956

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	80.0	19.4	28.0	3.1	0	0	0	0	0	0	0	‡ 0
2	80.0	‡ 16.9	28.0	1.5	‡ 0	‡ 0	0	0	0	0	2.6	0
3	79.0	1.5	28.0	0	0	0	0	‡ 0	0	0	‡ 3.1	0
4	76.0	3.0	28.0	0	0	0	0	0	0	178	3.6	0
5	‡ 74.7	4.8	27.6	0	0	0	40.9	0	0	70.4	4.8	0
6	72.6	6.0	76.7	0	0	0	25.9	0	0	6.3	2.4	0
7	71.2	7.6	58.6	‡ 0	0	0	1.0	0	0	5.8	0	0
8	71.2	9.0	35.8	0	0	0	‡ .2	0	0	5.3	0	0
9	72.6	9.7	31.6	0	0	0	11.9	0	‡ 0	4.9	0	0
10	73.3	10.1	‡ 26.6	0	0	0	5.7	0	0	5.0	0	0
11	72.6	10.1	22.9	0	0	0	0	0	0	5.1	0	0
12	69.2	10.1	21.3	0	0	0	0	0	0	‡ 4.6	0	0
13	66.7	10.1	25.7	0	0	0	0	0	0	3.4	0	0
14	64.2	10.1	19.9	0	0	0	0	0	0	2.8	0	0
15	61.7	10.1	16.9	0	0	0	0	0	0	2.8	0	0
16	59.2	7.1	16.1	0	0	0	0	0	0	2.2	0	‡ 0
17	56.8	3.4	15.3	0	0	0	0	0	0	0	0	0
18	54.3	8.5	11.5	0	0	0	0	0	0	0	0	2.3
19	51.8	11.6	13.6	0	‡ 0	0	‡ 1.0	0	0	0	0	9.6
20	49.3	9.3	14.2	0	0	‡ 0	0	0	0	0	0	1.5
21	46.8	29.9	14.2	0	0	0	0	0	0	0	‡ 0	0
22	44.3	27.8	13.9	0	0	0	0	0	0	0	0	0
23	41.8	29.8	13.1	0	0	0	1.6	0	0	0	0	0
24	39.3	28.7	7.5	0	0	0	2.0	‡ 0	0	0	0	0
25	36.8	27.6	6.9	0	0	0	27.9	0	0	0	3.8	0
26	34.3	27.6	6.9	0	0	0	.7	0	‡ 0	0	34.4	0
27	31.8	29.4	6.7	0	0	.3	0	0	0	0	37.8	0
28	29.4	29.0	51.7	0	0	0	0	0	0	0	37.1	0
29	26.8		18.4	0	0	0	0	0	0	0	5.5	0
30	24.4		6.9	0	0	0	0	0	0	0	0	0
31	21.9		6.2		0		0	0		0		0
Sum	1,734.0	408.2	698.7	4.6	0	0.3	118.8	0	0	296.6	135.1	13.4

Current Year 1977 — **Period 1939-1977**

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	Ø 80.0	31	Ø 21.9	55.9	3,439	4,043	11,900	0
Feb.	10.66	9.03	21	66.9	17	.7	14.6	810	2,622	37,000	0
Mar.	11.77	9.00	6	186	31	6.2	22.5	1,386	2,095	21,000	0
Apr.			1	Ø 3.1	† 3	0	.2	9.1	3,126	70,500	0
May				0		0	0	0	8,981	299,800	0
June	9.05		27	7.1	† 1	0	0	.6	7,705	241,000	0
July	11.08		6	146	† 1	0	3.8	236	7,897	118,500	0
Aug.				0		0	0	0	7,087	99,400	0
Sept.				0		0	0	0	7,838	119,200	0
Oct.	12.04		4	410	† 1	0	9.6	588	3,755	42,800	0
Nov.	9.84		28	39.5	1	0	4.5	268	1,072	7,270	0
Dec.	9.38		17	16.8	† 1	0	.4	26.6	1,872	12,900	0
Yearly	12.04			410		0	9.3	6,763.3	58,093	1,079,340	238.1
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	3.67			11.6		0	0.26	8,343	71,658	1,331,366	294

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

RIO GRANDE NEAR ACALA, TEXAS AND PRAXEDES GUERRERO, CHIHUAHUA

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 1,206.7 (1,942.0 km), 0.8 river mile (1.3 km) downstream from the El Paso-Hudspeth County Line, 5.5 miles (8.9 km) northwest of Acala, Texas, about 8 miles (12.9 km) southeast of Tornillo, Texas, and 47.2 river miles (76.0 km) downstream from the American Dam at El Paso, Texas. The zero of the gage is 3,547.59 feet (1,081.31 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 19 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1977. Records prior to 1976 were published under the title "Rio Grande - County Line Station near Acala, Texas."

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,340 second-feet (180 m^3/sec) on May 19, 1942 with a gage height of 8.66 feet (2.64 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 6,180 (175)	May 18, 1942	Min. 0		Frequently
Monthly:	Max. 4,920 (139)	May 1942	Min. 0		Frequently
Yearly:	Max. 1,720 (48.7)	1942	Min. 0		1956 & 1964

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	88.4	3.1	12.0	0	0	0	0	0	0	0	18.3	‡ 9.0
2	88.3	‡ 0	12.0	0	‡ 0	‡ 0	0	0	0	0	23.7	12.0
3	88.2	0	12.0	0	0	0	0	‡ 0	0	0	‡ 24.8	14.6
4	88.0	0	12.0	0	0	0	0	0	0	0	34.9	14.9
5	‡ 87.9	0	11.6	0	0	0	0	0	0	0	38.4	14.1
6	84.8	0	60.7	0	0	0	0	0	0	0	48.5	12.0
7	81.6	0	42.6	‡ 0	0	0	0	0	0	0	52.1	9.8
8	78.5	0	19.8	0	0	0	‡ 0	0	0	0	44.0	0
9	75.3	0	15.6	0	0	0	0	0	‡ 0	0	36.0	.7
10	72.2	0	‡ 10.0	0	0	0	0	0	0	0	40.0	10.9
11	69.1	0	6.9	0	0	0	0	0	0	0	40.0	11.6
12	65.9	0	5.3	0	0	0	0	0	0	‡ 0	36.0	11.4
13	62.8	0	9.7	0	0	0	0	0	0	0	37.6	5.6
14	59.6	0	3.9	0	0	0	0	0	0	0	35.2	2.8
15	56.5	0	.9	0	0	0	0	0	0	0	20.0	0
16	53.4	0	.1	0	0	0	0	0	0	0	22.7	‡ 0
17	50.2	0	0	0	0	0	0	0	0	0	25.4	0
18	47.1	0	0	0	0	0	0	0	0	0	22.7	0
19	43.9	0	0	0	‡ 0	0	‡ 0	0	0	0	46.7	0
20	40.8	0	0	0	0	‡ 0	0	0	0	0	26.7	0
21	37.7	13.9	0	0	0	0	0	0	0	0	‡ 21.9	0
22	34.5	11.8	0	0	0	0	0	0	0	0	13.9	0
23	31.4	13.8	0	0	0	0	0	0	0	0	9.7	0
24	28.3	12.7	0	0	0	0	0	‡ 0	0	0	4.1	0
25	25.1	11.6	0	0	0	0	0	0	0	0	4.4	0
26	22.0	11.6	0	0	0	0	0	0	‡ 0	0	2.4	0
27	18.8	13.4	0	0	0	0	0	0	0	0	0	0
28	15.7	13.0	35.7	0	0	0	0	0	0	0	0	0
29	12.6		2.4	0	0	0	0	0	0	0	0	0
30	9.4		0	0	0	0	0	0	0	0	0	0
31	6.3		0		0		0	0		21.4		0
Sum	1,624.3	104.9	273.2	0	0	0	0	0	0	21.4	730.1	129.4

Month	Current Year 1977 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 1938-1977 Acre-Feet Average	Maximum	Minimum
Jan.			1	ø 88.4	31	ø 6.3	52.4	3,222	5,256	20,000	0
Feb.			21	ø 13.9	† 2	0	3.7	208	4,357	47,900	0
Mar.			6	ø 60.7	†17	0	8.8	542	3,874	38,900	0
Apr.				0		0	0	0	5,771	84,200	0
May				0		0	0	0	11,131	303,000	0
June				0		0	0	0	9,841	239,000	0
July				0		0	0	0	10,440	140,000	0
Aug.				0		0	0	0	9,582	123,000	0
Sept.				0		0	0	0	12,380	140,000	0
Oct.	2.06		31	57.0	† 1	0	.7	42.4	7,537	61,400	0
Nov.	2.21		11	54.0	†27	0	24.3	1,448	4,727	20,400	0
Dec.	1.44		4	18.4	8	0	4.2	257	5,377	29,700	0
Yearly				ø 88.4		0	7.9	5,719.4	90,273	1,247,500	0
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				2.50		0	0.22	7,055	111,352	1,538,791	0

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

RIO GRANDE AT FORT QUITMAN, TEXAS
NEAR COLONIA LUIS LEON, CHUIHUAHUA

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank of the rectified channel of the Rio Grande at latitude 31°05'10", longitude 105°36'30", and river mile 1,173.2 (1,888.1 km); 1.5 river miles (2.4 km) downstream from Old Fort Quitman, 9 miles (14.5 km) southeast of Esperanza, Texas, and 17.5 miles (28.2 km) southeast of McNary, Texas. The zero of the gage is 3,450.57 feet (1,051.73 m) above 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: 1889 through 1977.

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

EXTREME FLOWS FROM RECORDS**: Momentary: Max. 10,600 second-feet (300 m^3/sec) October 5, 1946 with a gage height of 10.00 feet (3.05 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	5,890 (167)	May 19, 1942	Min.	0	Frequently
Monthly:	Max.	5,030 (142)	May 1942	Min.	0	Several months since 1951
Yearly:	Max.	1,750 (49.6)	1942	Min.	2.3 (0.07)	1965

Mean Daily Discharge in Second-Feet 1977 —— Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	125	36.0	20.3	9.0	11.0	5.0	0	0	0	0	0	‡ 15.2
2	126	‡ 34.4	20.1	8.8	‡ 11.4	‡ 5.0	0	0	0	0	0	16.0
3	124	33.7	19.8	8.6	11.6	4.8	0	‡ 0	0	0	‡ 1.3	20.3
4	122	32.3	19.6	8.4	11.4	4.5	0	0	0	0	0	21.5
5	‡ 118	31.6	19.4	8.0	11.0	4.2	0	0	0	0	0	19.3
6	105	30.8	19.6	7.7	10.7	4.0	0	0	0	0	0	23.3
7	91.8	29.6	19.3	‡ 7.5	10.4	3.8	0	0	0	0	0	22.4
8	80.1	29.1	18.7	7.9	10.4	3.5	‡ 0	0	0	0	9.7	14.5
9	71.1	28.4	18.5	8.4	10.4	3.2	0	0	‡ 0	0	24.4	11.2
10	63.1	27.8	‡ 18.2	8.6	10.4	3.0	0	0	0	1.5	16.6	10.4
11	56.1	27.2	17.3	9.0	10.3	2.8	0	0	0	0	15.8	11.8
12	48.5	26.6	16.8	9.6	10.1	2.5	0	0	0	‡ 0	15.5	18.0
13	48.7	25.9	15.8	10.0	9.8	2.2	0	0	0	0	24.9	13.7
14	47.0	25.3	15.6	10.1	9.5	2.0	0	0	0	0	27.6	10.0
15	45.4	24.3	15.0	10.2	9.5	1.8	0	0	0	0	20.9	11.7
16	42.8	23.4	14.3	10.4	9.0	1.5	0	0	0	0	20.9	‡ 13.6
17	42.1	23.3	13.9	10.3	8.9	1.2	0	0	0	0	17.7	10.2
18	41.4	22.7	13.6	10.6	8.4	1.0	0	0	0	1.9	20.5	9.5
19	40.8	22.6	13.1	10.5	‡ 8.0	.8	‡ 0	" 8.5	0	10.0	23.1	9.7
20	40.3	22.5	12.8	10.7	7.4	‡ .5	0	0	0	3.8	24.0	10.4
21	39.8	22.3	12.3	10.5	7.0	.5	0	0	0	2.4	‡ 19.9	9.7
22	39.2	21.8	12.0	10.6	6.7	.4	2.8	0	0	0	22.5	8.8
23	38.6	21.6	11.4	10.6	6.4	.4	4.4	0	0	0	24.4	8.4
24	38.8	‡ 21.9	11.0	10.8	6.4	.4	0	‡ 0	0	0	19.9	8.3
25	39.0	21.7	10.8	10.7	5.9	.4	0	0	0	0	17.1	7.9
26	38.4	21.2	10.6	10.8	5.8	.3	0	0	‡ 0	0	16.0	8.0
27	38.6	21.0	10.2	11.0	5.4	.3	0	0	0	0	14.6	8.2
28	38.0	20.8	10.0	11.1	5.4	.3	0	0	0	0	14.6	9.5
29	38.2		9.8	11.0	5.4	.2	0	0	0	0	13.3	13.7
30	37.7		9.6	11.0	5.3	.2	0	0	0	0	13.6	7.6
31	36.4		9.2		5.1		0	0		0		7.2
Sum	1,901.9	729.8	458.6	292.4	264.4	60.7	7.2	" 8.5	0	19.6	438.8	390.0

Month	Current Year 1977 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 1938-1977 Acre-Feet Average	Maximum	Minimum
Jan.	5.59	4.90	1	128	31	36.4	61.4	3,772	6,088	20,900	0
Feb.	4.90	4.62	1	36.6	28	20.8	26.1	1,448	5,132	50,100	0
Mar.	4.60	4.33	1	20.3	31	9.2	14.8	910	4,000	38,900	0
Apr.	4.42	4.32	28	11.1	7	7.5	9.7	580	5,008	77,000	0
May	4.38	4.04	† 2	11.6	31	5.1	8.5	524	11,819	309,000	0
June	4.04		† 1	Ø 5.0	†29	Ø .2	2.0	120	10,514	240,000	0
July	4.15		22	6.6	† 1	0	.2	14.3	12,103	140,000	3.8
Aug.			19	Ø" 8.5	† 1	0	" .3	" 16.9	11,404	127,000	16.7
Sept.				0		0	0	0	15,879	147,000	0
Oct.			19	Ø 10.0	† 1	0	.6	38.9	11,699	66,500	0
Nov.	4.85		13	32.0	† 1	0	14.6	870	7,411	24,500	0
Dec.	5.02	4.22	29	40.5	15	7.1	12.6	774	7,641	31,000	0
	5.59			128		0	12.5	9,068.1	108,698	1,270,400	1,662.3
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.70			3.62		0	0.35	11,186	134,079	1,567,038	2,050

** Period 1924-1977 ‡ Discharge measurement made on this day " Estimated
Ø Mean daily † And other days

RIO GRANDE NEAR CANDELARIA, TEXAS AND SAN ANTONIO DEL BRAVO, CHIHUAHUA

DESCRIPTION: Cableway, gravity well, and digital recorder located on the left bank of the Rio Grande at San Antonio Diversion Dam, latitude 30°10'30", longitude 104°41'10" and river mile 1,038.8 (1,671.8 km), 0.5 river mile (0.8 km) upstream from Capote Creek and about 2.5 miles (4.0 km) north of Candelaria, Texas and San Antonio, Chihuahua. The zero of the gage has not been determined.
RECORDS: Based on 30 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: November 19, 1975 through 1977.
REMARKS: Reservoirs, diversions, and drainage returns modify the flow at this station. An auxiliary well, located 300 feet (91 m) upstream, is used to record extreme low flows.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,620 second-feet (45.9 m^3/sec) on July 13, 1976 with a gage height of 8.65 feet (2.64 m). Min. frequently no flow.

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	160	102	35.9	17.6	0	0	‡ 42.0	‡ 0.1	12.6	0	‡ 0	0
2	160	103	‡ 36.0	16.4	‡ 0	0	43.8	0	3.6	0	0	‡ 0
3	158	‡ 90.5	34.1	13.1	0	‡ 0	0	0	1.0	‡ 0	0	0
4	156	78.7	33.7	10.4	0	54.4	0	28.9	0	0	0	0
5	152	69.4	31.3	12.8	0	18.0	0	32.8	0	0	0	0
6	‡ 150	62.6	31.4	14.5	0	.1	0	1.9	0	38.7	0	0
7	151	62.6	32.0	13.0	0	0	0	.2	0	162	0	0
8	149	55.7	‡ 30.9	12.5	0	0	4.6	0	‡ 0	17.1	0	0
9	142	54.2	31.7	12.9	0	0	1.1	0	0	1.7	0	0
10	131	56.2	32.9	10.9	0	0	2.8	.1	0	0	0	0
11	122	53.6	28.6	8.6	0	0	0	72.4	32.1	0	0	0
12	‡ 117	52.7	26.1	6.5	‡ 0	0	0	18.7	67.0	0	0	0
13	115	51.3	26.5	4.5	0	11.8	0	.3	2.8	0	0	0
14	115	51.9	23.4	2.6	0	1.1	0	0	.9	0	0	0
15	117	48.1	21.4	1.1	0	0	‡ 0	.2	0	0	‡ 0	‡ 0
16	118	‡ 47.6	‡ 21.2	.8	0	‡ 0	0	0	‡ 53.6	0	0	0
17	114	47.9	22.7	1.1	‡ 0	0	0	‡ 0	4.5	‡ 0	0	0
18	103	46.2	21.9	‡ .5	0	0	0	0	2.4	0	0	0
19	‡ 95.4	44.8	25.3	.5	0	0	0	0	1.9	0	0	0
20	95.0	43.8	21.4	.5	0	0	0	44.0	.2	0	0	0
21	99.1	44.6	17.6	.1	0	0	‡ 14.5	71.6	0	0	0	0
22	102	43.0	17.5	0	0	0	212	2.0	0	0	‡ 0	0
23	105	38.6	‡ 20.0	0	0	0	252	0	0	0	0	0
24	105	39.0	20.6	0	0	‡ 0	17.0	0	0	0	0	0
25	98.1	39.7	20.8	0	0	0	10.2	0	0	0	0	0
26	96.8	37.0	18.0	0	0	0	0	38.4	0	0	0	0
27	99.8	36.3	17.5	0	0	0	0	29.5	0	0	0	0
28	102	35.0	17.3	0	0	0	0	2.4	0	0	0	0
29	105		15.9	0	0	0	.2	.5	0	0	0	0
30	104		15.3	0	0	0	2.7	0	0	0	0	0
31	101		16.4		0		2.8	0		0		0
Sum	3,738.2	1,536.0	765.3	160.9	0	85.4	605.7	344.0	182.6	219.5	0	0

Month	Current Year 1977 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 Dec. 1975-1977 Acre-Feet Average	Maximum	Minimum
Jan.	4.18	3.77	† 1	164	20	89.7	121	7,415	6,222	7,415	5,028
Feb.	3.87	3.37	2	107	28	33.2	54.9	3,047	3,222	3,396	3,047
Mar.	3.40	3.15	† 1	37.0	30	13.0	24.7	1,518	1,514	1,518	1,511
Apr.	3.23		1	18.7	†21	0	5.4	319	1,412	2,505	319
May				0		0	0	0	2,516	5,031	0
June	4.42		4	220	† 1	0	2.8	169	2,622	5,075	169
July	5.11		23	422	† 1	0	19.5	1,201	5,310	9,420	1,201
Aug.	4.54		26	250	† 1	0	11.1	682	3,453	6,224	682
Sept.	4.59		16	261	† 1	0	6.1	362	5,786	11,210	362
Oct.	5.05		7	405	† 1	0	7.1	435	4,322	8,210	435
Nov.				0		0	0	0	5,120	10,241	0
Dec.				0		0	0	0	5,697	11,506	0
Yearly	5.11			422		0	20.9	15,148	47,196	79,357	15,148
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.56			12.0		0	0.59	18,685	58,216	97,887	18,685

‡ Discharge measurement made on this day † And other days

RIO GRANDE ABOVE RIO CONCHOS NEAR PRESIDIO, TEXAS AND OJINAGA, CHIHUAHUA

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank at latitude 29°37'25", longitude 104°28'30", and river mile 966.4 (1,555.3 km), 6.5 miles (10.5 km) northwest of the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua, and 5.1 river miles (8.2 km) upstream from the Rio Conchos. The zero of the gage is 2,576.66 feet (785.37 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on 56 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1977.
REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 14,900 second-feet (396 m^3/sec) on June 14, 1905. Highest flow recorded since 1924 was 5,160 second-feet (146 m^3/sec), with a gage height of 10.57 feet (3.22 m), on May 26, 1942. Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	13,700 (388)	June 13 & 14, 1905	Min.	0	Frequently
Monthly:	Max.	10,150 (287)	June 1905	Min.	0	Frequently
Yearly:	Max.	1,970 (55.8)	1907	Min.	1.3 (0.04)	1964

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	134	‡ 92.3	‡ 40.7	‡ 16.9	9.0	26.0	25.3	34.4	‡ 26.3	7.8	‡ 1.0	‡ 4.9
2	134	93.2	28.5	16.2	11.2	26.2	25.5	23.4	26.4	12.1	1.2	2.7
3	132	93.0	28.1	16.8	‡ 14.0	30.0	29.2	22.5	26.6	‡ 14.5	1.2	6.3
4	132	93.5	‡ 28.1	‡ 14.2	19.3	36.7	21.3	25.0	26.8	11.8	1.9	5.4
5	131	93.3	35.3	11.3	19.1	36.6	‡ 18.4	24.8	27.0	12.4	2.9	‡ 10.6
6	129	97.9	33.0	7.4	18.9	‡ 31.8	17.3	18.5	27.1	15.3	2.8	6.7
7	127	‡ 97.7	‡ 34.7	7.1	14.5	30.4	16.4	19.7	27.3	19.8	‡ 3.0	1.8
8	130	95.8	35.5	6.5	19.7	27.4	14.2	‡ 18.8	27.4	16.2	3.2	1.6
9	130	89.0	30.8	11.1	‡ 15.5	26.7	21.4	26.9	‡ 27.6	10.8	3.6	1.3
10	‡ 125	82.4	28.9	15.4	10.7	23.8	14.6	24.0	28.5	9.3	8.2	.6
11	119	78.0	28.0	‡ 15.6	19.6	26.6	‡ 12.3	19.5	29.4	‡ 4.9	6.1	.1
12	116	71.4	28.3	11.2	88.7	28.4	10.9	25.1	‡ 30.3	5.0	6.0	‡ 0
13	112	70.9	31.0	14.4	196	‡ 26.4	11.0	23.3	30.7	6.6	8.1	0
14	114	‡ 69.8	‡ 37.4	8.5	46.2	20.4	10.2	20.9	31.0	4.0	11.3	0
15	116	65.7	29.5	4.3	35.8	13.4	15.5	‡ 30.0	31.4	2.2	‡ 6.6	‡ 0
16	115	64.1	26.9	7.5	‡ 32.0	10.8	17.8	33.6	31.8	2.7	1.3	0
17	‡ 114	60.8	25.0	3.9	27.4	9.9	25.2	32.1	32.2	‡ .8	4.3	0
18	114	60.8	22.3	‡ 3.9	25.1	11.2	‡ 27.2	31.1	32.5	1.2	2.3	0
19	108	55.2	21.8	3.7	25.8	12.0	21.2	26.6	‡ 30.8	1.1	1.6	‡ 0
20	101	54.3	24.9	4.6	25.7	‡ 14.4	33.6	27.7	29.8	.5	2.4	0
21	109	52.7	‡ 24.7	7.5	25.0	18.4	32.4	30.9	25.6	.3	‡ 6.0	0
22	115	‡ 52.7	23.1	10.3	25.4	96.4	29.3	‡ 36.3	19.1	.5	5.5	0
23	112	51.9	16.5	10.9	‡ 27.0	53.4	34.8	34.5	24.7	1.8	6.8	0
24	‡ 109	51.3	15.1	12.6	28.2	27.1	44.2	34.0	21.4	2.5	11.2	0
25	105	50.8	11.8	‡ 15.4	26.5	21.5	‡ 41.8	44.1	19.3	‡ 2.0	11.1	0
26	104	48.5	15.0	13.5	26.2	30.4	30.8	33.9	‡ 19.4	.9	8.7	0
27	103	46.9	22.2	11.6	26.8	‡ 29.4	26.9	35.0	20.0	1.6	8.0	‡ 0
28	94.4	44.1	‡ 22.0	14.1	29.3	20.4	23.8	38.2	21.4	1.9	‡ 9.4	0
29	96.9		21.1	12.5	30.0	14.0	26.9	‡ 40.2	20.6	.9	12.0	0
30	87.2		20.2	12.5	28.3	16.9	30.9	35.6	‡ 11.2	.9	8.8	0
31	88.0		14.5		‡ 23.1		35.5	31.0		1.6		0
Sum	3,556.5	1,978.0	804.9	321.4	970.0	797.0	745.8	901.6	783.6	173.9	166.5	42.0

Month	Current Year 1977 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1977 Acre-Feet Average	Maximum	Minimum
Jan.	12.00	11.62	1	138	30	84.2	115	7,054	5,534	24,400	0
Feb.	11.68	10.92	6	98.7	28	42.8	70.6	3,923	4,495	40,800	0
Mar.	10.92	10.18	1	42.9	31	10.2	26.0	1,596	3,215	36,100	0
Apr.	10.41	9.87	11	20.3	19	3.7	10.7	637	2,348	41,600	0
May	12.74	10.05	13	290	1	7.2	31.3	1,924	8,248	240,000	0
June	11.76	9.98	21	112	16	9.2	26.6	1,581	8,802	216,000	0
July	10.85	9.97	21	52.3	†13	6.7	24.1	1,479	11,685	156,000	0
Aug.	11.46	10.13	25	62.7	6	14.4	29.1	1,788	11,439	133,000	0
Sept.	11.78	9.98	19	50.0	30	7.6	26.1	1,554	16,038	151,000	0
Oct.	10.19	9.65	7	21.3	21	.3	5.6	345	13,753	105,000	0
Nov.	10.11	9.68	29	13.8	1	.8	5.6	330	5,719	34,500	0
Dec.	10.06		6	11.9	†12	0	1.4	83.3	5,754	30,900	0
Yearly	12.74			290		0	30.8	22,294.3	97,030	1,176,700	951.8
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	3.88			8.21		0	0.87	27,500	119,686	1,451,459	1,174

** Period June 1900-March 1914; September 1919-March 1920; and 1924-1977
‡ 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 (2.5 km) from the confluence with the Rio Grande, 1.9 miles (3 km) west of Ojinaga, Chihuahua, and 3.7 miles (6 km) west of Presidio, Texas. This stream enters the Rio Grande at river mile 961.4 (1,547.2 km), 11.6 river miles (18.7 km) upstream from the "Rio Grande below Rio Conchos" Gaging Station. The zero of the gage is 2,568.04 feet (782.74 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 128 discharge measurements during the year, a continuous record of gage heights, and a rating curve which, above 15,000 second-feet (425 m^3/sec), was defined previously by related gage heights and records of discharge at the "Rio Grande below Rio Conchos" Gaging Station. Computations by shifting control methods. Records available: 1896 through 1977. 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 Rio Conchos confluence.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. La Boquilla Reservoir, La Colina Reservoir, La Rosetilla Reservoir, and Luis L. Leon Reservoir are located 250, (402), 242 (389), 186 (299), and 112 (180) river miles (km), respectively, upstream from this station. Francisco I. Madero Reservoir is located on the Rio San Pedro, a tributary which enters the Rio Conchos 174 river miles (280 km) 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 (4,590 m^3/sec) on September 11, 1904.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	24,500 (695)	Sept. 22, 1974	Min.	23.0 (0.65)	Dec. 19, 1973
Monthly:	Max.	7,880 (223)	Sept. 1968	Min.	57.9 (1.64)	Feb. 1968
Yearly:	Max.	1,490 (42.2)	1968	Min.	639 (18.1)	1971

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	268	192	194	‡ 1,470	1,540	858	576	487	1,170	165	267	‡ 239
2	267	190	205	1,420	‡ 1,550	501	533	466	‡ 727	164	241	237
3	‡ 265	‡ 187	‡ 221	1,460	1,520	‡ 374	565	‡ 463	307	‡ 178	‡ 252	240
4	264	178	169	‡ 1,420	‡ 1,490	593	‡ 773	427	280	246	247	‡ 240
5	261	179	195	1,420	1,480	388	565	‡ 413	‡ 252	‡ 288	249	255
6	258	178	200	‡ 1,420	‡ 1,470	‡ 604	‡ 512	413	231	255	252	273
7	257	‡ 177	‡ 200	1,400	1,470	463	512	‡ 777	‡ 703	‡ 544	257	296
8	261	178	194	1,400	1,450	‡ 434	‡ 452	1,170	247	306	260	326
9	265	177	186	1,440	‡ 1,470	530	1,350	1,140	‡ 212	286	236	‡ 650
10	‡ 249	‡ 176	‡ 202	1,430	1,460	‡ 322	745	‡ 1,120	195	‡ 228	238	540
11	247	188	678	‡ 1,450	‡ 1,430	281	‡ 625	1,140	309	239	238	302
12	245	185	1,320	1,410	1,480	266	583	‡ 1,150	‡ 249	252	246	‡ 290
13	‡ 244	186	1,410	1,410	‡ 1,440	‡ 258	‡ 551	1,140	685	‡ 249	259	305
14	245	‡ 189	‡1,440	1,420	1,390	279	519	1,230	‡ 337	‡ 251	‡ 257	289
15	245	187	1,440	‡ 1,460	1,370	‡ 459	‡ 509	‡ 1,480	224	240	258	‡ 309
16	244	182	‡1,450	1,500	‡ 1,400	491	484	1,640	‡ 256	241	259	293
17	‡ 245	‡ 177	1,460	1,190	1,370	‡ 487	445	‡ 1,330	215	‡ 230	249	292
18	246	169	‡1,440	‡ 1,330	‡ 1,360	463	‡ 445	1,210	208	234	‡ 248	254
19	243	182	1,450	1,590	1,330	445	466	‡ 1,270	‡ 226	‡ 236	254	‡ 257
20	‡ 239	188	1,440	‡ 1,580	‡ 1,330	‡ 445	‡ 837	1,250	214	238	252	159
21	191	‡ 190	‡1,500	1,570	1,280	466	501	1,270	213	‡ 240	‡ 250	167
22	176	192	1,480	‡ 1,560	1,290	‡ 2,630	‡ 530	1,390	206	236	254	‡ 214
23	203	196	‡1,480	1,550	‡ 1,290	872	713	1,330	‡ 194	252	254	225
24	‡ 212	‡ 180	1,470	1,550	1,290	‡ 710	788	‡ 1,350	186	‡ 660	‡ 248	229
25	205	182	‡1,480	‡ 1,550	‡ 1,270	675	‡ 830	1,320	176	424	242	236
26	207	181	1,470	1,530	1,390	537	689	‡ 1,250	‡ 168	278	243	‡ 245
27	‡ 206	185	1,470	‡ 1,590	‡ 1,420	‡ 537	‡ 523	1,260	158	‡ 272	248	263
28	201	‡ 188	‡1,480	1,560	1,410	477	494	1,240	‡ 152	272	‡ 248	280
29	195		1,470	‡ 1,510	1,380	477	‡ 491	‡ 1,240	156	268	240	‡ 283
30	209		‡1,430	1,500	‡ 1,410	491	487	1,240	‡ 164	262	232	283
31	‡ 194		1,430		1,410		540	‡ 1,190		‡ 277		283
Sum	7,257	5,139	31,654	44,090	43,640	16,813	18,633	33,796	9,020	8,511	7,478	8,754

Month	Current Year 1977 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 1968-1977 Acre-Feet Average	Maximum	Minimum
Jan.	6.07	5.54	9	304	22	170	234	14,390	40,676	131,293	14,390
Feb.	6.23	5.48	25	337	†18	159	184	10,191	34,801	124,386	3,336
Mar.	8.50	5.51	18	1,530	4	155	1,020	62,765	53,584	201,219	4,171
Apr.	8.69	6.63	27	1,700	†17	788	1,470	87,472	38,672	87,472	5,565
May	8.53	7.91	12	1,630	29	1,250	1,410	86,590	39,880	123,749	10,932
June	10.66	5.81	22	3,640	14	240	562	33,342	43,127	91,767	6,008
July	9.91	6.23	9	2,840	† 8	431	600	36,949	68,404	154,562	23,833
Aug.	9.58	6.20	15	2,360	5	406	1,090	67,055	94,556	243,660	31,728
Sept.	8.63	5.41	7	1,600	†28	152	301	17,892	158,101	468,680	17,892
Oct.	7.51	5.45	†24	1,010	2	162	275	16,883	84,105	226,877	16,883
Nov.	6.14	5.71	7	399	†29	219	249	14,833	41,641	125,311	7,484
Dec.	8.46	5.48	9	1,500	21	145	283	17,367	29,962	51,114	17,367
Yearly	10.66	5.41		3,640		145	643	465,729	727,509	1,082,065	463,767
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	3.25	1.65		103		4.10	18.2	574,471	897,373	1,334,715	572,051

** Period 1968-1977 ‡ 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 (91.4 m) upstream from the highway bridge on Farm-to-Market Road 170 at latitude 29°31'25", longitude 104°17'15", about 2,000 feet (610 m) from the confluence with the Rio Grande, and about 6 miles (9.7 km) southeast of Presidio, Texas. This stream enters the Rio Grande near the lower end of the Presidio Valley at river mile 950.1 (1,529.1 km), 8.6 river miles (13.8 km) downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. Measurements of high flows are made from the highway bridge. The zero of the gage is 2,541.61 feet (774.68 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 58 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 1977.

REMARKS: A small irrigation reservoir (San Esteban) 10.5 miles (16.9 km) 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 Rio Conchos reaches about 35,000 second-feet (991 m^3/sec).

EXTREME FLOWS FROM RECORDS: Momentary: Max. 56,400 second-feet, (1,600 m^3/sec), determined by slope-area calculations, on September 2, 1962, with a gage height of 13.54 feet (4.13 m). Min. Ø0.1 second-foot (0.003 m^3/sec) on July 25, 1953 and several days in August 1958.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	12,400 (351)	Sept. 21, 1974	Min.	0.1 (0.003)	July 25, 1953 and several days in August 1958
Monthly:	Max.	998 (28.3)	Sept. 1974	Min.	0.4 (0.01)	June 1974
Yearly:	Max.	97.1 (2.75)	1974	Min.	4.3 (0.12)	1951

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	‡ 1.4	‡ 1.7	‡ 1.6	1.0	1.0	‡ 126	‡ 1.0	‡ 0.5	1.1	‡ 1.0	‡ 0.7
2	1.5	1.4	1.7	1.5	1.0	1.0	161	.9	.5	1.0	1.0	.8
3	‡ 1.5	1.4	1.7	1.5	‡ 1.0	.9	13.2	.9	.5	‡ 1.0	1.0	.8
4	1.5	1.4	1.7	‡ 1.4	1.0	.8	6.0	.8	.5	1.0	1.0	.8
5	1.5	1.5	1.7	1.3	1.0	.8	‡ 1.1	.7	.5	1.0	1.1	‡ .9
6	1.5	1.5	1.7	1.3	1.0	‡ .7	1.1	.6	40.1	.9	1.1	.9
7	1.6	‡ 1.5	‡ 1.7	1.2	1.0	75.3	1.1	.6	23.8	.9	‡ 1.1	1.0
8	1.6	1.5	1.7	1.2	1.0	2.4	1.1	‡ .5	.9	.9	1.1	1.0
9	1.6	1.5	1.6	1.1	‡ 1.0	‡ 1.0	1.1	.5	‡ .7	.8	1.1	1.0
10	‡ 1.6	1.5	1.6	1.1	1.0	.9	1.1	.6	.7	.8	1.1	1.0
11	1.6	1.5	1.6	‡ 1.0	1.0	.9	‡ 1.1	.6	.7	‡ .8	1.1	1.1
12	1.6	1.5	1.6	1.0	292	.8	1.1	.7	.7	.8	1.1	‡ 1.1
13	1.6	1.5	1.5	1.1	742	‡ 6.8	1.1	.7	.7	.7	1.1	1.3
14	1.6	‡ 1.5	‡ 1.5	1.1	12.0	.5	1.1	.8	.8	.6	1.1	1.4
15	1.6	1.5	1.5	1.1	1.9	.5	1.1	‡ .8	.8	.6	‡ 1.1	‡ 1.6
16	1.6	1.5	1.5	1.1	‡ 1.6	.5	1.1	.8	.8	.6	1.0	1.4
17	‡ 1.6	1.5	1.5	1.2	1.5	.5	1.1	.8	.8	‡ .5	1.0	1.2
18	1.6	1.5	1.5	‡ 1.2	1.4	.5	‡ 1.1	.8	.8	.5	.9	1.1
19	1.6	1.5	1.5	1.2	1.3	.5	1.1	.8	‡ .8	.5	.8	‡ .9
20	1.6	1.5	1.5	1.1	1.3	‡ .5	1.1	.8	.8	.5	.8	.9
21	1.7	1.5	‡ 1.5	1.1	1.2	.7	1.1	.8	.9	.5	‡ .7	.9
22	1.7	‡ 1.5	1.6	1.1	1.1	34.1	10.8	‡ 150	.9	.5	.8	.9
23	1.7	1.5	1.6	1.1	‡ 1.0	17.8	.7	9.1	1.0	5.9	.8	1.0
24	‡ 1.7	1.6	1.6	1.0	1.0	.9	.7	‡ 1.1	1.0	6.5	.9	1.0
25	1.7	1.6	1.7	‡ 1.0	1.0	.7	‡ .7	.8	1.1	‡ 1.0	.9	1.0
26	1.7	1.6	1.8	1.0	1.0	.6	.7	.8	‡ 1.1	1.0	1.0	1.0
27	1.6	1.6	‡ 1.8	1.0	1.0	‡ .6	.7	.7	1.1	1.0	1.0	‡ 1.0
28	1.6	1.7	1.8	1.0	1.1	.6	.7	.7	1.1	1.0	‡ 1.1	1.0
29	1.5		1.7	1.0	1.1	.8	9.9	.6	1.1	1.0	1.0	1.0
30	1.5		1.7	1.0	1.1	1.0	1.0	.6	‡ 1.1	1.0	.8	1.0
31	1.4		1.6		‡ 1.1		1.0	.5		1.0		1.0
Sum	49.2	42.2	50.4	34.6	1,077.7	154.6	351.8	180.4	86.8	35.9	29.6	31.7

Month	Current Year 1977 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 1932-1977 Acre-Feet Average	Maximum	Minimum
Jan.	7.11	7.01	†21	Ø 1.7	31	Ø 1.4	1.6	97.6	141	273	46.4
Feb.	7.06	7.04	28	Ø 1.7	† 1	Ø 1.4	1.5	83.7	195	3,120	41.5
Mar.	7.06	7.01	26	Ø 1.8	†13	Ø 1.5	1.6	100	163	1,018	46.4
Apr.	7.01	6.98	1	Ø 1.6	†11	Ø 1.0	1.2	68.6	215	1,140	40.3
May	10.28	6.95	12	17,300	† 1	Ø 1.0	34.8	2,138	995	8,520	34.7
June	8.51	6.65	7	1,340	†14	Ø .5	5.2	307	1,888	12,653	24.2
July	8.81	6.64	1	1,660	†23	Ø .7	11.3	698	3,311	18,500	46.8
Aug.	8.20	6.58	22	1,640	† 8	Ø .5	5.8	358	3,313	16,330	56.9
Sept.	8.29	6.61	6	1,910	† 1	Ø .5	2.9	172	4,862	59,380	128
Oct.	7.22	6.61	23	35.2	†17	Ø .5	1.2	71.2	1,824	19,200	36.9
Nov.	6.67	6.64	† 5	Ø 1.1	21	Ø .7	1.0	58.7	208	2,554	35.7
Dec.	6.83	6.64	15	Ø 1.6	1	Ø .7	1.0	62.9	149	408	39.3
Yearly	10.28	6.58		17,300		Ø 0.5	5.8	4,215.7	17,264	70,273.8	3,109.2
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	3.13	2.01		490		0.01	0.16	5,200	21,295	86,683	3,835

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

RIO GRANDE BELOW RIO CONCHOS NEAR PRESIDIO, TEXAS AND OJINAGA, CHIHUAHUA

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°31'10", longitude 104°17'10", and river mile 949.8 (1,528.5 km); 0.4 river mile (0.6 km) downstream from Alamito Creek and 9.0 river miles (14.4 km) downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. The zero of the gage is 2,536.00 feet (772.97 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 40 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 1977. Records are also available from 1896 through June 13, 1932 for a station located about 12.1 river miles (19.5 km) downstream from the Rio Conchos and 1.3 miles (2.1 km) upstream from Alamito Creek; and from June 14, 1932 through 1954 for a station about 2.0 river miles (3.2 km) downstream from the Rio Conchos and 11.4 river miles (18.3 km) upstream from Alamito Creek.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The transmitter, operated in cooperation with the National Weather Service, relays gage height data upon interrogation by telephone via commercial circuits.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 54,300 second-feet (1,540 m^3/sec) on October 1, 1958 with a gage height of 20.37 feet (6.21 m). The greatest recorded flow occurred September 11, 1904, with a peak flow estimated at 162,000 second-feet (4,590 m^3/sec) at a station 11.8 miles (19.0 km) upstream. Min. 0.2 second-foot (0.01 m^3/sec) several days in July 1955, and on June 30, 1958.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	24,800 (702)	Sept. 30, 1974	Min.	12.9 (0.37)	March 27, 1968
Monthly:	Max.	7,900 (224)	Sept. 1974	Min.	74.5 (2.11)	March 1968
Yearly:	Max.	1,710 (48.4)	1968	Min.	667 (18.9)	1977

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	405	‡ 298	‡ 199	1,390	1,540	1,080	690	519	1,170	204	258	‡ 252
2	397	284	197	1,360	1,590	‡ 560	819	447	948	194	242	251
3	415	283	196	1,390	‡ 1,530	446	526	433	516	‡ 205	241	235
4	429	269	200	‡ 1,380	1,500	567	760	414	419	228	243	235
5	433	262	203	1,380	1,510	492	‡ 543	393	369	309	237	252
6	433	269	217	1,380	1,490	‡ 586	492	369	400	277	247	260
7	434	‡ 277	233	1,370	1,500	634	490	536	835	457	‡ 261	259
8	436	276	220	1,350	1,490	513	448	‡ 1,100	407	350	271	292
9	440	273	204	1,410	1,510	536	862	1,100	‡ 303	334	264	402
10	‡ 420	273	195	1,420	1,490	414	924	1,130	276	275	256	621
11	412	274	402	‡ 1,460	1,480	366	‡ 616	1,120	246	‡ 254	256	336
12	411	274	1,160	1,420	1,630	330	577	1,160	365	257	252	‡ 292
13	411	272	1,330	1,400	2,850	‡ 335	558	1,160	554	251	266	283
14	410	‡ 273	‡1,390	1,410	1,450	255	526	1,170	470	243	271	282
15	408	264	1,410	1,410	1,330	407	487	1,360	313	235	269	295
16	402	240	1,430	1,480	‡ 1,400	480	484	1,490	337	218	258	294
17	‡ 393	227	1,430	1,330	1,400	482	460	1,380	315	223	252	305
18	382	214	1,430	‡ 1,050	1,340	466	‡ 451	1,190	301	222	253	295
19	379	211	1,420	1,560	1,280	452	460	1,170	‡ 302	226	257	‡ 283
20	374	234	1,460	1,550	1,280	‡ 457	751	1,180	282	220	264	149
21	286	239	1,490	1,570	1,260	457	495	1,190	266	222	‡ 267	177
22	226	‡ 215	1,450	1,560	1,280	2,250	546	‡ 1,630	257	217	257	231
23	309	207	1,460	1,580	‡ 1,290	1,100	622	1,370	238	265	256	242
24	‡ 329	210	1,460	1,620	1,290	742	640	1,260	218	434	259	243
25	332	193	1,440	‡ 1,640	1,270	737	‡ 824	1,280	203	‡ 481	260	250
26	318	200	1,420	1,610	1,340	582	726	1,150	‡ 210	300	260	255
27	329	181	1,460	1,590	1,410	‡ 581	535	1,210	208	279	256	255
28	330	207	‡1,480	1,670	1,410	525	468	1,210	200	270	257	266
29	324		1,450	1,550	1,410	481	520	‡ 1,180	203	267	262	270
30	312		1,420	1,540	1,420	502	482	1,250	207	270	260	269
31	315		1,390		1,400		504	1,220		269		270
Sum	11,634	6,899	30,846	43,830	45,370	17,815	18,286	32,771	11,338	8,456	7,712	8,601

Month	Current Year 1977								Period 1968-1977		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	2.31	1.86	9	465	22	214	375	23,076	41,697	116,947	20,968
Feb.	2.03	1.68	1	300	25	147	246	13,684	35,150	110,937	4,745
Mar.	3.40	1.76	21	1,510	4	176	995	61,182	53,486	223,755	4,583
Apr.	3.53	2.60	†27	1,730	18	635	1,460	86,936	38,133	89,704	6,497
May	5.77	3.11	13	8,930	†19	1,200	1,460	89,990	40,465	124,046	12,147
June	4.28	1.90	22	3,400	14	241	594	35,336	42,082	89,211	5,927
July	3.66	2.24	9	2,000	8	432	590	36,270	73,902	172,324	24,764
Aug.	3.86	2.13	22	2,400	7	356	1,060	65,000	99,931	270,367	30,365
Sept.	3.45	1.79	6	1,610	29	196	378	22,489	174,005	469,832	22,489
Oct.	2.72	1.76	†24	728	† 2	189	273	16,772	100,618	335,405	16,772
Nov.	2.03	1.90	7	295	5	233	257	15,297	45,415	113,407	8,741
Dec.	3.06	1.45	9	1,020	21	99.3	277	17,060	32,723	52,176	17,060
Yearly	5.77	1.45		8,930		99.3	667	483,092	777,607	1,238,356	483,092
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.76	0.44		253		2.81	18.9	595,894	959,178	1,527,512	595,894

** Period 1968-1977 ‡ 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°11'50", longitude 103°36'20", 2.6 creek miles (4.2 km) from the confluence with the Rio Grande, and about 8.5 miles (13.7 km) south of Terlingua, Brewster County, Texas. This creek enters the Rio Grande at river mile 885.2 (1,424.6 km), the lower end of Santa Helena Canyon. The zero of the gage is 2,200.64 feet (670.76 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on 59 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1977.
REMARKS: Irrigation diversions modify the flow of this spring-fed creek at this station.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 34,900 second-feet (988 m^3/sec) on May 24, 1935 with a gage height of 17.59 feet (5.36 m) on a gage 0.3 mile (0.5 km) downstream. Min. 0.1 second-foot (0.003 m^3/sec) several days in June and July 1950.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	17,200 (487)	June 1, 1937	Min. 0.1 (0.003)	Several days in June & July 1950
Monthly:	Max.	1,150 (32.6)	Sept. 1974	Min. 0.8 (0.02)	October 1934
Yearly:	Max.	146 (4.13)	1937	Min. 5.5 (0.16)	1943

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	2.9	‡ 2.5	‡ 2.0	4.8	‡ 1.8	2,250 ‡	‡ 1.5	‡ 2.6	1.8	‡ 2.3	‡ 2.4
2	2.5	‡ 3.0	2.5	2.0	‡ 3.2	1.7	749	1.5	2.6	1.9	2.3	2.4
3	‡ 2.5	3.0	2.5	2.0	3.1	1.7	226	1.5	2.6	‡ 1.9	2.3	2.4
4	2.5	2.9	2.5	2.0	3.0	1.6	15.2	1.5	2.6	1.9	2.2	2.4
5	2.5	2.8	2.5	‡ 2.0	2.8	1.5	‡ 11.6	1.4	2.6	1.8	2.2	2.4
6	2.5	2.8	2.5	2.0	2.7	1.5	2.8	1.4	235	1.8	2.2	‡ 2.4
7	2.4	2.8	‡ 2.5	2.0	2.6	‡ 1.4	2.5	1.4	7.3	1.8	‡ 2.2	2.4
8	2.4	‡ 2.7	2.5	2.0	2.4	1.4	210	1.4	11.2	1.7	2.2	2.4
9	2.4	2.7	2.5	1.9	‡ 2.3	1.4	229	‡ 1.4	‡ 2.6	1.7	2.3	2.4
10	2.4	2.7	2.5	1.9	‡ 2.2	1.4	4.7	1.4	2.6	1.6	2.4	2.4
11	‡ 2.4	2.7	2.4	‡ 1.9	2.2	1.4	3.1	1.4	2.6	‡ 1.6	2.4	2.4
12	2.4	2.6	2.4	1.9	192	260	‡ 3.1	1.4	‡ 2.6	1.6	2.4	‡ 2.4
13	2.3	2.6	2.4	7.6	1,780	‡ 110	3.1	298	2.6	1.6	2.5	2.4
14	2.3	2.6	2.4	691	4.5	23.2	3.1	348	2.6	1.6	2.6	2.4
15	2.3	‡ 2.6	‡ 2.4	4.6	2.6	19.6	24.3	‡ 11.6	28.2	1.6	‡ 2.6	‡ 2.4
16	2.3	2.6	2.4	4.2	‡ 2.1	16.0	7.0	3.1	3.6	1.6	2.5	2.4
17	2.2	2.6	2.4	3.9	2.1	12.3	2.3	2.5	3.2	‡ 1.6	2.5	2.3
18	‡ 2.2	2.6	2.4	3.1	2.0	8.7	‡ 2.3	2.5	2.9	1.6	2.4	2.3
19	2.2	2.5	2.5	‡ 2.4	2.0	5.1	2.3	2.3	‡ 2.7	1.6	2.3	2.2
20	2.2	2.5	2.5	2.4	2.0	‡ 1.5	2.3	3.1	2.6	1.6	2.3	‡ 2.2
21	2.2	2.5	2.5	2.3	1.9	1.5	5.1	2.5	2.4	160	‡ 2.2	2.2
22	2.3	‡ 2.5	‡ 2.5	2.2	1.9	99.6	512	‡ 2.5	2.3	4.5	2.2	2.2
23	2.3	2.5	2.4	2.2	1.8	.8	193	2.5	2.1	260	2.2	2.2
24	‡ 2.3	2.5	2.4	2.2	‡ 1.8	.7	27.4	2.5	2.0	220	2.2	2.2
25	2.3	2.5	2.3	‡ 2.1	1.8	1.3	2.5	2.5	1.8	‡ 30.9	2.2	2.2
26	2.4	2.5	2.2	2.0	1.8	1.7	‡ 2.4	2.5	‡ 1.7	7.3	2.2	2.2
27	2.5	2.5	2.1	13.2	1.8	‡ 2.1	2.2	693	1.7	2.6	2.2	2.2
28	2.6	2.5	2.1	2.9	1.8	117	2.1	91.9	1.8	1.8	‡ 2.2	‡ 2.2
29	2.7		‡ 2.0	38.4	1.8	‡ 902	2.0	6.2	1.8	2.0	2.3	2.2
30	2.8		2.0	101	1.8	10.0	1.8	‡ 2.9	1.8	2.2	2.3	2.2
31	2.8		2.0		1.8		1.6	2.6		2.3		2.2
Sum	74.6	74.2	73.7	911.3	2,040.6	1,609.9	4,505.8	1,499.9	344.7	727.5	69.3	71.6

Month	Current Year 1977 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 1932-1977 Acre-Feet Average	Maximum	Minimum
Jan.	2.42	2.37	†30	Ø 2.8	†17	Ø 2.2	2.4	148	192	875	82.7
Feb.	2.42	2.38	† 2	Ø 3.0	†19	Ø 2.5	2.6	147	241	4,400	73.4
Mar.	2.37	2.35	† 1	Ø 2.5	†29	Ø 2.0	2.4	146	270	2,410	72.4
Apr.	4.22	1.72	14	3,040	26	1.4	30.4	1,808	955	15,500	55.1
May	5.00		13	5,020	†23	Ø 1.8	65.8	4,048	3,558	26,000	81.3
June	5.46		29	6,530	24	Ø .7	53.7	3,193	6,253	54,800	59.5
July	7.96		1	14,200	31	Ø 1.6	145	8,937	8,648	28,700	518
Aug.	7.12	1.62	27	11,300	† 5	Ø 1.4	48.4	2,975	6,190	33,617	123
Sept.	4.84	1.62	6	4,580	†26	Ø 1.7	11.5	684	8,510	68,375	123
Oct.	4.13	1.91	21	2,850	†10	Ø 1.6	23.5	1,443	3,209	27,900	50.8
Nov.	2.18	2.16	†14	Ø 2.6	† 4	Ø 2.2	2.3	137	355	2,980	64.9
Dec.	2.17	2.16	† 1	Ø 2.4	†19	Ø 2.2	2.3	142	324	3,080	90.0
	7.96			14,200		0.7	32.9	23,808	38,705	105,807	3,958
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	2.43			402		0.02	0.93	29,367	47,743	130,513	4,882

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

RIO GRANDE AT JOHNSON RANCH NEAR CASTOLON, TEXAS AND SANTA ELENA, CHIHUAHUA

DESCRIPTION: Cableway, gravity well, and digital water-stage recorder located on the left bank at latitude 29°02'05", longitude 103°23'25", and river mile 862.4 (1,388.0 km); 1.3 river miles (2.2 km) upstream from the old Johnson Ranch headquarters, 6.0 river miles (9.7 km) downstream from Smoky Creek, and 9.2 river miles (14.8 km) upstream from Chizos Crossing and the Chihuahua-Coahuila state line. The zero of the gage is 2,045.30 feet (623.41 m) 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. Computations by shifting control methods. Records available: April 1936 through 1977.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 61,900 second-feet (1,750 m^3/sec) on September 27, 1958 with a gage height of 24.70 feet (7.53 m). A flow estimated at 97,000 second-feet (2,750 m^3/sec) with a stage of 24.6 feet (7.50 m) 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 (Cubic Meters per Second)**

Daily:	Max.	31,000	(878)	Sept. 21, 1974	Min.	27.5	(0.78)	Sept. 9, 1968
Monthly:	Max.	7,930	(225)	Sept. 1968	Min.	96.9	(2.74)	April 1976
Yearly:	Max.	1,910	(54.1)	1974	Min.	692	(19.6)	1977

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	463	332	‡ 201	1,350	1,460	‡ 1,360	‡ 950	‡ 483	1,090	229	‡ 268	‡ 280
2	439	‡ 318	211	1,350	‡ 1,460	1,220	4,100	499	1,010	227	260	275
3	‡ 431	310	194	1,310	1,490	729	2,270	459	912	‡ 329	263	262
4	436	314	197	1,340	1,450	657	952	432	573	244	255	258
5	433	312	199	‡ 1,380	1,410	576	‡ 833	415	426	236	250	257
6	425	298	220	1,340	1,410	507	660	387	913	249	252	‡ 260
7	424	305	‡ 215	1,330	1,400	‡ 460	574	370	848	285	‡ 251	274
8	412	‡ 314	230	1,310	1,380	655	519	369	692	277	261	286
9	405	307	232	1,310	1,380	643	806	‡ 777	‡ 582	397	268	300
10	417	297	208	1,370	1,390	498	599	896	397	318	275	327
11	‡ 435	290	197	‡ 1,390	1,360	552	1,040	891	352	‡ 297	275	562
12	416	277	190	1,410	1,430	441	‡ 603	902	‡ 580	252	286	‡ 478
13	409	281	806	1,560	3,280	‡ 720	530	950	452	237	283	365
14	400	288	1,190	2,200	2,290	388	482	1,410	396	235	286	329
15	393	‡ 282	‡1,260	1,440	1,580	364	463	‡ 1,590	541	229	‡ 305	‡ 317
16	387	281	1,270	1,420	‡ 1,430	314	455	1,470	413	221	307	310
17	385	273	1,290	1,440	1,410	491	427	1,390	376	‡ 213	298	316
18	‡ 390	253	1,310	1,360	1,340	462	‡ 425	1,320	349	213	291	308
19	388	239	1,310	‡ 970	1,270	449	421	1,100	‡ 325	213	288	309
20	392	229	1,310	1,480	1,250	‡ 436	441	1,080	313	218	288	‡ 292
21	395	232	1,360	1,480	1,250	483	566	1,070	306	223	‡ 296	284
22	384	‡ 259	‡1,380	1,480	1,240	878	551	‡ 1,090	275	494	298	219
23	309	254	1,340	1,490	1,250	2,360	1,010	1,440	257	306	294	200
24	‡ 288	224	1,370	1,500	‡ 1,250	1,250	615	1,240	250	465	285	243
25	350	220	1,360	‡ 1,520	1,250	789	605	1,160	243	‡ 346	289	252
26	362	213	1,380	1,530	1,220	795	‡ 725	1,190	‡ 230	511	292	254
27	353	210	1,370	1,540	1,270	‡ 592	673	1,060	233	372	289	259
28	346	217	1,390	1,530	1,360	549	534	2,120	222	304	‡ 283	‡ 255
29	348		‡1,410	1,590	1,360	1,150	451	1,230	219	284	284	259
30	336		1,400	1,540	1,400	583	488	‡ 1,160	220	269	285	269
31	320		1,350		1,350		626	1,140		269		274
Sum	12,071	7,629	27,350	43,260	45,070	21,351	24,394	31,090	13,995	8,962	8,405	9,133

Month	Current Year 1977 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 1968-1977 Acre-Feet Average	Maximum	Minimum
Jan.	2.47	2.00	1	474	24	264	389	23,942	42,606	118,276	23,830
Feb.	2.17	1.80	1	346	28	200	272	15,132	35,401	111,869	7,743
Mar.	3.79	1.74	†29	1,440	12	183	882	54,248	51,747	211,676	6,067
Apr.	5.63	2.89	14	3,640	19	762	1,440	85,805	37,539	98,106	5,765
May	6.29	3.49	13	4,620	26	1,190	1,450	89,395	41,587	116,801	14,454
June	5.20	1.94	29	3,000	16	294	712	42,349	45,550	96,474	5,839
July	11.97	2.41	2	11,500	1	395	787	48,385	84,621	194,499	29,430
Aug.	7.44	2.26	28	6,080	† 7	359	1,000	61,666	108,617	242,539	30,689
Sept.	6.49	1.85	6	5,010	30	216	467	27,759	186,805	472,093	27,759
Oct.	3.51	1.83	22	1,080	18	207	289	17,776	115,305	372,000	17,776
Nov.	2.13	1.99	†15	313	† 6	245	280	16,671	48,371	121,232	13,267
Dec.	2.87	1.77	11	683	23	179	295	18,115	34,552	54,064	18,115
Yearly	11.97	1.74		11,500		179	692	501,243	832,701	1,382,082	501,243
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	3.65	0.53		326		5.07	19.6	618,283	1,027,137	1,704,798	618,283

** Period 1968-1977 ‡ Discharge measurement made on this day † And other days

RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TEXAS AND RANCHO SANTA ROSA, COAHUILA

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°45'30", and river mile 657.5 (1,058.2 km); 500 feet (152 m) downstream from the Terrell-Val Verde County Line, 5.4 river miles (8.8 km) downstream from Lozier Canyon, and about 12.3 miles (19.8 km) west of Langtry, Texas. The zero of the gage is 1,157.17 feet (352.71 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 24 discharge measurements during the year, 23 by the United States Section and 1 by the Mexican Section of the 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 1977.

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.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 137,000 second-feet (3,880 m^3/sec) on September 20, 1974 with a gage height of 36.64 feet (11.17 m). Min. 188 second-feet (5.32 m^3/sec) on August 19, 1965.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	81,600 (2,310)	Sept. 20, 1974	Min.	217 (6.15)	July 1, 1968
Monthly:	Max.	9,920 (281)	Sept. 1974	Min.	322 (9.12)	March 1968
Yearly:	Max.	2,480 (70.2)	1974	Min	907 (25.7)	1977

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	745	628	484	1,480	1,620	1,410	1,020	708	1,340	428	526	523
2	752	627	489	1,450	‡ 1,570	1,380	1,080	713	1,310	421	503	523
3	‡ 758	620	477	1,410	1,590	1,400	2,830	809	1,280	‡ 416	489	523
4	758	618	475	‡ 1,360	1,800	1,380	2,720	701	1,230	405	492	526
5	748	624	457	1,340	1,520	1,130	‡ 2,610	682	1,190	396	492	‡ 522
6	728	614	456	1,320	1,520	‡ 901	1,630	656	‡ 1,080	396	492	521
7	710	‡ 613	‡ 449	1,370	1,460	797	1,030	623	879	473	‡ 492	509
8	710	618	447	1,360	1,420	717	982	611	1,040	442	503	502
9	710	603	449	1,340	2,760	1,020	884	600	1,590	420	499	512
10	710	586	482	1,340	1,500	714	1,330	575	890	426	493	512
11	710	591	475	1,320	1,680	833	1,010	554	911	471	502	512
12	710	587	482	1,340	1,530	838	960	846	842	528	502	512
13	710	583	477	1,390	1,710	748	954	1,020	1,020	546	509	521
14	712	572	470	1,990	1,580	741	1,030	1,050	699	523	518	528
15	700	563	463	1,640	3,470	691	844	‡ 1,060	794	514	523	533
16	700	554	757	2,260	‡ 2,250	842	777	1,230	735	479	523	543
17	‡ 686	566	1,220	1,560	1,700	649	728	1,750	655	‡ 458	523	550
18	686	570	1,320	‡ 1,440	1,490	600	‡ 706	1,340	774	453	523	556
19	685	568	1,340	1,460	1,450	550	694	1,390	‡ 692	453	528	‡ 560
20	683	565	1,390	1,450	1,430	‡ 598	665	1,460	621	453	533	554
21	698	557	‡ 1,410	1,240	1,360	648	696	1,220	600	453	‡ 533	552
22	698	‡ 543	1,400	1,240	1,300	684	785	1,170	573	641	533	547
23	698	531	1,400	1,480	1,280	1,100	873	1,160	546	726	514	550
24	692	508	1,460	1,490	1,270	960	824	1,170	530	628	512	539
25	676	510	1,430	1,490	1,220	2,510	1,040	1,310	518	828	512	523
26	644	521	1,470	1,490	1,250	1,720	970	1,520	494	595	509	468
27	600	512	1,460	1,490	1,250	1,290	838	1,320	480	661	508	446
28	604	487	1,440	1,520	1,240	1,010	820	1,370	464	‡ 648	512	483
29	618		1,440	1,630	1,230	960	925	1,960	452	686	512	491
30	628		1,440	1,790	2,070	877	889	2,070	439	657	516	499
31	618		1,470		1,460		794	1,390		577		506
Sum	21,485	16,039	28,879	44,480	49,980	29,698	33,938	34,038	24,668	16,201	15,326	16,146

Month	Current Year 1977 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 1968-1977 Acre-Feet Average	Maximum	Minimum
Jan.	2.16	2.01	† 2	758	†27	586	693	42,615	57,138	122,084	40,143
Feb.	2.06	1.91	† 1	641	28	482	573	31,813	48,575	115,301	22,435
Mar.	2.84	1.86	26	1,940	† 7	434	932	57,281	67,455	224,767	19,789
Apr.	3.51	2.38	14	3,930	22	1,050	1,480	88,225	57,916	129,796	20,200
May	4.23	2.49	9	5,810	25	1,210	1,610	99,134	58,925	120,734	28,616
June	3.60	1.94	25	4,260	†19	512	990	58,905	64,794	101,462	22,463
July	4.47	2.07	3	6,240	20	652	1,090	67,315	103,533	218,916	51,780
Aug.	3.20	1.97	†29	2,920	10	543	1,100	67,513	129,813	212,846	45,474
Sept.	2.88	1.85	9	2,040	30	425	822	48,928	219,715	590,037	48,928
Oct.	2.48	1.80	22	1,190	6	380	523	32,134	141,107	396,655	32,134
Nov.	1.98	1.91	1	554	3	482	511	30,399	64,705	129,741	30,399
Dec.	1.99	1.86	†18	564	27	434	521	32,025	50,131	71,001	32,025
Yearly	4.47	1.80		6,240		380	907	656,287	1,063,807	1,796,884	656,287
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.36	0.55		177		10.8	25.7	809,530	1,312,206	2,216,456	809,530

** Period 1968-1977 ‡ Discharge measurement made on this day † And other days

PECOS RIVER NEAR LANGTRY, TEXAS

DESCRIPTION: 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 (12.1 km) east of Langtry, Texas, 9.5 river miles (15.3 km) upstream from the Pecos High Bridge, and 15.0 river miles (24.1 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 616.0 (991.4 km); 23.6 river miles (38.0 km) downstream from Langtry, Texas. The zero of the gage is 1,133.08 feet (345.36 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 22 discharge measurements during the year, 19 by the United States Section and 3 by the Mexican Section of the Commission, 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 1977. Records are also available for Pecos River near Comstock, 9.5 river miles (15.3 km) downstream, from March 17 through December 3, 1898 and May 1900 through October 7, 1954; for Pecos River near Shumla, 3.5 river miles (5.6 km) 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.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 577,000 second-feet (16,300 m^3/sec) on September 20, 1974 with a gage height of 75.30 feet (22.95 m). The greatest flood of record, which exceeded a gage height of 100 feet (30.5 m) at this station, occurred on June 28, 1954. The peak discharge was 948,000 second-feet (26,800 m^3/sec) at the gaging station located near the railroad bridge 9.5 river miles (15.3 km) downstream. Min. 58.3 second-feet (1.65 m^3/sec) on July 27, 1974 with a gage height of 1.47 feet (0.45 m).

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 153,000 (4,330)	Sept. 20, 1974	Min. 59.5 (1.69)	Aug. 20, 21, & 22, 1970
Monthly:	Max. 13,500 (382)	Sept.	1974	Min. 68.0 (1.93)	August 1970
Yearly:	Max. 1,500 (42.5)		1974	Min. 131 (3.71)	1970

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	294	275	255	258	333	245	204	186	175	168	213	199
2	298	274	250	264	‡ 325	237	205	186	174	174	202	200
3	301	278	258	263	311	233	203	187	176	‡ 186	199	201
4	301	278	249	‡ 251	314	231	197	183	176	187	209	200
5	300	278	248	245	304	222	‡ 196	178	173	178	217	‡ 201
6	‡ 292	272	249	238	375	‡ 221	197	177	‡ 173	179	212	195
7	290	‡ 282	‡ 249	242	298	224	196	177	176	182	‡ 206	192
8	290	309	246	245	298	245	197	176	175	187	226	198
9	291	285	242	246	289	241	198	175	178	188	215	196
10	285	278	250	240	284	225	197	176	181	183	201	191
11	281	277	248	239	280	217	193	176	179	181	200	191
12	288	278	246	240	278	216	188	175	197	174	199	195
13	289	275	246	247	288	223	187	179	201	175	198	199
14	290	270	245	370	284	219	185	177	195	173	200	197
15	294	264	248	627	279	218	184	‡ 174	186	173	201	197
16	286	269	242	2,850	‡ 277	213	187	173	182	174	203	198
17	‡ 284	264	243	1,330	267	210	191	175	181	‡ 175	201	196
18	282	264	259	696	264	207	‡ 188	176	182	178	199	195
19	282	266	258	577	258	204	188	176	‡ 184	181	198	197
20	285	265	249	509	256	‡ 201	189	175	180	183	201	193
21	290	264	‡ 251	469	258	198	188	174	176	182	199	190
22	299	‡ 264	250	434	248	220	191	173	176	201	197	190
23	303	265	243	412	253	236	191	175	172	216	197	193
24	290	261	244	391	246	‡ 232	188	173	175	203	‡ 197	198
25	284	260	250	370	246	226	186	171	177	210	196	199
26	275	257	249	348	246	224	187	170	178	250	195	191
27	281	254	501	319	250	218	186	175	174	241	196	193
28	281	258	298	342	249	212	186	173	169	226	199	198
29	274		270	332	246	212	182	174	167	223	200	202
30	276		264	878	245	210	192	178	167	222	201	204
31	281		253		239		188	177		220		204
Sum	8,937	7,584	8,053	14,472	8,588	6,640	5,935	5,470	5,355	5,973	6,077	6,093

Current Year 1977 — **Period July 1967-1977**

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.	2.29	2.20	†22	305	†10	271	288	17,726	13,096	29,240	7,559
Feb.	2.34	2.14	8	336	†26	249	271	15,043	11,660	25,414	7,012
Mar.	2.85	2.10	27	827	†10	235	260	15,973	11,745	22,124	6,929
Apr.	5.14	2.09	16	6,090	11	232	482	28,705	15,260	28,705	8,156
May	2.56	2.11	6	514	31	238	277	17,034	14,247	28,767	7,207
June	2.20	1.98	8	271	21	194	221	13,170	9,574	14,676	5,458
July	2.03	1.93	† 1	211	†28	178	191	11,772	19,387	76,891	4,289
Aug.	1.97	1.89	† 1	191	26	166	176	10,850	25,988	162,055	4,178
Sept.	2.04	1.88	12	214	30	163	179	10,621	88,717	804,466	7,674
Oct.	2.15	1.87	26	253	1	160	193	11,847	22,757	113,911	7,123
Nov.	2.10	1.98	8	235	† 3	194	203	12,054	17,019	59,734	6,589
Dec.	2.02	1.96	†30	208	† 7	188	197	12,085	14,112	37,859	7,662
	5.14	1.87		6,090		160	244	176,880	263,562	1,087,822	94,683
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.57	0.57		172		4.53	6.91	218,181	325,104	1,341,828	116,791

‡ Discharge measurement made on this day † And other days

DEAD MANS CANYON NEAR COMSTOCK, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Pecos River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Dead Mans Canyon.

DESCRIPTION: Cableway, control weir, bubbler gage, and digital recorder located on the left bank of the canyon at latitude 29°47'05", longitude 101°19'25", 2.3 miles (3.7 km) upstream from its confluence with the Pecos River, which is 9.5 miles (15.3 km) upstream from the Pecos River confluence with the Rio Grande. The zero of the gage is 1,178.00 feet (359.05 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: March 1968 through 1977.
REMARKS: This stream is normally dry, its flow being confined to periods of storm runoff from its 88 square miles (228 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 37,800 second-feet (1,070 m^3/sec) on September 17, 1974 with a gage height of 12.78 feet (3.90 m). Maximum volumes: Monthly, 29,164 acre-feet (35,974,000 m^3) in September 1974; yearly, 30,527 acre-feet (37,655,000 m^3) in 1974.

Mean Daily Discharge in Second-Feet 1977

Month and Day			
	No flow during 1977		

Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Yearly		Meters	Cubic Meters per Second	Thousands of Cubic Meters

DOLAN SPRINGS NEAR LOMA ALTA, TEXAS

DESCRIPTION: Concrete wall control, 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 (19.3 km) west of Loma Alta, Val Verde County, Texas. Snake Creek enters Dolan Creek from the left side, 0.9 creek mile (1.4 km) from the confluence with Devils River. Dolan Creek enters Devils River from the left side, 16.8 river miles (27.0 km) upstream from Pafford Crossing, and 42.3 river miles (68.1 km) from the confluence with the Rio Grande. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 12 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1966 through 1977.

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. The previous 90° V-notch weir was destroyed by a flood in 1971.

EXTREME FLOWS FROM RECORDS:

		Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max.	25.0 (0.71)	July 18, 1976	Min.	1.0 (0.03)	Several days in May 1971
Monthly:	Max.	20.4 (0.58)	March 1977	Min.	1.1 (0.03)	March, April & May 1971
Yearly:	Max.	17.2 (0.49)	1977	Min.	1.7 (0.05)	1968

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18.2	18.6	20.4	20.0	15.6	‡ 15.7	18.2	‡ 18.2	16.9	15.1	‡ 18.0	13.9
2	18.2	18.6	20.5	19.4	‡ 15.5	15.8	17.9	18.2	16.6	15.2	18.4	13.8
3	‡ 18.2	18.7	20.1	19.1	15.5	15.8	18.0	18.1	16.2	‡ 15.2	18.3	13.7
4	17.2	18.7	19.9	‡ 19.1	15.4	15.9	17.7	17.8	16.2	15.6	18.5	13.6
5	17.2	18.5	20.0	19.0	15.4	16.2	‡ 18.1	18.0	15.3	15.8	18.4	‡ 13.5
6	17.3	18.5	20.1	18.5	15.4	16.3	18.1	18.0	‡ 15.6	15.9	18.3	14.0
7	17.3	‡ 18.6	‡ 20.2	18.4	15.7	16.3	18.1	18.3	15.9	16.0	17.9	14.1
8	17.4	18.7	20.2	17.9	15.6	16.4	18.1	18.2	15.7	16.2	17.8	14.1
9	17.4	18.8	20.2	17.8	15.6	16.7	18.2	18.2	15.7	16.3	17.7	14.1
10	17.5	18.9	20.5	17.7	15.6	17.1	17.9	18.1	15.7	16.4	17.7	14.0
11	17.5	19.0	20.5	17.3	15.5	17.1	17.9	18.1	15.4	16.2	17.6	14.0
12	17.3	18.9	20.5	17.2	15.5	17.2	18.2	18.0	15.5	16.4	17.5	14.0
13	17.3	19.0	20.5	17.0	15.5	17.2	18.2	18.0	16.1	16.5	17.4	14.1
14	17.4	19.1	20.5	17.4	15.4	17.3	18.2	18.0	15.5	16.6	17.1	14.1
15	17.4	19.2	20.5	17.3	15.4	16.7	18.2	17.9	15.6	16.6	16.7	14.1
16	17.5	19.3	20.5	18.5	15.4	16.8	18.3	17.9	15.6	16.4	16.6	14.2
17	17.5	19.4	20.5	18.4	15.3	16.8	18.3	17.8	15.6	16.5	16.5	14.2
18	17.6	19.5	20.5	18.0	15.3	17.2	18.3	18.1	15.7	16.7	16.1	14.2
19	17.6	19.6	20.5	18.1	15.0	17.0	18.3	17.8	15.7	16.8	16.0	14.3
20	17.7	19.7	20.5	18.3	15.0	17.0	18.3	17.4	15.4	16.9	15.9	14.0
21	17.7	19.9	20.2	18.1	16.0	17.1	18.3	17.4	15.4	17.1	15.8	14.1
22	17.8	20.0	20.2	18.0	16.0	17.4	18.4	17.3	14.9	17.2	15.5	14.1
23	18.1	19.8	20.0	17.6	16.0	17.5	18.4	17.3	14.9	17.1	14.9	14.1
24	18.2	19.9	20.0	17.4	15.9	17.5	18.4	17.5	14.9	17.3	14.8	14.2
25	18.2	19.7	20.0	17.3	15.9	17.9	18.4	17.2	15.0	17.1	14.7	14.2
26	18.3	19.8	20.2	16.9	15.9	17.9	18.1	17.2	15.0	17.2	14.6	14.2
27	18.3	19.9	22.7	16.8	15.9	17.7	18.1	17.1	15.3	17.3	14.6	14.3
28	18.4	20.3	21.7	16.4	15.8	18.3	18.1	17.1	15.1	17.5	14.5	14.1
29	18.4		20.5	16.2	15.8	18.4	18.2	17.0	14.9	17.6	14.4	13.4
30	18.5		20.0	16.0	15.8	18.7	18.2	17.0	15.1	17.7	14.0	13.2
31	18.5		20.0		15.7		18.2	17.0		17.9		13.2
Sum	551.1	538.6	632.6	535.1	483.3	510.9	563.3	549.2	466.4	514.3	496.2	433.1

Current Year 1977 — **Period 1966-1977**

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.	2.24	2.20	†30	18.5	† 4	17.2	17.8	1,093	470	1,093	77.2
Feb.	2.21	2.17	28	20.3	† 5	18.5	19.2	1,068	390	1,068	66.8
Mar.	2.25	2.14	27	23.4	4	19.9	20.4	1,255	394	1,255	70.4
Apr.			1	ø 20.0	30	ø 16.0	17.8	1,061	332	1,061	65.5
May	2.16	2.12	†21	16.0	†19	15.0	15.6	959	378	1,096	66.2
June	2.21	2.16	30	18.7	1	15.7	17.0	1,013	373	1,129	87.9
July	2.22	2.17	1	19.2	4	17.7	18.2	1,117	406	1,117	80.9
Aug.	2.19	2.15	7	18.3	†29	17.0	17.7	1,089	506	1,105	93.8
Sept.	2.17	2.07	1	16.9	25	14.5	15.5	925	528	1,167	85.5
Oct.	2.20	2.05	31	17.9	1	15.1	16.6	1,020	614	1,188	87.9
Nov.	2.08	2.00	3	18.6	30	14.0	16.5	984	624	1,203	84.5
Dec.	2.02	1.95	†19	14.3	†30	13.2	14.0	859	600	1,177	83.9
Yearly	2.25	1.95		23.4		13.2	17.2	12,443	5,615	12,443	1,257.2
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.69	0.59		0.66		0.37	0.49	15,348	6,926	15,348	1,551

‡ Discharge measurement made on this day ** Includes storm flow ø Mean daily
† And other days

DEVILS RIVER AT PAFFORD CROSSING NEAR COMSTOCK, TEXAS

DESCRIPTION: Concrete control wall with rectangular notch opening of 900 second-foot (25.5 m^3/sec) capacity, cableway, bubbler gage, water-stage recorders (graphic & digital), and binary decimal transmitter located on the left bank at latitude 29°40'35", longitude 101°00'00", about 11.5 miles (18.5 km) east of Comstock, Val Verde County, Texas, and 25.5 river miles (41.0 km) from the confluence with the Rio Grande. The confluence is located at river mile 574.6 (924.7 km), 0.7 river mile (1.1 km) upstream from Amistad Dam. The zero of the gage is 1,131.88 feet (345.00 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 14 discharge measurements during the year, 11 by the United States Section and 3 by the Mexican Section of the Commission, a stable rating curve based on meter measurements, and a continuous record of gage heights. Records available: 1960 through 1977. Records are also available from May 1900 through March 1914 for a station 23.8 river miles (38.3 km) downstream; from December 1923 through September 1932 for a station 22.8 river miles (36.7 km) downstream; from September 2, 1932 through August 1957 for a station 21.0 river miles (33.8 km) downstream; from August 7, 1954 through January 1958 for a station 5.4 river miles (8.7 km) upstream; and from August 1954 through May 31, 1968 for a station at the mouth 24.7 river miles (39.8 km) downstream.

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 the Commission and is also programmed to relay similar data to this same office at predetermined time intervals. Transmission is via radio.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 250,000 second-feet (7,080 m^3/sec) on September 18, 1974 with a gage height of 19.82 feet (6.04 m). Min. 48.6 second-feet (1.38 m^3/sec) on August 20, 1969.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	123,000 (3,480)	Sept. 18, 1974	Min.	53.7 (1.52)	Aug. 20, 1969
Monthly:	Max.	8,460 (240)	Sept. 1974	Min.	64.3 (1.82)	August 1964
Yearly:	Max.	977 (27.7)	1974	Min.	99.9 (2.83)	1968

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	481	452	432	430	464	431	417	393	375	360	369	362
2	486	446	437	432	463	427	413	396	375	380	356	362
3	483	451	437	425	466	421	408	400	376	428	362	362
4	481	453	427	412	472	417	403	391	378	389	362	359
5	480	450	429	413	483	419	408	384	380	375	362	355
6	475	445	428	411	499	419	407	388	378	373	362	351
7	472	473	429	410	485	421	405	390	379	373	368	351
8	473	513	425	407	466	420	401	388	378	375	414	‡ 358
9	472	485	424	407	466	408	401	387	376	372	379	354
10	469	477	426	406	455	405	398	390	368	364	367	351
11	474	475	422	404	452	407	394	388	365	360	367	351
12	483	470	419	413	449	422	387	390	429	359	367	356
13	486	465	418	408	453	‡ 419	389	390	389	362	371	359
14	479	461	421	416	446	419	394	389	373	359	366	356
15	477	454	424	735	445	417	393	‡ 386	370	363	362	356
16	469	454	415	2,270	‡ 447	411	392	390	362	362	364	355
17	468	454	418	2,500	446	405	397	384	362	‡ 362	363	351
18	467	454	417	‡ 1,490	444	407	‡ 397	387	367	364	362	351
19	461	449	412	957	438	405	397	398	‡ 373	367	362	351
20	459	441	405	693	441	402	399	389	372	367	362	349
21	459	442	‡ 413	582	464	403	411	384	367	363	359	348
22	477	‡ 445	410	539	469	428	407	385	367	417	356	‡ 349
23	472	443	407	516	457	440	400	384	‡ 365	381	356	345
24	‡ 462	441	416	498	447	420	395	380	369	378	361	349
25	454	441	419	486	443	414	389	380	373	373	362	350
26	454	437	438	474	439	410	389	372	371	370	359	345
27	454	437	547	464	‡ 441	408	388	371	366	374	359	345
28	453	441	468	463	441	412	391	377	362	378	362	349
29	449		454	472	438	416	393	382	362	377	358	351
30	454		441	478	432	432	397	387	362	373	359	351
31	458		434		432		392	379		373		351
Sum	14,541	12,749	13,312	19,411	14,083	12,485	12,352	11,979	11,189	11,571	10,938	10,933

Month	Current Year 1977							Period 1960-1977		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	2.15	2.06	† 2	486	†28	446	469	28,842	13,616	28,842	4,647
Feb.	2.24	2.02	7	528	26	428	455	25,287	11,623	25,287	3,999
Mar.	2.51	1.96	28	667	20	396	429	26,404	11,461	26,404	4,186
Apr.	4.13	1.96	16	5,820	† 7	396	647	38,501	12,917	38,777	4,520
May	2.50	2.01	5	655	† 8	424	454	27,933	12,919	32,716	4,517
June	2.17	1.95	22	495	†12	390	416	24,764	16,851	54,328	4,259
July	2.03	1.91	21	432	12	367	398	24,500	22,352	186,522	4,034
Aug.	2.00	1.89	12	419	27	356	386	23,760	51,881	408,908	3,955
Sept.	2.18	1.89	12	500	11	356	373	22,193	57,211	503,506	5,000
Oct.	2.10	1.88	2	463	11	351	373	22,951	20,670	50,845	5,004
Nov.	2.03	1.88	8	432	† 1	351	365	21,695	15,697	33,013	4,532
Dec.	1.91	1.87	9	367	†20	345	353	21,685	14,743	31,063	4,697
Yearly	4.13	1.87		5,820		345	426	308,515	261,941	707,092	72,494
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.26	0.57		165		9.77	12.1	380,553	323,104	872,198	89,421

‡ Discharge measurement made on this day † And other days

BIG SATAN CREEK NEAR COMSTOCK, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Big Satan Creek.

DESCRIPTION: Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29°39'50", longitude 100°57'50", 1.1 miles (1.8 km) upstream from its confluence with the Devils River, which is 21.2 river miles (34.1 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,134.00 feet (345.64 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: May 1968 through 1977.
REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 42 square miles (109 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 56,100 second-feet (1,590 m^3/sec) on August 15, 1971 with a gage height of 12.31 feet (3.75 m). Maximum volumes: Monthly 12,204 acre-feet (15,054,000 m^3) in August 1971; yearly, 12,525 acre-feet (15,450,000 m^3) in 1971.

Mean Daily Discharge in Second-Feet 1977

Month and Day		
	No flow during 1977	

Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Yearly		Meters	Cubic Meters per Second	Thousands of Cubic Meters

ROUGH CANYON NEAR DEL RIO, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Rough Canyon.

DESCRIPTION: Cableway, control weir, bubbler gage, and digital recorder located on the right bank at latitude 29°34'40", longitude 100°56'00", 3.9 miles (6.3 km) upstream from its confluence with the Devils River which is 11.1 river miles (17.9 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,129.00 feet (344.12 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: January 1968 through 1977.
REMARKS: This stream is normally dry, its flow being confined to periods of storm runoff from its 24 square miles (62.2 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 7,040 second-feet (199 m^3/sec) on August 12, 1972 with a gage height of 6.80 feet (2.07 m). Maximum volumes: Monthly, 8,230 acre-feet (10,152,000 m^3) in August 1971; yearly, 8,232.2 acre-feet (10,154,000 m^3) in 1971.

Mean Daily Discharge in Second-Feet 1977

Month and Day			
Mar. 26 7.0 27 62.5 28 2.6	Sept. 12 19.2	Oct. 22 24.8 23 .4	

Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Mar.	27	1.71	277	143
Sept.	12	1.37	102	38.1
Oct.	22	1.24	52.2	50.0
		1.71	277	231.1
Yearly		Meters	Cubic Meters per Second	Thousands of Cubic Meters
		0.52	7.84	285

NORTH FORK SAN PEDRO CREEK NEAR DEL RIO, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on the north fork of San Pedro Creek.

DESCRIPTION: Cableway, control weir, bubbler gage, and digital recorder located on the left bank of the creek at latitude 29°31'20", longitude 100°53'00", 3 miles (4.8 km) upstream from its confluence with the Middle Fork Branch, which is 6.3 miles (10.1 km) upstream from its confluence with Devils River, which itself is 4.5 river miles (7.2 km) above the Devils River confluence with the Rio Grande. The zero of the gage is 1,126.92 feet (343.49 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: January 1968 through 1977.
REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 17 square miles (44 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 5,070 second-feet (144 m^3/sec) on August 12, 1972 with a gage height of 8.44 feet (2.57 m). Maximum volumes: Monthly, 3,403 acre-feet (4,198,000 m^3) in October 1969; yearly, 4,061.7 acre-feet (5,010,000 m^3) in 1969.

Mean Daily Discharge in Second-Feet 1977

Month and Day							
Apr. 15	0.4	Apr. 26	0.3	May 7	0.7	May 20	0.1
16	.8	27	.4	8	.4	21	.2
17	.1	28	.3	9	.2	22	.2
18	.1	29	.2	10	.2	23	.1
19	.2	30	.4	11	.1	24	.1
20	.1	May 1	.4	12	.1	25	.1
21	1.6	2	.3	13	.2	26	.1
22	.5	3	.2	14	.1	27	.2
23	.4	4	.7	15	.1	28	.1
24	.1	5	.5	16	.1	29	.1
25	.1	6	.3	17	.1	30	.1

Annual Summary

Month	Maximum Gage and Discharge: Day	Feet	Second-Feet	Total Acre-Feet
April	15	1.14	10.8	11.9
May	9	1.05	1.8	12.1
		1.14	10.8	23.0
Yearly		Meters	Cubic Meters per Second	Thousands of Cubic Meters
		0.35	0.31	28.4

MIDDLE FORK SAN PEDRO CREEK NEAR DEL RIO, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on the middle fork of San Pedro Creek.

DESCRIPTION: Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29°29'30", longitude 100°52'50", 3.2 miles (5.1 km) upstream from its confluence with the North Fork Branch which is 6.3 miles (10.1 km) above the confluence with Devils River, which itself is 4.5 river miles (7.2 km) above the Devils River confluence with the Rio Grande. The zero of the gage is 1,132.02 feet (345.04 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: December 1967 through 1977.
REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 12 square miles (31 km^2) of watershed area. Only the days of flow are shown below.
EXTREME FLOWS FROM RECORDS: Momentary: Max. 10,200 second-feet (289 m^3/sec) on July 17, 1975 with a gage height of 5.84 feet (1.78 m). Maximum volumes: Monthly 3,726 acre-feet (4,596,000 m^3) in July 1975; yearly, 3,726 acre-feet (4,596,000 m^3) in 1975.

Mean Daily Discharge in Second-Feet 1977

Month and Day	Month	Maximum Gage and Discharge: Day	Feet	Second-Feet	Total Acre-Feet
No flow during 1977					
	Yearly		Meters	Cubic Meters per Second	Thousands of Cubic Meters

Annual Summary

EVANS CREEK NEAR COMSTOCK, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Evans Creek.

DESCRIPTION: Cableway, control weir, bubbler gage, and digital recorder located on the left bank of the creek at latitude 29°32'15", longitude 101°06'10", 11.0 miles (17.7 km) upstream from its confluence with Devils River, which is 3.2 miles (5.1 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,162.54 feet (354.34 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: December 1967 through 1977.

REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 74 square miles (192 km^2) of watershed area. Only the days of flow are shown below.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 17,400 second-feet (493 m^3/sec) on June 12, 1971 with a gage height of 5.99 feet (1.83 m). Maximum volumes: Monthly, 9,281 acre-feet (11,448,000 m^3) in August 1971; yearly, 14,404 acre-feet (17,767,000 m^3) in 1971.

Mean Daily Discharge in Second-Feet 1977

Month and Day				
Mar. 26	3.2			
27	.9			

Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Mar.	26	1.20	58.4	8.1
		1.20	58.4	8.1
Yearly		Meters	Cubic Meters per Second	Thousands of Cubic Meters
		0.37	1.65	10.0

CARMINA SPRINGS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 70.6 second-foot (2.0 m^3/sec) capacity and staff gage located on a creek that runs almost parallel to Amistad Dam, about 130 feet (40 m) from the confluence with the Rio Grande, at latitude 29°26'50", longitude 101°03'35", and about 11.0 miles (17.7 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 573.7 (923.2 km), 0.2 river mile (400 m) downstream from Amistad Dam and 12.6 river miles (20.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.
RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1977.
REMARKS: At least six separate springs have emerged on the watershed of this small creek since operation of Amistad Dam began in May 1968. Prior to this time, flow in this creek was exclusively from storm runoff. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. On September 24, 1971, a flood destroyed part of the weir.

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	51.9	53.0	51.9	54.7	54.7	51.6	48.0	50.1	50.1	49.8	47.7	47.3
2	51.9	53.0	51.9	54.7	54.7	51.6	48.0	50.1	50.1	49.8	47.3	47.3
3	51.9	53.0	51.9	54.7	54.7	51.2	48.0	50.1	50.1	49.8	47.3	47.3
4	51.9	53.0	51.9	54.7	54.7	50.9	48.0	50.1	50.1	49.4	47.3	47.3
5	51.9	53.0	51.9	54.7	54.7	50.9	47.7	50.1	50.1	49.1	47.3	47.3
6	51.9	53.0	51.9	54.7	54.7	50.9	47.7	50.1	50.1	49.1	47.3	47.3
7	51.9	53.0	51.9	54.7	54.7	51.2	48.0	50.1	50.1	48.7	47.3	47.3
8	51.9	53.0	51.9	54.7	54.7	51.2	48.0	50.1	50.1	48.7	47.3	47.3
9	51.9	53.0	51.9	54.7	53.7	51.2	48.0	50.1	50.1	48.4	47.3	47.3
10	51.9	53.0	51.9	54.7	53.7	51.2	48.0	50.1	50.1	48.0	47.3	47.3
11	51.9	53.0	51.9	54.7	53.7	51.2	48.0	50.1	50.1	47.7	47.3	47.3
12	51.9	51.9	51.9	54.7	53.7	50.9	48.4	50.1	50.1	47.7	47.3	47.3
13	51.9	51.9	51.9	54.7	53.7	50.9	49.1	50.1	50.1	47.7	47.3	47.3
14	51.9	51.9	51.9	54.7	53.7	50.9	49.4	50.1	50.1	47.7	47.3	47.3
15	51.9	51.9	51.9	54.7	53.7	50.9	50.1	50.5	50.1	48.0	47.3	47.3
16	51.9	51.9	51.9	54.7	53.7	50.9	50.1	50.5	49.8	48.0	47.3	47.3
17	51.9	51.9	51.9	54.7	53.7	50.1	50.1	50.5	49.8	48.0	47.3	47.3
18	51.9	51.9	51.9	54.7	53.7	49.4	50.1	50.5	49.8	48.0	47.3	47.3
19	51.9	51.9	51.9	54.7	53.7	49.4	50.1	50.5	49.8	48.0	47.3	47.3
20	51.9	51.9	51.9	54.7	53.7	49.4	50.1	50.5	49.8	48.0	47.3	47.3
21	51.9	51.9	51.9	54.7	53.3	49.4	50.1	50.5	49.8	47.7	47.3	47.3
22	51.9	51.9	51.9	54.7	53.0	49.1	50.1	50.1	49.8	47.7	47.3	47.3
23	51.9	51.9	51.9	54.7	53.0	49.1	50.1	50.1	49.8	47.7	47.3	47.3
24	51.9	51.9	51.9	54.7	51.9	48.7	50.1	50.1	49.8	47.7	47.3	47.3
25	51.9	51.9	51.9	54.7	51.9	48.0	50.1	50.1	49.8	47.7	47.3	47.3
26	51.9	51.9	51.9	54.7	51.9	47.7	50.1	50.1	49.8	47.7	47.3	47.3
27	51.9	51.9	51.9	54.7	51.9	47.7	50.1	50.1	49.8	47.7	47.3	47.3
28	51.9	52.3	51.9	54.7	51.9	48.0	50.1	50.1	49.8	47.7	47.3	47.3
29	51.9		54.7	54.7	51.9	48.0	50.1	50.1	49.8	47.7	47.3	47.3
30	51.9		54.7	54.7	51.9	48.0	50.1	50.1	49.8	47.7	47.3	47.3
31	51.9		54.7		51.9		49.8	50.1		47.7		47.3
Sum	1,608.9	1,465.7	1,617.3	1,641.0	1,656.5	1,499.6	1,525.7	1,555.9	1,498.5	1,494.3	1,419.4	1,466.3

Current Year 1977 — **Period 1969-1977**

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	51.9	† 1	51.9	51.9	3,192	2,399	3,707	364
Feb.			† 1	53.0	†12	51.9	52.3	2,907	2,223	3,405	373
Mar.			†29	54.7	† 1	51.9	52.3	3,209	2,362	3,621	525
Apr.			† 1	54.7	† 1	54.7	54.7	3,257	2,289	3,497	629
May			† 1	54.7	†24	51.9	53.3	3,286	2,308	3,492	709
June			† 1	51.6	†26	47.7	50.1	2,974	2,199	3,383	598
July			†15	50.1	† 5	47.7	49.1	3,028	2,251	3,412	533
Aug.			†15	50.5	† 1	50.1	50.1	3,088	2,379	3,361	540
Sept.			† 1	50.1	†16	49.8	50.1	2,974	2,414	3,377	593
Oct.			† 1	49.8	†11	47.7	48.0	2,964	2,610	3,816	830
Nov.			1	47.7	† 2	47.3	47.3	2,816	2,541	3,685	964
Dec.			† 1	47.3	† 1	47.3	47.3	2,910	2,653	3,786	1,077
Yearly				54.7		47.3	50.5	36,605	28,628	41,290	9,080
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				1.55		1.34	1.43	45,152	35,312	50,932	11,201

∅ Mean daily † And other days

LOURDES, HILDA, AND ERNESTINA SPRINGS NEAR CD. ACUNA, COAHUILA

LOURDES SPRING

DESCRIPTION: Rectangular sharp-crested weir of 28.8 second-foot (815 l/sec) capacity and staff gage located at latitude 29°26'35", longitude 101°03'30", at the base of the high bank of the Rio Grande, and about 11.1 miles (17.9 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 573.2 (922.5 km), 12.2 river miles (19.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 926.28 feet (282.33 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1977.

REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted. The daily flow throughout the year ranged from 1.8 (0.05) to 2.1 second-feet (0.06 m^3/sec) and averaged 1.8 second-feet (0.05 m^3/sec). The volume for the year amounted to 1,389 acre-feet (1,712,000 m^3).

HILDA SPRING

DESCRIPTION: Rectangular sharp-crested weir of 53.0 second-foot (1.50 m^3/sec) capacity and staff gage located at latitude 29°26'20", longitude 101°03'35" about 328 feet (100 m) from the confluence with the Rio Grande and about 11.0 miles (17.7 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 572.8 (921.8 km), 11.8 river miles (19.0 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 908.14 feet (276.80 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1977.

REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted. The daily flow throughout the year ranged from 2.8 (0.08) to 4.2 second-feet (0.12 m^3/sec) and averaged 3.2 second-feet (0.09 m^3/sec). The volume for the year amounted to 2,275 acre-feet (2,808,000 m^3).

In order to determine what effect storage in Amistad Reservoir has on the flow of various Mexican springs in the vicinity of Amistad Dam, gaging stations were established in November 1961 at Ernestina and Rosita Springs. The station at Rosita Spring was discontinued in June 1976. The station and spring at Ernestina are described as follows:

ERNESTINA SPRING

DESCRIPTION: A 90° v-notch weir of 1.4 second-foot (39 l/sec) capacity and staff gage located at the spring on the right bank of Arroyo del Buey about 100 feet (30 m) from the right bank of the Rio Grande at latitude 29°24'20", longitude 101°02'10", and about 8.5 miles (13.7 km) northwest of Cd. Acuna, Coahuila. This spring enters the Rio Grande at river mile 570.4 (918.0 km), 9.4 river miles (15.1 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 3.5 river miles (5.6 km) downstream from Amistad Dam. The elevation of the zero of the gage has not been determined.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 7, 1961 through 1977.

REMARKS: 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 and the monthly average throughout the year ranged from 0.106 (0.003) to 0.141 second-foot (0.004 m^3/sec), or 48 to 63 gallons per minute. The volume for the year amounted to 80.3 acre-feet (99,000 m^3). Waters from this spring have a high sulfur content.

RIO GRANDE BELOW AMISTAD DAM NEAR CD. ACUNA, COAHUILA AND DEL RIO, TEXAS

DESCRIPTION: Cableway, gravity well, concrete control weir, and water-stage recorders (graphic and digital), and binary decimal transmitter located on the left bank at latitude 29°25' 30", longitude 101°02' 25", and river mile 571.8 (920.3 km), 2.2 river miles (3.4 km) downstream from Amistad Dam and 10.8 river miles (17.4 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 898.94 feet (274.00 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 23 discharge measurements during the year, 11 by the Mexican Section and 12 by the United States Section of the 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 1977. Records are also available from May 1900 through April 1915 for a station 1.9 miles (3 km) upstream; from December 1919 through March 1920 for a station 1.7 miles (3 km) 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; and from December 1923 through July 2, 1941, and 1968 through 1977 for a station approximately 10.6 miles (17.0 km) 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, 2.1 river miles (3.3 km) upstream. The transmitter relays gage height data upon interrogation by telephone via private line to the Amistad office.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,158,000 second-feet (32,800 m^3/sec) on June 28, 1954, determined by slope-area computation, with a gage height of 55.72 feet (16.98 m) at the old station site 500 feet (152 m) downstream. This is the greatest rate of discharge recorded at any point on the Rio Grande. Max. since Amistad Dam, 62,200 second-feet (1,760 m^3/sec) on Sept. 21, 1974. Min. 22.2 second-feet (0.63 m^3/sec) on Feb. 14, 1969 with a gage height of 1.08 feet (0.33 m)

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	61,100 (1,730)	Sept. 22,	1974	Min.	46.6 (1.32)	Aug. 13,	1971
Monthly:	Max.	21,500 (609)	Sept.	1974	Min.	60.7 (1.72)	Oct.	1971
Yearly:	Max.	4,910 (139)		1974	Min.	576 (16.3)		1972

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,500	1,020	996	1,020	8,190	3,260	2,030	1,060	1,740	1,080	893	‡ 932
2	1,500	999	999	1,020	8,160	2,390	2,030	1,060	1,730	1,080	893	932
3	1,500	999	999	1,020	8,160	2,390	2,030	1,060	1,740	1,080	893	932
4	1,490	1,010	999	1,020	8,120	2,390	2,030	1,050	1,740	1,080	893	932
5	1,490	1,010	999	1,020	8,120	2,390	2,040	908	1,730	1,080	893	929
6	1,490	1,010	999	1,020	8,550	2,390	2,040	908	1,720	1,080	893	929
7	1,550	999	999	1,020	9,080	2,390	2,040	893	3,020	1,080	893	929
8	1,680	1,530	999	1,020	9,080	2,390	2,050	682	5,230	1,080	904	929
9	1,700	2,000	999	1,020	9,080	3,010	2,050	526	5,230	1,080	897	918
10	1,710	1,980	999	1,020	9,110	4,520	2,050	530	5,230	1,090	897	925
11	1,710	1,980	999	1,020	9,080	692	2,050	526	5,230	1,090	886	932
12	1,710	1,980	999	1,020	9,040	2,930	2,050	530	‡ 5,230	1,090	886	932
13	1,790	1,980	999	1,020	9,040	2,930	1,560	530	5,230	1,030	886	932
14	1,930	1,980	999	‡ 1,030	9,040	2,900	1,050	530	5,230	897	897	932
15	1,940	1,980	999	1,010	9,010	2,890	1,050	530	‡ 5,230	897	897	‡ 932
16	1,940	2,000	999	1,010	9,010	2,890	1,050	675	5,230	‡ 897	‡ 897	932
17	1,940	1,980	999	1,010	8,970	2,570	1,050	940	5,230	‡ 915	‡ 893	943
18	1,940	‡ 1,980	999	1,010	8,970	2,020	1,050	‡ 925	5,230	890	897	943
19	1,940	1,980	999	1,310	8,970	1,870	1,050	925	5,230	890	897	805
20	‡ 1,940	1,980	999	2,020	8,930	1,140	‡ 1,060	925	5,190	890	897	855
21	1,940	1,980	1,010	‡ 2,030	8,930	918	1,060	925	5,190	890	886	971
22	1,940	1,980	1,010	2,030	8,830	925	1,060	1,080	5,190	925	893	971
23	1,940	1,430	1,010	2,030	8,830	929	1,060	1,360	5,190	893	886	971
24	1,940	999	‡ 1,010	2,020	8,620	918	1,060	1,370	5,190	893	929	971
25	1,940	‡ 999	1,010	2,020	7,840	918	1,060	1,360	5,190	893	929	971
26	1,940	999	1,030	3,920	‡ 6,850	918	1,070	2,570	5,190	893	932	971
27	1,940	1,010	1,010	8,190	6,180	915	1,110	4,590	5,190	893	932	971
28	‡ 1,940	1,010	1,010	8,190	6,180	1,500	1,100	4,590	5,190	893	932	971
29	1,940		‡ 999	8,190	6,180	‡ 2,040	1,060	4,800	5,190	893	929	971
30	1,940		992	8,190	6,180	‡ 2,040	‡ 1,060	5,190	3,030	893	929	971
31	1,480		1,010		5,230		1,060	3,640		893		971
Sum	42,784		68,470		62,373		47,188		30,148		29,106	
	55,270		31,078		255,560		45,170		131,110		27,059	

Month	Current Year 1977 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 1968-1977 Acre-Feet Average	Maximum	Minimum
Jan.	1.54	1.12	†14	1,940	31	1,020	1,780	109,656	64,174	112,570	5,318
Feb.	1.57	1.08	9	2,000	† 2	999	1,530	84,832	124,703	467,202	12,467
Mar.	1.25	1.08	26	1,270	30	992	1,000	61,710	90,430	239,030	7,271
Apr.	3.28	1.12	†26	8,190	†15	1,010	2,280	135,790	98,380	342,129	27,570
May	3.48	2.26	10	9,110	31	3,960	8,230	506,848	177,748	506,848	24,137
June	3.25	.26	10	8,120	11	82.6	2,080	123,735	104,912	260,436	16,418
July	1.61	1.12	† 8	2,050	†13	1,050	1,450	89,532	85,322	143,887	23,182
Aug.	2.59	.75	30	5,190	† 8	526	1,520	93,580	147,779	662,215	15,589
Sept.	2.59	1.44	† 7	5,230	6	1,720	4,380	260,008	251,610	1,280,079	17,606
Oct.	1.15	1.02	†10	1,090	†18	890	975	59,881	157,924	812,596	3,734
Nov.	1.05	.95	†26	932	23	766	901	53,683	96,104	502,295	4,539
Dec.	1.08	.52	†21	971	19	286	939	57,739	54,513	216,286	4,859
Yearly	3.48	0.26		9,110		82.6	2,260	1,636,994	1,453,599	3,566,066	416,788
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.06	0.08		258		2.34	64.0	2,019,210	1,792,995	4,398,694	514,104

‡ Discharge measurement made on this day † And other days

SPRING M-15 AND SPRING M-5 NEAR CD. ACUNA, COAHUILA

SPRING M-15

DESCRIPTION: Rectangular sharp-crested weir of 8.1 second-foot (230 l/sec) capacity and staff gage located at latitude 29°25'20", longitude 101°02'40", about 1,300 feet (400 m) from the confluence with the Rio Grande, and about 9.4 miles (15.1 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 571.3 (919.4 km), 10.3 river miles (16.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 925.13 feet (281.98 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1977.
REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

Month	Current Year 1977								Period 1969-1977		
	Extreme Gage Feet		ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			† 1	1.8	† 1	1.8	1.8	109	80.3	131	21.1
Feb.			† 1	1.4	† 1	1.4	1.4	78.6	72.2	123	19.5
Mar.			† 1	1.4	† 1	1.4	1.4	86.7	73.0	122	21.9
Apr.			† 1	1.8	† 1	1.8	1.8	105	73.8	105	21.1
May			† 1	1.8	† 1	1.8	1.8	109	77.8	109	21.9
June			†28	2.5	† 1	1.8	2.1	121	64.0	121	21.1
July			† 1	2.5	†28	1.1	1.8	106	66.5	106	21.1
Aug.			† 1	1.1	† 1	1.1	1.1	64.9	68.9	122	0
Sept.			† 1	1.1	† 1	1.1	1.1	63.2	68.1	105	0
Oct.			† 1	1.1	† 1	1.1	1.1	64.9	72.2	117	0
Nov.			† 1	1.1	† 1	1.1	1.1	63.2	75.4	124	21.1
Dec.			† 1	1.1	† 1	1.1	1.1	64.9	80.3	131	21.9
Yearly				2.5		1.1	1.4	1,036.4	872.5	1,362.2	257.2
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.07		0.03	0.04	1,278	1,076	1,679	317

SPRING M-5

DESCRIPTION: Rectangular sharp-crested weir of 17.7 second-foot (500 l/sec) capacity and staff gage located at latitude 29°25'20", longitude 101°02'35", at the base of the high bank of the Rio Grande, and about 9.2 miles (14.8 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 571.1 (919.1 km), 10.1 river miles (16.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna. The zero of the gage is 932.38 feet (284.19 m) above mean sea level, U. S. C. & G. S. datum.
RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1977.
REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

Month	Current Year 1977								Period 1969-1977		
	Extreme Gage Feet		ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			† 1	2.8	† 1	2.8	2.8	173	147	173	86.7
Feb.			† 1	2.8	† 1	2.8	2.8	157	132	162	78.6
Mar.			† 1	2.8	† 1	2.8	2.8	173	141	173	64.9
Apr.			† 1	2.8	† 1	2.8	2.8	168	136	168	63.2
May			† 1	2.8	† 1	2.8	2.8	173	142	173	64.9
June			† 1	2.8	† 1	2.8	2.8	168	132	168	63.2
July			† 1	2.8	† 1	2.8	2.8	173	132	173	43.8
Aug.			† 1	2.8	† 1	2.8	2.8	173	139	173	43.8
Sept.			† 1	2.8	† 1	2.8	2.8	168	137	168	42.2
Oct.			† 1	2.8	† 1	2.8	2.8	173	143	173	43.8
Nov.			† 1	2.8	† 1	2.8	2.8	168	140	168	63.2
Dec.			† 1	2.8	† 1	2.8	2.8	173	144	173	64.9
Yearly				2.8		2.8	2.8	2,040	1,665	2,045	723.2
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.08		0.08	0.08	2,520	2,055	2,526	892

ø Mean daily † And other days

ARROYO DE LOS JABONCILLOS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 70.6 second-foot (2 m^3/sec) capacity and staff gage located at latitude 29°24'25", longitude 101°02'20", about 660 feet (200 m) from the confluence with the Rio Grande, and about 8.6 miles (13.8 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 570.5 (918.2 km), 9.5 river miles (15.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.
RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1977.
REMARKS: At least 9 separate springs have emerged along this creek since operation of Amistad Dam began in May 1968. Prior to this time, flow in this creek was exclusively from storm runoff. 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 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	69.2	69.6	64.3	68.9	70.3	66.4	64.3	62.5	61.1	62.5	65.0	64.3
2	69.6	69.6	64.3	68.9	74.5	66.4	64.3	62.5	61.1	62.5	61.8	64.3
3	69.9	69.6	64.3	68.9	74.5	66.4	64.3	62.5	61.1	62.5	61.8	64.3
4	69.9	69.6	64.3	68.9	74.5	65.7	64.3	62.9	61.1	61.1	61.8	64.3
5	69.9	68.9	64.3	68.9	74.5	64.3	64.3	62.9	61.1	61.1	61.4	64.3
6	70.3	68.9	64.3	68.9	76.3	64.3	64.3	62.9	61.1	61.1	61.4	63.2
7	70.3	68.9	64.3	68.9	78.6	64.3	64.3	63.2	61.1	61.1	61.4	63.6
8	70.6	68.9	64.3	68.9	78.0	64.3	64.3	63.2	61.1	61.1	66.4	63.6
9	70.6	68.9	64.3	68.9	78.4	64.3	64.3	63.2	61.1	61.1	66.4	62.5
10	71.3	68.9	64.3	68.9	78.4	64.3	64.3	63.2	61.1	61.1	66.4	62.5
11	71.3	68.9	64.3	68.9	78.4	64.3	64.3	63.2	61.1	62.5	66.4	63.2
12	70.6	68.9	64.3	68.9	78.4	64.3	64.3	63.2	66.4	62.2	66.4	65.7
13	70.3	68.9	64.3	69.9	78.4	64.3	64.3	63.2	66.4	62.2	66.4	64.6
14	70.3	68.2	64.3	70.6	78.4	64.3	64.3	63.2	66.4	61.8	66.4	65.0
15	69.9	67.1	65.0	71.3	78.4	64.3	64.3	63.2	66.4	61.8	66.0	65.0
16	69.9	67.1	66.4	72.0	78.4	64.3	64.3	63.2	65.7	61.8	65.7	65.0
17	69.6	67.1	67.1	72.7	77.0	64.3	64.3	62.9	65.0	61.8	65.7	64.3
18	69.6	67.1	68.2	73.4	75.9	64.3	64.3	62.9	63.6	62.5	65.7	64.3
19	69.6	66.7	68.9	73.4	75.9	64.3	63.9	62.5	62.9	62.5	65.7	64.3
20	69.6	66.7	68.6	72.4	74.5	64.3	63.6	62.5	62.9	62.5	65.0	65.0
21	69.6	66.4	70.3	70.6	74.5	64.3	63.2	62.5	63.2	61.8	65.0	64.6
22	69.6	67.1	70.3	70.3	74.5	64.3	62.9	62.5	63.2	64.3	65.0	64.3
23	70.3	65.7	70.3	70.3	74.5	64.3	62.5	61.1	63.2	64.3	65.0	64.3
24	69.6	65.0	69.9	70.3	71.3	64.3	62.5	61.1	63.2	64.3	64.6	64.3
25	69.2	65.0	69.6	70.3	68.2	64.3	62.5	61.1	62.5	64.3	64.6	64.3
26	68.9	63.9	68.9	70.3	66.4	64.3	62.5	61.1	62.5	64.3	64.6	64.3
27	69.2	64.3	68.5	70.3	66.4	64.3	62.5	61.1	62.5	64.3	64.6	64.3
28	69.2	64.3	68.2	70.3	66.4	64.3	62.5	61.1	62.5	64.3	64.6	64.3
29	69.6		65.7	70.3	65.0	64.3	62.5	61.1	62.5	64.3	64.3	64.3
30	69.6		64.3	70.3	65.0	64.3	62.5	61.1	62.5	64.3	64.3	64.3
31	69.6		63.2		65.0		62.5	61.1		64.3		64.3
Sum	1,890.2		2,105.8		1,936.7			1,933.9		1,941.6		1,990.9
	2,166.7		2,053.6		2,288.9		1,973.5		1,885.6		1,939.8	

Month	Current Year 1977								Period 1969-1977		
	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.			†10	71.3	26	68.9	69.9	4,298	3,129	4,720	349
Feb.			† 1	69.6	26	63.9	67.5	3,748	2,836	4,207	381
Mar.			†21	70.3	31	63.2	66.4	4,074	3,069	4,574	526
Apr.			†18	73.4	† 1	68.9	70.3	4,176	2,963	4,345	636
May			7	78.6	†29	65.0	73.8	4,540	3,008	4,540	721
June			† 1	66.4	† 5	64.3	64.6	3,840	2,774	4,071	678
July			† 1	64.3	†23	62.5	63.6	3,913	2,915	4,367	769
Aug.			† 7	63.2	†23	61.1	62.5	3,835	3,033	4,321	782
Sept.			†12	66.4	† 1	61.1	62.9	3,740	3,133	* 4,417	782
Oct.			†22	64.3	† 4	61.1	62.5	3,850	3,466	‼ 5,211	1,097
Nov.			† 8	66.4	† 5	61.4	64.6	3,848	3,407	4,847	1,282
Dec.			12	65.7	† 9	62.5	64.3	3,948	3,510	4,709	1,398
Yearly				78.6		61.1	66.0	47,810	37,243	51,839	9,850
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				2.23		1.73	1.87	58,972	45,939	63,943	12,152

∅ Mean daily † And other days * Partly estimated ‼ Estimated

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

ARROYO DEL BUEY

DESCRIPTION: Cipolletti weir of 35.3 second-foot (1 m^3/sec) capacity, located at latitude 29°24'20", longitude 101°02'25", 0.2 creek mile (300 m) from the confluence with the Rio Grande, and about 8.5 miles (13.7 km) northwest of Cd. Acuna, Coahuila. This stream enters the Rio Grande from the Mexican side at river mile 570.4 (918.0 km), 3.5 river miles (5.6 km) downstream from Amistad Dam and 9.4 river miles (15.2 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 1961 through 1977.

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 (0.5 km) 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 (566 m^3/sec).

Current Year 1977									Period #Nov. 1961-1977		
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.			† 1	6.7	† 1	6.7	6.7	413	258	528	6.8
Feb.			† 1	6.7	† 1	6.7	6.7	373	233	477	5.4
Mar.			† 1	6.7	† 1	6.7	6.7	413	251	520	9.3
Apr.			† 1	6.7	† 1	6.7	6.7	399	286	540	6.3
May			† 1	6.7	† 1	6.7	6.7	413	299	544	10.9
June			† 1	6.7	† 1	6.7	6.7	399	266	492	6.3
July			† 1	6.7	†18	6.4	6.7	403	252	503	6.5
Aug.			† 1	6.4	† 1	6.4	6.4	391	279	517	6.7
Sept.			† 1	6.4	† 1	6.4	6.4	379	289	493	6.6
Oct.			† 3	6.7	† 1	6.4	6.7	411	313	544	6.5
Nov.			† 1	6.7	† 1	6.7	6.7	399	270	515	6.3
Dec.			† 1	6.7	† 1	6.7	6.7	413	271	538	6.5
				6.7		6.4	6.7	4,806	3,267	6,031	216.8
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.19		0.18	0.19	5,925	4,029	7,438	267

ARROYO DE LA TREINTA Y UNA

DESCRIPTION: Cipolletti weir of 35.3 second-foot (1 m^3/sec) capacity, located at latitude 29°22'35", longitude 101°01'15", 0.6 creek mile (900 m) from the confluence with the Rio Grande, and about 6.5 miles (10.5 km) northwest of Cd. Acuna, Coahuila. This stream enters the Rio Grande from the Mexican side at river mile 567.6 (913.5 km), 6.3 river miles (10 km) downstream from Amistad Dam, 6.6 river miles (10.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: May 1961 through 1977.

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.

Current Year 1977									Period #May 1961-1977		
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.			† 1	4.2	† 1	4.2	4.2	260	146	282	15.2
Feb.			† 1	4.2	† 1	4.2	4.2	235	134	257	13.9
Mar.			† 1	4.2	† 1	4.2	4.2	260	148	327	14.2
Apr.			† 1	4.2	† 1	4.2	4.2	252	160	302	10.5
May			† 1	4.2	† 1	4.2	4.2	260	144	261	5.9
June			† 1	4.2	† 1	4.2	4.2	252	139	254	4.2
July			† 1	4.2	†15	3.9	3.9	249	135	250	0
Aug.			† 1	3.9	† 1	3.9	3.9	239	148	323	0
Sept.			† 1	3.9	† 1	3.9	3.9	231	165	273	13.1
Oct.			† 1	3.9	† 1	3.9	3.9	239	173	282	12.1
Nov.			† 1	3.9	† 1	3.9	3.9	231	165	273	14.2
Dec.			† 1	3.9	† 1	3.9	3.9	239	156	282	15.2
				4.2		3.9	4.2	2,947	1,813	3,264	250.4
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.12		0.11	0.12	3,637	2,236	4,025	308.6

Ø Mean daily † And other days # Some months missing

MARIS SPRING NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 106 second-foot (3 m^3/sec) capacity and staff gage located at the spring about 100 feet (30 m) from the right bank of the Rio Grande at latitude 29°24'00", longitude 101°01'40", and about 8 miles (12.9 km) northwest of Cd. Acuna, Coahuila. This spring enters the Rio Grande at river mile 569.9 (917.2 km), 8.9 river miles (14.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 4.0 river miles (6 km) downstream from Amistad Dam. The elevation of the zero of the gage has not been determined.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 14, 1961 through 1977.

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. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. Prior to May 1969 the weir had an 11.1 second-foot (315 l/sec) capacity.

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.0	11.3	12.0	12.0	11.7	11.3	10.9	9.9	9.5	9.5	11.3	8.8
2	12.0	11.7	12.0	12.0	11.7	11.3	10.9	9.9	9.5	9.5	11.3	8.8
3	12.0	11.7	12.0	12.0	11.7	11.3	10.9	9.9	9.5	9.5	11.3	8.8
4	12.0	11.7	12.0	12.0	11.7	10.9	10.9	9.9	9.5	10.9	10.9	8.8
5	11.7	12.0	12.0	11.7	11.7	10.9	10.9	9.9	9.5	10.6	10.9	8.8
6	11.7	12.4	12.0	11.7	11.7	10.9	10.9	9.9	9.5	9.5	10.6	8.8
7	11.7	12.7	12.0	11.7	11.7	10.9	10.9	9.9	9.5	9.2	10.2	8.8
8	11.7	12.7	12.0	11.7	11.7	10.9	10.9	9.9	9.5	9.2	10.2	8.8
9	11.7	12.7	12.0	11.7	12.0	10.9	10.9	9.9	9.5	9.2	10.2	8.8
10	11.7	12.7	12.0	11.7	12.0	10.9	10.9	9.9	9.5	9.2	9.9	8.8
11	11.7	12.7	12.0	11.7	13.4	10.9	10.9	9.9	9.5	9.2	9.5	8.8
12	11.7	12.7	12.0	11.7	15.5	10.9	10.9	9.9	9.9	8.8	9.5	8.8
13	11.3	12.7	12.0	11.7	15.2	10.9	10.9	9.9	9.9	8.8	9.5	8.8
14	11.3	12.7	11.7	12.0	13.4	10.9	10.9	9.9	9.9	8.8	9.5	8.8
15	11.3	12.7	11.7	12.4	13.1	10.9	10.6	9.9	9.9	8.8	9.5	8.8
16	11.3	12.7	11.7	12.4	13.8	10.9	10.6	9.9	9.9	8.8	9.5	8.8
17	11.3	12.7	11.7	12.7	13.4	10.9	10.2	9.9	9.9	8.8	9.2	8.8
18	11.3	12.4	11.7	13.1	13.4	10.9	10.2	9.9	9.9	9.2	9.2	8.8
19	11.3	12.4	11.7	13.1	13.4	10.9	10.2	9.9	9.9	9.2	9.2	8.8
20	11.3	12.4	11.7	12.7	13.1	10.9	10.2	9.9	9.9	9.2	9.2	8.8
21	11.3	12.0	11.7	12.4	13.1	10.9	10.2	9.9	9.9	9.2	9.2	8.8
22	11.3	12.0	11.7	12.0	12.0	10.9	10.2	9.9	9.9	15.5	9.2	8.8
23	11.3	12.0	11.7	12.0	12.0	10.9	10.2	9.9	9.5	17.3	9.2	8.5
24	11.3	12.0	11.7	11.7	11.7	10.9	10.2	9.9	9.5	16.6	8.8	8.5
25	11.3	12.0	11.7	11.7	11.7	10.9	10.2	9.9	9.5	16.2	8.8	8.5
26	11.3	12.0	11.7	11.7	11.3	10.9	10.2	9.9	9.5	15.9	8.8	8.5
27	11.3	12.0	11.7	11.7	11.3	10.9	9.9	9.9	9.5	13.8	8.8	8.5
28	11.3	12.0	11.7	11.7	11.7	10.9	9.9	9.9	9.5	12.4	8.8	8.5
29	11.3		11.7	11.7	11.7	10.9	9.9	9.9	9.5	11.7	8.8	8.5
30	11.3		11.7	11.7	11.7	10.9	9.5	9.9	9.5	10.9	8.8	8.5
31	11.3		11.7		11.7		9.5	9.9		10.9		8.5
Sum	343.7		360.0		328.2		306.9			336.3		270.1
	356.3		366.6		385.2		324.5		289.4		289.8	

Current Year 1977 — **Period #Dec. 1961-1977**

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.			† 1	12.0	†13	11.3	11.7	706	448	934	4.4
Feb.			† 7	12.7	1	11.3	12.4	682	397	843	4.1
Mar.			† 1	12.0	†14	11.7	11.7	726	420	923	4.9
Apr.			†18	13.1	† 5	11.7	12.0	713	436	878	4.2
May			†12	15.5	†26	11.3	12.4	763	519	976	8.7
June			† 1	11.3	† 4	10.9	10.9	653	460	917	6.0
July			† 1	10.9	†30	9.5	10.6	646	476	977	7.9
Aug.			† 1	9.9	† 1	9.9	9.9	608	512	1,216	6.2
Sept.			†12	9.9	† 1	9.5	9.5	575	602	1,111	5.4
Oct.			†23	17.3	†12	8.8	10.9	667	679	1,420	4.6
Nov.			† 1	11.3	†24	8.8	9.5	576	585	1,338	4.2
Dec.			† 1	8.8	†23	8.5	8.8	537	501	1,187	4.4
				17.3		8.5	10.9	7,852	6,035	11,421	146.2
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.49		0.24	0.31	9,684	7,445	14,089	180.1

ø Mean daily † And other days # Some months missing

EIGHT MILE CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Concrete wall with 90° V-notch weir of 6.9 second-foot (0.2 m^3/sec) capacity, bubbler gage, and water-stage recorder located on the left bank at latitude 29°24'00", longitude 101°00'55", 0.8 creek mile (1.3 km) from the confluence with the Rio Grande, and about 8 miles (12.9 km) northwest of Del Rio, Texas. This stream enters the Rio Grande from the United States side at river mile 569.3 (916.2 km), 4.6 river miles (7.4 km) downstream from Amistad Dam, and 8.3 river miles (13.4 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. 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: March 1961 through 1977.

REMARKS: 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. All storm water from surface runoff passing this station is deducted and is 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 may have on the flow of this stream.

EXTREME FLOWS FROM RECORDS:

	Average Flow in Second-Feet (Cubic Meters per Second)			
Daily:	Max. 15.9 (0.45)	July 23 & 24, 1976	Min. 0	Occasionally
Monthly:	Max. 6.3 (0.18)	July 1976	Min. 0	Occasionally
Yearly:	Max. 4.0 (0.11)	1974 & 1975	Min. 0	Several years

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.7	3.9	3.8	4.0	3.6	3.2	3.3	2.8	2.8	2.7	3.1	3.1
2	3.8	3.9	3.7	4.0	3.7	3.2	3.0	2.8	2.8	2.9	3.0	3.1
3	3.8	3.7	3.6	3.9	3.7	3.1	3.0	2.8	2.8	3.0	3.0	3.1
4	3.8	3.7	3.6	3.9	3.7	3.0	3.0	2.8	2.8	3.0	3.0	3.0
5	3.8	3.8	3.7	3.8	3.6	3.0	3.0	2.7	2.8	3.0	3.0	3.1
6	3.8	3.8	3.7	3.6	3.6	3.0	3.0	2.7	2.8	2.8	3.0	3.0
7	3.8	3.8	3.6	3.6	3.6	2.9	3.0	2.7	2.8	2.9	3.0	3.0
8	3.8	4.4	3.7	3.6	3.7	2.9	3.0	2.7	2.8	2.9	3.5	3.0
9	3.9	4.2	3.8	3.6	3.6	2.8	3.0	2.7	2.8	2.9	3.3	3.0
10	3.9	4.2	3.7	3.6	4.1	2.8	3.0	2.7	2.6	2.9	3.1	3.0
11	4.0	4.1	3.6	3.5	4.0	2.8	3.0	2.7	2.6	2.9	3.1	3.0
12	4.0	4.0	3.6	3.6	3.9	2.9	3.0	2.7	2.7	2.9	3.1	3.0
13	4.0	3.9	3.6	3.6	3.9	2.8	3.0	2.6	2.6	2.9	3.1	3.0
14	4.0	3.9	3.7	3.7	3.7	2.9	3.0	2.6	2.6	2.9	3.2	3.1
15	4.0	3.9	3.6	3.8	3.8	2.9	3.0	2.6	2.6	2.9	3.2	3.1
16	4.0	3.9	3.6	4.1	3.6	2.8	3.0	2.6	2.7	2.9	3.0	3.1
17	3.9	3.9	3.6	4.0	3.6	2.8	3.0	2.6	2.8	2.9	3.0	3.1
18	3.9	3.8	3.6	3.9	3.6	2.8	3.0	2.6	2.8	2.9	3.0	3.0
19	3.9	3.8	3.3	3.8	3.4	2.8	3.0	2.6	2.9	2.8	3.0	3.0
20	3.8	3.6	3.4	3.8	3.4	2.8	3.0	2.6	2.9	2.8	3.0	3.0
21	3.8	3.8	3.4	3.6	3.4	2.8	3.2	2.6	2.7	2.7	3.0	3.0
22	4.0	3.8	3.3	3.7	3.4	2.8	3.1	2.6	2.6	3.3	3.0	3.0
23	3.9	3.6	3.5	3.7	3.4	2.8	2.8	2.7	2.5	3.4	3.0	3.0
24	3.9	3.7	3.5	3.6	3.4	2.8	2.8	2.7	2.5	3.4	2.9	3.0
25	3.9	3.6	3.5	3.6	3.3	2.8	2.8	2.7	2.5	3.3	2.9	3.0
26	3.8	3.6	3.6	3.6	3.3	2.8	2.8	2.7	2.6	3.2	3.0	3.1
27	3.8	3.8	4.6	3.4	3.3	2.8	2.8	2.7	2.6	3.3	3.0	3.1
28	3.7	3.7	4.7	3.4	3.3	2.7	2.8	2.7	2.6	3.3	3.0	3.1
29	3.6		4.2	3.5	3.3	3.8	2.8	2.7	2.6	3.2	3.0	3.2
30	3.8		4.0	3.6	3.4	6.5	2.8	2.7	2.7	3.3	3.1	3.2
31	3.9		4.0		3.3		2.8	2.8		3.3		3.2
Sum	119.7	107.8	114.8	111.1	110.6	90.8	91.8	83.2	80.9	93.5	91.6	94.7

Month	Current Year 1977 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 #March 1961-1977 Acre-Feet Average	Maximum	Minimum
Jan.	1.27	1.16	†11	4.0	29	3.6	3.9	237	81.3	294	0
Feb.	1.56	1.13	8	4.4	23	3.6	3.8	214	74.3	273	0
Mar.	1.44	1.10	28	4.7	†19	3.3	3.7	228	76.1	271	0
Apr.	1.97	1.12	16	4.1	†27	3.4	3.7	220	81.6	244	0
May	2.67	1.10	10	4.1	†25	3.3	3.6	219	78.6	224	0
June	1.82	1.03	30	6.5	28	2.7	3.0	180	66.8	214	0
July	1.19	1.04	1	3.3	†22	2.8	3.0	182	85.8	390	0
Aug.	1.04	1.02	† 1	2.8	†13	2.6	2.7	165	87.3	299	0
Sept.	1.06	1.00	†19	2.9	†10	2.5	2.7	160	76.5	240	0
Oct.	2.08	1.03	†23	3.4	† 1	2.7	3.0	185	96.0	334	0
Nov.	1.15	1.06	8	3.5	†24	2.9	3.1	182	83.3	321	0
Dec.	1.10	1.07	†29	3.2	† 4	3.0	3.1	188	86.2	283	0
Yearly	2.67	1.00		6.5		2.5	3.3	2,360	973.8	2,892	3.4
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.81	0.30		0.18		0.07	0.09	2,911	1,201	3,567	4.2

Some months missing ** Includes storm runoff Ø Mean daily † And other days

MCKEE SPRING NEAR DEL RIO, TEXAS

DESCRIPTION: Cipolletti weir of 21.5 second-foot (0.6 m^3/sec) capacity, gravity well, and water-stage recorder located on the source pool of this spring which is located on the left flood plain of the Rio Grande at latitude 29°23'35", longitude 101°01'15", about 150 feet (45.7 m) from the edge of the low-flow channel and about 8 miles (12.9 km) northwest of Del Rio, Texas. Water from this spring enters the Rio Grande at river mile 569.1 (915.9 km), 4.8 river miles (7.7 km) downstream from Amistad Dam. The zero of the gage is 894.59 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 4 discharge measurements during the year and a continuous record of gage heights and the weir discharge table. Records available: November 1961 through 1977.

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 this spring when the river flow is approximately 14,000 second-feet (396 m^3/sec). This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of this spring.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 9.1 (0.26)	Aug. 15, 1972	Min. 0	Occasionally
Monthly:	Max. 8.1 (0.23)	Sept. 1972	Min. 0	Occasionally
Yearly:	Max. 7.5 (0.21)	1974	Min. 0	1963

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.0	6.7	6.8	6.7	7.0	6.8	6.7	6.7	6.8	6.7	6.7	6.7
2	7.0	6.7	6.8	6.7	7.0	6.8	6.7	6.7	6.7	6.7	6.7	6.7
3	7.0	6.7	6.8	6.7	7.0	6.8	6.7	6.7	6.7	6.7	6.7	6.7
4	7.0	6.7	6.8	6.7	7.0	6.8	6.7	6.7	6.7	6.7	6.7	6.6
5	7.0	6.7	6.8	6.7	7.0	6.8	6.7	6.7	6.7	6.7	6.7	6.6
6	7.0	6.7	6.8	6.7	7.0	6.7	6.7	6.7	6.7	6.7	6.7	6.6
7	7.0	6.7	6.8	6.7	7.0	6.7	6.7	6.7	6.8	6.7	6.7	6.6
8	7.0	6.8	6.8	6.7	7.0	6.7	6.7	6.7	7.0	6.7	6.8	‡6.6
9	7.0	6.8	6.8	6.7	7.0	6.7	6.7	6.7	7.0	6.7	6.8	6.7
10	7.0	6.8	6.7	6.7	7.2	6.7	6.7	6.7	7.0	6.7	6.7	6.7
11	7.0	6.8	6.7	6.7	7.2	6.7	6.7	6.7	7.0	6.7	6.7	6.8
12	7.0	6.8	6.7	6.7	7.2	6.7	6.7	6.7	7.2	6.7	6.7	6.9
13	6.8	6.8	6.7	6.7	7.2	6.7	6.7	6.7	7.2	6.7	6.7	6.9
14	6.8	6.8	6.7	7.0	7.2	6.7	6.7	6.7	7.0	6.7	6.7	‡7.0
15	6.8	6.8	6.7	7.2	7.0	6.7	6.7	6.7	7.0	6.7	6.7	6.9
16	6.8	6.8	6.5	7.0	7.0	6.7	6.7	6.7	7.0	6.7	6.7	6.7
17	6.8	6.8	6.5	6.8	7.0	6.7	6.7	6.7	7.0	6.7	6.7	6.6
18	6.8	6.8	6.5	6.7	7.0	6.7	6.7	6.7	7.0	6.7	6.7	6.4
19	6.8	6.8	6.5	6.7	7.0	6.7	6.7	6.7	7.0	6.7	6.7	6.3
20	6.8	6.8	6.5	6.7	7.0	6.7	6.7	6.7	7.0	6.7	6.7	6.1
21	6.8	7.0	6.5	6.7	7.0	6.7	6.7	6.7	7.0	6.7	6.7	‡6.0
22	6.8	7.0	6.5	6.7	7.0	6.7	6.7	6.7	7.0	6.8	6.7	6.1
23	6.8	6.8	6.5	6.7	7.0	6.7	6.7	6.7	6.8	7.5	6.7	6.2
24	6.8	7.0	6.5	6.7	7.0	6.7	6.7	6.7	6.8	7.2	6.7	6.3
25	6.8	6.8	6.5	6.7	7.0	6.7	6.7	6.7	6.8	7.0	6.7	6.3
26	6.8	6.8	6.5	6.8	6.8	6.7	6.7	6.8	6.8	6.8	6.7	6.4
27	6.8	6.8	7.2	7.2	6.8	6.7	6.7	6.8	6.8	6.8	6.7	6.5
28	6.8	6.8	7.0	7.2	6.8	6.8	6.7	6.8	6.8	6.8	6.7	‡6.6
29	6.8		6.8	7.2	6.8	6.8	6.7	7.0	6.8	6.7	6.7	6.6
30	6.8		6.7	7.2	6.8	6.8	6.7	7.0	6.8	6.7	6.7	6.5
31	6.7		6.7		6.8		6.7	6.8		6.7		6.4
Sum	213.1	190.3	207.3	204.3	216.8	201.8	207.7	208.7	206.9	209.7	201.2	203.0

Current Year 1977 — **Period Nov. 1961-1977**

Month	Extreme Gage Feet		∅ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	0.66	0.64	† 1	7.0	31	6.7	6.9	423	241	466	0
Feb.	.66	.64	†21	7.0	† 1	6.7	6.8	377	220	430	0
Mar.	.68	.63	27	7.2	†16	6.5	6.7	411	242	457	0
Apr.	.64	.58	†15	7.2	† 1	6.7	6.8	405	248	442	0
May	.64	.54	†10	7.2	†26	6.8	7.0	430	272	480	.7
June	.54	.52	† 1	6.8	† 6	6.7	6.7	400	237	436	0
July	.53	.48	† 1	6.7	† 1	6.7	6.7	412	243	474	0
Aug.	.48	.45	†29	7.0	† 1	6.7	6.7	414	247	473	0
Sept.	.45	.44	†12	7.2	† 2	6.7	6.9	410	252	479	0
Oct.	.46	.38	23	7.5	† 1	6.7	6.8	416	264	484	0
Nov.	.38	.35	† 8	6.8	† 1	6.7	6.7	399	249	475	0
Dec.	.35	.23	14	7.0	21	6.0	6.5	403	253	475	0
Yearly	0.68	0.23		7.5		6.0	6.8	4,900	2,968	5,395	0.7
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.21	0.07		0.21		0.17	0.19	6,044	3,661	6,655	0.9

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

CANTU SPRING NEAR DEL RIO, TEXAS

DESCRIPTION: Gravity well and water-stage recorder located at the spring source in the channel of a small tributary to Cienegas Creek at latitude 29°23'15", longitude 100°56'00", about 2.5 miles (4.0 km) northwest of Del Rio, Texas, and 3.5 creek miles (5.6 km) from the confluence with the Rio Grande. The spring is isolated from surface runoff by the concrete enclosure, but creek backwater may influence the recorded gage heights. Cienegas Creek enters the Rio Grande at river mile 562.9 (905.8 km), 1.8 river miles (3.0 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 52 discharge measurements during the year and a continuous record of gage heights. Records available: March 1961 through 1977.

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. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of this spring.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	10.0 (0.28)	July 27 & 28, 1976	Min.	0	Occasionally
Monthly:	Max.	8.9 (0.25)	December 1976	Min.	0	Occasionally
Yearly:	Max.	8.2 (0.23)	1977	Min.	0	1963

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.8	8.1	8.4	7.9	8.3	8.6	8.7	6.9	6.9	8.6	9.0	8.6
2	8.7	‡ 8.1	8.3	7.8	8.2	‡ 8.6	8.6	6.8	7.1	8.7	‡ 9.0	8.5
3	8.7	8.2	‡ 8.2	7.6	8.2	8.7	8.4	‡ 6.7	7.3	8.7	8.9	8.4
4	8.6	8.3	8.2	7.5	‡ 8.1	8.8	8.3	6.8	7.6	8.7	8.8	8.3
5	‡ 8.6	8.4	8.2	7.3	8.2	8.9	8.2	6.9	7.8	‡ 8.7	8.7	8.2
6	8.6	8.5	8.3	‡ 7.2	8.2	9.0	8.1	7.0	8.0	8.7	8.7	8.1
7	8.6	8.6	8.3	7.2	8.3	‡ 9.1	‡ 8.0	7.2	8.2	8.7	8.6	‡ 8.0
8	8.6	8.7	8.3	7.3	8.3	9.1	8.0	7.3	‡ 8.4	8.7	8.5	8.0
9	8.6	‡ 8.8	‡ 8.3	7.3	8.4	9.1	7.9	7.4	8.4	8.6	‡ 8.4	8.1
10	8.6	8.7	8.3	7.3	8.4	9.1	7.8	‡ 7.5	8.4	8.6	8.5	8.1
11	8.6	8.7	8.4	7.3	‡ 8.5	9.0	7.8	7.4	8.3	8.6	8.5	8.1
12	‡ 8.6	8.6	8.4	7.4	8.4	9.0	7.8	7.2	8.3	‡ 8.6	8.6	8.1
13	8.6	8.6	8.5	‡ 7.4	8.4	9.0	‡ 7.7	7.1	8.3	8.6	8.7	8.2
14	8.6	8.5	8.5	7.3	8.3	‡ 9.0	7.7	7.0	‡ 8.3	8.6	8.8	‡ 8.2
15	8.6	8.5	8.6	7.3	8.2	9.0	7.7	6.9	8.3	8.6	8.8	8.2
16	8.7	‡ 8.4	‡ 8.6	7.2	8.1	9.0	7.7	6.7	8.3	8.7	‡ 8.9	8.2
17	8.7	8.5	8.4	7.1	8.1	9.0	7.7	‡ 6.6	8.3	8.7	8.9	8.2
18	8.7	8.5	8.3	7.0	‡ 8.0	8.9	7.7	6.5	8.2	8.7	8.9	8.1
19	‡ 8.7	8.6	8.1	7.0	8.0	8.9	7.7	6.4	8.2	‡ 8.7	8.9	8.1
20	8.6	8.6	8.0	‡ 6.9	8.1	8.9	‡ 7.7	6.3	8.2	8.7	8.8	8.1
21	8.6	8.7	7.8	7.1	8.1	‡ 8.9	7.7	6.2	‡ 8.2	8.8	8.8	‡ 8.1
22	8.5	8.7	7.7	7.4	8.2	8.9	7.6	‡ 6.1	8.3	8.8	8.8	8.0
23	8.5	‡ 8.8	‡ 7.5	7.6	8.2	8.9	7.6	6.2	8.3	8.8	‡ 8.8	7.9
24	8.4	8.7	7.6	7.8	8.3	8.9	7.5	6.2	8.4	8.9	8.8	7.8
25	8.4	8.6	7.7	8.0	‡ 8.3	8.9	7.5	6.3	8.4	8.9	8.8	7.7
26	‡ 8.3	8.6	7.8	8.3	8.3	8.9	7.4	6.4	8.5	9.0	8.8	7.6
27	8.3	8.5	7.9	‡ 8.5	8.4	8.9	‡ 7.4	6.4	8.5	‡ 9.0	8.7	7.5
28	8.2	8.4	8.0	8.4	8.4	8.9	7.3	6.5	‡ 8.6	9.0	8.7	‡ 7.4
29	8.2		8.1	8.4	8.4	‡ 8.9	7.2	6.6	8.6	9.0	8.7	7.6
30	8.2		‡ 8.2	8.3	8.5	8.8	7.1	6.6	8.6	9.0	‡ 8.7	7.7
31	8.2		8.1		8.5		7.0	‡ 6.7		9.0		7.9
Sum	264.6	238.9	253.0	226.1	256.3	267.6	240.5	208.8	245.2	271.4	262.5	249.0

Month	Current Year 1977								Period March 1961-1977		
	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	8.8	†28	8.2	8.5	525	253	525	0
Feb.	2.98	2.86	9	8.8	† 1	8.1	8.5	474	225	474	0
Mar.	3.65	2.98	†15	8.6	23	7.5	8.2	502	239	518	0
Apr.	3.45	2.60	27	8.5	20	6.9	7.5	448	231	480	0
May	2.60	2.51	†11	8.5	†18	8.0	8.3	508	225	508	0
June	2.62	2.49	† 7	9.1	† 1	8.6	8.9	531	208	531	0
July	2.86	2.63	1	8.7	31	7.6	7.8	477	219	505	0
Aug.	3.05	2.87	10	7.5	22	6.1	6.7	414	230	526	0
Sept.	3.12	2.54	†28	8.6	1	6.9	8.2	486	239	520	0
Oct.	2.63	2.54	†26	9.0	† 1	8.6	8.8	538	262	538	0
Nov.	2.70	2.47	† 1	9.0	9	8.4	8.8	521	258	521	0
Dec.	2.58	2.48	1	8.6	28	7.4	8.0	494	269	544	0
	3.65	2.47		9.1		6.1	8.2	5,918	2,858	5,918	0
Yearly	Meters			Cubic Meters per Second					Thousands of Cubic Meters		
	1.11	0.75		0.26		0.17	0.23	7 300	3.525	7,300	0

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

CIENEGAS CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Gravity wells and water-stage recorders located, one each, on the left bank of the Cienegas Creek at latitude 29°21'00", longitude 100°56'40", 0.3 creek mile (0.5 km) 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 (884 m) 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 (4.0 km) west of Del Rio, Texas. The point of diversion is 1.8 creek miles (2.9 km) from the confluence with the Rio Grande. Cienegas Creek enters the Rio Grande at river mile 562.9 (905.8 km), 1.8 river miles (3.0 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gages has not been determined.

RECORDS: Based on 52 and 52 discharge measurements at Cienegas Creek and Briggs Farm Ditch, respectively, during the year and a continuous record of gage heights. Mean daily discharge computations determined by combining the two records for the total yield of the springs. Records available: March 1965 through 1977. Discharge measurement data available since November 1962. Records are also available from September 1931 through June 1935 for a station 0.1 creek mile (0.2 km) downstream.

REMARKS: Low flow of this stream is from springs, one of which is Cantu Spring whose discharge is shown on page 40. The flow of this stream is modified by irrigation diversions through the Briggs Farm ditch. During 1977 there were no appreciable diversions from the creek, other than through the Briggs Farm ditch whose net amount of diversion is 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 may have on the flow of these springs.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	42.7 (1.21)	August 12, 1972	Min.	0.5 (0.01)	April 21, 1966
Monthly:	Max.	24.8 (0.70)	July 1976	Min.	0.8 (0.02)	August 1967
Yearly:	Max.	17.9 (0.51)	1977	Min.	2.2 (0.06)	1968

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	19.2	20.6	20.2	21.2	18.3	19.2	17.2	16.2	16.0	13.5	21.5	17.9
2	18.9	20.2	19.5	19.9	18.4	18.7	16.5	16.2	16.1	14.3	21.8	17.7
3	19.3	20.2	16.3	19.9	18.5	18.6	16.1	15.8	15.8	16.2	21.1	18.2
4	19.5	20.5	18.9	19.3	19.2	18.1	15.9	14.7	15.9	15.6	20.5	18.1
5	19.8	19.8	19.4	20.0	19.4	18.1	16.2	14.5	15.7	15.1	19.9	18.0
6	20.3	20.6	17.4	19.9	19.6	17.1	15.7	14.9	15.6	15.4	19.1	18.0
7	20.9	21.9	17.4	19.4	19.4	17.1	15.6	15.5	15.8	15.5	18.2	18.6
8	21.0	23.7	17.6	17.1	18.9	17.3	15.6	15.9	16.2	16.1	18.4	18.4
9	19.7	22.2	19.2	17.0	19.1	16.7	15.1	16.1	16.6	16.4	17.7	16.9
10	19.9	22.0	20.3	17.1	19.0	16.7	14.9	16.8	16.3	16.6	17.7	17.6
11	20.4	21.7	20.1	17.3	19.0	16.0	15.1	16.8	16.5	16.9	18.0	18.4
12	21.0	21.8	20.3	17.9	17.9	16.0	13.5	16.9	16.7	17.8	18.1	18.9
13	20.6	21.8	19.5	18.0	18.6	14.1	13.1	16.8	17.2	17.6	18.1	18.8
14	20.2	21.7	19.7	18.0	18.5	13.5	13.1	16.9	17.4	17.3	18.1	18.3
15	19.9	21.8	19.9	18.4	18.1	13.6	13.9	16.9	17.1	17.1	18.3	18.0
16	19.5	21.8	19.9	20.3	18.1	14.3	14.5	17.0	17.0	17.0	18.2	17.8
17	19.9	21.3	19.5	20.3	18.2	14.7	14.8	17.0	16.5	16.7	17.8	17.3
18	20.1	20.3	19.4	19.9	18.0	15.4	14.8	16.2	16.5	16.8	17.8	16.5
19	19.8	19.9	19.0	19.8	18.1	15.3	15.6	15.7	16.4	16.7	17.7	16.0
20	19.8	20.1	18.4	19.7	18.2	15.5	15.8	15.1	16.3	16.5	17.7	16.3
21	20.3	19.9	18.7	19.3	18.4	15.5	15.8	14.6	15.2	16.5	17.6	15.6
22	19.8	20.3	18.9	18.8	18.8	15.9	15.7	13.9	14.9	20.8	17.7	16.1
23	20.3	21.1	16.8	19.2	19.2	16.6	15.7	14.1	15.2	21.7	17.7	16.3
24	20.4	20.2	15.9	18.8	19.3	16.8	15.5	14.7	15.8	20.6	18.1	16.4
25	20.9	19.5	18.7	18.6	19.7	16.6	15.2	14.8	15.0	20.4	18.0	15.9
26	21.2	19.3	19.9	18.6	19.5	16.7	15.0	15.0	15.1	20.6	18.3	16.1
27	20.8	19.5	21.9	18.2	19.3	17.0	15.3	15.3	14.7	21.2	18.8	16.6
28	20.6	19.4	21.0	18.2	19.2	17.1	15.3	15.5	14.2	21.2	18.5	17.0
29	20.7		21.1	18.5	19.4	17.3	15.4	16.4	13.8	21.3	18.5	17.4
30	20.9		21.4	18.4	19.6	17.1	15.3	16.6	13.8	21.6	18.2	17.5
31	20.8		21.4		19.4		15.9	16.5		21.8		17.5
Sum	626.4	583.1	597.6	567.0	584.3	492.6	473.1	489.3	475.3	552.8	557.1	538.1

Month	Extreme Gage Feet		∅ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period March 1965-1977 Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			26	21.2	2	18.9	20.2	1,242	708	1,242	134
Feb.			8	23.7	26	19.3	20.8	1,157	670	1,157	98.0
Mar.			27	21.9	24	15.9	19.3	1,185	675	1,185	102
Apr.			1	21.2	9	17.0	18.9	1,125	627	1,125	100
May			25	19.7	12	17.9	18.8	1,159	632	1,159	109
June			1	19.2	14	13.5	16.4	977	538	1,070	86.3
July			1	17.2	†13	13.1	15.3	938	628	1,527	85.5
Aug.			†16	17.0	22	13.9	15.8	971	641	1,241	48.4
Sept.			14	17.4	†29	13.8	15.8	943	615	1,043	84.1
Oct.			31	21.8	1	13.5	17.8	1,096	727	1,135	150
Nov.			2	21.8	21	17.6	18.6	1,105	705	1,105	152
Dec.			12	18.9	21	15.6	17.4	1,067	734	1,168	133
				23.7		13.1	17.9	12,965	7,900	12,965	1,530.9
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.67		0.37	0.51	15,992	9,745	15,992	1,888

∅ Mean daily † And other days

RIO GRANDE AT DEL RIO, TEXAS AND CD. ACUNA, COAHUILA

DESCRIPTION: Cableway, gravity well, concrete control weir, water-stage recorders (graphic and digital), and binary decimal transmitter located on the right bank at latitude 29°19'40", longitude 100°55'50", and river mile 561.2 (903.2 km), 1,200 feet (366 m) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 12.7 river miles (20.4 km) downstream from Amistad Dam. The zero of the gage is 869.20 feet (264.93 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 23 discharge measurements during the year, 12 by the United States Section and 11 by the Mexican Section of the 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 and January 1968 through 1977. Records are available from May 1900 through April 1915 for a station 12.2 miles (19.6 km) upstream; for December 1919 through March 1920 for a station 8.7 miles (14.0 km) upstream near McKee's Switch; from July 2, 1941 through 1954 and October 1960 through 1967 for a station 1,200 feet (366 m) downstream at the international highway bridge; and from September 1954 through 1977 for a station, Rio Grande below Amistad Dam, 10.6 miles (17.0 km) 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 is controlled largely by releases from Amistad Reservoir. The transmitter, operated in cooperation with the National Weather Service, 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 (32,300 m^3/sec) occurred on June 28, 1954, with a gage height of 38.25 feet (11.66 m) at a station 1,200 feet (366 m) downstream. The lowest recorded flow was 124 second-feet (3.51 m^3/sec) which occurred March 5 and 6, 1969, with a gage height of 1.24 feet (0.38 m).

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	63,800 (1,810)	Sept. 22, 1974	Min.	164 (4.64)	Aug. 13, 1971
Monthly:	Max.	22,300 (632)	Sept. 1974	Min.	188 (5.32)	October 1971
Yearly:	Max.	5,170 (146)	1974	Min.	701 (19.9)	1972

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,760	1,250	1,250	1,210	8,200	3,620	2,140	1,180	1,850	1,250	1,010	‡ 1,070
2	1,770	1,250	1,240	1,210	8,170	2,570	2,140	1,170	1,830	1,260	1,000	1,070
3	1,770	‡ 1,240	‡ 1,250	1,210	8,170	2,550	2,130	1,170	1,830	1,250	‡ 1,000	1,070
4	1,780	‡ 1,250	1,240	1,180	8,170	2,570	2,130	‡ 1,170	1,830	1,230	1,000	1,070
5	‡ 1,780	1,260	1,250	1,200	‡ 8,170	2,560	2,130	1,120	1,830	1,220	1,010	1,070
6	1,770	1,260	1,250	1,200	8,520	2,550	2,140	1,030	1,830	‡ 1,220	1,000	1,070
7	1,860	1,290	1,230	‡ 1,220	9,210	‡ 2,540	‡ 2,130	1,030	3,070	1,220	1,010	1,070
8	2,010	1,740	1,230	1,230	9,200	2,530	2,130	898	5,400	1,210	1,040	1,070
9	2,010	2,410	1,230	1,230	9,230	2,880	2,130	633	5,400	1,200	1,000	1,060
10	2,010	2,420	1,230	1,230	9,200	5,000	2,130	627	5,400	1,210	1,010	1,060
11	2,010	2,410	1,230	1,230	9,160	754	2,110	634	5,420	1,190	1,000	1,050
12	2,020	2,400	1,230	1,230	9,160	3,060	2,120	631	5,480	1,200	1,010	1,060
13	2,100	2,410	1,230	1,230	9,180	3,060	1,810	628	5,430	1,150	1,020	1,060
14	2,280	2,410	1,230	1,280	9,140	3,040	1,170	627	5,430	1,000	1,020	1,050
15	2,280	2,410	1,220	1,260	9,150	3,030	1,160	625	‡ 5,400	1,000	1,020	1,050
16	2,280	2,410	1,210	1,330	9,140	3,030	1,160	688	5,400	1,000	1,020	1,060
17	2,280	2,410	1,230	1,260	9,120	2,820	1,160	1,040	5,400	1,010	1,010	1,050
18	2,280	2,410	1,220	1,260	9,040	2,140	1,160	1,050	5,410	1,000	1,010	1,050
19	2,280	2,410	1,210	1,460	9,000	2,010	1,160	1,050	‡ 5,400	1,000	1,010	‡ 947
20	2,280	2,400	1,210	2,370	9,080	1,390	1,170	1,050	5,400	1,000	1,030	964
21	2,280	2,400	1,230	2,390	9,030	1,060	1,170	1,050	5,400	1,000	1,010	1,090
22	2,320	2,400	1,210	2,390	9,030	1,050	1,170	1,160	5,420	1,300	1,030	1,080
23	2,310	1,910	1,210	2,390	9,000	‡ 1,060	1,170	1,460	5,410	1,050	1,010	1,090
24	2,310	1,270	1,220	2,390	8,820	1,060	1,170	1,460	5,400	1,030	1,060	1,090
25	2,300	1,260	1,210	‡ 2,390	8,100	1,050	1,170	1,460	5,380	1,030	1,070	1,090
26	2,310	1,240	1,250	3,660	7,170	1,050	1,170	‡ 2,200	5,360	‡ 1,030	1,070	1,090
27	2,300	1,260	1,420	8,190	‡ 6,520	1,040	1,200	4,440	5,360	1,030	1,070	1,090
28	2,300	1,260	1,230	8,230	6,490	1,460	1,190	4,460	5,400	1,030	1,070	1,090
29	2,310		‡ 1,210	8,230	6,480	2,140	‡ 1,180	4,620	5,450	1,030	‡ 1,060	1,090
30	2,330		1,210	8,250	6,430	2,200	1,180	5,020	3,810	1,030	1,070	1,090
31	1,960		1,210		5,850		1,170	3,920		1,030		1,090
Sum	65,640	52,450	38,230	74,540	260,330	66,874	48,450	49,301	136,830	34,410	30,750	33,001

Month	Current Year 1977 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 #1968-1977 Acre-Feet Average	Maximum	Minimum
Jan.	2.37	2.00	†16	2,390	31	1,260	2,120	130,195	70,900	130,195	14,497
Feb.	2.38	1.98	† 9	2,420	26	1,210	1,870	104,033	127,688	448,205	18,633
Mar.	2.28	1.97	27	2,080	†20	1,180	1,230	75,828	98,400	253,329	17,298
Apr.	3.70	1.96	29	8,380	13	1,160	2,480	147,848	105,557	354,407	33,846
May	3.92	2.90	9	9,600	31	4,400	8,400	516,357	184,976	516,357	30,928
June	3.64	1.43	10	7,810	11	240	2,230	132,643	110,710	250,318	23,143
July	2.37	1.95	2	2,180	24	1,090	1,560	96,099	94,447	161,363	31,474
Aug.	3.14	1.69	†30	5,050	†14	595	1,590	97,787	156,179	670,572	28,826
Sept.	3.19	2.03	12	5,630	30	1,270	4,560	271,398	266,803	1,327,497	38,850
Oct.	2.30	1.90	22	1,970	17	983	1,110	68,251	168,347	815,207	11,578
Nov.	1.95	1.88	† 8	1,090	23	942	1,020	60,992	104,832	527,524	13,644
Dec.	1.95	1.70	† 2	1,090	19	612	1,060	65,457	61,574	228,774	13,918
	3.92	1.43		9,600		240	2,440	1,766,888	1,550,413	3,743,795	508,583
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.19	0.44		272		6.80	69.1	2,179,456	1,912,434	4,617,971	627,337

** Period 1968-1977 ‡ Discharge measurement made on this day † And other days

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

ARROYO DE LAS VACAS AT CD. ACUNA, COAHUILA

DESCRIPTION: Concrete wall with a V-shape concrete control weir of 353 second-foot (10 m3/sec) capacity, gravity well, and water-stage recorder located on the left bank at Cd. Acuna, Coahuila, latitude 29°19'45", longitude 100°57'20" and 1.8 creek miles (3 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 561.0 (902.9 m), on the upstream side of the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 12.9 river miles (20.7 km) downstream from Amistad Dam. The zero of the gage is 885.82 feet (270 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 11 discharge measurements during the year, a stable rating curve up to 353 second-feet (10 m3/sec), 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. During 1977, the capacity of the weir was exceeded only on October 22. Records available: Occasional estimates from June 1935 to March 19, 1938 and a continuous record from March 20, 1938 through 1977.

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-shape concrete control weir with a capacity of 353 second-feet (10 m3/sec), 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 (275.08 m) at this station. Records prior to 1965 were published under the title "Arroyo Las Vacas near Cd. Acuna, Coahuila.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 63,570 second-feet (1,800 m3/sec) with a gage height of 25.26 feet (7.70 m) on June 17, 1961. Min. no flow several occasions in 1956, 1957, 1960, 1961, and September 1, 1967.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	23,940 (678)	June 17, 1961	Min.	0	Several days Dec. 1956, Jan. 1957, & Sept. 1, 1967
Monthly:	Max.	1,050 (29.8)	June 1961	Min.	0.4 (0.01)	Several months 1952, 1953, & 1954
Yearly:	Max.	96.7 (2.74)	1961	Min.	2.8 (0.08)	1952

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.6	12.7	14.8	10.2	19.1	10.6	3.5	3.2	2.5	2.5	7.1	4.2
2	16.6	12.7	14.8	10.2	11.3	8.5	4.2	3.2	2.5	210	7.1	4.2
3	16.6	12.7	14.8	10.2	11.3	8.5	4.2	2.8	2.5	63.2	7.1	4.2
4	15.9	11.3	14.8	8.5	11.3	7.1	4.2	2.8	2.1	14.8	7.1	4.2
5	13.4	10.9	14.8	8.5	11.3	7.1	4.2	2.8	2.1	13.8	6.0	4.2
6	14.1	11.3	14.8	8.5	22.6	6.0	4.2	2.8	24.0	12.7	6.0	4.2
7	‡ 13.8	13.4	11.3	8.5	16.2	6.0	4.2	2.8	5.7	12.4	6.0	4.2
8	13.8	19.1	11.3	8.5	15.9	6.0	4.2	2.8	3.2	9.9	13.8	4.2
9	13.4	17.0	11.3	‡ 9.2	‡ 14.8	6.0	4.2	2.8	2.8	7.8	8.5	4.2
10	13.4	19.1	11.3	10.2	15.2	6.0	4.2	2.8	2.8	7.1	8.5	4.2
11	11.3	13.8	11.3	10.2	25.4	6.0	3.5	2.8	2.8	‡ 6.0	8.5	4.2
12	16.6	12.7	11.3	10.2	17.3	7.1	3.2	3.5	7.1	5.3	7.8	‡ 4.2
13	12.7	11.3	11.3	11.7	37.8	9.5	3.2	3.5	3.5	4.2	8.5	4.2
14	12.7	11.3	‡ 11.3	11.7	24.0	9.5	2.8	3.5	3.2	4.2	8.5	4.2
15	15.2	11.3	11.3	16.2	16.6	7.1	2.8	3.5	3.2	4.2	7.8	4.2
16	12.0	11.3	11.3	48.0	16.6	6.0	2.8	3.5	2.8	4.2	7.1	4.2
17	12.0	11.3	11.3	25.1	16.6	6.0	2.8	3.5	2.8	3.9	7.1	4.2
18	12.4	‡ 12.7	11.3	19.8	16.6	6.0	2.8	3.5	‡ 2.8	3.9	7.8	4.2
19	11.3	12.7	11.3	18.4	15.9	6.0	2.8	3.5	‡ 3.5	3.9	7.8	4.2
20	11.3	12.7	11.3	16.2	14.8	3.5	2.8	3.5	3.5	3.9	7.8	4.2
21	11.3	12.7	11.3	106	14.8	3.5	‡ 2.8	3.5	3.2	3.9	7.8	4.2
22	10.6	12.7	11.3	24.4	14.8	3.5	2.8	3.5	3.2	696	8.5	4.2
23	11.3	12.7	11.3	16.2	19.1	3.5	2.8	2.8	3.2	17.7	7.1	4.2
24	11.3	12.7	11.3	13.8	14.8	3.5	2.8	2.8	3.2	11.3	7.1	4.2
25	11.3	12.7	11.3	16.2	11.3	3.5	2.8	2.8	2.8	9.5	5.3	4.2
26	10.6	12.7	11.3	16.2	11.3	4.2	2.8	‡ 2.5	2.8	8.5	4.2	4.2
27	9.5	12.7	11.3	16.2	11.3	4.2	2.8	2.5	2.8	8.5	3.5	4.2
28	9.5	13.8	11.3	16.2	11.3	4.2	2.8	2.5	2.8	8.5	3.9	4.2
29	9.5		10.2	16.2	11.3	4.2	2.8	2.5	2.5	8.5	‡ 4.2	4.2
30	10.9		9.9	20.8	11.3	3.9	2.8	2.5	2.5	8.5	4.2	4.2
31	12.7		9.5		10.6		2.8	2.5		8.5		4.2
Sum	393.6	364.0	367.0	542.2	492.5	176.7	101.6	93.5	114.4	1,187.3	211.7	130.2

Month	Current Year 1977 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 1938-1977 Acre-Feet Average	Maximum	Minimum
Jan.	0.69	0.56	† 1	16.6	†27	9.5	12.7	781	379	910	31.5
Feb.	.72	.56	† 8	19.1	5	10.6	13.1	722	512	5,950	33.3
Mar.	.66	.56	† 1	14.8	31	9.5	12.0	729	558	2,600	59.2
Apr.	2.53	.52	21	540	† 4	8.5	18.0	1,076	1,409	16,610	75.4
May	1.12	.66	13	61.4	31	10.6	15.9	977	1,323	9,080	90.0
June	.56	.36	1	10.6	†20	3.5	6.0	351	2,513	62,520	43.8
July	.39	.33	† 2	4.2	†14	2.8	3.2	203	1,574	16,409	26.8
Aug.	.36	.33	†12	3.5	†26	2.5	3.2	186	1,105	13,661	42.2
Sept.	1.84	.30	6	229	† 4	2.1	3.9	227	2,915	49,566	37.3
Oct.	5.61	.33	22	3,810	1	2.5	38.1	2,355	1,660	20,444	22.6
Nov.	.79	.36	8	25.4	27	3.5	7.1	419	382	1,670	21.0
Dec.	.39	.39	† 1	4.2	† 1	4.2	4.2	260	353	1,066	22.0
Yearly	5.61	0.30		3,810		2.1	11.3	8,286	14,683	70,026.3	2,066.7
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.71	0.09		108		0.06	0.32	10,222	18,112	86,384	2,555

** Period 1938-1977 ‡ 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 (1.0 km) downstream from the source of the springs and 2.9 creek miles (4.7 km) 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 (91 m) 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 560.5 (902.1 km), 0.5 river mile (0.8 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zeros of the gages for the two stations are, respectively, 942.58 feet (287.30 m) and 930.77 feet (283.70 m) 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 52 and 52 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, Feb. 1961 through 1977.

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

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 171 (4.84)	July 23, 1976	Min. 29.2 (0.83)	July 29, 1964
Monthly:	Max. 153 (4.33)	December 1976	Min. 34.4 (0.97)	August 1964
Yearly:	Max. 149 (4.22)	1977	Min. 50.5 (1.43)	1963

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	156	150	144	141	150	152	155	145	147	150	151	150
2	153	149	144	143	150	150	159	149	149	150	151	150
3	151	148	148	146	152	151	158	148	149	150	150	153
4	151	149	148	149	154	151	161	146	150	145	150	154
5	151	147	148	149	151	152	160	148	148	145	151	151
6	153	145	147	146	152	149	150	148	148	145	149	153
7	153	152	151	145	150	151	148	149	150	144	149	151
8	153	152	150	144	151	150	149	147	150	142	152	153
9	158	148	148	140	147	150	150	149	150	142	149	151
10	153	147	147	140	148	152	151	147	154	143	147	151
11	154	147	145	139	151	155	152	142	151	144	147	150
12	155	144	145	138	150	157	154	146	149	144	147	151
13	154	144	146	142	153	157	157	144	147	147	148	148
14	153	144	146	143	150	152	152	144	146	149	149	149
15	153	143	144	144	151	149	150	147	147	150	150	148
16	153	142	143	148	148	153	152	147	147	153	150	148
17	152	140	144	148	152	153	153	148	148	149	152	149
18	152	142	146	146	155	154	147	144	148	149	152	149
19	152	144	148	147	154	154	147	148	147	148	153	150
20	153	146	152	146	150	153	152	146	147	147	153	149
21	152	141	149	146	150	151	153	144	147	149	156	149
22	153	143	150	142	151	152	153	146	146	150	154	150
23	152	139	148	146	149	152	152	147	149	153	154	150
24	153	138	151	146	149	151	153	149	150	148	153	148
25	150	142	146	144	151	151	150	149	151	146	152	150
26	152	141	148	146	149	150	153	149	152	147	151	150
27	149	146	152	145	153	150	150	149	150	147	150	148
28	151	143	148	145	154	150	149	148	148	148	150	148
29	148		141	146	155	153	146	148	146	150	150	152
30	151		142	147	155	157	148	148	150	151	150	150
31	150		143		154		146	148		151		149
Sum	4,724	4,056	4,552	4,337	4,689	4,562	4,710	4,557	4,461	4,576	4,520	4,652

Month	Current Year 1977 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 February 1961-1977 Acre-Feet Average	Maximum	Minimum
Jan.			9	158	29	148	152	9,370	6,330	9,370	2,274
Feb.			† 7	152	24	138	145	8,045	5,588	8,045	2,119
Mar.			†20	152	29	141	147	9,029	6,064	9,029	2,365
Apr.			† 4	149	12	138	145	8,602	5,799	8,602	2,291
May			†18	155	9	147	151	9,300	6,133	9,300	2,842
June			†12	157	† 6	149	152	9,049	5,936	9,049	2,481
July			4	161	31	146	152	9,342	6,145	9,342	2,214
Aug.			† 2	149	11	142	147	9,039	6,132	9,039	2,114
Sept.			10	154	†14	146	149	8,848	6,060	8,884	2,555
Oct.			†16	153	† 8	142	148	9,076	6,505	9,249	2,508
Nov.			21	156	†10	147	151	8,965	6,299	8,965	2,384
Dec.			4	154	†13	148	150	9,227	6,591	9,431	2,390
				161		138	149	107,892	73,582	107,892	36,580
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				4.56		3.91	4.22	133,085	90,763	133,085	45,121

Ø Mean daily † And other days

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°19'50", longitude 100°53'20", immediately upstream from the Silos Farm road bridge, 1.1 creek miles (1.8 km) from the confluence with the Rio Grande, and about 2 miles (3.2 km) south-southeast of Del Rio, Texas. This stream enters the Rio Grande at river mile 560.5 (902.1 km), 0.5 river mile (0.8 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 877.43 feet (267.44 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 52 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: September 1931 through 1977.

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 (4.6 m), or a flow of about 60,000 second-feet (1,700 m^3/sec). On June 28, 1954 combined creek flow and backwater from the Rio Grande reached a stage of 24.51 feet (7.47 m), the highest of record, at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 45,000 second-feet (1,270 m^3/sec) on June 14, 1935 with a gage height of 23.20 feet (7.07 m). Min. 0.4 second-foot (0.01 m^3/sec) on July 20, 1953.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 16,200 (459)	June 14, 1935	Min. 1.5 (0.04)	July 21, 1953
Monthly:	Max. 805 (22.8)	June 1935	Min. 4.6 (0.13)	July 1953
Yearly:	Max. 136 (3.85)	1935	Min. 25.1 (0.71)	1953

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	151	‡ 144	‡ 136	122	140	‡ 128	119	101	110	110	‡ 141	130
2	150	147	137	119	138	128	125	‡ 99.4	112	126	143	128
3	149	148	133	118	‡ 137	127	127	101	113	139	145	127
4	‡ 150	148	129	116	138	123	126	99.2	115	‡ 130	140	126
5	149	149	128	‡ 111	134	124	123	100	114	130	137	125
6	142	149	129	113	135	122	‡ 122	96.7	131	128	137	‡ 126
7	138	166	127	113	134	‡ 124	123	97.7	125	127	‡ 139	126
8	136	‡ 160	‡ 130	114	134	124	119	102	‡ 124	125	153	126
9	137	153	131	116	135	123	117	‡ 102	122	125	143	128
10	134	153	131	119	‡ 140	124	118	103	126	123	141	130
11	‡ 135	155	132	119	149	126	118	105	128	124	141	131
12	136	155	131	‡ 125	137	124	‡ 110	107	129	‡ 124	141	133
13	136	155	133	131	144	126	118	108	‡ 122	122	142	‡ 132
14	135	156	133	141	137	‡ 123	118	109	118	124	142	133
15	134	‡ 158	‡ 133	148	136	117	112	106	114	121	‡ 142	134
16	135	153	128	154	137	113	107	‡ 105	112	119	142	132
17	134	151	130	155	‡ 136	111	110	105	111	120	138	131
18	‡ 134	154	128	157	135	112	111	107	111	‡ 120	136	131
19	134	152	128	‡ 157	137	113	‡ 113	112	112	120	135	130
20	135	152	130	156	137	113	112	110	‡ 107	120	134	‡ 131
21	133	150	116	191	136	‡ 113	113	112	114	120	129	131
22	139	‡ 149	‡ 120	153	146	114	115	‡ 111	117	270	‡ 131	130
23	137	140	120	151	139	142	112	108	118	189	131	130
24	137	134	122	149	‡ 139	127	112	109	‡ 116	141	132	133
25	‡ 138	134	127	146	138	128	108	110	115	139	132	140
26	137	135	133	‡ 146	136	128	‡ 103	107	118	‡ 138	131	140
27	137	137	145	143	136	125	104	110	116	136	132	139
28	137	135	136	139	137	‡ 126	111	110	117	132	133	‡ 138
29	137		‡ 133	152	138	127	108	110	113	137	‡ 136	139
30	140		127	147	136	126	105	‡ 110	110	140	133	139
31	139		126		136		104	110		140		137
Sum	4,295	4,172	4,022	4,121	4,267	3,681	3,543	3,283.0	3,510	4,159	4,132	4,086

Month	Current Year 1977								Period 1932-1977		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	1.62	1.43	30	154	26	130	139	8,519	4,729	8,906	934
Feb.	2.37	1.01	7	255	7	86.5	149	8,275	3,829	8,630	487
Mar.	2.18	1.24	26	233	22	111	130	7,978	3,603	7,978	689
Apr.	3.47	1.25	21	429	5	106	137	8,174	4,090	10,407	566
May	2.34	1.39	11	245	9	123	138	8,463	4,866	17,600	739
June	2.92	1.22	23	327	†16	103	123	7,301	5,144	47,900	301
July	1.45	.79	3	134	12	59.0	114	7,027	4,207	22,077	285
Aug.	1.32	1.11	†21	121	1	91.9	106	6,512	3,712	7,584	350
Sept.	2.34	1.15	6	253	†19	102	117	6,962	5,175	28,678	872
Oct.	5.25	1.15	22	846	1	103	134	8,249	5,005	14,229	1,000
Nov.	2.08	1.37	8	219	†21	128	138	8,196	4,219	8,567	526
Dec.	1.52	1.33	30	145	5	119	132	8,104	4,324	8,642	496
Yearly	5.25	0.79		846		59.0	130	93,760	52,903	98,137	18,201
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.60	0.24		24.0		1.67	3.68	115,653	65,256	121,052	22,451

‡ Discharge measurement made on this day † And other days

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 (0.8 km) downstream from the Tequesquite Creek Siphon, 3.5 canal miles (5.6 km) upstream from the Las Moras Creek Siphon, about 7.5 miles (12.1 km) north-northwest of Quemado, Maverick County, Texas, and 12.8 canal miles (20.6 km) from the canal intake. The canal intake is at river mile 543.6 (874.9 km), 17.4 river miles (28.0 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 39 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 1977.

REMARKS: At canal mile 31.8 (51.2 km) a portion of the diverted water returns to the river through the Maverick Power Plant, and the remainder enters the Maverick Canal Extension. In 1977, 10,136 acres (4,102 ha) of land were irrigated between canal mile 31.8 (51.2 km) and the power plant, and 26,626 acres (10,775 ha) were irrigated from the extension, making a total of 36,762 acres (14,877 ha). A total of 645,047 acre-feet (795,665,000 m^3) returned to the Rio Grande at the power plant and through the irrigation system (see pages 51, 53, and 56).

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,750 second-feet (49.6 m^3/sec) on August 30, 1973. Min. no flow several days in June, July, and November 1954.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 1,730 (49.0)	August 29, 1973	Min. 0	June 28 through July 11 & Nov. 2, 1954	
Monthly:	Max. 1,580 (44.7)	August 1973	Min. 295 (8.35)	February 1977	
Yearly:	Max. 1,420 (40.2)	1961	Min. 632 (17.9)	1972	

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	467	314	476	775	1,430	1,490	1,490	1,300	1,380	1,380	1,240	1,260
2	426	242	476	780	1,430	1,490	1,500	‡ 1,270	1,430	1,410	1,220	1,240
3	336	‡ 233	‡ 474	775	1,420	1,500	1,520	1,280	1,410	1,480	1,220	1,230
4	‡ 330	230	464	762	1,410	1,520	1,520	1,310	1,420	1,440	1,210	1,240
5	330	228	574	760	1,420	1,510	‡ 1,510	1,290	1,430	1,420	1,210	1,240
6	332	225	591	757	1,410	1,530	1,520	1,200	1,410	1,420	1,200	‡1,250
7	327	226	591	754	1,430	‡ 1,560	1,510	1,140	1,430	1,420	1,220	1,250
8	328	231	588	757	1,440	1,550	1,500	1,140	1,450	1,410	‡ 1,310	1,240
9	329	229	584	757	1,430	1,520	1,490	935	1,470	1,410	1,330	1,240
10	332	232	582	772	‡ 1,450	1,540	1,500	828	1,480	1,400	1,270	1,230
11	331	231	582	778	1,450	1,310	1,480	785	1,490	‡ 1,400	1,250	1,250
12	334	230	580	1,110	1,440	1,170	1,460	836	1,490	1,390	1,230	1,280
13	335	228	595	1,270	1,450	1,530	1,450	834	‡ 1,480	1,380	1,240	1,300
14	336	227	593	‡ 1,310	1,470	1,500	1,400	853	1,480	1,280	1,240	1,290
15	336	‡ 226	‡ 592	1,350	1,480	1,490	1,340	836	1,480	1,180	1,230	1,280
16	337	230	613	1,420	1,470	1,490	1,320	‡ 772	1,480	1,170	1,220	1,280
17	337	232	612	1,410	1,460	1,520	1,330	944	1,480	1,160	1,220	1,260
18	‡ 337	229	611	‡ 1,390	1,410	1,480	1,320	955	1,490	1,170	1,220	1,260
19	335	232	601	‡ 1,380	1,430	1,510	‡ 1,300	972	1,490	1,140	1,220	1,250
20	335	237	606	‡ 1,410	1,430	1,480	1,280	972	1,480	1,140	1,230	‡1,130
21	334	254	616	‡ 1,430	1,420	‡ 1,330	1,280	983	1,480	1,140	1,220	1,190
22	334	378	606	1,410	1,420	1,310	1,290	980	1,480	1,290	‡ 1,210	1,270
23	335	482	605	1,410	1,440	1,310	1,300	1,210	1,480	1,340	1,220	1,290
24	334	624	611	1,440	‡ 1,440	1,310	1,300	1,370	1,480	1,320	1,230	1,290
25	331	484	619	1,430	1,430	1,310	1,300	1,370	1,490	‡ 1,300	1,250	1,300
26	330	441	619	1,420	1,400	1,310	1,270	1,360	1,490	1,260	1,260	1,300
27	331	447	634	1,420	1,450	1,310	1,260	1,390	‡ 1,490	1,240	1,260	1,300
28	326	468	640	1,430	1,500	1,300	1,300	1,440	1,500	1,250	1,260	1,300
29	321		‡ 639	1,430	1,500	1,410	1,310	1,440	1,490	1,240	1,250	1,310
30	325		673	1,360	1,500	1,480	1,340	‡ 1,460	1,490	1,240	1,250	1,300
31	326		788		1,490		1,350	1,420		1,240		1,300
Sum	10,517	8,270	18,435	34,657	44,750	43,070	43,040	34,875	44,020	40,460	37,140	39,150

Month	Current Year 1977 — Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1950-1977 — Acre-Feet		
			High		Low						
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	4.91	3.76	2	470	30	318	339	20,860	69,320	93,229	20,860
Feb.	6.12	2.97	24	712	7	224	295	16,403	63,288	86,817	16,403
Mar.	6.36	4.64	31	804	4	463	595	36,565	67,752	91,359	27,679
Apr.	8.85	6.15	27	1,470	8	750	1,160	68,741	66,276	88,483	40,721
May	8.95	8.58	†28	1,510	†26	1,390	1,440	88,760	73,369	91,458	39,400
June	9.11	5.91	7	1,560	12	627	1,440	85,428	74,298	90,547	31,210
July	9.02	7.98	† 2	1,520	26	1,240	1,390	85,369	74,413	93,900	19,600
Aug.	9.04	6.58	30	1,470	16	770	1,120	69,174	76,640	97,111	36,708
Sept.	9.04	8.45	28	1,510	1	1,290	1,470	87,312	75,517	89,851	32,963
Oct.	8.98	7.70	3	1,510	21	1,130	1,310	80,251	76,045	94,076	22,235
Nov.	8.43	7.74	8	1,380	16	1,170	1,240	73,666	69,446	92,509	22,487
Dec.	8.26	7.51	29	1,320	20	1,100	1,260	77,653	68,213	93,402	23,516
Yearly	9.11	2.97		1,560		224	1,090	790,182	854,577	1,027,400	458,631
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	2.78	0.91		44.2		6.34	30.9	974,615	1,054,121	1,267,298	565,721

‡ Discharge measurement made on this day † 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 (2.6 km) from the confluence with the Rio Grande, and about 19 miles (30.6 km) southeast of Del Rio, Texas. This stream enters the Rio Grande at river mile 536.9 (864.1 km), 5.6 river miles (9.1 km) downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam. The zero of the gage is 813.68 feet (248.01 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 12 discharge measurements during the year and a continuous record of gage heights. Records available: September 1955 through 1977 at this station, and November 22, 1928 through August 1955 at a site 3.9 miles (6.3 km) 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 (2,270 m^3/sec), backwater may reach this station. Backwater from the Rio Grande flood of June 1954 reached a gage height of 28.8 feet (8.78 m), or an elevation of 842.50 feet (256.79 m) above mean level, at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 186,000 second-feet (5,270 m^3/sec) on June 24, 1948 with a gage height of 32.0 feet (9.75 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 28,200 (799)	June 24, 1948	Min. 0	Frequently
Monthly:	Max. 953 (27.0)	June 1948	Min. 0	Frequently
Yearly:	Max. 105 (2.97)	1932	Min. 1.8 (0.05)	1945

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	37.2	37.5	41.5	‡ 22.6	38.4	19.2	‡ 17.7	9.1	‡ 4.5	7.5	16.5	‡ 13.5
2	36.3	37.0	43.0	22.9	32.6	‡ 18.4	16.9	8.7	4.5	7.5	15.7	13.6
3	37.1	‡ 36.9	38.2	23.1	‡ 32.6	17.8	16.8	9.5	4.4	7.2	‡ 15.4	13.6
4	37.7	36.3	‡ 31.6	21.8	32.6	17.0	16.2	‡ 10.3	4.5	7.3	15.4	13.4
5	36.8	35.8	31.5	22.1	32.4	16.4	16.0	10.8	4.7	7.1	15.6	13.0
6	‡ 37.0	36.3	33.3	22.9	32.6	16.0	11.8	8.7	4.7	‡ 6.9	15.7	12.6
7	37.2	38.3	37.2	23.0	32.7	15.6	11.8	9.3	8.9	6.4	16.0	12.5
8	35.6	47.3	36.1	23.0	32.2	15.0	11.2	9.0	16.7	6.8	39.8	11.9
9	34.8	43.8	35.4	23.4	32.2	14.8	10.4	8.4	13.8	7.2	21.3	11.9
10	32.9	41.8	34.4	22.7	38.6	14.5	9.9	7.6	8.9	7.4	18.5	12.7
11	33.7	42.3	33.7	22.7	38.9	13.4	10.3	7.1	7.3	7.5	16.8	12.8
12	35.6	41.9	33.2	23.2	35.4	12.8	15.1	6.7	7.1	7.5	16.2	13.9
13	37.8	41.1	32.7	24.0	30.9	12.7	15.3	6.4	6.7	7.5	15.8	14.0
14	36.9	41.4	31.9	25.2	30.3	12.3	15.3	6.1	6.9	7.7	15.6	13.6
15	35.9	41.1	30.5	25.6	30.7	11.6	15.0	6.3	7.2	7.9	15.6	13.3
16	35.3	41.6	29.1	31.2	31.7	10.5	14.6	7.1	7.4	8.4	15.7	13.0
17	35.1	41.1	28.1	39.4	31.4	10.0	14.2	7.4	9.2	9.3	15.8	12.8
18	35.6	41.6	26.9	28.9	29.8	9.7	13.9	6.8	9.2	9.4	15.8	12.7
19	34.5	41.8	26.2	27.9	29.2	9.3	13.9	6.3	8.9	9.5	15.7	12.6
20	33.4	40.4	25.4	28.0	28.9	9.3	14.0	5.7	8.9	9.5	15.5	12.6
21	33.9	40.4	25.1	42.9	27.6	10.4	14.3	5.4	8.6	9.5	15.0	12.6
22	40.7	42.1	24.9	32.8	28.7	8.2	14.0	4.9	8.7	10.5	14.4	12.6
23	42.2	42.1	25.2	29.2	26.1	8.2	13.8	4.7	8.4	41.2	14.6	13.2
24	40.1	40.8	25.3	28.6	24.7	16.4	13.7	4.6	8.4	23.2	14.3	13.5
25	37.4	42.1	25.5	28.1	23.8	22.9	13.4	4.4	8.1	22.3	13.9	13.3
26	36.2	41.3	26.1	27.9	23.4	16.3	13.7	4.4	8.2	21.4	13.7	13.3
27	36.4	40.1	33.3	28.2	23.3	14.8	15.0	4.1	7.9	20.5	13.7	13.3
28	35.8	41.6	29.1	28.2	22.9	15.1	8.8	4.1	7.9	19.6	13.5	13.2
29	34.5		26.1	29.8	22.1	17.8	11.8	4.2	7.7	18.8	13.3	13.2
30	37.1		25.0	45.8	21.0	18.5	9.1	4.5	7.7	18.0	13.3	13.4
31	39.4		23.5		19.8		9.0	4.6		17.2		13.5
Sum	1,135.8		825.1		424.9		207.2		377.7			405.1
	1,130.1		949.0		917.5		416.9		236.0		489.1	

Current Year 1977 — **Period 1929-1977**

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	1.78	1.69	†22	42.2	†10	32.9	36.5	2,242	555	2,270	0
Feb.	1.82	1.64	8	49.5	† 4	35.5	40.6	2,253	606	5,760	0
Mar.	1.68	1.35	† 2	45.2	31	22.9	30.6	1,882	531	2,500	0
Apr.	1.82	1.29	21	61.3	† 4	21.5	27.5	1,637	1,365	27,100	0
May	1.65	1.24	10	42.9	31	19.2	29.6	1,820	2,143	29,400	0
June	1.55	.84	25	30.0	23	7.6	14.2	843	3,765	56,700	0
July	1.26	.90	1	18.8	28	7.7	13.4	827	1,630	30,000	0
Aug.	1.04	.81	5	11.9	28	4.0	6.7	411	1,787	48,700	0
Sept.	1.55	.84	7	27.0	† 1	4.3	7.9	468	2,407	48,965	0
Oct.	2.00	.88	23	83.6	† 7	6.4	12.2	749	1,071	8,940	0
Nov.	1.90	1.09	8	67.2	26	13.0	16.3	968	507	2,590	0
Dec.	1.15	1.00	13	14.3	† 8	10.0	13.1	804	584	2,470	0
	2.00	0.81		83.6		4.0	20.6	14,904	16,951	76,259.3	1,325.3
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	0.61	0.25		2.37		0.11	0.58	18,384	20,909	94,066	1,635

‡ Discharge measurement made on this day † And other days

RIO SAN DIEGO NEAR JIMENEZ, COAHUILA

DESCRIPTION: Cableway, masonry and concrete Cipolletti weir of 777 second-foot (22 m^3/sec) capacity, gravity well, and water-stage recorder located on the left bank of Rio 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°47'35", about 3.5 miles (6 km) west of Jimenez, Coahuila, and 4.1 river miles (7 km) 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 532.2 (856.4 km), 10.4 river miles (16.8 km) downstream from Maverick County Water Control and Improvement District No. 1 diversion dam and 28.9 river miles (46.4 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 831.73 feet (253.51 m) 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 8 discharge measurements during the year and a continuous record of gage heights. The flow tabulated below includes the flow of the canal, and prior to 1964, records do not include this flow. In 1977, the capacity of the weir was exceeded only on October 22. Records available: 1922 through 1977. 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 (0.80 m); in November 1961 an additional 0.20 foot (0.06 m), and the capacity of weir was increased from 706 (20 m^3/sec) to 777 second-feet (22 m^3/sec).

EXTREME FLOWS FROM RECORDS**: Momentary: Max. 81,930 second-feet (2,320 m^3/sec) on June 17, 1961 with a gage height of 20.70 feet (6.31 m). 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 (Cubic Meters per Second)**

Daily:	Max.	36,700 (1,040)	July 18, 1975	Min.	0	Occasionally	
Monthly:	Max.	2,380 (67.5)	Oct. 1932	Min.	8.0 (0.23)	July 1956	
Yearly:	Max.	622 (17.6)	1976	Min.	24.0 (0.68)	1956	

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	413	448	353	173	498	403	403	303	188	149	220	173
2	413	448	309	173	498	403	413	303	188	153	220	173
3	388	399	308	173	498	403	413	303	188	216	220	173
4	438	448	297	173	473	403	427	303	188	174	224	173
5	413	424	287	173	484	403	427	286	188	174	208	173
6	427	399	287	173	473	403	417	286	188	174	208	173
7	413	399	287	157	498	378	403	286	191	191	208	164
8	413	399	277	157	498	‡ 378	403	286	192	191	254	173
9	413	424	267	157	498	353	403	265	179	191	212	164
10	413	424	267	157	498	353	403	265	171	191	208	164
11	413	424	267	157	597	353	378	265	171	191	190	173
12	413	424	247	157	629	331	378	275	171	192	190	181
13	413	399	247	156	671	331	‡ 378	285	179	192	190	173
14	399	399	247	512	770	331	378	265	163	159	190	‡164
15	399	399	247	749	752	331	378	245	155	159	190	157
16	399	399	247	643	770	331	378	245	155	159	190	157
17	399	‡ 399	246	562	770	310	371	236	155	158	190	140
18	413	399	227	505	‡ 773	310	367	226	155	158	190	124
19	413	399	227	480	773	310	371	216	155	150	190	117
20	413	399	217	452	706	310	353	216	‡ 155	142	173	96.1
21	413	399	217	463	706	289	353	207	155	142	173	96.1
22	438	388	217	452	706	289	353	207	155	2,200	166	95.7
23	438	374	199	452	706	311	353	207	147	484	157	95.7
24	438	364	190	452	604	311	341	207	147	304	157	95.7
25	413	364	190	452	501	310	341	207	148	‡ 242	156	95.7
26	413	353	190	505	477	310	330	207	149	230	172	95.7
27	‡ 413	353	210	491	477	289	319	207	149	220	172	83.0
28	438	353	190	494	452	349	308	198	149	220	173	83.3
29	438		182	509	427	403	308	198	149	249	173	83.3
30	438		173	554	427	403	308	198	149	239	173	83.3
31	438		173		427		308	189		220		83.3
Sum	12,936	11,200	7,489	10,863	18,037	10,392	11,464	7,592	4,972	8,214	5,737	4,175.9

Month	Current Year 1977							Period 1933-1977		
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	0.92	0.89	† 4	438	3	388	417	25,665	7,746	36,430	1,860
Feb.	.92	.82	† 1	448	†26	353	399	22,218	6,182	25,760	1,060
Mar.	.82	.49	1	353	†30	173	242	14,855	5,333	27,040	1,340
Apr.	1.90	.46	14	1,470	†13	148	364	21,545	6,444	40,270	1,110
May	1.28	.92	†18	777	†30	420	583	35,779	11,579	120,200	861
June	.92	.82	† 1	417	†21	289	346	20,611	10,512	108,300	543
July	.92	.72	† 4	427	†28	308	371	22,737	13,925	136,149	490
Aug.	.75	.56	† 1	303	31	189	245	15,065	11,099	91,248	738
Sept.	.62	.43	8	245	†23	147	166	9,865	17,167	94,667	1,183
Oct.	5.81	.43	22	9,320	†21	135	265	16,293	18,100	71,830	1,698
Nov.	.66	.49	8	254	25	156	191	11,380	12,106	64,060	803
Dec.	1.48	.30	12	181	27	83.0	135	8,285	8,379	45,320	1,130
	5.81	0.30		9,320		83.0	310	224,298	128,572	451,952	17,430
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.77	0.09		264		2.35	8.77	276,667	158,591	557,477	21,508

** Period October 1932-1977 ‡ Discharge measurement made on this day † And other days

RIO GRANDE NEAR JIMENEZ, COAHUILA AND QUEMADO, TEXAS

DESCRIPTION: Cableway, bubbler gage, control weir of 1,270 second-foot (36 m^3/sec) capacity, gravity well, and water-stage recorder located on the right bank at latitude 29°03'00", longitude 100°39'50", and river mile 530.3 (853.5 km); 1.5 miles (2.4 km) south-southeast of Jimenez, Coahuila, 1.8 river miles (3.0 km) downstream from Rio San Diego about 7.5 miles (12.1 km) north-northwest of Quemado, Maverick County, Texas, 12.3 river miles (19.8 km) downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam, and 30.7 river miles (49.4 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 769.00 feet (234.39 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 11 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 1977. Records, excluding some high flow periods, are also available from 1956 through May 1965 for a station 8.1 river miles (14 km) upstream. Records prior to 1976 were published under the title "Rio Grande below Maverick Dam near Quemado, Texas."

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 13.3 river miles (21.5 km) 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 (1 m) higher.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 79,800 second-feet (2,260 m^3/sec) on July 18, 1975 with a gage height of 25.20 feet (7.68 m). Min. 3.5 second-feet (0.10 m^3/sec) on March 9, 1969 with a gage height of 0.16 foot (0.05 m).

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 67,100 (1,900)	July 18, 1975	Min. 7.1 (0.20)	July 16, 17, and 18, 1969	
Monthly:	Max. 21,300 (602)	Sept. 1974	Min. 28.3 (0.80)	June 1969	
Yearly:	Max. 4,380 (124)	1974	Min. 286 (8.11)	1968	

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,870	1,750	1,130	706	6,670	3,230	1,200	318	1,090	653	283	205
2	1,960	1,700	1,140	710	6,670	1,860	1,240	318	696	220	261	205
3	2,080	1,690	1,140	710	6,670	1,700	1,240	318	696	487	261	205
4	2,080	1,640	1,100	696	6,390	1,670	1,240	295	706	307	261	215
5	2,120	1,640	1,070	682	6,390	1,670	1,200	295	696	226	249	215
6	2,120	1,640	1,010	682	6,070	1,670	1,200	295	710	226	249	205
7	2,120	1,670	1,010	682	7,490	1,580	1,200	295	805	237	249	194
8	2,300	1,890	1,010	682	7,490	1,580	1,200	295	3,810	237	385	205
9	2,300	2,610	1,010	682	7,490	1,620	1,200	295	3,880	237	315	194
10	2,300	2,690	1,010	682	7,630	3,570	1,200	295	3,880	226	272	194
11	2,230	2,690	975	682	7,730	1,640	1,200	295	3,880	226	246	205
12	2,230	2,650	950	437	‡ 7,660	1,050	1,200	295	3,960	215	238	205
13	2,260	2,650	946	283	7,880	2,120	1,240	307	3,880	215	226	205
14	‡ 2,460	2,650	946	459	7,770	2,120	650	272	3,880	215	226	205
15	2,460	2,650	946	805	7,700	2,080	424	272	3,880	205	237	205
16	2,460	2,650	929	777	7,660	2,070	424	272	3,880	201	249	205
17	2,460	2,650	932	703	7,700	2,010	413	‡ 272	3,880	184	249	205
18	2,500	2,650	918	586	7,700	1,300	413	272	3,880	184	237	184
19	2,460	2,650	890	544	7,700	1,050	‡ 413	249	3,880	184	226	168
20	2,460	2,650	869	1,040	7,660	724	‡ 403	249	3,880	173	226	143
21	2,460	2,610	879	1,790	7,660	430	388	249	3,880	‡ 173	226	‡ 143
22	2,540	2,500	869	1,600	7,630	‡ 357	388	237	3,880	4,170	226	133
23	2,500	2,270	858	1,550	7,520	378	378	237	3,880	1,650	215	133
24	2,500	1,180	879	1,520	7,380	378	367	357	3,880	583	205	153
25	2,500	1,220	‡ 858	1,520	6,780	367	367	388	3,880	351	205	153
26	2,500	1,240	876	1,550	5,790	367	367	388	3,880	296	205	143
27	2,500	1,210	1,200	‡ 5,860	4,940	342	353	2,870	3,850	272	215	124
28	2,500	1,190	943	6,570	4,870	388	342	3,350	3,850	272	215	124
29	2,500		893	6,600	4,870	932	330	3,350	3,810	298	205	124
30	2,550		840	6,850	4,870	1,270	330	3,810	‡ 3,640	295	‡ 205	124
31	2,510		699		4,770		318	3,710		283		124
Sum	72,790	58,880	29,725	48,640	213,200	41,523	22,828	24,720	94,279	13,701	7,267	5,445

Current Year 1977									Period 1968-1977		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day	High	Day	Low					
Jan.	2.30	1.97	30	2,570	1	1,870	2,340	144,286	34,614	144,286	5,236
Feb.	2.20	1.51	†10	2,690	24	1,060	2,100	116,787	94,836	401,339	5,788
Mar.	1.84	1.15	27	1,580	31	682	957	58,936	55,084	181,473	5,874
Apr.	4.10	.56	30	7,130	14	226	1,620	96,481	54,988	293,637	5,030
May	4.46	2.95	13	8,120	31	4,130	6,890	422,934	124,069	422,934	6,574
June	3.54	.72	10	5,620	27	342	1,380	82,365	50,381	164,298	1,671
July	1.74	.69	4	1,410	31	318	735	45,254	77,100	311,781	2,322
Aug.	2.82	.59	30	3,810	†22	237	798	49,046	136,253	710,869	11,855
Sept.	2.92	1.15	8	4,100	† 2	696	3,150	187,161	229,042	1,264,108	13,678
Oct.	6.20	.62	22	13,000	†20	173	441	27,171	157,977	831,298	13,399
Nov.	.95	.52	8	530	†24	205	242	14,414	79,134	499,143	13,343
Dec.	.52	.43	† 4	215	†27	124	176	10,798	34,711	181,109	7,486
Yearly	6.20	0.43		13,000		124	1,730	1,255,633	1,128,189	3,169,805	207,998
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.89	0.13		368		3.50	49.1	1,548,805	1,391,607	3,909,913	256,561

‡ Discharge measurement made on this day † And other days

RIO SAN RODRIGO AT EL MORAL, COAHUILA

DESCRIPTION: Gravity well and water-stage recorder located on the left bank at El Moral, Coahuila, latitude 28°53'20", longitude 100°37'55", 0.6 river mile (1 km) from the confluence with the Rio Grande, and about 15.5 miles (25 km) northwest of Piedras Negras, Coahuila. The stream enters the Rio Grande at river mile 518.2 (834.0 km), 24.4 river miles (39.3 km) downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam and 21.9 river miles (35.2 km) upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 751.61 feet (229.09 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 16 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1962 through 1977.

REMARKS: This station, located 10.6 river miles (17.1 km) 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 operation of the upstream station was discontinued. Prior to 1976, this station was published under the heading "Rio San Rodrigo near Mouth at El Moral, Coahuila". The rating curve for this station is affected by backwater from the Rio Grande when its flow is approximately 10,000 second-feet (283 m^3/sec). The flow of this spring-fed stream is modified by diversions above this station. The concrete control weir, placed in operation on November 25, 1969, was destroyed by the flood of July 12, 1976. Prior to Nov. 25, 1969, the zero of the gage was 746.82 feet (227.63 m) above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS**: Momentary: Max. 140,000 second-feet (3,970 m^3/sec) on July 18, 1975 with a gage height of 18.44 feet (5.62 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	44,500 (1,260)	July 18, 1975	Min. 0	Frequently
Monthly:	Max.	7,380 (209)	July 1976	Min. 0	Frequently
Yearly:	Max.	837 (23.7)	1976	Min. 5.3 (0.15)	1963

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	208	174	137	121	96.7	99.6	61.8	45.2	29.7	20.8	32.5	25.1
2	208	‡ 170	‡ 137	121	93.6	90.8	59.3	45.2	29.7	20.5	32.5	25.1
3	208	170	137	117	93.6	84.8	59.3	41.7	29.7	20.5	32.5	25.1
4	208	164	137	117	87.9	81.9	56.9	41.7	29.7	‡ 23.3	29.7	23.7
5	208	164	137	113	87.9	81.9	55.1	41.7	29.7	32.5	29.7	23.7
6	208	163	137	‡ 103	87.9	‡ 79.5	‡ 53.0	39.6	27.9	31.1	29.7	23.7
7	208	159	137	99.6	87.9	79.5	53.0	38.1	27.9	29.7	29.7	23.7
8	208	184	133	96.8	87.9	76.6	53.0	38.1	27.9	29.7	29.7	23.7
9	197	184	‡ 129	96.8	93.6	70.6	53.0	38.1	26.8	27.9	‡ 29.7	23.7
10	203	179	125	93.6	93.6	70.6	53.0	38.1	26.1	26.1	29.7	23.7
11	203	179	125	98.8	96.4	70.6	49.4	38.1	26.1	26.1	29.7	23.7
12	203	174	121	93.6	93.6	68.2	49.4	38.1	26.1	25.1	29.7	23.7
13	203	174	121	99.6	93.6	66.0	49.1	38.1	26.1	23.7	27.9	23.7
14	203	173	117	99.6	93.6	66.0	49.1	38.1	26.1	23.7	27.9	23.7
15	197	164	117	106	90.8	63.9	49.1	36.7	26.1	23.7	27.9	23.7
16	190	164	‡ 121	126	90.8	61.8	49.1	35.3	26.1	23.7	27.9	23.7
17	190	163	121	117	90.8	61.8	49.1	35.3	24.7	23.7	27.9	23.7
18	190	155	121	106	90.8	61.8	47.3	33.9	24.7	23.7	27.9	23.0
19	184	155	121	106	99.6	59.3	47.3	33.9	24.7	25.1	27.9	22.6
20	184	155	121	‡ 103	99.6	56.9	47.3	32.5	‡ 23.7	25.1	27.9	21.5
21	184	150	121	132	153	56.9	49.4	32.5	23.7	25.1	27.9	‡ 21.5
22	184	146	121	113	653	56.9	49.4	31.1	23.7	34.3	27.9	21.5
23	184	137	121	106	210	67.1	49.4	31.1	22.6	39.2	27.9	20.8
24	184	133	121	99.6	‡ 153	78.8	49.4	31.1	22.6	38.1	26.1	20.5
25	179	133	121	96.8	129	68.2	45.2	29.7	22.6	38.1	26.1	21.5
26	‡ 169	129	121	93.6	125	66.0	45.2	29.7	22.6	35.3	26.1	21.5
27	169	125	121	‡ 93.6	113	63.9	45.2	27.9	21.5	35.3	25.4	21.5
28	169	125	146	93.6	106	61.8	45.2	27.9	21.5	35.3	25.1	21.5
29	169		137	93.6	103	61.8	45.2	29.7	21.5	33.9	25.1	21.5
30	169		129	99.6	99.6	61.8	45.2	29.7	21.5	33.9	25.1	21.5
31	174		125		99.6		45.2	‡ 29.7		32.5		21.5
Sum	5,945	4,445	3,936	3,147.8	3,794.4	2,095.3	1,557.6	1,097.6	763.3	886.7	850.7	709.0

Month	Current Year 1977								Period 1962-1977		
	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.	2.89	2.76	† 1	208	†26	169	192	11,799	3,420	11,799	0
Feb.	2.82	2.62	† 8	184	†27	125	159	8,825	2,333	8,825	0
Mar.	2.69	2.56	28	146	†14	117	127	7,818	1,917	7,818	0
Apr.	2.72	2.43	21	150	11	90.8	105	6,247	3,411	21,692	122
May	5.84	2.43	22	4,060	† 4	87.9	123	7,527	3,386	14,027	17.0
June	2.46	2.23	1	99.6	†20	56.9	69.9	4,156	1,625	4,705	0
July	2.26	2.13	1	61.8	†25	45.2	50.1	3,090	45,151	454,643	0
Aug.	2.13	1.94	† 1	45.2	†27	27.9	35.3	2,177	13,007	89,017	0
Sept.	1.97	1.87	† 1	29.7	30	21.2	25.4	1,514	15,417	48,065	0
Oct.	2.13	1.84	22	45.2	† 2	20.5	28.6	1,758	13,479	53,088	0
Nov.	2.00	1.94	† 1	32.5	†28	25.1	28.3	1,687	6,046	19,270	0
Dec.	1.90	1.71	† 1	25.1	24	20.5	23.0	1,406	4,694	15,058	0
Yearly	5.84	1.71		4,060		20.5	80.2	58,004	113,886	606,526	3,850.7
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	1.78	0.52		115		0.58	2.27	71,547	140,478	748,140	4,750

** Period 1961-1977 ‡ Discharge measurement made on this day † And other days

RETURN FLOW TO THE RIO GRANDE FROM THE MAVERICK CANAL 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 (14.5 km) north-northwest of Eagle Pass, Texas, and about 32.2 canal miles (51.8 km) downstream from the point of diversion. The return enters the Rio Grande at river mile 506.8 (815.6 km).

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 the Commission. There were 56 discharge measurements made during the year. Records available: 1949 through 1977.

REMARKS: This power plant began operating April 16, 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 when shortage of water prevented operation and from June 30 through July 19, during flood of 1954, and while the canal was being repaired. The plant's operation is now governed by the amount of water released from Amistad Reservoir which began operations on May 31, 1968.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 1,460 (41.3)	Aug. 29, 1969 & Oct. 23, 1973	Min. 0		Occasionally
Monthly:	Max. 1,340 (37.9)	Nov. 1974	Min. 14.1	(0.40)	June 1953
Yearly:	Max. 1,020 (28.9)	1950 & 1961	Min. 232	(6.57)	1972

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	253	‡151	‡103	278	1,180	1,190	920	‡ 669	894	852	1,050	848
2	243	118	114	288	‡ 1,160	‡ 1,180	919	588	966	887	973	847
3	‡ 116	91.2	76.7	316	1,170	1,110	980	599	944	‡ 934	972	828
4	75.2	76.9	51.1	‡ 291	1,160	1,080	928	624	993	956	985	861
5	67.7	54.0	26.0	257	1,170	1,140	892	625	969	953	1,010	‡ 836
6	69.4	35.0	173	259	1,170	‡ 1,060	876	585	929	967	961	843
7	52.9	‡ 43.5	‡159	142	1,200	1,020	‡ 867	580	973	982	‡ 906	853
8	53.1	54.7	137	152	1,180	982	874	‡ 539	980	988	946	844
9	113	78.9	133	161	‡ 1,190	892	887	335	889	999	1,020	842
10	‡ 63.7	104	125	257	1,230	900	947	133	988	950	967	832
11	79.5	89.6	144	262	1,220	842	‡ 909	290	1,010	926	934	903
12	78.2	74.1	138	‡ 470	1,220	591	837	10.0	‡ 1,000	904	914	‡ 937
13	103	64.7	95.4	730	1,220	‡ 900	823	66.4	1,000	‡ 912	932	946
14	88.4	‡ 71.1	‡151	776	1,230	864	797	148	1,010	886	‡ 940	970
15	85.9	63.3	141	843	1,230	806	732	‡ 88.2	1,010	782	933	963
16	145	56.1	135	1,180	‡ 1,220	783	709	65.8	1,020	777	924	957
17	‡ 107	53.5	145	1,320	1,250	842	771	290	1,040	‡ 747	896	924
18	92.6	43.0	169	‡ 1,170	1,210	836	‡ 700	527	1,050	729	855	929
19	77.6	38.7	165	‡ 1,050	1,140	895	692	497	‡ 973	718	837	‡ 892
20	68.9	43.3	185	‡ 1,050	1,070	‡ 848	670	489	958	696	858	828
21	78.6	36.1	‡154	1,110	1,050	713	627	579	954	681	‡ 850	841
22	120	‡ 30.0	107	‡ 1,120	1,100	530	639	‡ 521	938	864	842	929
23	135	63.5	104	1,100	‡ 1,350	633	682	641	942	1,120	858	990
24	‡ 129	359	95.3	1,190	1,350	832	731	828	959	1,240	865	977
25	123	247	93.5	1,170	1,340	788	‡ 691	840	970	1,260	866	1,010
26	109	96.5	116	1,130	1,330	787	621	833	‡ 993	1,230	848	993
27	115	146	158	1,120	1,280	‡ 707	592	810	999	‡ 1,210	874	958
28	136	73.2	‡200	1,110	1,320	629	579	918	994	1,210	‡ 875	956
29	122		203	1,130	1,330	700	596	‡ 907	959	1,190	862	1,000
30	137		221	1,100	1,340	865	659	964	949	1,190	849	1,000
31	134		306		1,250		760	931		‡ 1,190		1,000
Sum	2,455.9		22,532		25,945		16,520.4			29,930		28,337
	3,371.7	4,324.0		37,860		23,907			29,253		27,402	

Month	Current Year 1977 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 1949-1977 Acre-Feet Average	Maximum	Minimum
Jan.			1	253	7	52.9	109	6,688	48,115	79,220	4,952
Feb.			24	359	22	30.0	87.7	4,871	43,401	68,500	4,871
Mar.			31	306	5	26.0	139	8,577	40,597	65,400	5,713
Apr.			17	1,320	7	142	751	44,692	38,278	63,907	4,301
May			23	1,350	21	1,050	1,220	75,094	48,377	75,094	2,280
June			1	1,190	22	530	865	51,461	42,909	68,900	841
July			3	980	28	579	771	47,419	41,916	76,637	2,880
Aug.			30	964	12	10.0	533	32,768	47,314	69,000	18,457
Sept.			18	1,050	9	889	975	58,022	53,597	75,591	13,741
Oct.			25	1,260	21	681	965	59,365	54,697	79,674	11,147
Nov.			† 1	1,050	19	837	913	54,351	48,316	79,478	3,203
Dec.			25	1,010	† 3	828	914	56,206	47,797	75,490	2,608
				1,350		10.0	690	499,514	555,314	740,000	168,354
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				38.2		0.28	19.5	616,151	684,980	912,790	207,665

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

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 (1.6 km) downstream from the heading of this canal extension, about 9 miles (14.5 km) north-northwest of Eagle Pass, Texas, and about 32.8 canal miles (52.8 km) downstream from the point of diversion from the Rio Grande, which is located at river mile 543.6 (874.9 km). 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 1977.

REMARKS: The main Maverick Canal divides into two branches at a point about 9 miles (14.5 km) north-northwest of Eagle Pass, Texas, and about 31.8 canal miles (51.2 km) 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 1977, 26,626 acres (10,775 ha) of land north and south of Eagle Pass were irrigated. A total of 100,997 acre-feet (124,580,000 m^3) of water from this canal extension returned to the river through the irrigation system which extends approximately 67 canal miles (108 km) downstream.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 580 second-feet (16.4 m^3/sec) on July 25, 1964. Min. occasionally no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 559 (15.8)	July 14, 1964	Min. 0	Occasionally	
Monthly:	Max. 525 (14.9)	July 1964	Min. 18.7 (0.53)	March	1939
Yearly:	Max. 345 (9.77)	1964	Min. 62.1 (1.76)		1939

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	168	121 ‡	‡ 248	335	207	217	323	‡ 317	299	334	123	228
2	162	96.2	275	340	‡ 190	‡ 196	324	324	267	349	204	228
3	‡ 146	92.9	254	340	190	183	343	328	304	‡ 336	202	228
4	142	93.5	192	‡ 325	190	229	358	333	305	312	178	229
5	169	115	230	376	191	253	358	338	307	308	154	‡ 229
6	162	130	306	429	192	‡ 251	359	342	306	289	187	208
7	163	131 ‡	‡ 319	456	192	276	‡ 359	352	285	272	‡ 220	197
8	173	128	321	436	193	310	358	‡ 359	299	272	221	218
9	169	110	307	400	‡ 185	309	357	348	301	273	223	231
10	‡ 165	93.3	300	386	155	332	357	337	302	271	208	234
11	174	98.4	303	361	153	348	‡ 355	172	304	270	194	222
12	163	135	300	‡ 316	152	345	352	439	‡ 304	270	195	‡ 199
13	163	117	302	292	151	‡ 363	351	461	279	‡ 272	198	200
14	156	121 ‡	‡ 311	271	150	370	349	481	262	272	‡ 200	203
15	132	112	303	271	149	393	347	‡ 459	266	271	199	205
16	118	117	288	140	‡ 149	411	345	438	265	269	198	210
17	‡ 113	112	294	20.4	127	411	345	355	265	‡ 270	205	241
18	147	112	288	‡ 149	108	410	‡ 344	321	296	272	232	242
19	154	119	282	‡ 278	146	414	344	362	‡ 311	272	231	‡ 240
20	160	135	323	‡ 279	206	‡ 423	342	387	310	283	230	221
21	157	132	‡ 339	‡ 260	207	417	343	391	308	300	‡ 229	208
22	141	103 ‡	337	‡ 239	196	410	347	‡ 397	308	292	230	206
23	133	171	352	239	‡ 33.7	396	361	361	308	203	230	191
24	‡ 133	199	351	190	29.4	340	361	336	307	18.6	229	182
25	133	181	342	213	29.0	322	‡ 364	331	307	17.0	229	182
26	130	234	340	226	28.7	319	368	328	‡ 309	16.7	229	183
27	127	249	349	227	92.2	‡ 313	357	351	310	‡ 16.4	228	184
28	123	239	‡ 359	226	126	339	349	362	307	17.7	‡ 228	184
29	120		300	227	137	355	339	‡ 343	306	17.7	226	185
30	126		278	227	137	334	329	321	312	19.0	228	186
31	125		319		159		321	322		‡ 19.2		185
Sum	4,547	3,797.3	9,412	8,474.4	4,551.0	9,989	10,809	11,096	8,919	6,674.3	6,288	6,489

Month	Current Year 1977 Average Rainfall Inches** 1939-1977	1977	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1939-1977 Acre-Feet Average	Maximum	Minimum
Jan.	0.77	1.08	11	181	17	100	147	9,019	12,586	19,800	2,140
Feb.	.92	.53	26	294	11	80.6	136	7,532	11,678	18,200	2,120
Mar.	.67	.17	28	383	4	180	304	18,668	15,526	23,397	1,150
Apr.	1.74	3.51	6	515	17	17.7	282	16,809	15,835	25,900	3,430
May	3.01	3.48	22	268	27	28.4	147	9,027	13,886	28,191	2,840
June	2.03	1.15	†19	426	† 2	182	333	19,813	17,027	30,173	3,750
July	1.55	.01	25	375	31	318	349	21,439	18,059	32,276	4,510
Aug.	2.15	.50	13	500	11	27.7	358	22,009	16,392	29,812	3,480
Sept.	3.00	.36	30	329	7	244	297	17,691	12,440	22,640	4,600
Oct.	2.28	2.50	3	357	23	15.4	215	13,238	12,833	21,800	4,702
Nov.	.68	.17	18	234	1	81.9	210	12,472	12,765	20,117	4,170
Dec.	.65	.14	18	244	24	174	209	12,871	12,910	20,200	4,233
Yearly	19.45	13.60		515		15.4	249	180,588	171,937	250,801	44,950
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	494	345		14.6		0.44	7.05	222,755	212,084	309,363	55,446

‡ Discharge measurement made on this day † And other days

** On the United States side from Maverick Power Plant to Cuervo Creek

RETURN FLOW TO THE RIO GRANDE FROM THE MAVERICK IRRIGATION DISTRICT ABOVE 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, Canon Grande, Quemado Creek, Lateral 15 Spill, Hardt Spill, Houchin Spill, Lateral 12 Spill, Lateral 8-B 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 1977. Records prior to 1976 were published under the title "Return Flow to the Rio Grande from Maverick Canal - Maverick Dam to Eagle Pass, Texas."

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 51).

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	929 (26.3)	Sept. 29, 1975	Min.	18.3 (0.52)	March 9, 1969
Monthly:	Max.	218 (6.17)	Jan. 1965	Min.	32.8 (0.93)	January 1973
Yearly:	Max.	145 (4.11)	1965	Min.	51.4 (1.46)	1973

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	29.5	28.0	71.0	86.8	40.8	42.9	109	94.5	89.0	95.7	41.7	70.7
2	30.0	27.7	59.9	84.9	41.6	51.2	123	106	92.7	88.9	33.7	73.5
3	34.0	32.9	57.6	66.6	38.4	57.3	108	93.9	86.1	105	33.9	79.2
4	34.4	34.3	49.8	88.9	42.5	65.0	102	106	82.5	73.8	35.6	90.1
5	33.3	36.2	61.3	85.0	46.7	54.8	102	99.0	86.3	65.9	33.4	84.8
6	33.1	35.6	52.2	78.2	53.7	67.6	121	94.9	97.2	73.1	29.7	84.2
7	35.0	39.6	48.6	83.8	53.5	82.6	116	83.3	85.6	70.0	38.1	79.3
8	38.5	41.7	64.3	113	57.8	86.2	115	88.1	79.5	64.8	41.0	75.4
9	33.4	32.2	59.7	110	60.0	109	117	107	87.0	64.6	31.3	78.1
10	34.3	30.7	71.4	106	52.1	121	96.5	93.1	88.9	80.1	43.5	71.2
11	42.2	30.8	77.1	130	48.7	117	86.4	97.5	85.5	78.3	55.0	52.5
12	53.6	26.3	74.4	140	46.8	80.8	109	118	94.5	88.0	61.2	56.6
13	45.5	24.2	97.0	150	43.2	84.2	127	126	93.6	82.4	61.4	54.7
14	44.1	31.7	73.7	139	34.7	103	101	103	92.6	84.9	49.0	46.7
15	43.7	32.5	86.8	125	32.8	128	91.4	101	89.4	91.4	50.5	44.4
16	45.0	27.6	96.9	106	34.9	130	89.0	104	91.1	87.6	54.1	50.5
17	46.7	35.3	100	83.1	35.4	112	85.9	97.8	82.8	72.2	68.7	46.2
18	45.7	36.3	77.3	64.1	49.1	104	67.6	101	88.1	82.6	63.5	54.4
19	34.6	34.9	82.6	48.3	69.0	61.4	73.5	104	89.1	97.7	62.2	57.2
20	34.8	32.7	63.6	44.4	54.4	81.5	67.7	105	72.7	87.3	65.7	59.7
21	35.3	39.9	79.5	52.3	66.2	99.3	83.0	115	76.4	90.9	60.3	51.2
22	44.1	56.9	89.7	56.9	71.6	90.2	95.2	119	87.5	78.4	67.4	53.4
23	33.0	68.7	84.0	52.5	56.3	93.3	95.0	114	85.5	60.3	62.0	45.0
24	33.4	61.9	96.4	51.7	41.7	62.0	102	106	86.4	49.1	54.1	44.4
25	35.7	55.4	94.4	44.0	34.6	68.7	98.2	110	94.8	38.9	62.0	36.3
26	40.6	60.2	103	41.9	31.9	58.0	125	113	77.0	34.7	78.8	40.1
27	39.4	55.8	94.1	43.3	29.9	73.0	117	116	66.6	38.6	71.0	52.3
28	37.5	62.3	73.6	47.2	28.7	90.7	121	105	67.7	41.1	58.7	58.6
29	45.7		80.6	49.7	29.3	105	113	115	86.9	43.3	64.4	63.5
30	33.5		95.8	46.6	29.7	111	101	99.2	102	45.2	67.9	55.7
31	30.2		92.7		32.8		96.7	90.8		44.1		65.1
Sum	1,112.3		2,419.2		2,591.2		3,226.1		2,198.9		1,875.0	
	1,179.8		2,409.0		1,388.8		3,155.1		2,585.0		1,599.8	

Month	Current Year 1977 Extreme Gage Feet High	Extreme Gage Feet Low	∅ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period April 1959-1977 Acre-Feet Average	Maximum	Minimum
Jan.			12	53.6	1	29.5	38.1	2,340	5,833	13,430	2,014
Feb.			23	68.7	13	24.2	39.7	2,206	4,997	7,652	2,206
Mar.			26	103	7	48.6	77.7	4,778	6,008	8,952	3,061
Apr.			13	150	26	41.9	80.6	4,798	5,989	7,795	3,515
May			22	71.6	28	28.7	44.8	2,755	5,698	8,777	2,755
June			16	130	1	42.9	86.4	5,140	6,350	9,219	2,912
July			13	127	18	67.6	102	6,258	6,712	9,858	2,811
Aug.			13	126	7	83.3	104	6,399	6,585	9,666	2,931
Sept.			30	102	27	66.6	86.2	5,127	5,747	9,477	2,835
Oct.			3	105	26	34.7	70.9	4,361	5,571	8,583	2,811
Nov.			26	78.8	6	29.7	53.3	3,173	5,465	8,696	2,717
Dec.			4	90.1	25	36.3	60.5	3,719	5,434	8,821	2,438
				150		24.2	70.5	51,054	70,389	104,997	37,237
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				4.25		0.69	2.00	62,975	86,825	129,514	45,932

∅ Mean daily

RIO GRANDE AT PIEDRAS NEGRAS, COAHUILA AND EAGLE PASS, TEXAS

DESCRIPTION: Cableway, gravity well, water-stage recorder, and resistance-type transmitter located on the left bank at latitude 28°42'50", longitude 100°30'25", and river mile 497.0 (799.8 km), 0.6 river mile (1.0 km) upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila and 77.0 river miles (123.8 km) downstream from Amistad Dam. The zero of the gage is 682.91 feet (208.15 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 66 discharge measurements during the year, 51 by the Mexican Section and 15 by the United States Section of the 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 1977. Records prior to 1976 were published under the title "Rio Grande at Eagle Pass, Texas."

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 National Weather Service.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 964,100 second-feet (27,300 m^3/sec), determined by slope-area calculations, on June 29, 1954 with a gage height of 53.51 feet (16.31 m). Well-authenticated information indicates the occurrence of a flood in June 1865 with an estimated discharge of 1,236,000 second-feet (35,000 m^3/sec) and a gage height of 56.00 feet (17.07 m) on the present gage, and also that these were the only floods since 1745 with flows greater than 825,000 second-feet (23,400 m^3/sec). Min. 24.4 second-feet (0.69 m^3/sec) on June 22, 1953 with a gage height of 0.07 foot (0.02 m).

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	101,400 (2,870)	July 19, 1975	Min.	187 (5.30)	June 6, 7, and 8, 1972
Monthly:	Max.	22,000 (622)	Sept. 1974	Min.	323 (9.16)	June 1969
Yearly:	Max.	5,190 (147)	1974	Min.	971 (27.5)	1972

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,290	‡ 2,490	‡ 1,560	1,310	8,900	5,120	2,490	1,190	3,600	3,310	‡ 1,430	1,100
2	2,330	2,020	1,560	1,320	‡ 8,900	4,170	2,440	‡ 1,050	2,020	1,540	1,280	1,090
3	2,350	1,990	1,540	1,320	‡ 8,860	3,400	2,540	1,030	1,940	1,450	1,250	1,110
4	‡ 2,360	1,920	1,480	1,310	8,860	3,260	2,440	1,050	1,940	‡ 1,610	1,250	1,140
5	2,340	1,900	1,450	‡ 1,280	8,860	3,280	‡ 2,370	1,050	1,880	1,340	1,300	1,120
6	2,350	1,840	1,470	1,290	8,860	3,220	2,350	1,000	‡ 1,820	1,300	1,280	‡ 1,120
7	2,310	1,870	1,470	1,230	9,780	‡ 3,110	2,310	982	1,910	1,320	1,210	1,140
8	2,390	‡ 2,100	‡ 1,380	1,200	10,100	3,000	2,310	929	3,640	1,300	‡ 1,210	1,120
9	2,540	2,530	1,380	1,240	10,200	2,990	2,320	‡ 802	5,190	1,300	1,440	1,120
10	2,480	2,980	1,370	1,300	‡10,300	3,850	2,390	551	5,230	1,280	1,250	1,110
11	‡ 2,480	2,980	1,370	1,250	10,500	4,980	2,340	699	5,260	1,250	1,250	1,160
12	2,540	2,930	1,300	‡ 1,410	‡10,400	1,740	‡ 2,300	‡ 508	5,330	1,230	1,230	1,210
13	2,620	2,880	‡ 1,340	1,370	10,500	3,380	2,270	523	‡ 5,470	‡ 1,230	1,230	‡ 1,210
14	2,670	2,880	1,330	1,330	10,500	3,440	2,120	565	5,400	1,210	1,210	1,210
15	2,780	‡ 2,900	1,310	1,720	10,500	‡ 3,460	1,460	512	‡ 5,400	1,110	‡ 1,210	‡ 1,160
16	2,860	2,890	1,290	2,020	10,300	3,490	1,350	459	5,400	1,070	1,190	1,160
17	2,800	‡ 2,890	1,300	2,200	‡10,300	3,500	1,420	611	5,400	1,060	1,210	1,160
18	‡ 2,800	2,860	1,310	1,940	10,300	3,160	1,350	‡ 925	5,400	‡ 1,020	1,160	1,160
19	2,780	2,840	1,260	‡ 1,730	10,200	2,670	‡ 1,290	901	5,370	1,150	1,140	1,120
20	‡ 2,730	2,820	1,260	1,730	10,200	2,450	1,260	840	5,260	968	1,140	‡ 1,030
21	2,730	2,850	1,220	2,730	10,200	‡ 1,830	‡ 1,220	939	‡ 5,260	943	1,140	978
22	2,870	2,740	1,180	2,780	12,000	1,390	1,250	893	5,260	3,570	‡ 1,120	1,080
23	2,900	2,670	‡ 1,120	2,580	11,500	‡ 1,450	1,250	‡ 961	5,260	4,240	1,120	1,140
24	2,850	‡ 2,290	‡ 1,120	2,530	10,500	1,740	1,300	1,200	5,260	2,570	1,120	1,160
25	‡ 2,830	1,750	1,140	2,530	‡ 9,890	1,600	1,240	1,330	5,300	‡ 1,880	‡ 1,100	1,190
26	2,840	1,690	1,150	‡ 2,530	8,830	1,540	‡ 1,150	1,330	5,300	1,610	1,120	1,160
27	2,820	1,620	1,350	5,330	‡ 7,730	1,410	1,140	2,330	‡ 5,330	‡ 1,540	1,140	1,130
28	2,830	1,580	1,450	8,400	7,350	1,300	1,130	4,410	5,260	1,540	1,140	1,100
29	2,780		‡ 1,290	8,580	7,240	‡ 1,440	1,150	‡ 4,560	5,260	1,510	1,120	1,160
30	2,870		1,270	9,180	7,170	2,410	1,210	‡ 4,940	5,260	1,510	‡ 1,080	1,120
31	2,890		1,240		‡ 7,100		1,270	5,190		1,510		1,140
Sum	82,010	67,700	41,260	76,670	296,830	83,780	54,430	44,260	135,610	49,471	36,070	35,108

Month	Current Year 1977 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1968-1977 Acre-Feet Average	Maximum	Minimum
Jan.	3.97	3.51	23	3,010	1	2,270	2,650	162,673	83,181	162,673	26,191
Feb.	3.97	3.02	†10	3,040	28	1,500	2,420	134,312	133,366	448,150	35,604
Mar.	3.22	2.69	28	1,770	23	1,020	1,330	81,827	95,739	236,403	20,899
Apr.	6.79	2.56	30	9,430	7	1,080	2,560	152,062	102,113	351,859	24,030
May	9.61	5.81	22	17,000	31	7,060	9,570	588,871	191,965	588,871	36,193
June	5.81	2.72	1	7,060	28	1,160	2,790	166,211	106,535	246,770	19,254
July	3.61	2.66	3	2,590	28	1,090	1,760	108,038	195,508	779,878	26,100
Aug.	4.99	2.00	31	5,260	16	420	1,430	87,816	197,158	743,286	56,856
Sept.	5.09	3.15	13	5,470	6	1,820	4,520	269,016	298,148	1,306,836	80,699
Oct.	7.15	2.56	22	10,500	21	918	1,600	98,175	232,654	891,747	80,699
Nov.	2.99	2.62	9	1,540	30	1,020	1,200	71,523	133,025	570,870	46,790
Dec.	2.79	2.56	†12	1,250	21	939	1,130	69,625	81,790	268,589	26,197
Yearly	9.61	2.00		17,000		420	2,750	1,990,149	1,851,182	3,753,089	705,670
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	2.93	0.61		482		11.9	77.8	2,454,823	2,283,410	4,629,385	870,435

** Period 1968-1977 ‡ 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 (50 m^3/sec) capacity, and water-stage recorder located on the downstream side of the left abutment of the highway bridge over Rio Escondido on the outskirts of Villa de Fuente, Coahuila, 1.2 river miles (1.9 km) downstream from the cableway at latitude 28°40' 05", longitude 100°31' 00", about 3 miles (5 km) southwest of Piedras Negras, Coahuila, 3.7 river miles (6.0 km) from the confluence with the Rio Grande, and 6.8 river miles (10.9 km) downstream from the confluence of Rio San Antonio with Rio Escondido. Rio Escondido enters the Rio Grande at river mile 493.2 (793.8 km), 3.1 river miles (5.0 km) downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 718.37 feet (218.96 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 13 discharge measurements during the year and a continuous record of gage heights. Records available: 1922 through 1977. 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 Rio Grande reached an elevation of 729.92 feet (222.48 m) 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, the concrete control weir was finished and placed in operation.

EXTREME FLOWS FROM RECORDS**: Momentary: Max. 24,000 second-feet (680 m^3/sec) on June 29, 1936 with a gage height of 19.13 feet (5.83 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	13,100 (371)	Sept. 24, 1964	Min. 0	Several days 1956-1958 & 1965
Monthly:	Max.	827 (23.4)	Sept. 1964	Min. 0.3 (0.01)	September 1965
Yearly:	Max.	219 (6.21)	1976	Min. 2.4 (0.07)	1956

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	343	284	208	151	81.2	86.2	46.2	25.4	27.9	20.5	‡ 39.6	30.4
2	343	279	208	144	81.2	81.2	46.2	25.4	27.9	20.5	33.5	30.4
3	343	268	217	136	75.9	75.9	46.2	24.0	29.0	43.8	33.5	27.9
4	337	268	217	129	75.9	71.3	46.2	23.0	29.0	33.5	33.5	27.9
5	334	279	217	129	71.3	71.3	46.2	25.4	27.9	27.9	35.0	27.9
6	325	279	217	129	71.3	71.3	46.2	27.9	27.9	27.9	35.0	27.9
7	325	279	217	133	71.3	66.7	46.2	27.9	29.0	27.9	36.4	27.9
8	313	290	208	129	75.9	66.7	46.2	27.9	29.0	27.9	39.6	30.4
9	313	290	208	129	97.8	71.3	46.2	‡ 27.9	29.0	27.9	39.6	30.4
10	313	290	208	129	75.9	71.3	46.2	32.5	27.9	27.9	39.6	30.4
11	313	279	204	129	‡388	62.2	44.5	27.9	27.9	27.9	39.6	30.4
12	313	273	191	‡ 129	163	57.9	‡ 41.0	27.9	27.9	27.9	39.6	33.5
13	313	268	191	129	123	57.9	36.7	27.9	27.9	‡ 27.9	39.6	‡ 33.5
14	313	268	191	129	109	54.0	33.5	30.1	27.9	27.9	39.6	30.4
15	305	268	182	129	109	54.0	33.5	30.4	27.9	27.9	37.8	30.4
16	301	247	174	193	109	54.0	33.5	27.9	27.9	27.9	37.8	30.4
17	290	247	166	147	109	50.1	33.5	29.3	27.9	27.9	37.8	30.4
18	290	247	166	136	109	46.2	35.0	32.5	27.9	27.9	37.8	30.4
19	290	247	169	129	97.5	46.2	36.4	31.8	27.9	27.9	39.6	30.4
20	290	242	159	116	117	46.2	39.5	24.4	‡ 27.9	27.9	39.6	30.4
21	290	242	159	‡ 142	116	‡ 46.2	37.4	23.0	30.4	27.9	39.6	30.4
22	302	242	159	91.8	367	46.2	27.9	23.0	30.4	27.9	39.6	30.4
23	307	237	159	86.2	112	56.9	27.9	23.0	25.4	98.5	39.6	30.4
24	301	‡ 237	166	83.7	107	74.9	25.4	23.0	23.0	50.1	39.6	30.4
25	295	237	‡ 174	81.2	97.5	50.1	25.4	23.0	23.0	43.1	39.6	33.5
26	‡ 295	232	174	78.4	97.5	46.2	24.0	23.0	24.0	39.6	39.6	33.5
27	295	232	174	75.9	97.5	46.2	24.0	25.4	23.0	39.6	36.0	33.5
28	290	232	174	71.3	97.5	46.2	24.0	25.4	22.2	39.6	30.4	33.5
29	290		174	71.3	97.5	46.2	24.0	27.2	21.2	39.6	29.3	33.5
30	290		160	75.9	91.8	46.2	27.9	27.9	20.5	39.6	30.4	33.5
31	290		159		91.8		27.9	30.4		39.6		33.5
Sum	9,552	7,283	5,750	3,561.7	3,584.3	1,767.2	1,124.9	831.7	806.6	1,049.8	1,117.8	957.8

Month	Current Year 1977 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 1933-1977 Acre-Feet Average	Maximum	Minimum
Jan.	2.36	2.23	† 1	343	†17	290	308	18,930	2,661	18,930	43.8
Feb.	2.23	2.07	† 8	290	†26	232	260	14,433	1,973	14,433	38.9
Mar.	2.03	1.77	† 3	217	†20	159	185	11,407	1,654	11,407	92.4
Apr.	2.49	1.64	21	388	†28	71.3	119	7,072	2,024	21,950	81.1
May	4.53	1.64	22	2,070	† 5	71.3	116	7,114	3,648	25,470	154
June	1.41	1.12	1	86.2	†18	46.2	59.0	3,507	2,255	19,730	60.3
July	1.12	.85	† 1	46.2	†26	24.0	36.4	2,233	1,908	15,568	57.6
Aug.	1.12	.85	10	46.3	† 4	23.0	26.8	1,649	3,439	30,106	34.9
Sept.	.98	.82	†21	30.4	30	20.5	26.8	1,600	4,803	49,182	17.8
Oct.	2.10	.82	23	247	† 1	20.5	33.9	2,082	3,886	28,327	43.8
Nov.	1.05	.92	† 1	39.6	29	29.3	37.1	2,216	2,730	25,730	43.8
Dec.	.98	.92	†12	33.5	† 3	27.9	30.7	1,899	2,435	22,003	67.3
	4.53	0.82		2,070		20.5	102	74,141	33,416	159,211	1,755.3
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.38	0.25		58.5		0.58	2.90	91,452	41,218	196,385	2,164

** Period 1932-1977 ‡ Discharge measurement made on this day † And other days

RETURN FLOW TO THE RIO GRANDE FROM THE MAVERICK IRRIGATION DISTRICT BELOW 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 Eagle Pass, Texas and the El Indio 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, Canon 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 1977. Records prior to 1976 were published under the title "Return Flow to the Rio Grande from Maverick Canal, Eagle Pass to San Antonio Crossing."

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 350 (9.91)	July 5, 1968	Min. 15.7 (0.44)	March 10, 1969
Monthly:	Max. 248 (7.02)	July 1967	Min. 54.6 (1.55)	December 1969
Yearly:	Max. 206 (5.83)	1963	Min. 131 (3.71)	1977

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	82.3	113	140	159	179	86.4	171	133	172	127	18.7	131
2	92.7	108	130	158	191	120	153	118	143	138	32.9	136
3	114	108	126	160	157	133	135	113	142	173	33.9	132
4	128	100	130	159	143	128	127	110	153	165	97.9	137
5	133	81.1	170	157	139	128	135	117	144	154	119	140
6	140	71.5	143	143	140	143	125	130	152	155	129	124
7	148	98.2	154	130	146	144	111	149	155	145	95.7	106
8	175	118	189	154	146	138	106	138	163	140	102	102
9	163	119	197	206	178	132	106	131	167	141	116	97.3
10	134	114	174	259	178	135	119	118	178	150	123	100
11	141	109	177	245	167	129	119	108	169	129	128	132
12	139	74.7	180	217	154	152	121	97.0	175	112	127	148
13	158	84.3	188	196	142	170	124	82.2	173	122	121	137
14	141	102	191	180	131	169	118	133	162	132	115	90.0
15	135	96.9	158	157	131	163	116	133	150	126	109	89.3
16	130	92.0	156	206	134	154	127	138	133	116	115	98.7
17	126	86.6	153	218	132	152	133	144	118	122	105	99.5
18	116	67.1	147	133	121	166	131	151	132	114	105	108
19	163	61 4	138	86.3	98.2	183	134	122	123	107	114	103
20	125	77.6	141	151	81.3	177	126	94.1	120	110	133	91.1
21	99.7	77.1	140	220	88.6	161	108	116	114	108	121	95.0
22	128	77.0	149	254	123	164	114	145	128	111	121	101
23	128	73.0	144	209	119	246	112	137	130	146	119	96.4
24	104	65.6	150	214	101	216	111	140	140	167	124	113
25	115	66.6	151	192	97.0	196	109	140	133	140	132	123
26	103	82.5	186	146	67.6	182	97.6	125	132	69.4	135	101
27	104	107	167	128	49.8	161	108	124	127	46.8	148	87.7
28	104	133	163	141	47.6	150	111	142	129	43.5	142	95.1
29	87.6		193	141	47.2	148	120	168	118	52.0	122	102
30	98.2		197	160	56.8	164	131	177	113	28.7	124	96.3
31	111		164		73.1		134	189		20.8		93.4
Sum	2,564.2		5,279.3			4,690.4		4,062.3		3,611.2		3,405.8
	3,866.5		4,986		3,759.2		3,792.6		4,288		3,328.1	

Month	Current Year 1977 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 April 1959-1977 Acre-Feet Average	Maximum	Minimum
Jan.			8	175	1	82.3	125	7,669	9,632	12,728	4,924
Feb.			28	133	19	61.4	91.6	5,086	8,748	13,117	4,397
Mar.			† 9	197	3	126	161	9,890	10,720	13,498	6,118
Apr.			10	259	19	86.3	176	10,471	10,988	14,646	8,187
May			2	191	29	47.2	121	7,456	10,293	14,327	6,205
June			23	246	1	86.4	156	9,303	11,231	14,430	7,798
July			1	171	26	97.6	122	7,523	11,171	15,219	5,223
Aug.			31	189	13	82.2	131	8,057	10,642	14,299	8,057
Sept.			10	178	30	113	143	8,505	8,945	13,974	4,541
Oct.			3	173	31	20.8	116	7,163	8,883	12,248	4,983
Nov.			27	148	1	18.7	111	6,601	8,841	11,843	5,067
Dec.			12	148	27	87.7	110	6,755	9,154	12,797	3,354
				259		18.7	131	94,479	119,248	149,031	94,479
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				7.33		0.53	3.71	116,540	147,092	183,830	116,540

∅ Mean daily † And other days

RIO GRANDE NEAR EL INDIO, TEXAS AND VILLA GUERRERO, COAHUILA

DESCRIPTION: Cableway, bubbler gage, concrete control weir, and water-stage recorders (graphic and digital) located on the left bank at latitude 28°20' 45", longitude 100°18' 35", and river mile 460.4 (741.0 km), 0.6 river mile (0.9 km) downstream from Cuervo Creek, which marks the lower end of the Maverick County Water Control and Improvement District No. 1, 1.9 river miles (3.1 km) upstream from Tovar Creek, 5 miles (8.0 km) northeast of Villa Guerrero, Coahuila, about 11.5 miles (18.5 km) south of El Indio, Texas, and 35.9 river miles (57.8 km) downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 580.00 feet (176.78 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 25 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: 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 1977 with several days missing prior to September 1955. Records prior to 1976 were published under the title "Rio Grande at San Antonio Crossing near El Indio, Texas."

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 912,000 second-feet (25,800 m^3/sec) in June 1954, determined by slope-area computation, with an elevation of 624.31 feet (190.29 m). Min. 54.4 second-feet (1.54 m^3/sec) on June 24, 1953 with an elevation of 581.96 feet (177.38 m) at a station 1,700 feet (518 m) upstream from the present site.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	96,400 (2,730)	July 19, 1975	Min.	327 (9.26)	June 29 & 30, 1972
Monthly:	Max.	21,800 (617)	Sept. 1974	Min.	501 (14.2)	February 1969
Yearly:	Max.	5,300 (150)	1974	Min.	1,230 (34.8)	1972

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,700	3,170	1,890	1,580	9,180	6,720	2,590	1,410	4,700	2,870	1,680	1,430
2	2,780	‡ 2,610	‡ 1,900	1,570	9,160	4,860	2,600	1,310	2,520	1,970	1,480	1,440
3	2,880	2,530	1,900	1,580	9,090	3,610	2,640	‡ 1,280	2,110	1,710	1,420	1,420
4	2,900	2,440	1,830	1,580	9,000	3,390	2,650	1,250	2,110	1,920	1,480	1,430
5	‡ 2,900	2,380	1,830	1,560	9,000	3,270	2,590	1,250	2,130	1,740	1,540	1,450
6	2,920	2,300	1,810	1,480	9,000	3,310	‡ 2,510	1,240	2,070	1,600	1,540	1,410
7	2,890	2,280	1,830	1,450	9,270	3,190	2,450	1,240	2,070	1,580	1,470	‡1,410
8	2,850	2,430	1,830	1,380	9,870	‡ 3,130	2,380	1,220	2,400	1,560	1,440	1,410
9	3,090	2,630	1,830	1,450	10,300	3,040	2,390	1,170	4,970	1,490	1,580	1,370
10	3,090	3,340	1,810	1,540	‡10,300	3,000	2,440	971	5,160	1,490	‡ 1,670	1,370
11	3,080	3,410	1,810	1,590	10,500	5,120	2,460	819	5,220	1,450	1,590	1,400
12	3,110	3,330	1,790	1,550	10,300	2,790	2,440	944	5,220	‡ 1,450	1,540	1,490
13	3,150	3,300	1,770	‡ 1,670	10,200	2,370	2,350	692	5,320	1,460	1,510	1,510
14	3,180	3,300	1,800	1,650	10,300	3,400	2,340	725	5,320	1,480	1,490	1,510
15	3,280	3,340	1,730	1,680	10,300	3,390	1,920	791	5,270	1,480	1,480	1,470
16	3,300	‡ 3,310	‡ 1,690	2,880	10,200	3,300	1,560	756	‡ 5,220	1,390	1,470	1,490
17	3,320	3,330	1,680	2,840	10,200	3,270	1,530	‡ 749	5,220	1,360	1,470	1,460
18	3,260	3,310	1,680	2,670	10,300	3,230	1,560	1,030	5,270	1,330	1,440	1,420
19	‡ 3,280	3,240	1,650	2,250	10,100	2,700	1,480	1,190	5,320	1,290	1,400	1,410
20	3,280	3,230	1,580	2,280	9,970	2,490	‡ 1,450	1,150	5,220	1,260	1,390	1,370
21	3,250	3,240	1,600	2,890	10,000	2,140	1,380	1,140	5,120	1,220	1,410	‡1,270
22	3,320	3,180	1,570	3,980	13,200	‡ 1,680	1,380	1,210	5,040	1,230	1,400	1,290
23	3,470	3,080	1,510	3,550	15,000	1,550	1,370	1,180	5,080	5,460	‡ 1,400	1,380
24	3,440	2,910	1,520	3,430	10,900	1,750	1,360	1,290	5,030	3,550	1,430	1,450
25	3,380	2,320	1,530	3,420	‡10,200	1,790	1,390	1,450	5,120	2,410	1,440	1,480
26	3,320	2,050	1,570	3,300	9,250	1,700	1,340	1,520	5,160	‡ 1,960	1,420	1,490
27	3,300	1,990	1,650	3,770	8,220	1,660	1,310	1,510	5,160	1,780	1,460	1,330
28	3,290	2,010	1,890	8,440	7,400	1,560	1,300	3,820	‡ 5,120	1,730	1,480	1,260
29	3,240		1,820	8,680	7,350	1,470	1,310	4,600	4,700	1,710	1,470	1,250
30	3,210		‡ 1,750	9,510	7,290	1,980	1,320	4,730	3,140	1,700	1,450	1,280
31	3,290		1,700		7,250		1,370	‡ 5,100		1,720		1,300
Sum	97,750	79,990	53,750	87,200	302,600	86,860	59,160	48,737	131,560	56,350	44,440	43,450

Month	Current Year 1977 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 1968-1977 Acre-Feet Average	Maximum	Minimum
Jan.	7.40	7.06	23	3,490	1	2,670	3,150	193,884	97,555	193,884	47,179
Feb.	7.39	6.74	11	3,460	†27	1,990	2,860	158,658	144,050	444,879	51,336
Mar.	6.79	6.47	28	2,090	†23	1,480	1,730	106,612	111,703	248,073	37,442
Apr.	8.57	6.38	30	9,650	8	1,330	2,910	172,959	116,023	361,567	37,386
May	9.86	8.23	22	23,600	31	7,100	9,760	600,198	206,806	600,198	50,723
June	8.24	6.41	1	7,260	29	1,410	2,900	172,284	126,650	353,792	29,808
July	7.06	6.33	1	2,720	†27	1,290	1,910	117,342	205,880	788,688	37,228
Aug.	7.91	5.89	31	5,230	13	659	1,570	96,668	218,981	824,033	66,822
Sept.	7.93	6.75	†10	5,320	† 6	2,070	4,390	260,945	310,028	1,296,059	83,327
Oct.	8.54	6.26	23	9,240	22	1,180	1,820	111,769	247,664	863,008	92,140
Nov.	6.56	6.37	1	1,720	†20	1,380	1,480	88,145	146,280	552,893	58,569
Dec.	6.50	6.28	13	1,600	†21	1,220	1,400	86,182	97,644	276,020	49,819
Yearly	9.86	5.89		23,600		659	2,990	2,165,646	2,029,264	3,835,752	896,415
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	3.01	1.80		668		18.7	84.7	2,671,324	2,503,097	4,731,400	1,105,728

** Period 1968-1977 ‡ Discharge measurement made on this day † And other days

RIO GRANDE AT VILLA HIDALGO, COAHUILA 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 406.0 (653.4 km); 1.9 river miles (3.1 km) downstream from Arroyo Agua Verde in Mexico, 13.1 river miles (21.1 km) upstream from Santo Tomas Creek in United States, and 45.1 river miles (72.6 km) upstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The zero of the gage is 436.02 feet (132.90 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 26 discharge measurements during the year 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 1977. Records prior to 1976 were published under the title "Rio Grande at Palafox near Laredo, Texas."

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 (6,060 m^3/sec) on September 25, 1964 with a gage height of 42.06 feet (12.82 m). Min. 314 second-feet (8.90 m^3/sec) on June 30 and July 1, 1972 with a gage height of -0.66 foot (-0.20 m).

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	134,000 (3,800)	June 29, 1971	Min.	314 (8.90)	July 1, 1972
Monthly:	Max.	21,000 (595)	Sept. 1974	Min.	434 (12.3)	June 1969
Yearly:	Max.	5,470 (155)	1974	Min.	1,270 (35.9)	1972

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,900	3,280	2,160	1,800	9,250	7,030	2,280	1,510	5,160	5,230	1,770	1,390
2	2,900	3,050	‡2,060	1,700	9,010	5,620	2,620	‡ 1,540	3,670	3,570	1,660	‡1,390
3	2,960	2,650	2,030	1,670	‡ 8,970	4,240	2,560	1,370	2,300	2,030	1,490	1,410
4	2,990	2,570	1,970	‡ 1,670	8,930	3,420	2,640	1,320	2,120	1,830	‡ 1,450	1,400
5	2,990	2,490	1,950	1,620	8,900	3,240	‡ 2,600	1,270	‡ 2,140	1,980	1,550	1,390
6	2,960	2,490	1,930	1,580	8,930	3,240	2,540	1,300	2,120	‡ 1,800	1,620	1,440
7	2,960	2,420	1,930	1,530	8,970	‡ 3,180	2,500	1,320	2,080	1,690	1,640	1,390
8	2,940	2,470	1,960	1,510	9,780	3,080	2,420	1,250	2,140	1,690	1,520	1,410
9	2,990	2,670	1,950	1,420	10,200	3,040	2,420	1,260	3,530	1,680	1,500	1,390
10	3,090	2,900	1,950	1,520	10,300	2,950	2,420	1,150	5,260	1,670	1,710	1,330
11	‡3,070	3,350	1,910	1,620	10,900	3,670	2,480	925	5,370	1,660	1,690	1,390
12	3,070	3,330	1,890	1,660	11,100	4,730	2,440	766	5,400	1,590	1,620	1,460
13	3,110	3,250	1,870	‡ 1,680	10,200	2,250	2,400	890	5,440	1,530	1,570	1,560
14	3,170	‡3,270	1,890	1,770	10,200	‡ 2,820	‡ 2,400	643	5,440	1,540	1,540	1,540
15	3,210	3,250	‡1,890	1,680	10,200	3,290	2,360	692	5,400	1,560	1,540	1,490
16	3,270	3,250	1,830	2,150	‡10,200	3,240	1,850	788	5,370	1,510	1,530	1,460
17	3,280	3,230	1,800	2,850	10,100	3,200	1,650	‡ 699	5,370	1,420	1,490	1,460
18	3,270	3,230	1,770	2,830	10,100	3,200	1,650	692	5,370	1,390	1,490	1,440
19	‡3,230	3,190	1,800	2,500	10,000	3,100	1,680	985	5,370	1,360	1,450	1,440
20	3,230	3,170	1,710	‡ 2,180	9,920	2,560	1,580	1,190	5,330	1,310	1,430	1,410
21	3,190	3,170	1,700	2,250	9,890	‡ 2,400	1,550	1,070	5,300	1,270	1,430	1,320
22	3,270	3,190	1,690	3,450	10,800	2,030	1,470	1,090	5,230	1,250	1,430	1,240
23	3,350	3,110	1,680	3,530	22,100	1,730	1,480	1,210	5,300	3,640	1,400	1,280
24	3,370	3,030	‡1,630	3,180	11,400	1,710	1,460	1,150	5,300	4,270	1,410	1,400
25	3,330	2,840	1,630	3,180	10,200	1,900	1,500	‡ 1,350	5,300	2,930	1,410	1,480
26	3,270	2,290	1,670	3,140	9,530	1,850	1,520	1,530	5,370	2,200	1,410	1,490
27	3,270	2,180	1,700	‡ 3,040	8,620	1,680	1,420	1,600	5,330	1,940	1,400	1,480
28	3,250	2,150	1,800	6,140	7,590	1,680	1,370	1,970	5,260	1,830	1,460	1,450
29	3,230		2,050	8,650	7,310	‡ 1,600	1,360	4,380	5,260	1,790	1,490	1,420
30	3,210		1,890	9,220	‡ 7,170	1,530	1,420	4,630	5,230	1,780	1,410	1,430
31	3,270		1,830		7,130		1,450	4,980		1,790		1,480
Sum	97,600	81,470	57,520	82,720	307,900	89,210	61,490	46,520	137,260	62,730	45,510	44,060

Month	Current Year 1977								Period 1968-1977		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	3.44	2.89	23	3,430	1	2,760	3,150	193,508	98,474	193,508	50,489
Feb.	3.38	2.26	†11	3,350	†27	2,040	2,910	161,581	143,221	455,925	48,884
Mar.	2.46	1.77	1	2,240	†24	1,600	1,850	114,013	115,716	245,194	38,574
Apr.	6.36	1.41	30	9,640	9	1,360	2,760	164,081	113,884	356,909	36,522
May	13.78	5.25	23	27,800	31	7,100	9,920	611,076	214,858	611,076	60,344
June	5.28	1.41	1	7,170	30	1,440	2,970	176,934	170,330	750,690	25,768
July	2.82	1.25	2	2,680	29	1,320	1,980	121,872	220,538	921,377	30,729
Aug.	4.33	.07	31	5,230	14	590	1,500	92,271	220,923	730,503	70,515
Sept.	4.49	2.26	14	5,540	7	2,060	4,590	272,210	314,230	1,250,870	93,812
Oct.	5.64	1.12	23	7,980	22	1,230	2,020	124,408	279,797	922,217	100,018
Nov.	1.94	1.41	1	1,800	30	1,380	1,520	90,316	156,089	601,059	56,954
Dec.	1.67	1.15	13	1,570	22	1,200	1,420	87,368	105,292	317,123	51,077
Yearly	13.78	0.07		27,800		590	3,050	2,209,638	2,153,352	3,963,062	920,935
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	4.20	0.02		788		16.7	86.4	2,725,558	2,656,132	4,888,381	1,135,961

** Period August 1959-1977 ‡ Discharge measurement made on this day † And other days

RIO GRANDE AT NUEVO LAREDO, TAMAULIPAS AND 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°29'25", and river mile 359.8 (579.0 km), immediately downstream from the Laredo, Texas sewage plant and 1.1 river mile (1.8 km) downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The zero of the gage is 345.28 feet (105.24 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 48 discharge measurements during the year, 40 by the Mexican Section and 4 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through 1913; May, June, and Oct. 1914; Sept. 1916; Sept. and Oct. 1917; Oct. 1918; Sept. and Oct. 1919; Aug. and Sept. 1920; June, Nov., and Dec. 1922; and 1923 through 1977. Gage height records are available for Jan., Feb., and Mar. 1914.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. This station was established in Jan. 1955 to replace the station 1.7 miles (2.7 km) upstream which was destroyed by the June-July 1954 flood. Prior to July 11, 1968 the recorder was located 0.2 river mile (0.3 km) upstream, where the cableway is still located, and the zero of the gage was 347.90 feet (106.04 m) above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 716,900 second-feet (20,300 m^3/sec) on June 30, 1954, determined by slope-area calculations, with a gage height of 61.35 feet (18.70 m). Much well-authenticated information established the occurrence of a greater flood in June 1865 with a gage height of 62.5 feet (19.05 m) on the same gage and discharge of approximately 950,000 second-feet (27,000 m^3/sec), and also that these were the only floods since 1745 with flows greater than 600,000 second-feet (17,000 m^3/sec). Min. no flow several days in June and July 1953 and on July 24, 1956.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	115,000 (3,270)	June 30, 1971	Min.	247 (7.00)	July 2, 1972
Monthly:	Max.	20,400 (579)	Sept. 1974	Min.	498 (14.1)	June 1969
Yearly:	Max.	5,370 (152)	1974	Min.	1,350 (38.3)	1972

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,040	3,670	‡ 2,200	1,900	9,430	7,350	1,710	‡ 1,470	5,230	5,300	1,490	1,260
2	3,130	3,670	2,140	1,840	‡ 9,040	6,710	2,480	1,500	4,940	4,870	1,440	1,260
3	‡ 3,140	‡ 3,040	2,100	1,780	9,000	5,190	2,600	1,500	3,050	2,800	1,360	1,260
4	3,180	2,660	2,090	‡ 1,740	8,970	3,960	‡ 2,580	1,390	2,460	1,790	1,230	1,270
5	3,220	2,510	2,060	1,730	8,900	3,670	2,610	‡ 1,350	‡ 2,260	1,580	1,240	1,240
6	3,200	2,420	2,050	1,700	8,900	‡ 3,500	2,550	1,350	2,240	1,740	1,310	1,240
7	3,180	‡ 2,390	2,040	1,640	8,900	3,500	2,480	1,370	2,240	1,530	1,370	1,270
8	3,160	2,370	‡ 2,040	1,640	9,360	3,380	2,430	‡ 1,330	2,220	1,440	1,360	1,240
9	3,120	2,480	2,050	1,600	‡ 10,300	3,280	2,400	1,470	2,290	1,420	1,270	1,240
10	‡ 3,300	2,750	2,040	1,550	10,700	3,150	2,430	1,450	4,800	1,410	1,260	1,240
11	3,340	3,420	2,040	‡ 1,670	11,900	3,070	‡ 2,420	‡ 1,230	5,230	1,390	1,490	1,230
12	3,380	3,670	2,030	1,750	11,700	5,050	2,460	1,040	5,370	1,370	1,440	1,260
13	3,410	3,640	2,030	1,750	10,900	‡ 3,340	2,430	904	5,440	1,320	1,410	1,290
14	3,430	3,530	‡ 1,980	1,880	10,500	2,730	2,420	985	‡ 5,510	1,270	1,360	1,370
15	3,450	3,570	1,980	1,840	10,600	3,390	2,400	‡ 802	5,470	1,240	1,320	1,360
16	3,530	‡ 3,600	1,980	2,640	‡ 10,500	3,470	2,220	802	5,440	1,260	1,310	1,310
17	3,600	3,600	1,930	2,750	10,500	3,350	1,820	879	5,370	1,190	1,270	1,290
18	‡ 3,600	3,600	1,910	‡ 2,960	10,500	3,330	‡ 1,690	840	5,370	1,120	1,270	1,290
19	3,600	3,530	1,890	2,800	10,500	3,330	1,690	812	‡ 5,440	1,080	1,260	1,270
20	3,570	3,510	1,910	2,360	10,300	‡ 2,890	1,680	1,070	5,370	1,060	1,240	1,270
21	3,530	‡ 3,510	1,860	2,250	10,200	2,500	1,610	1,200	5,330	1,040	1,230	1,270
22	3,570	3,510	‡ 1,840	2,460	12,000	2,300	1,590	‡ 1,130	5,300	1,030	1,240	1,230
23	3,640	‡ 3,490	1,820	3,850	‡ 29,500	1,950	1,510	1,140	5,300	1,070	1,240	1,120
24	‡ 3,810	3,350	1,820	3,460	‡ 18,400	1,720	1,520	1,240	5,330	5,370	1,230	1,160
25	3,780	3,240	1,780	‡ 3,290	‡ 12,100	1,770	‡ 1,510	1,210	5,370	3,740	1,240	1,240
26	3,710	2,680	1,780	3,270	10,500	1,890	1,520	1,390	‡ 5,370	2,420	1,230	1,290
27	3,640	2,220	1,800	3,170	9,360	‡ 1,840	1,540	1,550	5,370	1,890	1,240	1,310
28	3,640	2,220	‡ 1,840	3,520	8,230	1,770	1,470	1,590	5,370	1,620	1,230	1,310
29	3,600		1,890	‡ 8,050	7,520	1,690	1,430	‡ 3,670	5,330	1,530	1,310	1,290
30	3,600		1,980	8,900	7,450	1,580	1,420	‡ 4,980	5,330	1,510	1,320	1,260
31	3,640		1,900		‡ 7,380		1,450	5,080		1,510		1,260
Sum	106,740	87,850	60,800	81,740	334,040	96,650	62,070	47,724	139,140	58,910	39,210	39,200

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.	4.53	3.84	24	3,850	1	3,030	3,440	211,754	102,731	211,754	49,774
Feb.	4.46	3.25	1	3,710	27	2,130	3,140	174,286	147,039	450,602	39,225
Mar.	3.38	2.62	1	2,290	†24	1,780	1,960	120,569	117,953	257,213	37,096
Apr.	7.78	2.33	30	9,180	9	1,500	2,730	162,148	115,129	360,566	35,107
May	17.39	6.79	23	33,200	31	7,380	10,800	662,839	228,411	662,839	89,917
June	6.79	2.33	1	7,420	30	1,500	3,220	191,651	170,469	695,494	29,685
July	3.54	2.17	5	2,660	30	1,400	2,000	123,097	219,421	838,520	32,270
Aug.	5.35	1.44	29	5,440	16	752	1,540	94,723	233,093	794,314	65,681
Sept.	5.64	3.02	14	5,540	7	2,210	4,630	275,986	323,880	1,216,757	94,988
Oct.	6.63	2.17	24	6,990	23	985	1,900	116,864	308,491	956,960	105,334
Nov.	2.76	2.40	11	1,560	4	1,190	1,310	77,750	157,194	586,280	58,095
Dec.	2.59	2.30	15	1,390	23	1,100	1,260	77,778	106,399	307,569	51,316
	17.39	1.44		33,200		752	3,160	2,289,445	2,230,211	3,891,074	980,740
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	5.30	0.44		939		21.3	89.5	2,824,000	2,750,935	4,799,588	1,209,729

Current Year 1977 — Period 1968-1977

** Period 1968-1977 ‡ Discharge measurement made on this day † And other days

RIO SALADO NEAR LAS TORTILLAS, TAMAULIPAS

DESCRIPTION: Cableway, control weir with notch opening of 2,500 second-foot (72 m^3/sec) 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 (3 km) downstream from the confluence of Rio Sabinas with Rio Salado, 6 miles (10 km) southeast of the town of Las Tortillas, Tamaulipas, and 24.8 river miles (39.9 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 299.5 (482.0 km), 24.7 river miles (39.8 km) upstream from Falcon Dam. The zero of the gage is 325.72 feet (99.28 m) 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 (72 m^3/sec), and a continuous record of gage heights. Computations by shifting control methods for flows greater than 2,500 second-feet (72 m^3/sec). Records available: September 9, 1953 through 1977. Records are also available for a station at old Cd. Guerrero, 21.7 miles (35 km) 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. 65,000 second-feet (1,840 m^3/sec) on September 16, 1971 with a gage height of 40.39 feet (12.31 m). Min. frequently no flow. The maximum discharge was measured at the highway bridge 13.0 river miles (20.9 km) downstream from the station. Extreme flow data for the Rio Salado at Cd. Guerrero prior to September 8, 1953 may be found in previous bulletins.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	62,900 (1,780)	Sept. 16, 1971	Min.	0	Frequently
Monthly:	Max.	13,600 ((384)	Sept. 1971	Min.	0	Frequently
Yearly:	Max.	3,310 (93.6)	1971	Min.	56.8 (1.61)	1956

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,090	1,070	410	231	154	‡ 149	149	72.7	161	60.7	105	‡ 64.6
2	2,090	1,070	399	220	154	143	149	77.0	133	60.7	105	60.4
3	2,090	1,090	‡ 381	209	149	133	160	64.6	200	67.5	101	60.4
4	2,090	1,090	381	209	‡ 143	130	160	‡ 68.5	165	2,060 ‡	101	64.6
5	‡ 1,890	1,090	381	‡ 198	133	130	143	72.7	117	3,230	97.1	77.0
6	1,090	1,120	357	192	130	133	‡ 143	72.7	‡ 117	2,270	97.1	84.8
7	812	1,120	357	182	126	138	138	60.4	117	763	84.8	92.9
8	752	‡ 1,090	337	171	125	154	126	60.4	245	287	‡ 84.8	89.0
9	724	1,090	301	176	214	154	126	68.5	182	198	84.8	84.8
10	699	1,090	292	176	238	149	126	68.5	117	224	76.6	80.9
11	685	1,090	301	182	239	149	130	68.5	117	176	76.6	92.9
12	671	1,090	301	171	214	143	121	68.5	113	138	76.6	97.1
13	657	1,090	301	176	171	143	121	76.6	105	125	76.6	97.1
14	657	1,090	292	165	149	143	117	76.6	137	125	80.9	101
15	646	1,090	292	160	149	208	109	84.8	92.9	117	84.8	92.9
16	632	1,070	292	160	149	165	105	84.8	105	113	89.0	84.8
17	618	1,070	292	160	154	176	101	84.8	92.9	117	89.0	80.9
18	618	1,050	292	165	154	160	118	76.6	109	113	84.8	84.8
19	618	823	283	160	138	154	161	68.5	92.9	109	76.6	84.8
20	618	798	265	160	133	160	113	68.5	76.6	109	76.6	77.0
21	618	1,380	274	160	133	165	109	68.5	68.5	105	80.9	77.0
22	618	1,180	265	160	151	‡ 165	101	64.6	68.5	101	76.6	72.7
23	646	622	265	160	198	160	130	60.4	64.6	109	80.9	60.7
24	685	526	247	171	222	165	109	60.4	60.4	127	76.6	72.7
25	752	526	236	171	176	176	97.1	54.4	60.4	183	76.6	68.5
26	812	516	231	165	165	176	84.8	52.3	68.5	154	72.7	68.5
27	901	477	247	165	160	165	77.0	52.3	60.4	125	68.5	68.5
28	989	427	247	165	154	160	68.5	50.1	54.4	113	68.5	64.6
29	1,080		236	160	154	154	68.5	161	50.1	113	68.5	64.6
30	1,130		225	154	160	149	60.7	121	52.3	113	64.6	64.6
31	1,170		225		160		64.6	154		109		72.7
Sum	30,148	26,835	9,205	5,254	5,049	4,649	3,586.2	2,343.2	3,203.4	11,814.9	2,483.1	2,407.8

Month	Current Year 1977							Period 1954-1977		
	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.	3.02	1.77	† 1	2,120	†17	618	971	59,812	10,195	59,812	0
Feb.	2.66	1.61	22	1,490	28	410	961	53,361	8,573	66,880	0
Mar.	1.64	1.21	1	427	31	214	297	18,266	5,111	29,690	0
Apr.	1.31	1.05	1	247	30	154	175	10,405	6,328	21,994	0
May	1.35	.92	9	265	8	121	163	10,015	18,620	100,919	0
June	1.97	.95	15	671	† 4	130	155	9,221	22,536	172,970	0
July	1.44	.66	19	319	30	56.5	116	7,115	35,607	441,541	0
Aug.	1.28	.59	29	236	28	48.0	75.6	4,649	22,757	210,031	0
Sept.	1.44	.59	3	319	29	48.0	107	6,359	103,057	807,616	2,860
Oct.	3.97	.66	5	4,240	† 1	56.5	381	23,453	65,715	550,739	110
Nov.	.85	.66	† 1	105	30	56.5	82.6	4,926	34,110	338,000	0
Dec.	.85	.66	14	105	2	56.5	77.7	4,776	20,982	176,100	0
Yearly	3.97	0.59		4,240		48.0	293	212,358	353,591	2,400,553.5	41,238.2
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	1.21	0.18		120		1.36	8.31	261,940	436,149	2,961,050	50,859

** Period September 1953-1977 ‡ Discharge measurement made on this day † And other days

RIO GRANDE BELOW FALCON DAM NEAR FALCON, TEXAS AND NUEVA CD. GUERRERO, TAMAULIPAS

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' 35", longitude 99°10' 00", and river mile 274.8 (442.3 km); about 7 miles (11.3 km) southwest of Falcon, Texas, and 86.1 river miles (138.6 km) downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. A gravity well and water-stage recorder located 2.5 river miles (4.1 km) downstream and a cableway located one mile (1.6 km) farther 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. During 1977 there was 1 discharge measurement made by the United States Section of the Commission. Records available: 1958 through 1977. Records are also available from December 17, 1952 through 1957 for a station at Chapeno, 2.6 miles (4.1 km) 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 the 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. 82,600 second-feet (2,340 m^3/sec) on September 18, 1971. Min. 1.5 second-feet (0.04 m^3/sec) on March 24 and 25, 1957 (at Chapeno gaging station).

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	76,400 (2,160)	Sept. 18, 1971	Min.	1.5 (0.04)	March 24 & 25,	1957
Monthly:	Max.	32,500 (920)	Oct. 1958	Min.	23.5 (0.67)	November	1973
Yearly:	Max.	6,930 (196)	1958	Min.	1,580 (44.7)		1970

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,590	4,540	993	2,740	8,660	11,100	515	3,390	18.0	4,500	1,050	323
2	5,040	4,540	708	2,190	8,690	‡10,500	683	3,610	18.0	4,470	331	322
3	5,040	4,530	1,910	2,760	8,730	10,200	840	3,930	18.0	3,610	327	322
4	5,080	4,520	2,000	3,040	8,730	10,200	839	4,360	18.0	3,930	331	1,070
5	5,000	4,490	2,040	3,660	8,800	10,200	859	5,020	18.0	3,640	844	1,060
6	5,020	3,730	2,010	3,670	8,730	9,730	1,330	5,430	524	4,220	844	1,060
7	4,430	3,000	2,000	2,540	8,690	9,440	1,890	5,280	891	4,970	848	1,070
8	3,440	1,980	2,000	3,080	8,660	8,960	1,860	4,860	813	5,160	747	758
9	2,000	3,000	2,020	3,380	8,640	8,570	1,960	4,690	677	5,350	662	599
10	2,000	3,020	2,020	3,280	8,640	8,170	2,380	4,980	892	4,880	655	2,840
11	2,000	3,530	2,000	4,770	8,640	6,480	2,390	3,990	967	4,510	650	3,070
12	2,010	4,020	2,000	5,960	8,640	5,040	1,910	4,280	961	4,350	2,670	1,480
13	2,970	5,000	1,990	7,870	8,620	3,310	1,950	4,360	964	4,090	3,180	1,170
14	4,160	3,490	2,010	8,780	8,620	3,500	2,370	4,330	760	3,840	2,170	1,000
15	4,640	3,760	2,020	8,640	8,620	3,410	2,160	4,150	545	3,980	1,470	426
16	5,000	4,030	2,020	8,750	8,620	2,750	2,510	3,710	18.0	3,780	1,480	1,370
17	5,040	3,980	2,030	8,780	8,620	2,300	3,110	4,340	18.0	4,190	758	2,100
18	4,980	3,990	2,490	8,750	8,640	2,640	2,910	4,260	546	4,640	926	1,760
19	3,990	3,990	3,050	8,850	8,640	2,800	2,740	5,220	534	4,770	1,430	2,000
20	3,020	4,080	3,020	8,850	8,640	3,050	2,670	4,750	817	4,770	1,420	1,470
21	1,110	3,990	2,650	8,850	8,600	3,080	2,120	4,610	526	4,340	834	1,170
22	18.0	3,020	2,350	8,850	8,620	1,410	2,180	4,610	696	4,270	18.0	853
23	2,540	3,980	2,330	8,800	8,620	18.0	2,710	5,050	1,060	2,350	543	850
24	4,020	2,990	2,530	8,730	8,620	18.0	2,930	5,030	1,440	1,460	422	1,820
25	5,000	3,020	2,530	8,710	8,570	246	2,940	4,700	1,460	536	648	1,890
26	5,000	3,030	2,520	8,690	9,490	491	2,950	4,720	2,900	1,520	1,170	1,740
27	3,630	2,950	2,510	8,730	11,500	522	2,990	5,190	3,350	1,710	1,170	2,070
28	3,640	1,500	2,730	8,690	11,900	1,210	3,370	5,130	2,960	1,050	1,300	2,400
29	3,590		3,110	8,730	11,900	497	3,730	2,470	3,110	1,770	324	1,700
30	3,560		3,690	8,690	11,900	498	4,000	912	3,580	1,690	322	2,660
31	4,560		4,190		11,700		3,650	732		1,370		2,440
Sum	101,700		197,810		140,340.0		132,094		109,716		44,863	
	115,118.0		71,471		284,690		71,446		31,099.0		29,544.0	

Month	Current Year 1977								Period #1954-1977		
	Extreme Gage Feet		ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			4	5,080	22	18.0	3,710	228,333	209,424	414,129	16,245
Feb.			13	5,000	28	1,500	3,630	201,719	171,979	367,384	16,600
Mar.			31	4,190	2	708	2,310	141,761	132,231	347,000	2,390
Apr.			†19	8,850	2	2,190	6,590	392,350	248,066	503,683	19,530
May			†28	11,900	25	8,570	9,180	564,674	308,541	564,674	21,574
June			1	11,100	†23	18.0	4,680	278,360	243,549	551,000	22,887
July			30	4,000	1	515	2,300	141,711	117,891	302,471	12,839
Aug.			6	5,430	31	732	4,260	262,005	222,175	1,478,678	25,900
Sept.			30	3,580	† 1	18.0	1,040	61,684	192,654	1,080,871	1,428
Oct.			9	5,350	25	536	3,540	217,619	259,712	1,997,000	27,100
Nov.			13	3,180	22	18.0	985	58,600	118,878	1,128,000	1,400
Dec.			11	3,070	† 2	322	1,450	88,984	114,429	465,000	8,761
				11,900		18.0	3,640	2,637,800	2,339,529	5,016,800	1,143,806
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				337		0.51	103	3,253,726	2,885,809	6,188,223	1,410,885

** Period 1954-1977 ‡ Discharge measurement made on this day # Values prior to 1958 are Chapeno discharge less arroyo inflow
ø Mean daily † And other days

RIO ALAMO AT CD. MIER, TAMAULIPAS

DESCRIPTION: Cableway, reinforced concrete weir of 177 second-foot (5 m^3/sec) capacity, gravity well, and water-stage recorder located on the right bank at a point called "El Paso del Cantaro", latitude 26°27'00", longitude 99°09'05", about 0.5 mile (1 km) north of Cd. Mier, Tamaulipas, and 5.0 river miles (8 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 262.4 (422.3 km), 12.4 river miles (20.0 km) downstream from Falcon Dam. The weir is located about 300 feet (91 m) downstream from the recorder. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 1 discharge measurement 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 1977.

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 (0.40 m) to make it coincide with the weir crest elevation. Prior to January 1, 1969, the zero of the gage was 188.35 feet (57.41 m) above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 144,800 second-feet (4,100 m^3/sec) on September 11, 1948 with a gage height of 33.56 feet (10.23 m). Min. periods of no flow have occurred at times during all years of record except 1934, 1935, 1968, 1972, 1974, 1976, and 1977.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	87,230 (2,470)	Sept. 11, 1948	Min.	0	Frequently
Monthly:	Max.	7,310 (207)	Sept. 1967	Min.	0	Frequently
Yearly:	Max.	837 (23.7)	1967	Min.	16.4 (0.47)	1929

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	172	178	154	84.8	40.6	63.2	27.9	18.7	52.3	15.9	37.1	43.8
2	201	184	154	89.7	43.8	59.0	27.9	18.7	1,580	14.5	37.1	43.8
3	201	184	154	91.8	42.4	54.7	27.9	21.5	2,060	562	33.9	43.8
4	193	184	145	84.8	37.1	54.7	27.9	18.7	544	287	33.9	43.8
5	193	181	142	71.3	33.9	47.3	27.9	12.0	98.2	46.6	33.9	43.8
6	184	178	148	63.2	33.9	214	26.1	8.1	64.3	24.7	33.9	43.8
7	181	178	148	59.0	31.1	160	26.1	10.6	74.2	21.5	33.9	43.8
8	178	193	145	59.0	27.9	65.3	26.1	15.9	65.0	24.7	33.9	43.8
9	178	236	145	54.7	35.3	54.7	26.1	18.7	54.7	24.7	27.9	43.8
10	178	236	145	54.7	49.8	43.8	27.9	18.7	50.9	33.9	27.9	43.8
11	175	236	145	50.9	43.8	43.8	27.9	20.1	47.3	54.0	27.9	43.8
12	175	227	142	50.9	40.6	40.6	27.9	15.9	47.3	30.7	27.9	47.3
13	178	201	139	54.7	40.6	42.4	27.9	13.1	47.3	31.1	27.9	47.3
14	184	184	137	54.7	38.8	42.4	26.1	15.9	1,170	33.9	27.9	47.3
15	184	181	131	54.7	37.1	42.4	27.9	15.9	242	37.1	33.9	47.3
16	178	178	129	47.3	35.3	42.4	27.9	21.5	65.0	37.1	33.9	47.3
17	175	175	126	50.9	38.8	40.6	33.9	21.5	54.7	35.3	33.9	47.3
18	175	175	115	56.9	42.4	40.6	195	13.1	50.9	33.9	33.9	47.3
19	175	175	115	63.2	33.9	37.1	187	12.0	45.6	33.9	37.1	43.8
20	175	175	109	56.9	26.1	37.1	64.6	9.2	43.8	26.1	40.6	43.8
21	175	172	99.6	54.7	33.9	33.9	38.5	9.2	43.8	27.9	40.6	43.8
22	178	178	94.3	47.3	61.1	33.9	35.3	8.1	42.4	60.7	40.6	43.8
23	184	178	89.7	63.2	2,710	37.1	35.3	7.1	40.6	427	40.6	43.8
24	184	175	89.7	59.0	3,190 ‡	38.8	31.1	6.0	38.8	112	40.6	43.8
25	181	172	94.3	59.0	339	37.1	27.9	6.0	31.1	43.1	43.8	43.8
26	178	165	94.3	56.9	107	33.9	26.1	9.2	24.7	40.6	43.8	37.1
27	178	162	96.8	40.6	84.8	33.9	26.1	8.1	18.7	40.6	43.8	37.1
28	178	160	96.8	40.6	75.9	27.9	26.1	8.1	14.5	40.6	43.8	27.9
29	172		94.3	42.4	73.5	33.9	26.1	424	14.5	40.6	43.8	24.7
30	165		89.7	43.8	67.1	27.9	21.5	237	17.3	40.6	43.8	24.7
31	168		84.8		65.0		18.7	131		37.1		24.7
Sum	5,574	5,201	3,792.3	1,761.6	7,560.5	1,564.4	1,230.6	1,173.6	6,743.9	2,319.4	1,083.5	1,295.7

Current Year 1977 — Period 1924-1977

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day	High	Day	Low					
Jan.	189.70	189.57	† 2	201	30	165	180	11,065	3,499	34,920	0
Feb.	189.76	189.53	† 9	236	28	160	186	10,319	2,594	25,550	0
Mar.	189.50	189.14	† 1	154	31	84.8	122	7,518	2,612	19,830	0
Apr.	189.17	188.85	† 2	91.8	†27	40.6	58.6	3,494	6,023	36,210	0
May	193.27	188.71	24	4,560	20	26.1	244	15,005	12,321	137,000	0
June	190.03	188.75	6	385	†28	27.9	52.3	3,103	12,966	83,240	0
July	190.81	188.65	18	1,060	31	18.7	39.6	2,442	8,164	62,246	0
Aug.	190.75	188.48	29	992	†24	6.0	37.8	2,328	16,081	205,700	0
Sept.	192.45	188.58	2	3,330	†28	14.5	225	13,375	40,785	434,387	135
Oct.	190.98	188.58	3	1,220	3	13.1	74.9	4,601	19,172	193,700	0
Nov.	188.88	188.75	†25	43.8	† 9	27.9	36.0	2,149	4,494	25,165	0
Dec.	188.91	188.71	†12	47.3	†29	24.7	41.7	2,570	3,669	15,982	0
Yearly	193.27	188.48		4,560		6.0	108	77,969	132,380	605,678.4	11,898.7
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	58.91	57.45		129		0.17	3.05	96,174	163,289	747,096	14,686

** Period 1924-1977 ‡ Discharge measurement made on this day † And other days

CONTRIBUTIONS TO THE RIO GRANDE FROM THE LOWER RIO SAN JUAN IRRIGATION DISTRICT FALCON DAM TO RIO GRANDE CITY

DESCRIPTION: The Lower Rio San Juan Irrigation District in Mexico lies along the Rio Grande between Cd. Miguel Aleman and Rio Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gomez Dam situated on the Rio San Juan 12.4 river miles (20 km) upstream from the confluence with the Rio Grande. The Rio San Juan enters the Rio Grande at river mile 238.7 (384.1 km). Drain water from this irrigation district enters the Rio Grande between Falcon Dam and the Rio Grande City Gaging Station through the Rio San Juan channel, Rancherias Drain, and Los Fresnos Drain; and between this station and Anzalduas Dam through Puertecitos, Los Indios, Huizache, and Morillo Drains. Only the portion of water reaching the Rio Grande via drains located upstream from the Rio Grande City Gaging Station is shown below. Drain water reaching the Rio Grande through the Rio San Juan channel is included in the Rio San Juan tabulation. The portion of drain water from this irrigation district reaching the Rio Grande via channels located downstream from the Rio Grande City Gaging Station is shown on page 67 in this bulletin.

RECORDS: Water entering the Rio Grande through the Rio San Juan Channel, composed of spills and leakage from Marte R. Gomez Dam, storm inflow and drainage below the dam, is measured at the Rio San Juan Gaging Station at Camargo, Tamaulipas 3.1 river miles (5 km) upstream from the confluence with the Rio Grande. The discharge through Rancherias Drain was determined by prorating between 49 current meter measurements made during the year. There were no drainage flows through Los Fresnos Drain in 1977. All storm water measured at these two drains was deducted and is not included in the tabulation below. Records available: 1953 through 1977. Records prior to 1976 include Rio San Juan flow.

REMARKS: In 1977 there were 147,498 irrigable acres (59,691 ha) in the Lower Rio San Juan Irrigation District.

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.4	5.7	‡ 4.2	4.9	14.1	‡ 20.1	9.2	4.9	6.7	4.2	3.5	3.9
2	7.4	5.7	4.2	4.9	16.2	20.1	8.8	4.9	7.8	4.2	3.5	3.5
3	7.8	5.3	4.2	4.9	18.7	20.5	8.1	4.9	8.8	4.2	‡ 3.2	3.5
4	‡ 7.8	5.3	4.2	4.9	‡ 20.8	20.5	7.8	‡ 4.9	9.5	4.2	3.2	3.5
5	‡ 6.7	5.3	3.9	‡ 4.9	20.1	20.5	7.4	4.9	10.6	‡ 4.2	3.5	3.5
6	7.1	5.3	3.9	4.9	19.1	20.5	‡ 7.1	5.3	11.7	4.6	3.5	3.2
7	7.4	5.3	‡ 3.9	4.9	18.4	20.8	7.1	5.7	‡ 12.7	4.6	3.5	‡ 3.2
8	7.8	4.9	3.9	4.6	17.3	‡ 20.8	6.7	5.7	12.0	4.9	3.5	3.5
9	7.8	4.9	3.9	4.6	16.6	22.6	6.7	6.0	11.7	4.9	3.9	3.5
10	8.1	4.9	3.9	4.6	15.5	24.4	6.4	‡ 6.0	10.9	5.3	‡ 3.9	3.9
11	8.5	4.9	4.2	4.2	‡ 14.8	26.1	6.4	6.0	10.6	5.7	3.9	3.9
12	‡ 8.8	4.9	4.2	4.2	14.8	28.3	6.0	6.0	9.9	5.7	4.2	4.2
13	8.5	4.9	4.2	‡ 4.2	15.2	30.0	‡ 6.0	6.0	9.5	‡ 6.0	4.2	4.2
14	8.1	4.6	4.2	4.2	15.2	31.8	6.0	6.4	8.8	6.0	4.2	‡ 4.6
15	7.8	4.6	‡ 4.2	4.2	15.5	‡ 33.5	6.0	6.4	8.1	6.0	4.6	4.6
16	7.1	‡ 4.6	4.2	4.2	15.5	31.4	6.0	6.4	7.8	6.0	‡ 4.6	4.6
17	6.7	4.6	4.2	4.2	15.9	29.0	6.0	‡ 6.4	7.1	5.7	4.6	4.6
18	6.4	4.6	4.2	4.2	‡ 15.9	26.8	6.0	6.0	6.7	5.7	4.2	4.2
19	‡ 6.0	4.2	3.9	4.2	16.2	24.4	6.0	5.7	6.0	‡ 5.7	4.2	4.2
20	6.0	4.2	3.9	‡ 4.2	16.6	22.2	‡ 6.0	5.3	5.7	5.7	3.9	4.2
21	6.0	‡ 4.2	3.9	4.2	17.0	19.8	6.0	4.9	‡ 4.9	5.7	3.9	‡ 4.2
22	6.0	4.2	‡ 3.9	4.6	17.0	‡ 17.7	5.7	4.6	4.9	5.7	3.5	4.2
23	6.0	4.2	3.9	4.6	17.3	16.6	5.7	4.2	4.6	5.3	‡ 3.5	4.2
24	6.0	4.2	4.2	4.9	17.7	15.5	5.3	‡ 3.9	4.6	5.3	3.5	4.2
25	6.0	4.2	4.2	4.9	18.0	14.5	5.3	4.2	4.6	5.3	3.5	4.2
26	‡ 6.0	4.2	4.6	5.3	18.4	13.1	4.9	4.2	4.6	‡ 5.3	3.5	4.2
27	6.0	4.2	4.6	‡ 5.3	18.7	12.0	‡ 4.9	4.6	4.2	4.9	3.9	4.2
28	6.0	4.2	4.9	7.4	19.1	10.9	4.9	4.9	‡ 4.2	4.9	3.9	‡ 4.2
29	5.7		‡ 4.9	9.9	19.1	‡ 9.9	4.9	5.3	4.2	4.6	3.9	4.2
30	5.7		4.9	12.0	19.4	9.5	4.9	5.3	4.2	4.2	‡ 3.9	4.2
31	5.7		4.9		19.8		4.9	‡ 5.7		3.9		4.2
Sum	214.3	132.3	130.5	153.2	533.9	633.8	193.1	165.6	227.6	158.6	114.8	124.7

Month	Current Year 1977 Extreme Gage Feet High	Extreme Gage Feet Low	∅ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1954-1977 Acre-Feet Average	Maximum	Minimum
Jan.			12	8.8	†29	5.7	7.1	425	156	425	0
Feb.			† 1	5.7	†19	4.2	4.6	263	257	938	0
Mar.			†28	4.9	† 5	3.9	4.2	260	208	771	25.9
Apr.			30	12.0	†11	4.2	5.3	306	263	700	19.5
May			4	20.8	1	14.1	17.3	1,059	533	1,454	61.6
June			15	33.5	30	9.5	21.2	1,257	479	1,257	55.9
July			1	9.2	†26	4.9	6.4	383	241	525	32.4
Aug.			†14	6.4	24	3.9	5.3	328	188	443	25.9
Sept.			7	12.7	†27	4.2	7.8	452	210	697	15.4
Oct.			†13	6.0	31	3.9	4.9	315	187	797	19.5
Nov.			†15	4.6	† 3	3.2	3.9	229	187	641	6.5
Dec.			†14	4.6	† 6	3.2	3.9	249	172	495	29.2
				33.5		3.2	7.8	5,526	3,081	6,786	490
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				0.95		0.09	0.22	6,816	3,801	8,370	605

‡ Discharge measurement made on this day ∅ 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°18'40", longitude 98°50'15", 3.1 river miles (5 km) from the confluence with the Rio Grande, and 9.3 river miles (15 km) downstream from Marte R. Gomez Dam. This stream enters the Rio Grande at river mile 238.7 (384.1 km); 3.7 river miles (6.0 km) upstream from the Rio Grande gaging station at Rio Grande City, 36.1 river miles (58.1 km) downstream from Falcon Dam. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 57 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Discharge prorated between measurements during times of extremely low flow. Records available: January 1954 through 1977.

REMARKS: Except for storm inflow, diversions, and drainage returns below Marte R. Gomez Dam, the flow at this station is controlled by spills from Marte R. Gomez Reservoir and leakage through the dam. Backwater from the Rio Grande frequently reaches this station. Prior to July 1, 1968 the zero of the gage was 130.45 feet (39.76 m) above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 115,000 second-feet (3,270 m^3/sec) on September 25, 1967 with a gage height of 42.03 feet (12.81 m). Min. 0.7 second-foot (0.02 m^3/sec) several days in April 1960.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	115,000 (3,250)	Sept. 25, 1967	Min.	0.7 (0.02)	April 23, 24 & 25 1960
Monthly:	Max.	31,600 (894)	Sept. 1967	Min.	2.1 (0.06)	November 1964
Yearly:	Max.	3,990 (113)	1967	Min.	14.6 (0.41)	1963

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,950	1,310	‡ 650	74.9	30.0	‡ 12.0	9.9	5.3	17.7	8[illegible]	67.8	216
2	1,940	‡ 1,310	629	72.4	29.3	11.3	9.9	4.9	17.7	77.0		
3	1,920	1,270	607	69.9	28.3	10.9	9.9	4.6	17.7	71.3	‡ 81..	
4	‡ 1,900	1,230	586	67.8	27.2	10.2	9.9	‡ 4.2	17.7	65.3	84.4	
5	1,870	1,190	565	‡ 65.3	26.5	9.5	10.2	4.6	17.7	‡ 59.7	87.6	164
6	1,830	1,140	544	63.9	‡ 25.4	8.8	‡ 10.2	4.6	53.0	63.6	90.8	151
7	1,800	‡ 1,100	‡ 523	62.2	24.7	8.5	9.5	4.9	174	67.8	94.3	138
8	1,760	1,150	509	60.7	24.0	‡ 7.8	9.2	5.3	346	72.0	97.5	‡ 125
9	1,720	1,200	498	59.0	23.0	8.5	8.5	5.3	‡ 586	75.9	101	121
10	1,690	1,240	487	57.6	75.2	8.8	7.8	‡ 5.7	692	79.8	‡ 104	118
11	1,650	1,290	473	55.8	262	9.5	7.1	6.0	777	84.0	103	114
12	‡ 1,620	1,340	459	54.4	‡ 329	10.2	6.7	6.0	‡ 812	88.3	101	111
13	1,590	1,390	448	52.6	809	10.9	‡ 6.0	6.4	848	‡ 92.2	100	108
14	1,560	‡ 1,430	438	51.2	989	11.3	7.4	6.7	‡ 953	92.5	99.2	‡ 105
15	1,540	1,350	‡ 424	49.4	706	‡ 12.0	8.5	7.1	1,200	92.9	97.8	109
16	1,510	‡ 1,260	388	48.0	‡ 565	12.0	9.9	7.1	1,200	92.9	‡ 96.8	114
17	1,490	1,240	350	46.3	424	12.0	10.9	‡ 7.4	1,200	93.2	108	118
18	1,460	1,210	313	44.8	283	12.0	12.4	6.7	1,150	93.6	119	123
19	‡ 1,430	1,190	276	43.1	212	11.7	13.4	6.4	1,090 ‡	‡ 93.9	130	127
20	1,420	1,170	239	41.7	‡ 87.6	11.7	‡ 14.8	5.7	1,040	84.4	141	132
21	1,400	‡ 1,140	203	39.9	70.6	11.7	13.8	5.3	‡ 989	75.2	152	‡ 136
22	1,380	1,080	‡ 166	‡ 38.5	35.3	‡ 11.7	12.4	4.6	953	65.7	163	121
23	1,360	1,020	154	37.4	253	11.3	11.3	4.2	‡ 932	56.2	‡ 174	107
24	1,350	961	142	36.7	1,450 ‡	10.9	10.2	‡ 3.5	434	46.6	182	91.8
25	1,330	897	130	35.7	1,490 ‡	10.6	9.2	5.7	177	37.4	190	76.6
26	‡ 1,310	833	118	34.6	‡ 982	10.6	7.8	7.4	‡ 141	‡ 27.9	198	61.8
27	1,310	773	106	33.9	‡ 576	10.2	‡ 6.7	9.5	106	34.6	206	47.0
28	1,310	713	93.9	32.8	289	9.9	6.4	11.7	100	41.3	214	‡ 32.1
29	1,310		‡ 81.9	31.8	106	‡ 9.5	6.0	13.8	94.3	48.0	221	32.5
30	1,310		79.5	31.1	70.6	9.5	5.7	15.5	88.6	54.4	230	33.2
31	1,310		77.3		24.7		5.7	‡ 17.7		61.1		33.5
Sum	48,330	32,427	10,757.6	1,493.4	10,327.4	315.5	287.3	213.8	16,224.4	2,171.3	3,908.9	3,536.5

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1954-1977 Acre-Feet		
			High		Low						
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.			1	1,950	†26	1,310	1,560	95,871	12,962	95,871	88.4
Feb.			14	1,430	28	713	1,160	64,323	6,406	64,323	203
Mar.			1	650	31	77.3	347	21,335	3,681	24,513	212
Apr.			1	74.9	30	31.1	49.8	2,962	3,263	35,876	177
May			†24	1,620	10	22.2	333	20,483	4,511	28,709	245
June			† 1	12.0	8	7.8	10.6	626	21,697	334,608	274
July			†20	14.8	†30	5.7	9.2	569	37,958	341,429	182
Aug.			†31	17.7	24	3.5	7.1	424	28,037	273,904	161
Sept.			†15	1,200	† 1	17.7	540	32,197	133,928	1,878,406	226
Oct.			19	93.9	26	27.9	69.9	4,307	105,306	901,500	193
Nov.			30	230	1	67.8	130	7,746	32,757	230,100	126
Dec.			1	216	28	32.1	114	7,018	20,651	154,765	163
				1,950		3.5	357	257,861	411,157	2,891,093	10,534
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				55.2		0.10	10.1	318,069	507,157	3,566,125	12,993

‡ Discharge measurement made on this day † And other days

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE, FALCON DAM TO RIO GRANDE CITY

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1977, 5,925 irrigable acres (2,398 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between Falcon Dam and the Rio Grande City gaging station. Such irrigable area was 0.8% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1977 in this river reach was 12,625 acre-feet (15,573,000 m^3), or 1.4% of the total water diverted from the Rio Grande below Falcon Dam. All records of diversions in this river reach, which were determined by means of flow meters, were furnished by the Rio Grande Watermaster. More than one crop per year is often grown on parts of this land.

Records prior to 1976 were published under the title "Diversions from the Rio Grande, United States Side-Falcon Dam to Fort Ringgold."

EXTREME FLOWS FROM RECORDS:

	Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max. 77.0 (2.18	May 1, 1962	Min. 0		Occasionally
Monthly:	Max. 43.8 (1.24)	June 1960	Min. 2.2 (0.06)		March 1957
Yearly:	Max. 20.3 (0.57	1960	Min. 6.9 (0.20)		1968

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.0	3.1	23.4	26.0	21.2	21.5	7.4	9.8	4.0	23.5	16.4	9.0
2	8.1	2.3	22.3	12.0	25.8	29.5	13.5	16.6	4.1	19.0	12.6	9.0
3	10.9	2.3	22.5	30.1	27.7	27.6	9.3	14.6	4.0	23.6	11.5	18.2
4	5.6	2.3	27.6	52.6	27.1	20.4	9.3	18.5	1.7	24.9	13.2	9.2
5	2.5	4.3	28.2	46.6	28.9	17.2	9.3	16.0	1.7	18.7	10.3	20.5
6	2.5	4.6	22.2	46.7	28.8	27.6	10.9	22.5	1.1	22.5	9.8	15.6
7	6.8	8.0	27.6	50.0	24.5	22.2	9.4	13.7	2.4	29.7	16.2	22.4
8	11.9	10.2	17.3	44.8	22.1	19.8	11.2	18.2	2.4	24.1	14.8	18.9
9	7.8	4.1	23.9	44.8	25.2	19.5	15.0	15.1	7.8	20.1	19.0	25.2
10	20.3	2.0	15.6	37.5	15.5	22.3	7.4	18.9	9.5	30.6	7.0	21.0
11	20.3	2.0	26.6	45.8	9.1	15.5	5.6	15.7	8.4	33.0	20.0	10.7
12	18.2	3.7	19.3	31.8	3.2	6.6	6.2	32.7	8.4	28.6	17.7	7.7
13	6.0	2.5	17.0	47.9	3.2	8.0	11.1	21.3	16.7	49.1	11.5	7.0
14	6.0	11.7	22.9	44.1	8.3	11.8	11.2	18.2	15.9	64.5	25.0	7.0
15	8.1	14.9	25.4	47.8	13.7	12.1	15.8	34.9	12.4	66.0	14.5	12.4
16	3.8	18.7	25.4	33.6	14.3	11.9	18.7	29.9	10.0	46.7	10.4	15.4
17	10.1	15.1	25.4	29.6	12.9	9.1	9.3	39.6	12.4	48.1	5.9	23.7
18	9.2	21.7	27.9	32.4	17.9	7.5	10.7	24.4	5.2	38.2	5.9	16.0
19	9.1	21.2	19.9	28.5	16.6	1.1	7.7	36.4	10.8	33.7	7.0	25.4
20	21.6	21.3	13.7	32.9	22.0	7.1	12.6	21.6	17.2	28.8	3.7	13.6
21	16.4	33.4	23.7	42.9	13.9	5.9	12.7	21.9	12.6	18.3	7.6	14.6
22	13.4	45.1	17.4	50.2	2.9	4.7	14.7	27.5	17.9	12.1	6.2	12.6
23	9.5	38.8	17.7	31.0	5.0	1.1	14.8	20.3	11.6	4.8	9.9	12.6
24	19.9	37.3	20.9	24.4	8.2	1.1	1.6	16.4	20.7	6.1	9.9	7.4
25	9.2	52.7	27.7	48.2	14.1	1.1	5.1	25.4	8.7	3.4	14.2	5.1
26	18.6	40.6	15.5	32.3	29.1	4.3	8.1	24.0	15.8	17.1	6.6	9.0
27	20.1	30.6	16.2	34.1	24.7	4.3	8.1	26.9	10.4	14.8	1.6	16.2
28	23.4	34.8	23.7	29.1	27.9	4.3	8.3	14.5	7.2	14.8	7.0	14.5
29	19.4		18.6	24.4	15.5	6.6	6.6	7.9	9.3	3.2	6.6	16.8
30	22.0		21.5	26.6	22.2	7.4	4.4	4.0	13.9	4.5	6.8	22.0
31	20.5		21.5		21.5		4.4	4.0		8.3		15.7
Sum	396.2	489.3	678.5	1,108.7	553.0	359.1	300.4	631.4	284.2	780.8	328.8	454.4

Month	Current Year 1977								Period 1957-1977		
	Average Rainfall Inches**		∅ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	1957-1977	1977	Day		Day				Average	Maximum	Minimum
Jan.	1.02	1.30	28	23.4	† 5	2.5	12.8	786	652	1,482	159
Feb.	1.11	.70	25	52.7	†10	2.0	17.5	971	801	1,782	223
Mar.	.58	.10	5	28.2	20	13.7	21.9	1,346	1,007	1,845	158
Apr.	1.42	.32	4	52.6	2	12.0	37.0	2,199	1,065	2,199	357
May	2.29	1.18	26	29.1	22	2.9	17.8	1,097	1,033	2,624	211
June	2.62	1.34	2	29.5	†19	1.1	12.0	712	1,065	2,610	209
July	1.48	.65	16	18.7	24	1.6	9.7	596	724	1,620	278
Aug.	2.30	1.87	17	39.6	†30	4.0	20.4	1,252	695	1,252	278
Sept.	5.20	3.51	24	20.7	6	1.1	9.5	564	520	1,230	178
Oct.	2.25	.95	15	66.0	29	3.2	25.2	1,549	706	1,549	131
Nov.	1.20	.05	14	25.0	27	1.6	11.0	652	506	1,170	211
Dec.	.69	.31	19	25.4	25	5.1	14.7	901	590	1,580	145
	22.16	12.28		66.0		1.1	17.4	12,625	9,364	14,754	4,989
Yearly	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	563	312		1.87		0.03	0.49	15,573	11,550	18,199	6,154

** United States side - average of several stations in the reach ∅ Mean daily

† And other days

RIO GRANDE AT RIO GRANDE CITY, TEXAS
NEAR CAMARGO, TAMAULIPAS

DESCRIPTION: Cableway, bubbler gage, gravity well, water-stage recorders (graphic and digital), and digital transmitter located on the left bank at Fort Ringgold, latitude 26°22'00", longitude 98°48'10", and river mile 235.0 (378.1 km); about 1 mile (1.6 km) downstream from Rio Grande City, Texas, and 3.7 river miles (6.0 km) downstream from Rio San Juan. The zero of the gage is 100.00 feet (30.48 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 12 discharge measurements during the year, and a continuous record of gage heights. Computations by shifting control methods. Records available: January 1955 through 1977. Records prior to 1976 were published under the title "Rio Grande at Fort Ringgold, Rio Grande City, Texas." Records composed of the addition of discharges of the Rio Grande at Roma, Texas and the Rio San Juan at Santa Rosalia, 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 (4.8 km) 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 (64.1 km) upstream. The transmitter relays gage height data to the Harlingen office of the Commission and to the Anzalduas Dam control room via radio. The data is recorded automatically in the Harlingen office.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 220,000 second-feet (6,230 m^3/sec) on September 22 and 23, 1967 with a gage height of 61.40 feet (18.71 m). Min. no flow occurred several days in June and July 1953.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max.	207,000 (5,860)	Sept. 23, 1967	Min.	14.6 (0.41)	April 13, 1957
Monthly:	Max.	49,600 (1,400)	Oct. 1958	Min.	235 (6.66)	March 1957
Yearly:	Max.	9,140 (259)	1958	Min.	1,750 (49.6)	1970

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,240	6,090	2,620	4,400	8,610	11,300	771	3,040	1,110	3,610	1,660	545
2	5,360	6,000	2,110	2,910	8,630	‡ 10,800	743	3,140	2,490	4,350	998	‡ 536
3	6,550	5,920	1,860	2,500	8,610	10,300	848	3,280	3,290	3,960	506	562
4	6,370	5,990	2,900	2,890	8,630	10,200	974	3,530	1,580	3,970	446	568
5	6,410	6,040	2,890	3,350	8,630	10,400	989	4,080	761	3,820	465	1,280
6	6,460	5,950	2,970	3,800	‡ 8,650	10,500	1,010	4,780	488	‡ 3,770	962	1,360
7	6,310	4,700	2,740	3,780	8,510	9,840	1,370	5,140	667	4,030	1,070	1,340
8	5,450	4,410	2,770	‡ 2,800	8,510	9,290	1,830	4,230	1,350	5,220	1,110	1,310
9	4,890	3,780	2,730	3,200	8,630	8,660	1,800	4,350	1,530	4,910	1,050	998
10	3,600	4,780	2,750	3,630	8,570	8,150	1,920	4,300	1,560	4,740	908	917
11	3,480	4,770	2,710	3,350	8,830	6,950	2,350	4,330	1,780	4,160	743	2,930
12	3,580	5,330	2,620	5,210	8,750	6,590	2,350	3,550	1,930	4,360	849	2,980
13	3,620	6,100	2,580	7,650	9,140	3,250	1,940	4,040	1,970	4,150	2,910	1,720
14	4,700	6,080	2,500	8,360	9,430	3,400	1,960	4,090	3,030	3,810	2,900	1,460
15	5,770	5,240	2,500	8,410	9,180	4,000	2,330	3,780	3,090	3,780	2,370	1,260
16	6,170	5,610	2,450	8,410	8,990	3,440	2,070	3,450	‡ 2,050	3,900	1,830	633
17	6,320	5,830	2,420	8,530	8,770	2,870	2,580	3,610	1,680	3,640	1,800	1,470
18	6,390	5,600	2,450	8,530	8,670	2,460	3,170	3,710	1,530	4,220	972	2,190
19	6,090	5,570	2,830	‡ 8,560	8,580	2,900	3,130	4,300	1,680	4,470	1,230	1,880
20	4,970	5,770	3,360	8,630	8,490	2,730	2,790	4,480	1,840	4,490	1,750	2,110
21	4,420	5,430	3,180	8,660	8,420	‡ 3,190	2,590	4,560	2,010	4,460	1,760	1,720
22	2,690	5,150	2,670	8,660	8,400	3,070	2,110	3,840	1,800	4,050	1,230	1,450
23	1,840	4,770	2,430	8,660	9,450	1,680	2,120	4,180	1,840	3,870	515	1,060
24	4,160	5,240	2,420	8,630	13,100	652	2,760	4,740	1,400	2,670	548	1,030
25	5,780	4,320	‡ 2,600	8,610	11,400	382	2,530	4,430	1,640	1,820	690	1,870
26	6,310	4,350	2,620	8,610	9,770	340	2,750	4,250	1,690	927	900	1,970
27	5,980	4,410	2,530	8,530	‡ 11,200	672	2,760	4,420	2,830	1,660	1,530	1,920
28	5,140	3,820	2,600	8,560	11,900	746	2,800	4,980	3,190	1,880	1,570	2,120
29	5,020		2,690	‡ 8,580	11,900	1,280	3,090	4,110	2,880	1,340	1,750	2,400
30	5,310		3,050	8,630	11,800	835	3,520	2,700	2,990	1,890	900	1,840
31	4,930		3,640		‡ 11,700		3,860	1,270		1,860		2,580
Sum	147,050		195,030		150,877		122,690		109,787		48,009	
	159,310		83,190		293,850		67,815		57,676		37,922	

Current Year 1977									Period #1954-1977		
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.	30.84	26.99	6	8,340	24	1,740	5,140	315,987	220,798	416,906	33,043
Feb.	30.75	27.42	14	8,190	28	2,260	5,250	291,669	186,836	376,607	25,500
Mar.	29.54	26.24	31	5,890	24	852	2,680	165,005	139,176	378,000	14,400
Apr.	30.56	26.25	†22	8,710	3	1,150	6,500	386,836	253,925	510,426	75,100
May	33.41	30.42	24	13,800	†21	8,360	9,480	582,843	325,302	582,843	36,702
June	32.06	25.11	1	11,600	26	303	5,030	299,260	283,909	623,778	98,620
July	29.11	25.56	30	5,430	2	577	2,190	134,509	166,957	573,798	22,300
Aug.	29.86	25.76	24	7,040	31	724	3,960	243,352	255,816	1,502,678	25,000
Sept.	28.83	25.23	28	5,070	† 6	438	1,920	114,399	384,718	2,712,754	42,423
Oct.	29.50	25.59	8	6,390	29	694	3,540	217,759	390,111	3,047,000	30,000
Nov.	28.40	25.40	14	4,290	24	324	1,260	75,217	160,749	1,442,000	29,274
Dec.	28.61	25.55	12	4,660	2	428	1,550	95,224	134,828	540,000	36,100
	33.41	25.11		13,800		303	4,040	2,922,060	2,903,125	6,619,700	1,269,259
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	10.18	7.65		391		8.58	114	3,604,361	3,581,005	8,165,400	1,565,631

** Period 1955-1977 ‡ Discharge measurement made on this day † And other days

1954 values are Rio Grande City less arroyo inflow

CONTRIBUTIONS TO THE RIO GRANDE FROM THE LOWER RIO SAN JUAN IRRIGATION DISTRICT RIO GRANDE CITY TO ANZALDUAS DAM

DESCRIPTION: The Lower Rio San Juan Irrigation District in Mexico lies along the Rio Grande between Cd. Aleman and Rio Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gomez Dam situated on the Rio San Juan 12.4 river miles (20 km) upstream from the confluence with the Rio Grande. The Rio San Juan enters the Rio Grande at river mile 238.7 (384.1 km). Drain water from this irrigation district enters the Rio Grande between Falcon Dam and the Rio Grande City Gaging Station through the Rio San Juan channel, Rancherias Drain, and Los Fresnos Drain; and between this station and Anzalduas 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 Rio Grande City Gaging Station is shown below. The portion of water reaching the Rio Grande via channels located upstream from the Rio Grande City Gaging Station is shown on page 63 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 1977, 43, 43, 13, and 12 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 1977, 54 per cent of the drain water from this irrigation district reaching the Rio Grande between the Rio Grande City Gaging Station and Anzalduas Dam was contributed by Morillo Drain. Records available: 1953 through 1977.

REMARKS: In 1977 there were 147,498 irrigable acres (59,691 ha) in the Lower Rio San Juan Irrigation District. Since July 9, 1969 some water has been diverted from Morillo Drain directly to the gulf via the Morillo Drain Diversion Canal to reduce the salinity of Rio Grande waters. In 1977, 35,121 acre-feet (43,321,000 m^3) were diverted.

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.2	15.5	11.7	15.5	156	246	26.1	14.8	16.6	18.0	14.8	15.5
2	16.6	15.2	11.7	15.9	162	249	25.8	14.8	45.2	18.4	14.8	15.5
3	16.6	15.2	11.7	15.5	170	252	25.1	14.8	94.6	18.7	14.5	15.9
4	16.6	15.2	10.9	15.2	178	255	24.7	14.8	54.4	19.4	14.5	15.9
5	16.6	14.8	10.9	14.8	185	257	24.4	15.2	17.7	19.8	14.5	16.2
6	16.6	14.8	10.9	16.6	194	260	24.0	15.9	17.7	19.4	14.5	16.2
7	16.6	14.8	10.9	18.4	201	255	23.3	16.6	18.0	19.4	13.8	16.6
8	16.6	14.5	10.9	19.8	209	250	22.6	17.0	18.0	31.4	13.8	15.9
9	16.6	14.5	11.3	21.5	216	244	21.9	17.3	18.0	33.2	17.7	17.7
10	16.6	13.8	11.3	23.7	214	238	21.2	18.0	18.0	25.1	22.2	14.1
11	16.6	13.8	11.7	25.1	212	232	19.8	17.7	18.4	21.9	21.5	12.7
12	16.2	13.8	11.7	26.8	209	226	19.1	17.7	18.4	18.7	14.5	12.0
13	16.2	13.4	11.7	28.6	207	159	18.4	17.3	18.4	18.4	15.2	10.9
14	16.2	13.4	12.0	28.6	205	110	17.7	17.0	18.4	18.4	15.9	10.2
15	16.2	13.4	12.0	29.0	202	108	17.3	17.0	17.7	18.0	16.2	10.2
16	16.2	14.1	12.4	381	200	90.4	17.3	16.6	17.3	18.0	16.6	10.6
17	16.2	14.1	12.4	188	203	80.5	17.0	16.2	16.6	17.7	17.0	10.6
18	16.2	14.5	12.4	170	207	69.6	17.0	16.2	16.2	17.7	17.0	10.9
19	16.2	14.5	12.7	170	210	64.6	16.6	15.9	15.2	17.7	17.3	10.9
20	16.2	15.2	12.7	171	213	56.9	16.6	15.5	14.8	17.7	17.7	11.3
21	16.6	15.2	13.1	163	216	48.4	16.2	15.5	14.1	17.7	18.0	11.3
22	16.6	14.8	13.1	154	219	57.9	15.9	15.2	13.8	17.7	18.0	10.9
23	16.2	14.1	13.4	146	222	85.8	15.9	14.8	13.1	17.3	18.4	10.9
24	16.2	13.8	14.5	138	225	54.4	15.5	14.8	13.8	17.3	18.0	10.6
25	16.6	13.8	14.8	130	227	42.0	15.5	14.5	14.5	17.0	17.7	10.6
26	16.6	13.1	14.8	135	230	35.7	15.2	14.8	15.2	34.6	17.3	10.2
27	16.6	12.7	15.2	139	232	31.4	15.2	14.8	15.9	34.6	16.2	10.2
28	16.2	12.0	16.2	144	234	29.0	14.8	15.5	23.7	39.9	15.9	9.9
29	16.2		16.6	149	236	26.8	14.8	64.3	68.5	15.9	15.5	10.2
30	16.2		16.2	155	239	26.5	14.8	26.8	17.7	15.9	15.2	10.9
31	15.5		15.9		243		14.8	15.9		15.5		11.3
Sum	507.5	398.0	397.7	2,848.0	6,476	4,140.9	584.5	553.2	699.9	650.4	494.2	386.8

Month	Current Year 1977 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 1954-1977 Acre-Feet Average	Maximum	Minimum
Jan.			† 2	16.6	31	15.5	16.2	1,008	1,895	4,745	466
Feb.			1	15.5	28	12.0	14.1	790	2,992	7,059	509
Mar.			29	16.6	† 4	10.9	12.7	789	2,405	5,291	582
Apr.			16	381	5	14.8	95.0	5,650	3,120	6,111	899
May			31	243	1	156	209	12,849	7,364	30,179	1,557
June			6	260	30	26.5	138	8,212	8,649	85,952	2,027
July			1	26.1	†28	14.8	18.7	1,159	4,852	48,782	1,037
Aug.			29	64.3	25	14.5	17.7	1,098	2,722	13,292	661
Sept.			3	94.6	23	13.1	23.3	1,387	2,533	11,273	665
Oct.			28	39.9	31	15.5	20.8	1,290	3,021	9,831	623
Nov.			10	22.2	† 7	13.8	16.6	980	2,214	10,461	520
Dec.			9	17.7	28	9.9	12.4	769	3,008	34,043	512
				381		9.9	49.8	35,981	44,775	179,482	13,462
Yearly	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
				10.8		0.28	1.41	44,381	55,230	221,389	16,608

∅ Mean daily † And other days

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE, RIO GRANDE CITY TO ANZALDUAS DAM

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1977, 178,387 irrigable acres (72,191 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between the gaging station at Rio Grande City and Anzalduas Dam. Such irrigable area was 24.0% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1977 in this river reach was 259,906 acre-feet (320,594,000 m^3), or 27.6% of the total water diverted from the Rio Grande below Falcon Dam. About 84% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

	Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max. 1,220 (34.6)	June 21, 1960	Min. 0		Occasionally
Monthly:	Max. 1,010 (28.6)	June 1960	Min. 10.3 (0.29)		March 1957
Yearly:	Max. 417 (11.8)	1961	Min. 188 (5.32)		1966

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	77.1	49.7	282	515	210	692	150	828	9.3	267	560	318
2	12.0	83.4	341	268	504	693	93.3	836	44.7	306	523	78.8
3	121	35.9	291	252	526	625	72.4	845	0	504	259	51.1
4	81.5	18.2	330	612	563	354	80.3	835	0	343	76.0	34.3
5	73.7	17.4	198	688	626	324	252	664	39.9	315	77.3	51.4
6	48.4	0	176	687	624	666	314	496	64.1	396	57.8	73.6
7	27.0	81.9	498	632	350	595	380	408	73.5	510	97.9	101
8	22.1	73.3	439	435	231	666	390	845	71.1	350	58.1	133
9	7.7	56.0	462	186	550	552	290	822	77.0	331	73.1	115
10	92.7	2.3	478	133	590	470	258	769	53.3	591	106	86.0
11	67.4	81.2	417	669	545	234	564	680	91.6	677	105	29.0
12	93.5	2.3	177	677	483	231	564	524	153	590	86.1	157
13	16.6	2.3	149	736	435	541	596	320	214	566	63.4	571
14	56.4	73.3	521	675	241	535	579	255	152	522	285	606
15	0	42.5	518	631	218	564	580	627	82.8	350	659	635
16	0	53.3	632	263	575	578	314	686	101	249	760	629
17	67.3	69.6	535	211	522	521	279	702	75.8	639	702	412
18	78.4	112	544	583	451	397	649	688	67.4	694	666	302
19	62.5	45.7	271	573	480	310	648	601	141	702	429	782
20	84.8	30.4	216	539	475	656	695	400	212	787	277	741
21	71.8	127	667	455	243	701	689	314	286	733	722	783
22	31.5	147	782	440	208	595	556	851	285	464	672	750
23	23.5	182	769	186	471	176	293	869	320	341	700	375
24	100	168	668	185	487	57.4	244	882	219	558	411	54.7
25	117	261	490	441	580	1.2	718	834	118	362	416	18.1
26	89.1	155	282	504	547	1.2	798	633	300	420	207	127
27	114	103	213	503	452	51.5	778	451	390	364	204	604
28	151	324	542	491	217	113	764	318	513	274	662	582
29	70.1		584	502	208	102	664	172	347	209	593	611
30	36.5		763	288	313	108	391	127	414	206	570	594
31	121		620		654		346	9.3		520		300
Sum	2,397.7		13,960		12,110.3		18,291.3		14,140		10,705.0	
	2,015.6		13,855		13,579		13,989.0		4,915.5		11,077.7	

Month	Current Year 1977								Period 1957-1977		
	Average Rainfall Inches**		∅ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	1957-1977	1977	Day		Day				Average	Maximum	Minimum
Jan.	1.26	1.49	28	151	†15	0	65.0	3,998	11,540	28,747	2,010
Feb.	1.10	1.38	28	324	6	0	85.6	4,756	12,672	38,599	1,640
Mar.	.65	.04	22	782	13	149	447	27,481	18,859	41,200	637
Apr.	1.41	1.00	13	736	10	133	465	27,689	24,066	42,028	5,760
May	2.21	1.20	31	654	†22	208	438	26,934	23,100	48,400	3,177
June	2.72	3.33	21	701	†25	1.2	404	24,020	24,871	59,900	5,011
July	1.60	.52	26	798	3	72.4	451	27,747	19,944	45,400	6,753
Aug.	2.06	3.81	24	882	31	9.3	590	36,280	20,932	36,280	6,866
Sept.	4.17	3.72	28	513	† 3	0	164	9,750	14,227	35,000	4,136
Oct.	2.63	1.12	20	787	30	206	456	28,046	15,041	30,400	2,830
Nov.	1.03	.20	16	760	6	57.8	369	21,972	13,046	21,972	2,930
Dec.	.85	.01	21	783	25	18.1	345	21,233	11,463	21,233	2,506
Yearly	21.69	17.82		882		0	359	259,906	209,761	302,180	136,460
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	551	453		25.0		0	10.2	320,594	258,740	372,739	168,323

** United States side - average of several stations in the reach ∅ Mean daily
† 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°07'50", longitude 98°20'10", 0.5 canal mile (0.8 km) from the canal intake, and about 5 miles (8 km) northwest of Reynosa, Tamaulipas. The canal intake is immediately upstream from Anzaldas Dam at river mile 170.3 (274.1 km), 102.2 river miles (164.5 km) downstream from Falcon Dam. The zero of the gage is 86.32 feet (26.31 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 40 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1977.

REMARKS: Diversions by this canal are for irrigation and domestic use in Mexico and for conveying water for storage in Culebron, Villa Cardenas, and Palito Blanco Reservoirs about 23 canal miles (37.0 km) downstream from this station. During 1977, 456,502 acres (184,740 ha) 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 (7.2 km), 11.3 miles (18.2 km) and 22.5 miles (36.2 km) below this station. During 1977, there was no water returned to the Rio Grande through Poniente Drain.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 10,950 second-feet (310 m^3/sec) on June 2, 1957 with a gage height of 16.01 feet (4.88 m). Min. no flow occurs frequently.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	9,350 (265)	May 29, 1957	Min.	0	Frequently
Monthly:	Max.	5,090 (144)	April 1972	Min.	0	Several months
Yearly:	Max.	1,980 (56.1)	1959	Min.	150 (4.26)	1952

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	321	353	989	1.4	4,800	1.4	‡ 1,210	1.4	2,300	118	0.7
2	1.4	318	353	1,060	1.4	‡ 5,120	1.4	1,410	1.4	2,400	1.4	0
3	1.4	321	‡ 321	1,060	1.4	5,370	1.4	1,410	1.4	‡ 2,830	1 4	0
4	1.4	321	321	1,050	162	5,690	1.4	1,400	1.4	2,830	1.4	0
5	1.4	321	576	1,050	448	5,860	1.4	1,410	1.4	3,080	1.4	0
6	1.4	321	710	1,060 ‡	‡ 639	5,440	1.4	1,590	1.4	‡ 3,370	0	0
7	1.4	353	706	1,060	893	4,450	194	1,850	1.4	‡ 3,090	0	0
8	1.4	353	706	1,050	1,150	‡ 3,740	353	‡ 2,360	1.4	3,000	0	0
9	1.4	353	826	1,150	1,270	3,600	350	2,540	1.4	3,000	0	0
10	1.4	‡ 353	‡ 925	1,240	1,340	‡ 3,320	353	2,550	1.4	3,180	0	0
11	1.4	353	1,060	1,240	1,410 ‡	3,000	477	‡ 2,540	1.4	‡ 3,320	0	0
12	1.4	353	1,060	1,340	1,400	2,990	576	2,540	1.4	3,150	0	0
13	1.4	353	1,060	1,430	1,590	2,990	572	2,550	1.4	3,000	0	.7
14	1.4	353	989	1,400	1,770	‡ 2,420	576	2,550	1.4	‡ 3,000	0	.7
15	1.4	353	706	1,430	1,750	2,100	‡ 639	2,540	1.4	2,260	.7	.7
16	1.4	353	‡ 703	1,400	1,940	1,880	703	2,550	1.4	2,260	.7	258
17	162	353	703	1,410	2,450	1,590	706	2,370	1.4	‡ 2,100	.7	533
18	353	353	706	618	3,110	1,500	703	‡ 2,360	1.4	2,200	.7	268
19	360	353	706	1.4	3,600 ‡	1,240	706	2,360	1.4	2,370	.7	.7
20	353	353	706	1.4	3,710 ‡	1,240	480	2,480	177	‡ 2,360	.7	.7
21	353	353	703	1.4	4,130	1,240	290	2,490	‡ 544	2,300	.7	.7
22	357	353	703	1.4	4,270	1,240	‡ 321	2,370	‡ 795	2,300	.7	.7
23	258	353	706	1.4	4,910 ‡	731	353	2,370	795	2,020	.7	.7
24	290	353	703	1.4	5,120 ‡	1.4	353	‡ 2,390	883	‡ 1,850	.7	.7
25	321	353	703	1.4	4,410	1.4	360	2,370	1,150	1,940	.7	.7
26	‡ 318	353	706	1.4	4,410 ‡	1.4	480	2,370	‡ 851	1,180	.7	.7
27	321	353	703	1.4	4,450	1.4	607	2,360	353	‡ 639	247	.7
28	318	353	798	1.4	4,240	1.4	706	2,370	1,520	448	353	.7
29	321		883	1.4	3,960	1.4	706	1,580	1,690 ‡	353	353	.7
30	321		‡ 862	1.4	4,060	1.4	703	‡ 671	2,190 ‡	353	128	.7
31	321		893		4,380		989	1.4		350		.7
Sum	9,689		21,053.8		71,560.8		63,912.4		68,833		1,070.9	
	4,749.4		22,559		76,976.2		13,264.4		10,974.6		1,213.0	

Month	Current Year 1977 Average Rainfall **Inches		Ø Extreme Second-Feet High		Low		Average Second-Feet	Total Acre-Feet	Period 1954-1977 Acre-Feet		
	1954-1977	1977	Day		Day				Average	Maximum	Minimum
Jan.	1.24	2.05	19	360	† 1	1.4	153	9,424	98,694	259,799	1,520
Feb.	1.36	1.46	† 7	353	2	318	346	19,228	103,145	251,519	1,086
Mar.	.70	.12	11	1,060	† 3	321	727	44,752	43,885	147,900	1,128
Apr.	1.89	4.65	†13	1,430	†19	1.4	703	41,802	122,162	303,212	23,381
May	2.34	1.02	24	5,120	† 1	1.4	2,480	152,700	188,273	285,477	29,169
June	3.05	5.75	5	5,860	†24	1.4	2,390	141,953	113,872	270,700	14,221
July	1.94	.67	31	989	† 1	1.4	427	26,312	42,471	162,400	5,730
Aug.	2.45	2.09	†10	2,550	31	1.4	2,060	126,680	78,728	236,942	6,709
Sept.	4.85	2.87	30	2,190	† 1	1.4	367	21,760	68,486	165,800	8,708
Oct.	2.92	2.44	6	3,370	31	350	2,220	136,512	56,648	209,590	0
Nov.	1.37	1.69	†28	353	† 6	0	40.6	2,407	13,604	83,690	0
Dec.	1.02	.08	17	533	† 2	0	34.6	2,125	26,488	166,700	651
	25.13	24.89		5,860		0	1,000	725,655	956,456	1,434,920	551,946
Yearly	Millimeters		Cubic Meters per Second						Thousands of Cubic Meters		
	638	632		166		0	28.4	895,085	1,179,777	1,770,162	680,817

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

RIO GRANDE BELOW ANZALDUAS DAM NEAR REYNOSA, TAMAULIPAS AND MISSION, TEXAS

DESCRIPTION: Cableway, gravity well, water-stage recorder, and selsyn-type transmitter, located on the right bank at latitude 26°07'50", longitude 98°19'55", and river mile 169.8 (273.3 km); 0.5 river mile (0.8 km) downstream from Anzalduas Dam about 4.5 miles (7 km) northwest of Reynosa, Tamaulipas, and 10.3 river miles (16.6 km) upstream from the international highway bridge between Hidalgo, Texas and Reynosa, Tamaulipas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 67 discharge measurements during the year, 62 by the Mexican Section and 5 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1977.

REMARKS: Except during local storms, flow at this station is controlled largely by releases from Falcon Reservoir and by diversions into Anzalduas Canal. Excessive upstream flood flows are partly diverted into the United States floodway system inlet at Anzalduas Dam before reaching this station. Prior to January 1, 1968 the zero of the gage was 82.61 feet (25.18 m) above mean sea level, U. S. C. & G. S. datum. The transmitter relays gage height data to the Anzalduas Dam control room.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 131,000 second-feet (3,700 m^3/sec) on September 24, 1967 with a gage height of 30.51 feet (9.30 m). Min. periods of no flow have occurred on several occasions in 1953, 1954, 1956, and 1957.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	121,000 (3,440)	Sept. 25, 1967	Min.	0	Occasionally	
Monthly:	Max.	37,830 (1,070)	Oct. 1958	Min.	5.5 (0.16)	March 1957	
Yearly:	Max.	6,410 (182)	1958	Min.	158 (4.49)	1957	

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,540	4,870	3,110	1,710	8,720	‡ 6,600	770	1,970	2,540	731	1,010	1,410
2	5,690	5,620	‡ 2,100	2,520	8,550	5,690	1,190	1,760	2,860	992	1,070	1,390
3	5,930	‡ 5,720	1,650	1,890	8,330	4,840	1,220	1,680	3,850	‡ 1,010	1,710	1,190
4	6,850	5,830	1,450	1,780	‡ 8,230	4,030	‡ 1,470	1,710	3,570	869	1,560	1,080
5	6,780	5,830	1,240	1,820	7,840	4,030	918	‡ 1,620	‡ 1,750	844	1,330	819
6	6,710	5,900	2,020	‡ 1,660	7,560	‡ 4,840	625	1,440	795	837	1,190	915
7	‡ 6,960	5,510	‡ 1,960	‡ 1,460	7,630	5,830	636	1,540	614	802	953	1,320
8	7,350	4,560	1,780	1,210	7,420	5,720	‡ 795	2,190	‡ 593	742	‡ 1,130	1,370
9	6,500	4,030	1,700	1,240	7,130	5,370	689	‡ 1,720	593	1,060	1,130	1,350
10	5,190	‡ 3,920	‡ 1,530	1,780	6,960	‡ 5,260	975	1,610	664	‡ 1,210	1,140	1,200
11	4,130	4,340	1,410	2,220	6,990	5,440	‡ 1,170	1,580	710	1,210	1,110	1,140
12	3,850	4,660	1,390	2,640	‡ 7,200	4,450	1,200	1,300	685	1,190	922	1,420
13	3,880	5,050	1,740	‡ 3,990	7,130	3,390	1,360	809	1,050	‡ 1,250	840	‡ 936
14	‡ 4,170	5,720	‡ 1,640	‡ 5,440	7,350	1,600	1,350	922	2,260	1,210	855	862
15	5,330	5,690	1,750	‡ 6,290	7,660	‡ 1,470	1,500	‡ 1,210	4,380	1,100	‡ 1,130	773
16	6,220	‡ 5,120	1,560	6,960	7,270	1,480	1,560	1,210	3,600	1,250	1,430	696
17	6,430	5,260	‡ 1,410	7,030	6,600	‡ 1,400	1,710	1,210	2,050	1,410	904	445
18	6,320	5,400	‡ 1,380	7,490	5,790	1,490	‡ 1,740	1,190	1,620	1,400	805	576
19	6,290	5,260	1,910	8,370	‡ 5,090	1,650	1,710	1,220	‡ 1,240	‡ 1,480	614	1,080
20	‡ 6,040	5,300	2,230	‡ 8,300	4,590	1,880	1,670	1,220	‡ 936	1,580	604	1,200
21	4,630	5,260	1,330	8,580	4,060	‡ 1,750	2,000	1,250	869	1,570	1,020	1,250
22	3,780	5,090	1,930	‡ 8,650	3,740	1,250	1,860	1,530	685	1,500	904	1,330
23	2,640	4,660	1,870	8,720	3,640	1,040	1,550	1,480	558	1,070	‡ 611	‡ 1,180
24	‡ 1,970	4,520	‡ 1,770	8,790	‡ 4,800	1,420	1,860	1,520	417	812	417	629
25	3,710	4,520	1,530	8,550	‡ 7,770	989	‡ 1,980	1,510	600	1,010	417	632
26	5,370	4,030	1,420	8,370	6,500	710	1,840	‡ 1,390	‡ 904	‡ 904	417	950
27	6,070	3,960	1,720	‡ 8,330	5,690	‡ 459	1,840	1,150	819	922	516	1,720
28	‡ 5,650	‡ 3,810	‡ 2,200	8,330	7,130	459	1,730	1,390	‡ 752	925	844	1,980
29	4,800		2,060	8,370	‡ 8,260	459	1,640	3,570	809	1,200	893	‡ 2,010
30	4,660		1,830	8,580	8,160	618	1,620	3,470	784	893	929	1,950
31	4,700		1,490		7,240		1,900	‡ 2,310		‡ 1,100		1,590
Sum	164,140	139,440	54,110	161,070	211,030	85,614	44,078	49,681	43,557	34,083	28,405	36,393

Current Year 1977 — Period 1954-1977

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.	90.32	83.01	7	7,630	24	1,200	5,300	325,550	104,051	325,550	1,090
Feb.	89.17	85.17	14	6,600	28	3,040	4,980	276,539	78,985	276,539	830
Mar.	85.89	82.35	1	3,640	10	1,040	1,750	107,393	76,382	235,500	339
Apr.	90.29	81.76	†21	8,860	† 8	742	5,370	319,470	104,890	319,470	3,160
May	90.19	84.38	1	8,760	23	2,780	6,820	418,591	128,333	418,591	35,360
June	88.45	80.97	1	6,920	30	417	2,850	169,790	158,036	368,852	7,850
July	83.46	81.04	†21	2,590	1	459	1,420	87,424	119,718	557,022	2,000
Aug.	87.34	81.14	†29	6,140	14	710	1,600	98,533	152,411	1,207,862	943
Sept.	86.22	80.38	15	5,010	24	247	1,450	86,387	270,919	1,862,856	3,920
Oct.	82.28	80.64	20	1,680	28	554	1,100	67,622	313,994	2,326,000	1,730
Nov.	82.81	80.25	16	2,060	23	350	946	56,387	145,964	1,438,000	1,430
Dec.	83.07	80.18	12	2,510	†24	367	1,180	72,210	104,318	540,100	1,500
Yearly	90.32	80.18		8,860		247	2,880	2,085,896	1,758,001	4,640,968	114,749
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	27.53	24.44		251		7.00	81.6	2,572,923	2,168,471	5,724,004	141,538

‡ 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 with the inlet located at Anzalduas Dam near Mission, Texas.

Floodwater entering the system is measured first at the Banker Floodway Station at Anzalduas Dam near Mission and again 25.2 miles (40.6 km) downstream at the Main Floodway Station on Farm Road No. 88 bridge south of Weslaco. At a point 3 miles (4.8 km) southwest of Mercedes 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. At the point of diversion, a divisor dike which runs longitudinally in the Main Floodway, divides and controls the flows into the Arroyo Colorado Floodway and the North Floodway. The flow of the Arroyo Colorado is measured at El Fuste Siphon south of Mercedes and farther 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 farther downstream at the bridge on U. S. Highway No. 77 near Sebastian.

In 1977, 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 the inlet located 37.1 miles (59.7 km) downstream from Anzalduas Dam and, when necessary, through Anzalduas Canal located at Anzalduas Dam.

Floodwater entering the system through the Retamal Inlet flows into Culebron and Villa Cardenas Lakes through the Retamal Floodway, while flood flows entering the canal at Anzalduas Dam reach these lakes via the Culebron and Retamal Canals from where it flows in a southeastwardly direction via Floodway No. 1 into the Gulf of Mexico.

The Retamal Floodway replaces the previously used floodway system which consisted of Retamal Canal, San Rafael Floodway and Floodway No. 2.

In 1977, no flood flow was diverted through Retamal Floodway or Anzalduas Canal.

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

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1977, 140,407 irrigable acres (56,821 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between Anzalduas Dam and the Progreso International Bridge. Such irrigable area was 18.9% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1977 in this river reach was 201,189 acre-feet (248,167,000 m^3), or 21.4% of the total water diverted from the Rio Grande below Falcon Dam. About 94% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 1,120 (31.7)	June 16 & 17, 1965	Min. 0	Occasionally	
Monthly:	Max. 749 (21.2)	June 1969	Min. 13.3 (0.38)	May 1972	
Yearly:	Max. 333 (9.43)	1961	Min. 167 (4.73)	1970	

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.9	8.1	272	343	26.2	738	84.1	510	14.6	302	220	351
2	3.0	0	356	291	221	738	175	564	0	293	76.7	310
3	137	9.3	350	108	294	731	1.6	511	0	338	150	246
4	34.1	1.2	270	401	361	676	1.6	522	0	425	216	65.0
5	120	15.3	278	457	355	394	314	472	17.6	390	88.5	299
6	31.1	6.7	134	473	334	395	346	331	50.1	394	58.1	350
7	140	36.0	378	446	251	477	378	137	183	406	202	352
8	23.1	31.4	412	406	154	485	490	486	179	394	193	354
9	2.3	30.8	442	312	254	424	468	538	103	192	116	322
10	157	18.7	396	118	190	404	460	496	15.6	416	202	150
11	30.6	35.3	349	386	230	379	596	435	28.2	425	252	73.6
12	36.8	5.4	337	452	368	134	672	455	239	397	206	250
13	22.1	0	130	502	267	330	768	380	248	406	58.6	389
14	113	19.2	475	478	204	354	753	190	122	481	300	374
15	0	18.7	541	377	108	309	765	456	54.1	480	438	365
16	0	10.2	531	83.8	327	330	621	440	158	168	324	361
17	6.1	7.2	556	0	436	356	401	438	32.5	395	372	268
18	13.6	74.2	560	134	431	398	542	516	26.4	476	391	138
19	93.7	246	486	144	397	313	519	573	168	498	296	350
20	109	9.4	242	57.7	398	409	544	512	287	508	100	416
21	113	141	617	33.5	315	498	563	213	282	496	363	424
22	19.8	54.3	587	100	157	400	567	468	290	447	275	451
23	14.8	56.4	596	.8	310	296	383	556	286	215	272	405
24	106	157	571	.8	415	177	281	541	205	279	90.8	103
25	25.6	155	478	36.2	487	94.3	465	520	92.2	240	217	7.4
26	128	39.5	289	129	493	0	557	531	229	176	228	13.9
27	117	34.1	107	131	613	0	612	494	335	112	224	414
28	120	200	418	160	477	0	611	194	333	182	317	517
29	20.1		397	143	254	0	586	334	327	45.3	359	453
30	12.2		357	34.9	588	0	483	321	319	45.3	311	374
31	58.0		349		700		215	268		227		178
Sum	1,420.4		6,738.7		10,239.3		13,402		10,248.6		9,123.9	
	1,820.9		12,261		10,415.2		14,222.3		4,624.3		6,916.7	

Month	Current Year 1977 Average Rainfall Inches**		Ø Extreme Second-Feet High			Low		Average Second-Feet	Total Acre-Feet	Period 1957-1977 Acre-Feet		
	1957-1977	1977	Day			Day				Average	Maximum	Minimum
Jan.	1.41	1.73	10	157		†15	0	58.7	3,612	11,517	34,959	723
Feb.	1.26	1.62	19	246		† 2	0	50.7	2,817	10,139	28,535	1,140
Mar.	.74	.10	21	617		27	107	396	24,319	15,400	36,100	1,050
Apr.	1.55	1.88	13	502		17	0	225	13,366	18,225	39,277	3,630
May	2.50	.98	31	700		1	26.2	336	20,658	21,046	40,683	817
June	2.97	4.96	† 1	738		†26	0	341	20,309	27,167	44,541	5,336
July	1.82	.38	13	768		† 3	1.6	459	28,210	20,920	41,100	6,597
Aug.	2.15	2.63	19	573		7	137	432	26,582	15,580	27,542	7,452
Sept.	4.51	3.50	27	335		† 2	0	154	9,172	11,917	28,000	3,214
Oct.	2.95	1.71	20	508		†29	45.3	331	20,328	13,652	29,215	2,059
Nov.	1.31	1.44	15	438		6	58.1	231	13,719	10,312	22,818	1,015
Dec.	1.04	.20	28	517		25	7.4	294	18,097	9,977	18,097	1,852
Yearly	24.21	21.13		768			0	278	201,189	185,852	241,270	121,008
	Millimeters		Cubic Meters per Second						Thousands of Cubic Meters			
	615	537		21.7			0	7.87	248,167	229,248	297,607	149,263

** United States side - average of several stations in the reach Ø Mean daily

† And other days

RIO GRANDE AT PROGRESO, TAMAULIPAS
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°03'40", longitude 97°57'00", and river mile 123.4 (198.6 km); 0.8 river mile (1.3 km) downstream from the Progreso pumping plant, 2 miles (4 km) south of Progreso, Texas, and 47.0 river miles (75.6 km) downstream from Anzalduas Dam. Meter measurements are made from the bridge. An auxiliary gage well and water-stage recorder located about 300 feet (91 m) 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 56 discharge measurements during the year, 49 by the Mexican Section and 7 by the United States Section of the 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 1977.

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, 151.4 miles (243.7 km) upstream. Excessive upstream flood flows are partly diverted into the United States floodway system inlet at Anzalduas Dam 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 (16.02 m) above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 60,700 second-feet (1,720 m³/sec) on September 26, 1967 with a gage height of 24.84 feet (7.57 m). Min. no flow several days in June, July, and August 1953.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	48,400 (1,370)	Sept. 26, 1967	Min.	0	Frequently 1953
Monthly:	Max.	22,400 (634)	Oct. 1971	Min.	5.1 (0.15)	June 1953
Yearly:	Max.	4,560 (129)	1971	Min.	666 (18.9)	1957

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,900	4,940	‡ 3,710	1,370	8,510	6,220	915	1,670	2,250	544	‡ 992	‡ 650
2	5,900	5,300	2,930	1,720	8,580	5,580	890	1,470	‡ 2,890	530	943	964
3	6,100	5,860	2,050	2,380	‡ 8,230	4,910	1,320	‡ 1,250	3,190	682	1,120	1,060
4	6,600	‡ 5,930	‡ 1,620	1,990	7,950	4,100	1,410	1,240	3,920	‡ 759	1,540	1,040
5	‡ 6,960	5,900	1,440	‡ 1,540	7,770	3,670	‡ 1,330	1,230	3,380	629	1,510	1,060
6	6,920	5,860	1,420	1,440	7,490	4,030	812	1,180	‡ 2,100	530	1,390	692
7	6,890	5,790	1,740	1,380	7,490	4,770	505	1,210	1,330	480	1,260	470
8	7,100	5,370	‡ 1,660	1,250	7,520	5,260	424	1,500	904	463	1,030	784
9	7,170	4,700	1,460	1,080	7,490	‡ 5,230	463	1,610	780	487	‡ 1,020	908
10	6,570	4,130	1,290	1,290	‡ 7,880	5,010	547	‡ 1,310	855	805	1,120	943
11	‡ 5,370	‡ 4,240	1,170	1,880	6,960	5,050	593	‡ 1,250	1,000	848	1,090	1,040
12	4,590	4,480	1,110	‡ 2,090	6,920	5,090	‡ 551	1,240	996	788	999	1,110
13	4,240	4,840	1,060	2,610	6,960	4,380	441	1,060	‡ 830	‡ 784	915	1,160
14	4,200	5,260	996	3,670	7,130	‡ 3,070	551	780	1,060	‡ 823	904	‡ 593
15	4,480	5,690	‡ 1,310	4,480	7,450	1,640	590	773	2,420	742	713	487
16	5,400	5,540	1,330	5,440	7,490	1,300	727	‡ 851	3,990	678	‡ 869	420
17	6,140	‡ 5,400	1,120	6,430	6,850	1,290	1,050	883	3,180	1,000	1,110	353
18	‡ 6,390	5,540	‡ 1,010	‡ 7,270	6,180	1,310	1,310	862	2,270	‡ 968	738	258
19	6,320	5,510	975	‡ 7,700	5,370	1,340	‡ 1,260	752	1,850	883	604	456
20	6,180	5,440	1,400	8,260	4,840	1,490	1,200	689	1,390	936	533	657
21	5,760	5,440	1,940	8,330	4,340	‡ 1,570	1,120	826	1,010	1,050	674	675
22	4,910	5,300	1,550	8,550	3,990	1,460	1,450	1,110	‡ 883	1,090	865	738
23	3,960	5,190	‡ 1,360	8,580	3,960	1,340	1,340	‡ 1,060	756	1,230	773	812
24	3,060	4,730	1,350	8,690	3,570	1,320	1,350	982	646	1,030	‡ 586	819
25	‡ 2,640	4,660	1,310	8,690	‡ 5,160	1,470	1,610	1,010	618	‡ 727	484	706
26	4,270	4,480	1,310	‡ 8,440	6,600	1,360	1,510	1,020	600	816	417	717
27	5,400	4,270	1,500	8,190	5,650	1,070	‡ 1,310	961	‡ 678	805	344	872
28	5,900	4,170	1,760	‡ 8,090	5,370	‡ 791	1,260	890	600	855	371	‡1,180
29	5,620		‡ 1,850	8,090	6,710	780	1,150	1,350	523	897	470	1,350
30	5,160		1,780	8,300	7,450	780	1,090	3,380	505	1,260	551	1,390
31	5,010		1,660		‡ 6,960		1,310	2,830		1,060		1,390
Sum	143,960			149,220		86,681		38,229		25,179		25,754
	171,110		48,171		204,820		31,389		47,404		25,935	

Month	Current Year 1977 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 1954-1977 Acre-Feet Average	Maximum	Minimum
Jan.	64.96	58.33	9	7,240	25	2,250	5,510	339,405	102,912	339,405	17,340
Feb.	63.35	60.63	4	6,000	10	3,960	5,160	285,575	78,824	371,900	12,620
Mar.	60.63	55.97	1	4,060	14	876	1,550	95,563	68,409	379,400	4,990
Apr.	66.27	56.07	24	8,760	† 9	929	4,980	295,990	93,197	295,990	32,060
May	66.11	59.51	1	8,620	24	3,420	6,600	406,193	115,342	406,193	33,164
June	63.71	55.87	1	6,570	†28	780	2,890	171,877	130,649	279,383	50,884
July	57.02	54.79	22	1,750	† 8	424	1,010	62,250	112,745	510,700	16,970
Aug.	60.53	55.25	30	4,130	20	671	1,230	75,859	131,526	900,503	10,400
Sept.	60.56	54.79	16	4,170	30	477	1,580	94,001	213,723	837,532	21,650
Oct.	56.46	54.72	30	1,340	† 8	448	812	49,928	245,377	1,377,161	14,030
Nov.	56.99	54.46	4	1,640	27	343	865	51,452	111,368	735,000	18,000
Dec.	56.56	54.23	30	1,410	18	237	830	51,063	98,501	487,200	7,370
	66.27	54.23		8,760		237	2,730	1,979,156	1,502,573	3,291,271	482,410
Yearly	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	20.20	16.53		248		6.70	77.4	2,441,263	1,853,404	4,059,738	595,062

‡ Discharge measurement made this day

† And other days

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

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1977, 314,037 irrigable acres (127,088 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between the gaging stations at Progreso and near San Benito. Such irrigable area was 42.2% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1977 in this river reach was 363,453 acre-feet (448,319,000 m^3), or 38.6% of the total water diverted from the Rio Grande below Falcon Dam. About 99% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, by open channel rating stations, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

	Average Flow in Second-Feet (Cubic Meters per Second)					
Daily:	Max. 2,750 (77.9)	June 15, 1965	Min. 0		Occasionally	
Monthly:	Max. 2,080 (58.9)	June 1960	Min. 53.5 (1.52)		March 1957	
Yearly:	Max. 726 (20.6)	1965	Min. 367 (10.4)		1968	

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	43.5	287	523	855	216	1,700	208	1,310	111	375	478	319
2	38.2	252	508	683	253	1,830	78.5	1,330	22.1	282	581	450
3	63.8	15.5	517	566	422	1,810	56.4	1,210	234	445	556	509
4	52.3	38.0	380	878	476	1,820	4.4	1,060	127	547	322	399
5	279	62.7	332	1,050	466	1,540	303	1,070	65.1	546	241	465
6	360	17.8	246	1,010	336	1,420	409	946	254	537	250	536
7	276	33.4	536	1,000	154	1,560	316	854	326	460	208	490
8	137	32.4	621	941	122	1,700	95.8	921	278	322	302	450
9	111	32.1	590	564	317	1,860	94.3	1,040	289	136	330	384
10	93.1	40.6	437	355	513	1,850	74.6	1,040	261	558	212	344
11	56.7	33.2	277	764	580	1,500	279	992	94.3	700	80.3	334
12	55.3	52.5	97.2	825	585	956	399	946	87.8	742	81.5	225
13	33.0	17.2	76.4	682	598	479	399	666	151	707	104	408
14	29.3	32.5	479	407	293	594	440	359	296	748	134	427
15	57.8	217	780	247	238	755	435	553	356	639	128	367
16	12.4	296	747	51.3	476	714	526	635	442	543	264	406
17	16.9	237	782	16.0	571	800	728	666	454	770	459	363
18	45.1	47.0	778	112	685	664	918	677	452	799	498	120
19	175	54.6	481	165	1,000	687	1,040	646	540	788	404	403
20	293	17.1	234	186	1,190	976	1,020	693	596	783	248	640
21	218	286	678	251	1,070	1,020	1,030	623	531	718	296	545
22	61.4	395	794	361	808	898	1,100	794	558	817	278	454
23	14.9	390	762	251	818	416	914	891	413	789	314	540
24	32.0	432	763	205	976	23.1	744	854	245	818	272	430
25	31.7	354	741	248	1,100	26.3	1,080	836	117	791	196	234
26	40.8	172	489	226	1,140	0	1,200	798	293	662	61.0	288
27	33.5	135	271	421	1,060	51.5	1,260	706	399	800	25.8	590
28	41.9	385	613	493	1,010	66.8	1,250	524	360	668	286	696
29	76.8		850	404	942	52.0	1,110	779	443	473	466	534
30	11.3		929	233	936	221	904	861	424	321	496	761
31	206		865		1,350		883	563		345		895
Sum	4,364.6		14,450.3		27,989.7		25,843		18,629		14,006	
	2,990.7	17,176.6		20,701		19,299.0		9,219.3		8,571.6		

Month	Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1957-1977 Acre-Feet		
			High		Low						
	1957-1977	1977	Day		Day				Average	Maximum	Minimum
			Current Year 1977								
Jan.	1.56	1.97	6	360	30	11.3	96.5	5,932	37,441	97,130	4,872
Feb.	1.55	1.40	24	432	3	15.5	156	8,657	21,379	49,859	4,807
Mar.	.80	.14	30	929	13	76.4	554	34,069	24,895	54,200	3,280
Apr.	1.65	3.11	5	1,050	17	16.0	482	28,662	42,854	98,523	12,900
May	2.87	1.15	31	1,350	8	122	668	41,060	49,843	84,827	9,277
June	3.42	6.62	9	1,860	26	0	933	55,517	69,445	123,000	14,674
July	2.06	.70	27	1,260	4	4.4	623	38,279	36,982	77,132	11,307
Aug.	2.68	.45	2	1,330	14	359	834	51,259	28,069	64,223	12,736
Sept.	5.36	3.56	20	596	2	22.1	307	18,286	22,864	59,400	4,308
Oct.	3.26	2.00	24	818	9	136	601	36,950	22,560	58,164	5,146
Nov.	1.67	2.60	2	581	27	25.8	286	17,002	18,875	44,359	4,853
Dec.	1.23	.26	31	895	18	120	452	27,780	21,482	37,500	6,663
Yearly	28.11	23.96		1,860		0	502	363,453	396,689	525,771	266,680
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	714	609		52.7		0	14.2	448,319	489,316	648,539	328,950

** United States side - average of several stations in the reach Ø Mean daily

RIO GRANDE NEAR SAN BENITO, TEXAS
AND RAMIREZ, TAMAULIPAS

DESCRIPTION: Cableway, concrete control weir, bubbler gage, water-stage recorders (graphic and digital), and digital transmitter, located on the left bank at latitude 26°01'50", longitude 97°43'40", and river mile 96.8 (155.8 km), 3.9 river miles (6.3 km) downstream from San Benito pumping plant and about 9.5 miles (15.3 km) southwest of San Benito, Texas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 24 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 1977.

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, 178.0 river miles (286.4 km) 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 radio to the Texas Department of Water Resources office in Weslaco. 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 (708 m^3/sec) on September 29, 1967 with a gage height of 61.05 feet (18.61 m). Min. no flow occurs frequently.

Average Flow in Second-Feet (Cubic Meters per Second)**

Daily:	Max. 24,800 (702)	Sept. 29, 1967	Min. 0		Frequently
Monthly:	Max. 14,300 (405)	Oct. 1971	Min. 39.5 (1.12)		December 1956
Yearly:	Max. 3,780 (107)	1976	Min. 200 (5.66)		1956

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,650	4,590	3,360	502	7,870	4,540	503	382	1,930	116	510	206
2	5,620	4,660	2,810	469	8,020	3,850	698	270	2,210	191	372	442
3	‡5,680	5,250	2,010	1,160	7,820	‡ 3,210	1,120	159	2,650	232	428	501
4	5,850	‡5,710	1,470	1,070	7,460	2,510	1,490	153	3,080	242	‡ 873	549
5	6,350	5,730	1,250	533	7,210	2,060	1,420	‡ 221	3,340	185	1,210	‡547
6	6,450	5,660	1,030	401	6,980	2,430	710	228	2,170	‡ 129	1,080	432
7	6,410	5,630	‡1,200	‡ 438	6,910	2,760	381	307	1,090	87.3	969	179
8	6,550	5,490	1,220	410	6,950	3,310	‡ 292	416	602	79.0	899	124
9	6,800	4,900	979	513	‡ 6,870	3,230	331	523	‡ 461	197	600	411
10	6,550	4,370	906	783	6,540	3,080	343	382	454	270	714	510
11	5,670	4,120	911	1,170	6,180	3,150	303	269	602	200	908	558
12	4,680	4,260	1,010	1,140	6,040	3,690	240	271	663	158	848	566
13	4,120	4,470	1,040	1,620	6,070	3,980	251	306	563	112	758	643
14	4,000	4,760	1,080	2,820	6,260	2,990	193	403	528	119	691	315
15	4,060	5,140	652	4,110	6,580	1,510	223	309	1,060	102	569	161
16	4,590	‡5,100	540	5,070	6,790	‡ 717	254	210	2,790	139	486	124
17	5,410	4,800	483	6,060	6,370	613	273	200	2,910	‡ 133	599	85.1
18	5,860	4,930	‡ 341	6,470	5,640	639	‡ 376	‡ 207	1,840	173	‡ 426	107
19	5,910	5,070	311	‡ 6,810	4,590	620	323	197	1,270	164	221	‡128
20	‡5,670	5,000	606	7,430	‡ 3,640	558	252	167	848	145	283	86.2
21	5,420	4,990	945	7,730	3,270	555	232	125	490	183	274	75.1
22	4,830	4,710	633	7,830	3,080	635	176	225	‡ 321	238	491	89.0
23	4,190	4,560	516	7,910	3,000	829	406	236	303	305	415	182
24	3,350	4,330	500	8,050	2,720	1,130	450	173	290	335	372	264
25	2,630	4,010	516	8,110	2,930	1,240	519	157	433	216	250	410
26	3,390	4,160	510	7,980	4,820	1,300	427	181	368	117	385	336
27	4,560	3,980	705	7,770	4,810	1,090	244	232	272	115	364	283
28	5,320	3,770	787	7,550	4,010	761	130	292	288	98.7	306	195
29	5,420		696	7,460	4,750	624	100	353	195	121	172	456
30	5,070		575	7,640	6,020	595	115	1,380	130	528	138	440
31	4,770		623		5,800		271	2,460		580		348
Sum	160,830	134,150	30,215	127,009	176,000	58,206	13,046	11,394	34,151	6,010.0	16,611	9,752.4

Month	Current Year 1977 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 1954-1977 Acre-Feet Average	Maximum	Minimum
Jan.	48.68	40.06	9	6,860	25	2,480	5,190	319,002	56,302	319,002	2,920
Feb.	46.77	42.74	† 4	5,820	28	3,650	4,790	266,083	51,811	363,000	3,380
Mar.	42.74	34.82	1	3,650	19	264	975	59,931	38,891	360,000	2,560
Apr.	49.80	35.02	25	8,140	6	368	4,230	251,919	46,084	251,919	11,500
May	49.89	40.34	2	8,060	†24	2,410	5,680	349,091	58,077	349,091	16,873
June	46.20	35.34	1	5,100	30	518	1,940	115,450	55,500	159,560	16,100
July	37.58	34.34	5	1,570	29	91.5	421	25,876	74,541	447,886	4,690
Aug.	41.16	34.44	31	2,800	21	114	368	22,600	99,227	827,107	3,100
Sept.	43.06	34.44	5	3,590	30	108	1,140	67,738	164,431	638,757	7,710
Oct.	35.70	34.29	30	671	8	68.9	194	11,921	193,990	880,859	3,840
Nov.	36.63	34.48	5	1,230	30	126	554	32,947	87,889	662,000	5,640
Dec.	35.92	34.30	13	724	21	67.8	315	19,344	74,971	479,000	2,430
Yearly	49.89	34.29		8,140		67.8	2,130	1,541,902	1,001,714	2,743,424	145,520
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
	15.21	10.45		231		1.92	60.3	1,901,936	1,235,614	3,384,014	179,499

** Period 1954-1977 ‡ Discharge measurement made on this day † And other days

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

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1977, 100,191 irrigable acres (40,546 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between the gaging stations near San Benito and Brownsville. Such irrigable area was 13.5% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1977 in this river reach was 102,778 acre-feet (126,777,000 m^3), or 10.9% of total water diverted from the Rio Grande below Falcon Dam. About 89% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, by open channel rating stations, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 782 (22.1)	June 14, 1963	Min. 0		Occasionally
Monthly:	Max. 542 (15.3)	June 1965	Min. 18.5 (0.52)		February 1966
Yearly:	Max. 223 (6.32)	1965	Min. 102 (2.89)		1968

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30.0	30.0	186	255	33.7	392	30.0	91.3	15.6	55.1	311	70.5
2	30.0	30.0	297	52.5	130	284	30.0	304	16.0	39.7	317	52.4
3	30.0	30.0	235	89.9	167	370	30.0	259	30.5	188	257	67.0
4	30.0	30.0	72.5	261	175	375	30.0	218	30.0	166	138	64.3
5	30.0	30.0	86.4	365	185	404	204	201	30.0	206	100	156
6	30.0	30.0	72.6	402	320	416	242	248	73.9	186	69.9	157
7	30.0	30.0	93.2	383	65.1	398	247	235	190	113	198	150
8	30.0	30.0	106	226	62.6	414	134	299	172	126	115	121
9	30.0	30.0	101	126	62.1	474	89.8	342	189	77.9	78.9	98.0
10	73.8	30.0	157	124	70.7	505	61.9	358	95.5	207	153	60.7
11	81.7	30.0	128	299	69.2	488	51.8	350	34.8	252	150	37.3
12	76.9	30.0	66.1	364	68.2	395	272	299	148	246	65.4	58.6
13	83.2	30.0	70.5	402	67.2	164	201	218	157	204	53.7	102
14	84.2	30.0	223	301	68.0	165	95.1	185	30.5	106	67.3	121
15	30.0	30.0	244	191	68.3	241	129	259	132	121	44.3	153
16	30.0	30.0	270	55.6	68.7	307	95.8	243	132	123	55.5	139
17	130	30.0	219	48.9	74.8	347	86.3	237	31.5	194	50.3	89.7
18	180	30.0	141	46.2	102	157	94.1	200	31.5	184	51.6	38.4
19	180	30.0	34.7	43.0	79.9	134	92.2	193	153	192	58.7	129
20	180	30.0	34.0	20.0	67.8	191	192	74.2	232	145	51.7	166
21	144	30.0	227	12.5	66.4	282	282	53.7	141	178	48.4	123
22	30.0	206	322	7.5	66.4	219	280	207	139	96.1	32.6	45.3
23	30.0	253	285	7.9	63.7	19.6	292	217	165	101	138	90.9
24	30.0	270	274	7.3	117	12.6	367	282	120	179	29.7	152
25	30.0	188	190	12.3	231	23.7	214	202	79.1	233	88.8	46.4
26	30.7	72.9	95.3	20.0	330	18.9	196	145	181	262	26.4	144
27	33.4	34.0	82.5	20.0	454	19.1	278	105	197	154	26.5	274
28	30.0	50.0	243	20.0	366	21.0	275	60.9	170	125	108	325
29	30.0		308	29.9	119	16.6	151	75.0	176	95.0	118	258
30	30.0		294	34.1	336	9.4	118	57.8	109	88.5	129	375
31	30.0		353		401		72.0	38.9		220		257
Sum	1,703.9		4,226.6		7,262.9		6,257.8		4,863.3		4,121.5	
	1,847.9		5,510.8		4,555.8		4,933.0		3,401.9		3,131.7	

Month	Current Year 1977								Period 1957-1977		
	Average Rainfall Inches**		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	1957-1977	1977	Day		Day				Average	Maximum	Minimum
Jan.	1.71	1.54	†18	180	† 1	30.0	59.6	3,665	11,087	24,568	1,290
Feb.	1.79	1.72	24	270	† 1	30.0	60.9	3,380	7,544	20,626	1,028
Mar.	.66	.11	31	353	20	34.0	178	10,931	7,063	15,200	705
Apr.	1.79	4.84	† 6	402	24	7.3	141	8,383	11,507	27,753	2,180
May	2.74	1.00	27	454	1	33.7	147	9,036	14,466	27,670	2,561
June	3.44	5.27	10	505	30	9.4	242	14,406	18,024	32,279	6,690
July	1.95	1.15	24	367	† 1	30.0	159	9,784	10,614	23,145	3,687
Aug.	2.90	1.12	10	358	31	38.9	202	12,412	8,315	14,556	4,061
Sept.	5.56	2.53	20	232	1	15.6	113	6,748	5,760	12,600	876
Oct.	3.25	1.89	26	262	2	39.7	157	9,646	5,765	11,300	1,591
Nov.	1.60	2.77	2	317	26	26.4	104	6,212	4,694	9,021	1,796
Dec.	1.40	.16	30	375	11	37.3	133	8,175	6,055	11,200	2,014
Yearly	28.79	24.10		505		7.3	142	102,778	110,894	161,503	73,788
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	731	612		14.3		0.21	4.02	126,777	136,788	199,214	91,018

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

RIO GRANDE NEAR BROWNSVILLE, TEXAS AND MATAMOROS, TAMAULIPAS

DESCRIPTION: Cableway, bubbler gage, and water-stage recorders (graphic and digital) located on the left bank at latitude 25°52'35", longitude 97°27'20", and river mile 48.7 (78.3 km), 0.2 river mile (0.3 km) downstream from El Jardin pumping plant, and 7.0 river miles (11.2 km) downstream from the international highway bridge (Gateway) between Brownsville, Texas and Matamoros, Tamaulipas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 24 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1934 through 1977.

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, 226.1 river miles (363.9 km) 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 (898 m^3/sec) on October 8, 1945 with a gage height of 31.48 feet (9.60 m). Min no flow occurs frequently.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	30,800 (872)	Sept. 14, 1942; October 8, 1945	Min. 0	Frequently
Monthly:	23,200 (657)	October 1941	Min. 0	June, July 1953
Yearly:	9,010 (255)	1941	Min. 42.1 (1.19)	1956

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5,920	4,940	3,520	517	7,490	5,050	784	151	2,120	115	341	126
2	5,690	4,740	2,990	566	7,650	4,210	652	204	2,060	110	270	141
3	‡ 5,640	‡ 4,850	2,380	659	7,640	‡ 3,530	754	151	2,280	117	‡ 163	320
4	5,700	5,270	‡ 1,800	1,130	7,320	2,850	1,040	‡ 68.2	2,500	130	151	453
5	6,010	5,620	1,460	912	‡ 7,000	2,130	1,240	47.9	2,970	127	586	‡ 500
6	6,350	5,760	1,260	429	6,780	1,850	1,190	52.7	2,920	‡ 141	961	457
7	6,460	5,790	1,090	‡ 191	6,650	2,060	‡ 680	57.8	1,900	116	891	353
8	6,540	5,710	1,190	167	7,170	2,410	392	92.5	1,080	99.5	776	173
9	6,770	5,530	1,190	229	6,790	2,770	335	129	‡ 640	87.4	727	114
10	6,870	5,030	1,040	299	6,620	2,680	383	206	461	87.0	529	233
11	6,450	4,550	955	448	6,260	2,570	360	170	454	116	557	448
12	5,620	4,290	1,000	533	5,980	2,780	316	94.1	554	82.7	757	539
13	4,870	4,350	1,110	511	5,870	3,500	141	90.1	623	56.4	770	576
14	4,480	‡ 4,570	1,130	949	5,940	3,590	183	143	569	63.1	702	602
15	4,360	4,870	1,030	2,130	6,180	2,620	199	230	536	46.8	665	333
16	4,470	5,140	693	3,540	6,540	‡ 1,340	187	176	1,250	49.8	583	140
17	4,950	5,060	519	4,590	6,540	720	230	105	2,540	‡ 80.8	‡ 519	91.2
18	5,400	4,900	‡ 496	5,450	6,070	740	‡ 259	‡ 78.1	2,480	79.9	571	81.6
19	5,830	4,980	470	5,880	‡ 5,350	777	316	74.8	1,690	66.6	454	82.7
20	‡ 5,880	5,010	449	6,450	4,460	732	299	111	‡ 1,130	63.8	311	81.2
21	5,740	5,000	686	7,130	3,740	543	163	141	854	51.0	314	62.5
22	5,580	4,850	850	7,420	3,320	517	110	104	524	31.5	392	48.7
23	5,110	4,530	624	7,530	3,090	936	85.0	62.9	324	146	444	‡ 48.8
24	4,440	4,300	460	7,700	2,980	1,110	94.7	67.5	269	218	397	60.3
25	3,640	3,980	408	7,860	2,600	1,220	160	47.6	310	164	387	113
26	3,130	3,910	522	‡ 7,860	3,150	1,340	398	30.4	326	101	298	262
27	3,890	3,940	589	7,720	4,160	1,360	291	61.2	268	65.7	361	184
28	4,780	3,790	823	7,430	4,070	1,200	145	129	175	34.9	365	89.8
29	5,370		764	7,240	3,950	968	90.3	190	150	28.5	260	52.3
30	5,400		682	7,240	4,690	871	75.4	275	131	57.6	189	85.1
31	5,170		548		5,420		98.1	1,620		294		173
Sum	166,510	135,260	32,728	110,710	171,470	58,974	11,650.5	5,160.8	34,088	3,028.0	14,691	7,024.2

Month	Current Year 1977								Period 1954-1977		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	20.96	13.35	10	6,910	26	3,040	5,370	330,268	45,647	330,268	283
Feb.	19.24	15.72	6	5,810	28	3,690	4,830	268,284	46,078	362,000	1,060
Mar.	15.72	5.46	1	3,690	25	396	1,060	64,915	33,431	361,000	2,050
Apr.	22.79	4.23	25	7,930	8	160	3,690	219,590	33,138	219,590	875
May	22.69	13.05	3	7,740	25	2,400	5,530	340,106	42,243	340,106	4,140
June	19.35	6.59	1	5,400	22	485	1,970	116,973	36,348	143,517	2,430
July	9.76	4.31	5	1,290	30	69.8	376	23,108	64,803	437,546	1,120
Aug.	12.31	3.94	31	2,240	26	28.0	166	10,236	89,482	812.033	218
Sept.	14.69	4.73	† 5	3,150	30	124	1,140	67,613	148,798	635,722	950
Oct.	6.28	3.50	31	426	29	25.5	97.7	6,006	180,573	887,207	756
Nov.	8.33	4.48	6	999	4	124	490	29,139	82,433	528,000	1,290
Dec.	7.26	3.64	14	671	23	46.1	227	13,932	72,246	480,000	524
Yearly	22.79	3.50		7,930		25.5	2,060	1,490,170	875,220	2,645,434	30,596
	Meters		Cubic Meters per Second					Thousands of Cubic Meters			
	6.95	1.07		225		0.72	58.3	1,838,125	1,079,584	3,263,143	37,740

‡ Discharge measurement made on this day † And other days

DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE, BROWNSVILLE TO THE GULF OF MEXICO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1977, 4,212 irrigable acres (1,705 ha) were allotted Rio Grande water in the river reach between the gaging station near Brownsville and the mouth of the Rio Grande. Such irrigable area was 0.6% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1977 in this river reach was 692.3 acre-feet (854,000 m^3), or 0.1% of the total water diverted from the Rio Grande below Falcon Dam. All records of diversions in this river reach, which were determined by means of flow meters, were furnished by the Rio Grande Watermaster. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 40.4 (1.14)	June 17, 1965	Min. 0		Frequently
Monthly:	Max. 23.4 (0.66)	June 1965	Min. 0		Occasionally
Yearly:	Max. 7.0 (0.20)	1965	Min. 0.7 (0.02)		1976

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	2.7	0	0.9	0	1.0	0	0
2	0	0	0	0	0	2.7	0	.9	0	1.0	0	0
3	0	0	0	14.0	0	7.3	0	3.3	0	3.2	3.2	0
4	0	0	0	15.5	0	4.6	0	3.3	0	4.9	3.2	0
5	0	0	0	15.5	0	4.6	0	3.3	0	4.9	3.2	0
6	0	0	0	5.9	0	3.9	0	3.3	0	1.8	0	0
7	0	0	0	5.9	0	4.5	0	0	2.7	0	0	0
8	0	0	0	1.2	0	6.1	0	1.3	2.7	0	0	0
9	0	0	0	0	0	6.4	0	1.3	2.7	0	0	0
10	0	0	0	0	0	6.9	0	1.3	2.7	0	0	0
11	0	0	0	0	0	3.4	2.1	1.3	0	3.7	0	0
12	0	0	0	0	0	3.4	2.1	1.3	0	0	0	4.1
13	0	0	0	0	0	2.0	2.1	0	0	3.7	0	4.1
14	0	0	0	0	0	2.0	0	0	0	3.7	0	0
15	0	0	0	.6	0	6.3	0	1.3	0	3.7	0	0
16	0	0	0	.6	0	10.1	0	1.3	0	0	0	0
17	0	0	0	.6	0	10.1	0	0	0	0	0	0
18	0	0	0	.6	0	8.1	1.3	0	0	0	0	0
19	0	0	0	0	0	8.1	1.3	0	0	0	0	0
20	0	0	0	0	0	8.1	1.3	0	0	0	0	0
21	0	0	0	0	0	4.4	0	0	0	0	0	0
22	0	0	0	0	0	4.4	0	2.5	2.4	0	2.1	0
23	0	0	0	0	0	4.4	0	2.5	2.4	0	4.6	0
24	0	0	0	0	0	0	0	2.5	2.4	0	4.6	0
25	0	0	0	0	0	0	0	0	2.4	0	3.8	0
26	0	0	2.2	0	.9	0	0	0	0	0	0	3.9
27	0	0	2.2	0	.9	0	0	0	1.0	0	0	3.9
28	0	0	2.2	0	.9	0	0	0	1.0	0	0	5.1
29	0		0	0	0	0	0	0	1.0	0	0	5.1
30	0		0	0	0	0	0	.9	1.0	0	0	1.2
31	0		0		2.7		0	0		0		1.2
Sum	0	0	6.6	60.4	5.4	124.5	10.2	32.5	24.4	31.6	24.7	28.6

Month	Average Rainfall Inches**		Current Year 1977 ∅ Extreme Second-Feet High		Low		Average Second-Feet	Total Acre-Feet	Period 1957-1977 Acre-Feet		
	1957-1977	1977	Day		Day				Average	Maximum	Minimum
Jan.	1.73	1.24		0		0	0	0	414	1,275	0
Feb.	1.88	1.92		0		0	0	0	229	668	0
Mar.	.64	.08	†26	2.2	† 1	0	.2	13.1	145	634	0
Apr.	1.94	7.01	† 4	15.5	† 1	0	2.0	120	234	953	0
May	2.63	.73	31	2.7	† 1	0	.2	10.7	359	1,356	0
June	3.17	4.60	†16	10.1	†24	0	4.2	247	430	1,393	9.7
July	1.79	.09	†11	2.1	† 1	0	.3	20.2	178	778	0
Aug.	2.77	1.46	† 3	3.3	† 7	0	1.0	64.5	121	317	13.7
Sept.	5.48	2.27	† 7	2.7	† 1	0	.8	48.4	55.7	190	0
Oct.	3.16	2.02	† 4	4.9	† 7	0	1.0	62.7	58.6	218	0
Nov.	1.61	2.85	†23	4.6	† 1	0	.8	49.0	69.1	252	0
Dec.	1.45	.10	†28	5.1	† 1	0	.9	56.7	81.7	335	0
Yearly	28.25	24.37		15.5		0	1.0	692.3	2,375.1	5,036.3	543.2
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	718	619		0.44		0	0.03	854	2,930	6,212	670

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

DIVERSIONS FROM THE RIO GRANDE

UNITED STATES SIDE, FALCON DAM TO THE GULF OF MEXICO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

In 1977, 743,159 irrigable acres (300,749 ha), several towns, and many rural homes were allotted Rio Grande water between Falcon Dam and the Gulf of Mexico. The total diversion from the river was 940,674 acre-feet (1,160,321,000 m^3). About 91% of the water diverted was determined through records of discharge obtained by means of flow meters, by open channel rating stations, and by deflection meters developed by the Commission. The records for the balance of the diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. Drainage from more than 90% of this area does not return to the Rio Grande, but some of it is reused within 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 in 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 in 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.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max.	5,380 (152)	June 20 & 21,	1960	Min.	3.5 (0.10)	Oct. 31, 1976
Monthly:	Max.	4,350 (123)	June	1960	Min.	102 (2.89)	March 1957
Yearly:	Max.	1,590 (45.0)		1965	Min.	880 (24.9)	1970

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	180	378	1,290	1,990	507	3,550	480	2,750	154	1,020	1,590	1,070
2	85.3	368	1,520	1,310	1,130	3,580	390	3,050	86.9	941	1,510	900
3	363	93.0	1,420	1,060	1,440	3,570	170	2,840	268	1,500	1,240	891
4	204	89.7	1,080	2,220	1,600	3,250	126	2,660	159	1,510	768	572
5	505	130	923	2,620	1,660	2,680	1,080	2,430	154	1,480	520	992
6	472	59.1	651	2,620	1,640	2,930	1,320	2,050	443	1,540	446	1,130
7	480	189	1,530	2,520	845	3,060	1,330	1,650	778	1,520	722	1,120
8	224	177	1,600	2,050	592	3,290	1,120	2,570	705	1,220	683	1,080
9	159	153	1,620	1,230	1,210	3,340	957	2,760	668	757	617	944
10	437	93.6	1,480	768	1,380	3,260	862	2,680	438	1,800	680	662
11	257	182	1,200	2,160	1,430	2,620	1,500	2,470	257	2,090	607	485
12	281	93.9	697	2,350	1,510	1,730	1,920	2,260	636	2,000	457	702
13	161	52.0	443	2,370	1,370	1,520	1,980	1,610	787	1,940	291	1,480
14	289	167	1,720	1,910	814	1,660	1,880	1,010	616	1,930	811	1,540
15	95.9	323	2,110	1,490	646	1,890	1,920	1,930	637	1,660	1,280	1,530
16	46.2	408	2,210	488	1,460	1,950	1,580	2,040	843	1,130	1,410	1,550
17	230	359	2,120	306	1,620	2,040	1,500	2,080	606	2,050	1,590	1,160
18	326	235	2,050	908	1,690	1,630	2,220	2,110	582	2,190	1,610	614
19	520	398	1,290	954	1,970	1,450	2,310	2,050	1,010	2,210	1,190	1,690
20	688	108	740	836	2,150	2,250	2,460	1,700	1,340	2,250	680	1,980
21	563	617	2,210	795	1,710	2,510	2,580	1,230	1,250	2,140	1,440	1,890
22	156	847	2,500	959	1,240	2,120	2,520	2,350	1,290	1,840	1,270	1,710
23	92.7	920	2,430	477	1,670	913	1,900	2,560	1,200	1,450	1,440	1,420
24	288	1,060	2,300	422	2,000	271	1,640	2,580	812	1,840	818	747
25	214	1,010	1,930	786	2,410	147	2,480	2,420	417	1,630	936	311
26	307	480	1,170	911	2,540	24.4	2,760	2,130	1,020	1,540	529	586
27	318	337	692	1,110	2,600	126	2,940	1,780	1,330	1,440	482	1,900
28	366	994	1,840	1,190	2,100	205	2,910	1,110	1,380	1,260	1,380	2,140
29	216		2,160	1,100	1,540	177	2,520	1,370	1,300	826	1,540	1,880
30	112		2,360	617	2,200	346	1,900	1,370	1,280	665	1,510	2,130
31	436		2,210		3,130		1,520	883		1,320		1,650
Sum	10,371.3			40,527		58,089.4		64,483		48,689		38,456
	9,072.1		49,496		49,804		52,775		22,446.9		30,047	

Month	Average Rainfall Inches**		Current Year 1977 ∅ Extreme Second-Feet High		Low		Average Second-Feet	Total Acre-Feet	Period 1957-1977 Acre-Feet		
	1957-1977	1977	Day		Day				Average	Maximum	Minimum
Jan.	1.39	1.62	20	688	16	46.2	293	17,994	72,647	182,403	9,717
Feb.	1.35	1.39	24	1,060	13	52.0	370	20,571	52,761	126,230	11,785
Mar.	.68	.08	22	2,500	13	443	1,600	98,174	67,380	149,000	6,280
Apr.	1.55	2.13	† 5	2,620	17	306	1,350	80,384	97,944	209,970	25,100
May	2.47	1.12	31	3,130	1	507	1,610	98,785	109,874	190,532	16,071
June	3.02	4.11	2	3,580	26	24.4	1,940	115,219	141,052	259,000	31,931
July	1.75	.60	27	2,940	4	126	1,700	104,678	89,377	178,000	31,502
Aug.	2.40	2.37	2	3,050	31	883	2,080	127,900	73,710	143,286	36,208
Sept.	4.84	3.50	28	1,380	2	86.9	748	44,523	55,313	136,000	12,709
Oct.	2.88	1.46	20	2,250	30	665	1,570	96,573	57,795	124,598	12,991
Nov.	1.32	1.24	18	1,610	13	291	1,000	59,597	47,497	97,969	12,674
Dec.	1.04	.14	28	2,140	25	311	1,240	76,276	49,656	84,500	14,034
Yearly	24.69	19.76		3,580		24.4	1,300	940,674	915,006	1,153,049	636,835
	Millimeters		Cubic Meters per Second					Thousands of Cubic Meters			
	627	502		101		0.69	36.8	1,160,321	1,128,660	1,422,286	785,536

∅ 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 and Ascarate Sewage Plants, located 7.1 and 8.7 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 17.6 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
1977	2,249	1,928	2,126	2,160	2,371	2,056	2,120	2,127	1,737	1,668	1,588	1,564	23,694
* Average	1,796	1,673	1,805	1,825	1,942	1,887	2,035	2,028	1,907	1,876	1,736	1,786	22,296

EAGLE PASS SEWAGE OUTFALL

This sewage outfall enters the Rio Grande at river mile 495.8 and about 600 feet upstream from the Eagle Pass-Piedras Negras International Railroad Bridge. The records are based on weekly current meter measurements and estimates by personnel of the International Boundary and Water Commission.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1977	117	103	125	101	116	198	184	215	256	244	207	195	2,061
* Average	76.2	68.2	76.0	65.8	72.4	79.5	80.6	93.7	85.7	92.3	95.4	88.9	974.7

LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande at river mile 360.0 and immediately upstream from the Nuevo Laredo Gaging Station. The record is furnished by the Laredo Waterworks System.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1977	630	419	478	514	628	624	706	737	701	685	711	740	7,573
* Average	520	472	547	549	608	562	571	568	511	504	565	552	6,529

NUEVO LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande at river mile 358.7 and 357.7, 2.2 and 3.2 miles downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The records are computed by the International Boundary and Water Commission based on current meter measurements, the weir discharge table, and a continuous record of gage heights.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1977	1,163	996	881	910	1,167	893	984	908	809	1,057	1,061	966	11,795
# Average	944	788	838	859	1,104	893	853	671	802	1,020	1,046	1,137	10,955

BROWNSVILLE SEWAGE OUTFALL

This sewage outfall enters the Rio Grande at river mile 52.2, 3.5 river miles downstream from the Gateway Bridge between Brownsville, Texas and Matamoros, Tamaulipas and 3.5 river miles upstream from the Brownsville Gaging Station. Records are furnished by the City of Brownsville.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1977	893	856	793	816	782	819	862	824	821	821	772	740	9,799
* Average	549	534	558	535	560	562	586	579	573	590	551	553	6,730

* Period averages are for past 10 years # Period 1976-1977

MUNICIPAL AND INDUSTRIAL WATER USES
In Acre-Feet

Tabulated below are monthly and yearly amounts of water pumped from the Rio Grande directly into municipal distribution systems of cities along the border, except for the city of Del Rio, whose total supply is derived from San Felipe Springs; and the city of El Paso, whose supply is derived mainly from deep wells. The amount shown below for the city of El Paso is Rio Grande water pumped from the Franklin Canal at the El Paso Water Plant for municipal use. Included in this amount are 5,887 acre-feet of water pumped from wells near Canutillo, Texas into the Rio Grande to be conveyed 17 miles downstream to the point of diversion at the El Paso Water Plant. Ciudad Acuna, Coahuila, whose municipal diversion from the Rio Grande started in 1971, may at times use an alternate source from Arroyo Las Vacas, which was its previous source of supply. Such use would be reflected in the tabulations below.

All Rio Grande water used by U. S. municipalities below Falcon Dam is also included in the figures shown under "Diversions from the Rio Grande - United States Side..." (by river reaches and total below Falcon Dam) on pages 65, 68, 72, 74, 76, 78, and 79 herein. Population data for all cities are estimates based on the 1970 official census except for Falcon Village (estimated by the International Boundary and Water Commission), and Del Mar and San Ignacio which are based on utilities connections.

In United States

Month	EL PASO (Pop. 399,000)				DEL RIO ø (Pop. 32,000)			
	1977	Period 1968-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	0	0	0	0	416.9	390.2	495.1	303.8
Feb.	0	0	0	0	417.6	411.2	603.2	306.2
Mar.	0	305.1	829	0	624.9	573.6	714.9	350.1
Apr.	309	1,146.5	2,164	309	555.6	569.6	679.0	482.5
May	2,292	2,412.2	3,360	1,365	466.3	597.3	838.6	466.3
June	2,381	2,835.2	4,084	1,596	822.6	776.7	932.9	561.2
July	2,592	2,506.2	3,728	1,304	1,061.8	838.2	1,093.2	643.2
Aug.	2,670	2,790.6	3,850	1,748	1,236.9	855.6	1,236.9	500.8
Sept.	878	1,803.8	2,709	878	972.2	627.7	972.2	507.4
Oct.	0	307.3	769	0	514.1	489.9	650.6	376.8
Nov.	0	97.3	369	0	378.6	396.4	458.2	322.8
Dec.	0	40.2	131	0	441.1	391.8	444.3	313.3
Yearly	11,122	14,244.4	18,309	9,368	7,908.6	6,918.2	7,908.6	6,253.6

Month	EAGLE PASS (Pop. 23,000)				DEL MAR (Pop. 3,100)			
	1977	Period 1968-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	228.6	219.1	305.1	155.8	31.1	22.5	37.4	10.9
Feb.	237.1	208.8	331.9	153.5	36.0	26.0	51.1	12.8
Mar.	291.8	246.6	333.0	173.5	58.6	32.6	58.6	7.6
Apr.	238.2	248.1	306.8	189.3	37.4	39.7	55.1	26.3
May	274.4	278.8	400.1	204.6	52.1	42.7	63.8	21.2
June	409.5	323.6	409.5	253.6	60.9	48.7	71.4	26.6
July	518.4	353.3	518.4	278.5	75.0	43.2	75.0	16.5
Aug.	550.8	359.6	550.8	260.6	76.1	48.9	76.1	33.2
Sept.	478.7	278.9	478.7	195.1	71.1	41.0	71.1	23.4
Oct.	337.8	256.1	344.0	191.4	53.4	31.2	53.4	15.5
Nov.	250.6	219.3	278.6	183.9	54.2	29.3	54.2	18.2
Dec.	277.4	221.2	279.4	172.0	48.4	24.9	48.4	12.2
Yearly	4,093.3	3,213.4	4,093.3	2,489.5	654.3	430.7	654.3	246.7

Month	LAREDO (Pop. 85,000)				LAREDO POWER STATION			
	1977	Period 1968-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	1,052.6	957.0	1,135.0	674.0	89.4	60.0	89.4	40.1
Feb.	1,035.8	931.5	1,238.9	655.5	121.6	55.5	121.6	22.1
Mar.	1,340.7	1,140.2	1,402.4	786.4	125.0	63.6	125.0	21.1
Apr.	1,312.9	1,237.7	1,552.9	952.0	143.4	71.7	143.4	36.4
May	1,315.9	1,373.1	1,857.8	1,058.8	111.0	84.0	116.7	51.5
June	1,743.4	1,498.5	1,796.9	1,243.3	107.4	87.6	134.6	52.4
July	2,043.4	1,628.2	2,043.4	1,176.2	151.4	98.1	151.4	63.4
Aug.	2,125.7	1,640.0	2,125.7	1,339.0	173.8	105.4	173.8	73.4
Sept.	1,723.8	1,290.6	1,723.8	845.2	128.7	83.6	134.4	50.0
Oct.	1,467.2	1,224.2	1,467.2	898.8	103.9	70.8	103.9	45.0
Nov.	1,374.5	1,057.6	1,374.5	914.8	125.6	74.9	125.6	53.7
Dec.	1,035.3	987.5	1,190.0	840.8	120.9	72.1	120.9	52.5
Yearly	17,571.2	14,966.1	17,571.2	11,725.4	1,502.1	927.3	1,502.1	605.1

ø Includes Laughlin Air Force Base

MUNICIPAL AND INDUSTRIAL WATER USES

In Acre-Feet

In United States

Month	SAN YGNACIO (Pop. 1,050)				NEW ZAPATA (Pop. 3,550)			
	1977	Period 1968-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	3.8	2.6	3.8	1.6	42.4	31.5	43.0	20.2
Feb.	4.3	3.0	4.4	1.9	41.9	33.2	53.4	18.6
Mar.	4.7	3.7	5.2	2.2	61.2	41.1	61.2	25.0
Apr.	5.6	4.5	6.2	2.9	62.1	43.6	62.1	27.8
May	5.6	4.1	5.8	2.2	63.6	45.2	63.6	31.5
June	6.0	4.3	6.0	2.6	76.5	46.8	76.5	34.1
July	6.6	4.2	6.6	3.2	86.8	50.8	86.8	34.4
Aug.	8.5	4.9	8.5	3.2	89.5	53.2	89.5	31.5
Sept.	5.5	3.9	5.8	2.5	63.0	37.6	65.2	21.1
Oct.	4.7	3.2	4.7	1.8	55.2	36.2	57.0	20.0
Nov.	4.4	3.0	4.4	2.2	56.6	32.9	56.6	18.9
Dec.	3.5	2.8	3.9	1.7	53.3	32.3	53.3	20.7
Yearly	63.2	44.2	63.2	31.1	752.1	484.4	752.1	334.9

Month	FALCON VILLAGE (Pop. 365)				ROMA * (Pop. 2,690)			
	1977	Period 1968-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	8.3	8.0	9.9	5.4	42.7	31.8	47.1	14.4
Feb.	7.6	7.9	9.9	5.7	43.4	31.5	53.1	14.4
Mar.	10.4	9.6	12.9	5.9	61.5	38.0	61.5	18.2
Apr.	10.4	10.5	13.0	7.8	66.3	41.8	66.3	17.0
May	10.6	10.2	11.6	8.4	67.6	45.4	67.6	19.9
June	11.1	10.8	14.3	7.9	73.0	46.5	73.0	21.1
July	15.3	12.0	15.3	9.2	78.3	46.6	78.3	21.9
Aug.	14.5	11.7	14.5	9.7	78.3	46.4	78.3	25.7
Sept.	10.0	9.0	10.8	5.8	65.0	41.0	65.0	18.6
Oct.	10.3	8.8	10.5	6.2	72.8	38.1	72.8	19.5
Nov.	9.9	8.4	10.1	6.9	70.0	38.0	70.0	18.3
Dec.	10.1	8.3	10.3	5.7	66.1	36.6	66.1	18.9
Yearly	128.5	115.2	128.5	88.1	785.0	481.7	785.0	228.2

Month	RIO GRANDE CITY (Pop. 5,730)				BROWNSVILLE (Pop. 70,000)			
	1977	Period 1968-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	104.8	82.4	113.7	55.9	1,040.2	897.0	1,077.5	620.4
Feb.	100.9	78.3	119.5	53.7	988.2	886.3	1,132.2	599.1
Mar.	142.1	88.9	142.1	60.8	1,291.2	1,049.7	1,325.4	645.9
Apr.	153.1	93.6	153.1	61.4	1,244.5	1,067.6	1,413.9	676.4
May	160.1	96.5	160.1	62.9	1,342.0	1,095.8	1,454.9	675.3
June	166.0	102.9	166.0	59.2	1,414.8	1,115.9	1,434.0	752.5
July	195.9	117.1	195.9	59.2	1,603.6	1,204.8	1,603.6	860.4
Aug.	205.7	115.5	205.7	48.4	1,776.6	1,212.0	1,776.6	883.8
Sept.	148.9	104.8	148.9	62.9	1,534.0	1,049.1	1,534.0	733.6
Oct.	160.2	105.3	160.2	58.3	1,472.6	1,072.5	1,472.6	799.1
Nov.	155.0	96.2	155.0	59.8	1,341.9	1,004.6	1,341.9	798.5
Dec.	157.9	93.4	157.9	60.2	1,411.4	986.9	1,411.4	775.4
Yearly	1,850.6	1,174.9	1,850.6	768.2	16,461.0	12,642.2	16,461.0	9,043.1

* Includes Los Saenz and Escobares, Texas

MUNICIPAL AND INDUSTRIAL WATER USES

In Acre-Feet

In Mexico

Month	CD. ACUNA, COAHUILA (Pop. 43,258)				PIEDRAS NEGRAS, COAHUILA (Pop. 91,139)			
	1977	Period 1971-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	108.9	59.7	116.5	0	375.7	280.4	375.7	185.0
Feb.	101.1	85.7	128.8	38.0	340.8	247.0	340.8	166.8
Mar.	142.7	121.9	150.4	76.8	389.5	292.6	389.5	195.1
Apr.	147.4	122.1	166.8	67.9	336.0	297.6	384.7	209.8
May	165.4	123.8	165.4	77.6	405.2	331.4	405.2	242.4
June	196.2	128.4	196.2	83.7	455.5	359.0	455.5	275.2
July	213.0	145.2	213.0	80.1	473.9	373.8	473.9	301.2
Aug.	247.9	168.1	247.9	83.7	432.5	375.1	446.4	281.2
Sept.	237.4	136.2	237.4	81.9	454.2	331.6	454.2	248.1
Oct.	177.5	126.4	177.5	68.3	448.9	323.4	448.9	247.1
Nov.	181.0	102.0	181.0	55.7	415.5	283.5	415.5	213.8
Dec.	186.3	84.5	186.3	0	414.0	283.7	414.0	199.5
Yearly	2,104.8	1,404.0	2,104.8	828.8	4,941.7	3,779.1	4,941.7	2,869.2

Month	NUEVO LAREDO, TAMPS. (Pop. 204,000)				NUEVA CD. GUERRERO, TAMPS. (Pop. 4,819)			
	1977	Period 1968-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	1,619.8	1,430.7	1,879.9	875.4	28.1	27.7	48.7	19.8
Feb.	1,496.4	1,336.1	1,565.3	842.1	27.6	27.3	50.2	19.1
Mar.	1,746.0	1,550.8	1,960.3	972.3	33.1	31.2	54.3	25.4
Apr.	1,766.6	1,604.8	1,895.8	1,100.0	39.3	31.8	61.0	19.9
May	1,861.2	1,731.1	2,209.3	1,364.7	40.6	36.0	60.3	23.3
June	2,273.6	1,857.6	2,273.6	1,612.3	44.2	32.8	60.1	21.2
July	2,512.5	1,988.8	2,512.5	1,607.9	58.2	32.8	58.2	25.1
Aug.	2,330.4	2,011.2	2,330.4	1,745.5	53.2	33.8	53.2	19.3
Sept.	1,978.8	1,803.0	2,155.9	1,303.3	43.8	30.4	43.8	15.7
Oct.	2,097.6	1,797.5	2,149.8	1,339.0	40.6	31.0	46.9	20.5
Nov.	1,976.3	1,656.0	2,111.0	1,155.3	32.8	28.1	37.8	20.9
Dec.	1,952.5	1,590.0	1,952.5	1,155.0	25.6	26.0	30.8	20.5
Yearly	23,611.7	20,357.6	23,611.7	15,202.0	467.1	368.9	587.1	282.8

Month	CD. MIER, TAMPS. (Pop. 9,323)				CD. MIGUEL ALEMAN, TAMPS. (Pop. 15,152)			
	1977	Period 1968-1977			1977	Period 1968-1977		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	32.3	30.9	69.1	11.8	36.8	37.1	55.7	25.3
Feb.	50.0	25.7	50.0	10.5	34.0	36.7	55.0	25.9
Mar.	54.0	31.5	54.0	9.9	43.6	43.4	58.0	32.4
Apr.	43.3	29.6	43.3	9.1	45.4	44.7	62.8	31.0
May	49.0	33.0	49.0	9.1	47.9	46.2	63.9	36.5
June	57.5	36.2	57.5	24.8	47.3	49.0	66.7	37.4
July	73.6	37.7	73.6	28.6	53.5	53.2	65.6	40.6
Aug.	59.4	36.6	59.4	13.1	57.7	53.6	68.1	36.2
Sept.	49.4	31.9	49.4	15.2	48.6	46.3	59.9	35.6
Oct.	49.9	32.8	49.9	14.5	49.9	45.4	61.4	34.4
Nov.	46.4	35.5	72.2	13.3	46.2	45.3	62.0	36.3
Dec.	43.8	34.4	60.6	12.6	45.2	41.3	56.9	27.8
Yearly	608.6	395.8	608.6	191.3	556.1	542.2	721.9	420.6

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 Development Board originally had a capacity of 18,800 acre-feet. There are no monthly storage data available for this reservoir. Also presented on pages 87 and 88 are data for International Amistad and Falcon Reservoirs 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 agencies providing the data are: Rio Grande, Continental, Santa Maria, Terrace, Mountain Home, and Platoro from the State of Colorado, Division of Water Resources; Sanchez from the Sanchez Ditch and Reservoir Company; Abiquiu and Cochiti from the United States Corps of Engineers; Costilla, Blue-water, Lake Sumner, McMillan, and Avalon from the United States Geological Survey; Storrie from the State Engineer Office of New Mexico; Heron, El Vado, Elephant Butte, and Caballo 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; La Boquilla, La Colina, and Rosetilla from the Federal Power Commission of Mexico; Francisco I. Madero, Chihuahua, Luis L. Leon, Centenario, San Miguel, Venustiano Carranza, Laguna de Salinillas, La Boca, Marte R. Gomez, Culebron, Villa Cardenas, and Palito Blanco from the Ministry of Agriculture and Hydraulic Resources of Mexico; Amistad Reservoir (International) and Falcon Reservoir (International) from the International Boundary and Water Commission.

In 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)	
	1977	# Average 1927-1977	1977	# Average 1928-1977	1977	# Average 1928-1977	1977	# Average 1925-1977	1977	# Average 1924-1977
Jan.	3.0	13.7	1.8	4.6	7.3	6.6	4.8	3.7	2.0	3.5
Feb.	3.3	14.8	2.0	5.0	7.4	7.0	4.6	4.0	2.2	3.9
Mar.	3.9	16.2	2.4	5.5	7.6	7.9	4.5	4.4	2.3	4.2
Apr.	5.3	16.6	3.0	6.0	8.1	9.0	4.5	5.4	2.5	4.7
May	5.1	21.2	3.0	7.6	6.3	12.3	4.1	7.0	2.0	6.3
June	0	21.9	3.1	7.9	2.7	13.7	2.4	8.2	1.6	6.4
July	0	12.9	2.9	5.4	2.6	9.3	.3	5.6	1.1	4.7
Aug.	0	6.8	2.9	3.5	2.6	5.1	0	3.6	.6	3.0
Sept.	0	7.0	2.9	3.4	2.7	4.9	0	3.0	.2	2.6
Oct.	0	8.0	2.9	3.4	2.7	5.1	0	3.2	.6	2.6
Nov.	2.4	10.6	3.4	3.8	3.0	5.6	0	3.1	.9	2.9
Dec.	3.8	12.2	3.8	4.3	3.3	6.1	0	3.5	1.2	3.2
Avg.	2.2	13.5	2.8	5.0	4.7	7.7	2.1	4.6	1.4	4.0
Max.	5.3	52.1	3.8	26.7	8.1	42.1	4.8	17.7	2.5	16.4
Min.	0	0	1.8	0	2.6	0	0	0	0.2	0

Month	SANCHEZ (Capacity 103.2)		PLATORO (Capacity 60.0)		COSTILLA (Capacity 15.7)		HERON (Capacity 401.3)		EL VADO (Capacity 196.5)	
	1977	# Average 1927-1977	1977	Average 1952-1977	1977	#Average 1922-1977	1977	Average 1971-1977	1977	Average 1935-1977
Jan.	4.2	10.7	13.9	8.1	2.1	4.3	160.2	104.1	109.6	36.9
Feb.	4.5	10.9	13.5	8.1	2.3	4.6	160.3	104.6	109.6	34.6
Mar.	5.0	11.5	13.2	8.3	2.6	5.2	159.4	105.5	111.3	34.9
Apr.	5.3	12.8	12.8	9.0	3.3	6.3	162.4	104.9	123.7	71.8
May	4.4	16.1	12.8	10.7	2.8	8.1	164.4	128.3	106.6	113.7
June	2.2	15.3	12.8	16.1	.7	7.4	154.4	148.6	54.3	104.0
July	2.5	11.2	12.8	14.5	0	4.9	143.2	153.9	36.4	85.1
Aug.	1.8	8.8	12.8	13.8	0	3.3	140.9	153.8	26.1	64.0
Sept.	2.2	9.1	12.8	14.0	.5	2.8	133.6	152.3	23.6	52.6
Oct.	2.6	9.6	12.7	13.8	1.0	3.1	127.7	153.6	19.7	48.7
Nov.	3.5	9.9	12.7	8.6	1.4	3.5	127.1	153.4	19.7	38.7
Dec.	4.3	10.3	12.7	8.6	1.6	3.8	113.7	122.1	26.4	36.3
Avg.	3.5	11.4	13.0	11.1	1.5	4.8	145.6	132.1	63.9	60.1
Max.	5.3	62.4	13.9	54.0	3.3	15.1	164.4	252.1	123.7	203.5
Min.	1.8	0	12.7	0	0	0	113.7	0.6	19.7	0

Some months missing

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

In United States

Month	ABIQUIU (Capacity 1,216.0)		COCHITI (Capacity 498.1)		BLUEWATER (Capacity 43.5)		ELEPHANT BUTTE (Capacity 2,109.4)		CABALLO (Capacity 344.0)	
	1977	Average 1965-1977	1977	# Average 1973-1977	1977	# Average 1927-1977	1977	Average 1915-1977	1977	# Average 1938-1977
Jan.	25.1	4.6	47.5	26.2	3.0	6.6	317.1	737.6	133.6	96.4
Feb.	25.1	4.5	47.4	25.7	3.0	7.2	342.0	741.0	140.5	120.1
Mar.	25.0	5.4	47.4	26.1	2.9	10.4	350.9	718.1	82.8	103.5
Apr.	24.9	8.9	47.9	28.0	2.8	13.4	347.8	711.4	44.9	98.1
May	24.2	38.2	47.4	27.8	2.6	11.9	304.5	799.3	36.3	99.4
June	23.6	31.1	47.5	34.2	2.4	9.8	219.5	824.8	41.6	83.1
July	23.3	22.3	47.4	34.7	2.3	8.5	136.1	767.5	59.6	65.9
Aug.	23.2	22.4	47.7	34.5	2.6	7.5	120.9	712.6	23.0	38.1
Sept.	22.8	23.1	47.5	34.2	2.4	7.2	123.6	687.9	10.4	28.8
Oct.	19.3	21.7	47.4	36.5	2.2	6.8	127.8	688.1	12.7	43.2
Nov.	19.3	14.8	47.5	30.3	2.2	6.7	148.3	704.4	14.8	57.5
Dec.	19.1	9.5	47.6	32.3	2.1	6.5	181.4	724.3	17.2	73.4
Avg.	22.9	17.2	47.5	30.9	2.5	8.5	226.7	734.8	51.4	75.6
Max.	25.1	194.0	47.9	56.2	3.0	47.1	ø 356.0	ø 2,302.8	ø 141.5	ø 346.6
Min.	19.1	0	47.4	3.6	2.1	0	ø 119.3	ø 3.3	ø 8.4	ø 0.1

Month	STORRIE (Capacity 23.3)		LAKE SUMNER (Capacity 101.6)		McMILLAN & AVALON (Capacity 38.0)		RED BLUFF (Capacity 310.0)		LAKE CASA BLANCA (Capacity 19.1)	
	1977	# Average 1939-1977	1977	# Average 1937-1977	1977	# Average 1908-1977	1977	# Average 1936-1977	1977	Average 1962-1977
Jan.	1.1	7.3	29.9	66.0	7.0	26.0	70.0	96.2	18.8	13.6
Feb.	1.0	7.2	34.5	70.0	7.2	26.1	70.7	97.8	18.2	13.2
Mar.	1.3	7.9	4.4	58.3	19.2	26.0	62.8	94.7	17.7	12.9
Apr.	2.1	8.1	9.6	51.7	11.2	17.2	61.8	81.7	17.2	12.9
May	.7	8.6	14.2	53.7	5.6	19.3	51.5	84.4	20.2	13.6
June	0	7.2	15.6	47.0	1.7	18.6	48.5	85.1	18.4	14.1
July	0	7.8	4.5	45.7	3.0	17.7	38.5	75.8	16.7	13.6
Aug.	0	8.1	25.6	49.3	3.6	16.8	25.6	71.5	16.0	13.6
Sept.	0	7.5	32.0	51.7	2.9	17.9	21.1	74.2	15.2	15.3
Oct.	0	7.2	35.1	55.1	6.2	19.9	22.1	84.0	14.6	14.7
Nov.	0	7.2	40.1	57.3	8.1	21.4	22.4	86.6	14.0	14.4
Dec.	0	6.7	37.3	61.8	9.4	24.3	23.1	90.9	13.6	14.2
Avg.	0.5	7.6	23.6	55.6	7.1	20.9	43.2	85.2	16.7	13.8
Max.	2.1	26.3	40.1	156.3	19.2	85.5	70.7	327.5	20.2	28.2
Min.	0	0	4.4	0.4	1.7	0	21.1	10.0	13.6	3.5

Month	WILLACY (Capacity 25.0)								TOTAL IN U. S. RESERVOIRS (Capacity 5,659.4)	
	1977	# Average 1939-1977							1977	Estimated ‡ Average
Jan.	16.2	15.2							978.2	1,291.9
Feb.	17.8	14.5							1,017.1	1,324.8
Mar.	16.4	13.8							943.0	1,280.7
Apr.	16.5	13.8							917.6	1,291.7
May	17.7	14.5							836.4	1,502.0
June	17.7	14.8							670.7	1,519.3
July	15.4	14.5							548.6	1,381.5
Aug.	15.3	13.5							491.2	1,253.6
Sept.	15.7	14.9							472.1	1,213.8
Oct.	17.8	15.3							475.1	1,243.6
Nov.	14.6	15.1							505.4	1,255.8
Dec.	14.3	14.7							535.9	1,269.0
Avg.	16.3	14.6							699.1	1,319.0
Max.	17.8	22.6							1,017.1	
Min.	14.3	0							472.1	

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)		CHIHUAHUA (Capacity 25.9)	
	1977	# Average 1914-1977	1977	Average 1940-1977	1977	Average 1940-1977	1977	# Average 1948-1977	1977	Average 1961-1977
Jan.	1,489.9	1,436.9	17.9	17.9	14.3	12.5	305.5	224.7	10.4	7.7
Feb.	1,418.3	1,401.8	17.9	18.3	7.1	12.4	299.6	222.2	9.7	7.5
Mar.	1,328.3	1,345.5	18.7	18.3	3.6	11.7	268.3	209.5	8.8	7.1
Apr.	1,230.2	1,271.2	19.6	18.8	3.8	11.4	213.1	176.3	8.2	6.6
May	1,123.2	1,207.5	18.7	18.5	12.3	11.5	152.1	148.2	7.1	6.2
June	1,077.2	1,127.2	19.8	18.6	10.3	11.8	139.6	130.1	7.2	5.7
July	1,118.1	1,168.7	18.7	18.6	12.5	11.7	153.8	146.2	6.9	5.9
Aug.	1,116.6	1,334.4	19.9	18.3	13.9	12.7	99.5	172.7	5.8	7.1
Sept.	1,121.8	1,497.4	19.9	18.0	12.5	13.1	75.6	212.5	4.9	8.8
Oct.	1,135.1	1,503.4	19.9	17.8	13.7	13.0	106.6	221.4	4.2	8.7
Nov.	1,098.8	1,468.4	11.7	16.0	14.7	12.3	111.5	221.8	3.2	8.4
Dec.	1,089.2	1,452.4	22.5	18.1	12.5	12.8	115.6	222.7	2.6	8.0
Avg.	1,195.6	1,351.2	18.8	18.1	10.9	12.2	170.1	192.4	6.6	7.3
Max.	1,489.9	2,544.7	22.5	22.5	14.7	19.4	305.5	366.6	10.4	26.5
Min.	1,077.2	16.9	11.7	11.6	3.6	0	75.6	1.4	2.6	0.2

Month	LUIS L. LEON (Capacity 689.1)		CENTENARIO and SAN MIGUEL (Capacity 19.9)		VENUSTIANO CARRANZA (Capacity 1,122.8)		LAGUNA DE SALINILLAS (Capacity 15.4)		LA BOCA (Capacity 33.2)	
	1977	Average 1968-1977	1977	Average 1934-1977	1977	Average 1930-1977	1977	Average 1931-1977	1977	Average 1963-1977
Jan.	510.7	379.8	19.2	13.5	1,133.9	431.6	14.8	7.3	31.9	27.1
Feb.	531.8	379.0	17.4	13.3	1,124.4	411.0	10.2	9.1	33.2	27.2
Mar.	495.3	354.9	15.1	10.0	1,079.8	388.8	9.1	7.2	33.2	26.7
Apr.	428.9	327.2	15.7	8.6	1,065.7	377.7	8.4	8.6	33.2	25.6
May	364.8	311.1	15.2	9.2	1,022.1	361.1	8.7	8.7	33.2	25.3
June	380.2	317.6	11.2	7.6	935.9	342.5	7.9	7.8	32.4	25.1
July	413.5	342.3	9.8	7.5	893.1	357.9	2.8	7.3	30.5	25.6
Aug.	367.3	334.9	9.0	8.0	838.9	363.2	3.8	7.5	31.5	26.5
Sept.	385.9	405.9	9.5	10.1	805.8	413.2	3.4	8.4	33.0	28.3
Oct.	443.5	422.5	10.5	12.4	812.4	445.5	2.4	7.8	35.7	28.9
Nov.	461.3	427.9	10.5	12.6	792.6	451.0	3.1	7.0	33.0	28.6
Dec.	472.6	433.2	8.8	13.1	765.1	448.8	5.9	6.7	32.5	28.6
Avg.	438.0	369.7	12.7	10.5	939.1	399.4	6.7	7.8	32.8	27.0
Max.	∅ 539.9	∅ 675.3	19.2	20.7	∅1,133.9	∅ 1,167.8	14.8	15.8	35.7	35.7
Min.	∅ 364.8	∅ 3.8	8.8	0	∅ 765.1	* 1.0	2.4	0	30.5	0

Month	MARTE R. GOMEZ (Capacity 898.3)		CULEBRON and VILLA CARDENAS (Capacity 90.0)		PALITO BLANCO (Capacity 124.0)				TOTAL IN MEXICAN RESERVOIRS (Capacity 5,815.6)	
	1977	# Average 1943-1977	1977	# Average 1939-1977	1977	Average 1942-1977			1977	Estimated ‡ Average
Jan.	919.3	614.9	13.5	33.6	4.2	35.4			4,485.5	3,242.9
Feb.	916.3	566.6	10.5	31.0	4.2	30.7			4,400.6	3,130.1
Mar.	895.4	536.0	0	29.0	0	30.4			4,155.6	2,975.1
Apr.	856.6	499.5	0	30.4	0	28.1			3,883.4	2,790.0
May	763.0	463.3	0	32.3	0	28.2			3,520.4	2,631.1
June	688.2	457.9	0	34.0	0	30.6			3,309.9	2,516.5
July	645.1	448.4	0	29.9	0	29.6			3,304.8	2,599.6
Aug.	596.0	502.3	0	32.0	0	27.0			3,102.2	2,846.6
Sept.	840.9	616.7	0	39.3	0	38.4			3,313.2	3,310.1
Oct.	891.0	663.6	0	40.9	0	42.6			3,475.0	3,428.5
Nov.	898.4	665.5	0	34.5	0	41.0			3,438.8	3,395.0
Dec.	889.4	662.4	0	38.2	0	39.5			3,416.7	3,384.5
Avg.	816.6	558.1	2.0	33.8	0.7	33.5			3,650.5	3,020.8
Max.	∅ 923.8	∅1,465.4	13.5	116.8	4.2	140.1			4,485.5	
Min.	∅ 576.3	** 17.8	0	0	0	0			3,102.2	

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

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 573.9, 12.9 river miles upstream from Del Rio, Texas and Cd. Acuna, Coahuila.

Maximum storage for period of record: 4,859,900 acre-feet on September 22, 1974 with an elevation of 1,135.66 feet above mean sea level, U. S. C. & G. S. datum.

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 & 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 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,756.0	3,746.4	3,751.2	3,812.0	3,847.2	3,545.2	3,520.4	3,513.9	3,495.7	3,309.5	3,314.5	3,317.0
2	3,756.0	3,749.2	3,753.2	3,814.8	3,836.8	3,544.5	3,519.7	3,514.5	3,495.1	3,313.2	3,313.8	3,317.6
3	3,756.0	3,751.2	3,753.2	3,816.2	3,829.9	3,543.2	3,519.1	3,514.5	3,494.4	3,312.6	3,313.8	3,317.6
4	3,756.6	3,752.6	3,752.6	3,818.9	3,819.6	3,542.5	3,521.0	3,513.9	3,494.4	3,310.7	3,313.8	3,318.2
5	3,758.0	3,753.9	3,753.9	3,819.6	3,809.3	3,541.2	3,523.0	3,511.3	3,495.1	3,310.1	3,313.8	3,320.1
6	3,758.0	3,754.6	3,753.2	3,819.6	3,800.4	3,539.9	3,523.6	3,510.6	3,495.7	3,308.8	3,313.8	3,316.3
7	3,758.0	3,762.1	3,753.2	3,821.7	3,788.7	3,539.3	3,523.6	3,509.3	3,492.5	3,309.5	3,317.6	3,317.0
8	3,757.3	3,763.4	3,753.2	3,825.1	3,777.1	3,536.7	3,521.7	3,508.7	3,484.1	3,310.1	3,319.5	3,317.6
9	3,757.3	3,761.4	3,753.9	3,826.5	3,766.2	3,532.8	3,520.4	3,508.7	3,478.3	3,307.6	3,316.3	3,315.7
10	3,756.0	3,760.7	3,754.6	3,827.9	3,755.3	3,527.5	3,518.4	3,509.3	3,470.5	3,308.8	3,315.1	3,315.1
11	3,756.0	3,760.7	3,754.6	3,828.6	3,743.7	3,528.2	3,516.5	3,510.0	3,464.1	3,306.3	3,313.2	3,314.5
12	3,756.6	3,760.0	3,755.3	3,832.0	3,732.9	3,526.2	3,513.2	3,511.3	3,457.7	3,304.5	3,312.6	3,314.5
13	3,757.3	3,759.4	3,755.3	3,833.4	3,720.0	3,522.3	3,511.9	3,513.2	3,450.0	3,310.0	3,312.0	3,315.1
14	3,756.6	3,758.7	3,756.6	3,841.7	3,709.9	3,518.4	3,513.2	3,514.5	3,441.6	3,300.7	3,312.0	3,315.1
15	3,756.6	3,756.6	3,758.0	3,849.3	3,699.8	3,514.5	3,513.2	3,515.2	3,432.7	3,301.3	3,313.2	3,317.0
16	3,756.0	3,755.3	3,758.0	3,865.2	3,689.0	3,511.9	3,513.2	3,516.5	3,423.1	3,299.5	3,315.1	3,318.2
17	3,755.3	3,753.9	3,762.1	3,874.3	3,677.6	3,510.0	3,513.2	3,518.4	3,414.8	3,298.9	3,315.7	3,318.8
18	3,753.2	3,753.9	3,763.4	3,881.2	3,665.5	3,507.4	5,513.2	3,520.4	3,406.5	3,298.9	3,315.7	3,319.5
19	3,753.2	3,753.2	3,765.5	3,886.8	3,652.8	3,504.8	3,511.9	3,522.3	3,399.5	3,298.9	3,317.0	3,320.7
20	3,751.2	3,750.5	3,766.2	3,888.9	3,642.8	3,502.8	3,511.9	3,523.6	3,390.7	3,298.9	3,318.2	3,320.1
21	3,751.9	3,749.8	3,769.6	3,890.3	3,629.5	3,502.8	3,512.6	3,524.9	3,382.4	3,300.7	3,317.6	3,318.8
22	3,753.2	3,749.2	3,770.3	3,891.0	3,618.2	3,504.8	3,512.6	3,524.9	3,372.9	3,304.5	3,317.0	3,317.0
23	3,753.2	3,750.5	3,770.9	3,891.7	3,606.3	3,508.7	3,512.6	3,525.6	3,365.3	3,306.3	3,317.6	3,317.6
24	3,753.9	3,751.2	3,773.7	3,893.1	3,595.7	3,510.6	3,512.6	3,525.6	3,357.8	3,306.3	3,318.2	3,318.2
25	3,752.6	3,751.9	3,777.1	3,893.8	3,584.5	3,513.9	3,513.2	3,524.9	3,350.8	3,307.6	3,318.2	3,317.0
26	3,753.2	3,752.6	3,795.6	3,890.3	3,577.3	3,517.1	3,513.9	3,520.4	3,341.4	3,308.8	3,318.2	3,317.0
27	3,753.9	3,752.6	3,797.6	3,879.8	3,569.4	3,519.1	3,514.5	3,515.2	3,332.6	3,310.1	3,318.8	3,316.3
28	3,752.6	3,752.6	3,800.4	3,870.3	3,562.2	3,519.7	3,514.5	3,508.7	3,323.8	3,312.0	3,318.8	3,316.3
29	3,751.2		3,804.5	3,862.5	3,555.0	3,521.7	3,515.2	3,503.5	3,314.5	3,312.0	3,317.6	3,318.2
30	3,749.2		3,807.2	3,856.9	3,551.0	3,521.7	3,514.5	3,497.7	3,310.1	3,313.2	3,317.0	3,318.2
31	3,747.8		3,809.3		3,546.5		3,514.5	3,495.7	3,420.9	3,313.8		3,318.2

Month	1977							Period June 1968-1977		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage		
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum	Minimum
Jan.	1,120.80	3,758.0	† 5	1,120.65	3,747.8	31	3,754.5	2,823.6	4,030.4	722.6
Feb.	1,120.88	3,763.4	8	1,120.63	3,746.4	1	3,754.6	2,812.6	4,014.7	787.7
Mar.	1,121.55	3,809.3	31	1,120.70	3,751.2	1	3,767.9	2,786.1	4,016.4	861.7
Apr.	1,122.77	3,893.8	25	1,121.55	3,809.3	1	3,853.5	2,805.0	3,981.0	962.8
May	1,122.24	3,856.9	1	1,117.63	3,546.5	31	3,689.0	2,751.4	3,829.5	1,038.6
June	1,117.63	3,546.5	1	1,116.96	3,502.8	†20	3,522.7	2,437.6	3,807.8	3.0
July	1,117.28	3,523.6	† 6	1,117.10	3,511.9	†13	3,515.9	2,471.1	3,847.3	83.0
Aug.	1,117.31	3,525.6	†23	1,116.85	3,495.7	31	3,514.4	2,610.2	3,941.3	176.2
Sept.	1,116.85	3,495.7	† 1	1,113.93	3,310.1	30	3,420.9	2,699.5	4,117.2	355.7
Oct.	1,113.99	3,313.8	31	1,113.75	3,298.9	†17	3,306.6	2,826.2	4,471.2	661.0
Nov.	1,114.08	3,319.5	8	1,113.96	3,312.0	†13	3,315.9	2,833.3	4,241.4	702.9
Dec.	1,114.10	3,320.7	19	1,114.00	3,314.5	†11	3,317.4	2,845.1	4,029.7	706.1
Yearly	1,122.77	3,893.8		1,113.75	3,298.9		3,559.9	2,724.8	3,950.8	1,047.6

When necessary, the Commission may set temporary conservation levels † And other days

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 86.1 river miles downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas and 274.8 river miles upstream from the Gulf of Mexico.

Maximum storage for period of record: 3,490,600 acre-feet on October 19, 1958 with an elevation of 308.11 feet above mean sea level, U. S. C. & G. S. datum.

Storage Capacities

(1971-1972 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		
				67	Silt and Dead
203.33	Lowest Outlet (Mexican Penstock)	67	89		
				2,667,521	Silt and Conservation
301.2	Top of Conservation Storage *	2,667,588	86,843		
				509,505	Ordinary Flood
306.7	Top of Spillway Gates	3,177,093	98,512		
				801,323	Super Flood
314.2	Maximum Water Surface	3,978,416	115,406		

Storage in Thousands of Acre-Feet at 24:00 Hours 1977— Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,014.6	3,016.5	3,002.3	2,953.4	2,689.4	2,752.8	2,615.0	2,521.3	2,318.7	2,478.2	2,392.3	2,383.5
2	3,014.6	3,015.6	3,006.1	2,951.5	2,687.6	2,743.9	2,615.0	2,515.4	2,325.7	2,479.1	2,393.1	2,383.5
3	3,014.6	3,014.6	3,008.9	2,948.7	2,685.9	2,733.3	2,615.0	2,508.8	2,332.8	2,492.2	2,395.5	2,384.3
4	3,014.6	3,011.8	3,008.9	2,944.1	2,683.3	2,721.8	2,615.9	2,501.3	2,337.5	2,492.2	2,394.7	2,385.9
5	3,014.6	3,008.9	3,009.9	2,937.5	2,679.8	2,709.5	2,615.0	2,489.8	2,341.5	2,492.2	2,394.7	2,386.7
6	3,012.7	3,008.0	3,003.9	2,930.1	2,681.5	2,695.5	2,615.9	2,479.1	2,346.2	2,491.4	2,393.9	2,385.9
7	3,009.9	3,008.0	3,006.1	2,925.4	2,680.6	2,682.4	2,615.9	2,470.8	2,346.2	2,485.6	2,393.1	2,384.3
8	3,010.8	3,010.0	3,003.3	2,920.8	2,681.5	2,668.5	2,612.4	2,461.0	2,346.2	2,479.9	2,392.3	2,384.3
9	3,012.7	3,010.8	3,001.4	2,916.2	2,689.4	2,653.7	2,612.4	2,452.0	2,347.8	2,473.3	2,391.5	2,385.9
10	3,012.7	3,010.8	3,000.4	2,908.8	2,693.7	2,644.2	2,610.7	2,443.1	2,351.7	2,465.1	2,390.7	2,385.9
11	3,014.6	3,011.8	2,999.5	2,900.4	2,695.5	2,635.6	2,607.3	2,436.6	2,356.4	2,456.9	2,389.9	2,380.3
12	3,017.5	3,011.8	2,998.5	2,890.3	2,698.1	2,633.0	2,606.4	2,428.5	2,362.8	2,448.0	2,386.7	2,377.9
13	3,019.4	3,009.9	2,997.6	2,877.4	2,699.9	2,633.0	2,606.4	2,420.4	2,371.5	2,439.8	2,382.7	2,377.1
14	3,020.3	3,010.8	2,996.6	2,863.7	2,701.6	2,630.4	2,605.6	2,412.3	2,392.3	2,431.7	2,379.5	2,376.3
15	3,018.4	3,010.8	2,997.6	2,854.6	2,703.4	2,627.0	2,603.9	2,402.7	2,400.3	2,426.0	2,379.5	2,375.5
16	3,016.5	3,009.9	2,996.6	2,841.8	2,705.1	2,623.6	2,602.2	2,394.7	2,407.5	2,420.4	2,380.3	2,376.3
17	3,012.7	3,008.9	2,995.7	2,827.3	2,706.0	2,621.9	2,598.8	2,386.7	2,415.5	2,413.1	2,381.1	2,374.7
18	3,006.1	3,008.9	2,993.8	2,811.9	2,704.2	2,620.1	2,598.8	2,377.9	2,423.6	2,405.9	2,381.1	2,373.1
19	3,003.3	3,009.9	2,991.9	2,802.9	2,706.0	2,619.3	2,594.5	2,367.5	2,430.9	2,398.7	2,381.1	2,374.7
20	3,003.3	3,008.9	2,990.0	2,790.3	2,708.6	2,615.9	2,590.3	2,358.8	2,438.2	2,390.7	2,381.9	2,373.9
21	3,008.9	3,007.0	2,988.1	2,778.7	2,713.0	2,613.3	2,587.7	2,349.3	2,446.3	2,384.3	2,382.7	2,372.3
22	3,016.5	3,007.0	2,985.3	2,766.2	2,725.4	2,612.4	2,584.3	2,339.9	2,452.0	2,378.7	2,382.7	2,370.7
23	3,019.4	3,008.9	2,982.5	2,754.6	2,765.3	2,612.4	2,580.1	2,332.0	2,456.9	2,375.5	2,383.5	2,369.9
24	3,021.3	3,008.0	2,978.7	2,742.2	2,794.8	2,612.4	2,575.0	2,322.6	2,463.5	2,382.7	2,384.3	2,368.3
25	3,018.4	3,007.0	2,975.9	2,728.9	2,803.8	2,613.3	2,568.2	2,312.5	2,469.2	2,389.1	2,385.1	2,366.7
26	3,016.5	3,006.1	2,973.1	2,715.7	2,802.9	2,614.1	2,561.5	2,304.7	2,471.7	2,390.7	2,384.3	2,366.0
27	3,014.6	3,004.2	2,969.3	2,702.5	2,797.5	2,615.0	2,554.8	2,298.5	2,472.5	2,391.5	2,383.5	2,364.4
28	3,016.5	3,002.3	2,966.5	2,689.4	2,792.1	2,615.9	2,546.4	2,292.3	2,473.3	2,392.3	2,381.9	2,362.0
29	3,016.5		2,964.6	2,691.1	2,784.0	2,615.9	2,544.7	2,293.0	2,476.6	2,392.3	2,381.9	2,360.4
30	3,018.4		2,961.8	2,690.2	2,773.3	2,615.0	2,537.1	2,299.2	2,477.4	2,391.5	2,381.9	2,358.8
31	3,017.5		2,956.2		2,761.7		2,528.8	2,308.6		2,391.5		2,357.2

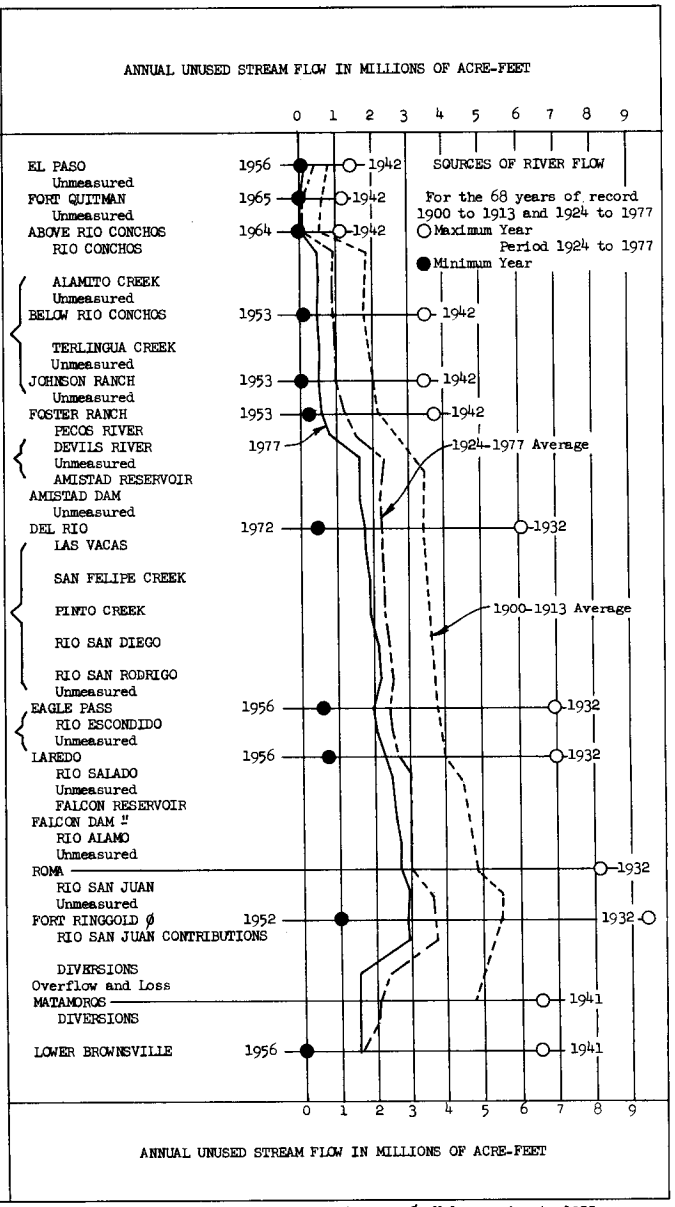
Month	1977						Period 1954-1977		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage		
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum	Minimum
Jan.	305.09	3,021.3	24	304.90	3,003.3	†19	3,014.5	2,168.0	3,070.8	218.7
Feb.	305.05	3,017.5	1	304.89	3,002.3	28	3,009.6	2,052.3	3,009.6	156.2
Mar.	304.97	3,009.9	5	304.40	2,956.2	31	2,990.8	2,019.4	2,990.8	226.7
Apr.	304.40	2,956.2	1	301.45	2,689.4	28	2,835.2	1,913.9	2,954.6	325.6
May	302.74	2,803.8	25	301.34	2,679.8	5	2,722.4	1,803.2	2,869.9	490.1
June	302.27	2,761.7	1	300.56	2,612.4	†22	2,646.8	1,711.4	2,673.3	273.7
July	300.60	2,615.9	† 4	299.57	2,528.8	31	2,591.2	1,825.3	2,685.9	209.9
Aug.	299.57	2,528.8	1	296.63	2,292.3	28	2,396.2	1,812.6	2,771.4	208.0
Sept.	298.95	2,477.4	30	296.84	2,308.6	1	2,401.8	1,915.7	2,871.1	256.2
Oct.	299.13	2,492.2	† 3	297.69	2,375.5	23	2,429.7	2,176.9	3,250.2	308.3
Nov.	297.94	2,395.5	3	297.74	2,379.5	†14	2,386.2	2,245.6	3,124.5	390.9
Dec.	297.83	2,386.7	5	297.46	2,357.2	31	2,375.0	2,272.5	3,129.7	343.4
Yearly	305.09	3,021.3		296.63	2,292.3		2,647.9	1,993.1	2,764.2	544.3

* When necessary, the Commission may set temporary conservation levels † 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	1924-1977	1924-1977	
29.7	13.7	14.4	EL PASO
			Unmeasured
19.6	3.6	4.3	FORT QUITMAN
			Unmeasured
16.4	3.0	3.6	ABOVE RIO CONCHOS
47.7	30.8	31.1	RIO CONCHOS
			ALAMITO CREEK
			Unmeasured
			BELOW RIO CONCHOS
17.7	17.8	17.8	
			TERLINGUA CREEK
			Unmeasured
			JOHNSON RANCH
			Unmeasured
27.0	15.6	16.0	FOSTER RANCH
12.4	8.9	8.9	PECOS RIVER
103.0	106.7	106.7	DEVILS RIVER
			Unmeasured
			AMISTAD RESERVOIR
27.6	18.5	18.2	AMISTAD DAM
			Unmeasured
27.6	18.6	18.3	DEL RIO
			LAS VACAS
			SAN FELIPE CREEK
100.9	57.3	57.3	PINTO CREEK
			RIO SAN DIEGO
			RIO SAN RODRIGO
			Unmeasured
30.0	19.8	19.5	EAGLE PASS
33.3	41.4	41.4	RIO ESCONDIDO
			Unmeasured
30.1	20.7	20.4	LAREDO
25.1	15.8	15.2	RIO SALADO
			Unmeasured
			FALCON RESERVOIR
			FALCON DAM ‼
			RIO ALAMO
			Unmeasured
			ROMA
**48.4	**49.7	**48.4	RIO SAN JUAN
			Unmeasured
			FORT RINGGOLD ø
			RIO SAN JUAN CONTRIBUTIONS
			DIVERSIONS
			Overflow and Loss
			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 Rio 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 weights 66.7 pounds, or one acre-foot of silt weighs 1,452 tons.

Month	1977							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 Conchos near Ojinaga, Chihuahua

Period: 1956-1977

Jan.	19,557,000	0	9	0	0	0	0	0	0	0
Feb.	13,850,000	0	8	0	0	0	0	.20	4.5	0
Mar.	85,302,000	0	11	0	0	0	0	.30	6.6	0
Apr.	118,881,000	0	12	0	0	0	0	.73	10.2	0
May	117,682,000	0	13	0	0	0	0	32.6	145	0
June	45,314,000	29,800	12	.0657	.3372	0	20.5	148	688	0
July	50,216,000	16,400	13	.0326	.4978	0	11.3	249	1,450	0
Aug.	91,132,000	0	13	0	0	0	0	437	2,650	0
Sept.	24,316,000	9,970	13	.0410	.4565	0	6.9	1,060	9,330	0
Oct.	22,945,000	0	12	0	0	0	0	645	12,400	0
Nov.	20,159,000	0	6	0	0	0	0	5.1	70.2	0
Dec.	23,603,000	0	9	0	0	0	0	1.3	14.0	0
Yearly	632,957,000	56,170	131	0.008874	0.4978	0	38.7	2,579.23	21,903.3	32.9

Samples and analyses by Mexican Section, Method B

Rio Grande at Foster Ranch near Langtry, Texas and Rancho Santa Rosa, Coahuila

Period: 1969-1977

Jan.	57,917,000	2,340	31	0.004040			1.6	6.6	34.9	0.61
Feb.	43,236,000	1,520	26	.003520			1.0	4.3	17.8	.57
Mar.	77,849,000	5,170	29	.006640			3.6	11.3	49.2	.72
Apr.	119,904,000	17,800	30	.01484			12.3	8.0	22.1	.22
May	134,730,000	461,000	31	.3425	1.577	0.005120	317	83.3	317	.60
June	80,056,000	95,700	29	.1195	.6490	.003400	65.9	192	657	24.6
July	91,486,000	280,000	30	.3066	1.594	.01580	193	495	875	51.0
Aug.	91,755,000	248,000	31	.2701	1.146	.007000	171	542	1,320	21.8
Sept.	66,497,000	179,000	30	.2694	1.064	.005360	123	745	1,660	81.3
Oct.	43,672,000	5,680	30	.01300			3.9	254	1,070	3.5
Nov.	41,314,000	62,500	27	.1512	.2429	.004160	43.0	21.0	91.6	.76
Dec.	43,524,000	28,500	30	.06540			19.6	9.6	19.6	.62
Yearly	891,940,000	1,387,210	354	0.1555			954.9	2,372.1	3,951.48	954.9

Samples by U.S. Geological Survey and analyses by U. S. Section, Method A

Rio Grande at Nuevo Laredo, Tamaulipas and Laredo, Texas

Period #1953-1977

Jan.	287,789,000	8,860	31	0.003080			6.1	8.1	28.0	0.93
Feb.	236,867,000	11,800	28	.005000			8.1	17.7	109	.88
Mar.	163,862,000	3,540	31	.002160			2.4	10.4	26.8	.78
Apr.	220,370,000	8,550	30	.003880			5.9	141	1,920	.47
May	900,845,000	91,900	31	.01020			63.3	269	3,540	2.3
June	260,467,000	8,020	30	.003080			5.5	778	12,400	.56
July	167,297,000	3,880	30	.002320			2.7	495	3,440	1.3
Aug.	128,735,000	3,400	31	.002640			2.3	401	1,960	2.3
Sept.	375,084,000	22,700	30	.006040			15.6	884	5,010	9.0
Oct.	158,826,000	10,900	31	.006840			7.5	657	7,520	7.5
Nov.	105,668,000	3,470	30	.003280			2.4	77.6	1,190	1.6
Dec.	105,706,000	3,170	31	.003000			2.2	10.2	67.6	.83
Yearly	3,111,516,000	180,190	364	0.005791			124.0	3,749.0	19,257.72	124.0

Samples by Laredo Water Plant and analyses by U. S. Section, Method C

Some months missing

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

Rio Alamo at Cd. Mier, Tamaulipas

Period: #1934-1977

Month	1977							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
Jan.	15,038,000		0					1.5	21.8	0
Feb.	14,024,000		0					2.5	48.6	0
Mar.	10,217,000		0					5.6	91.2	0
Apr.	4,749,000		0					26.0	229	0
May	20,393,000	100,000	4	0.491	0.6287	0	68.9	41.8	281	0
June	4,217,000	84.3	5	.002	.0035	.0011	.06	62.8	471	0
July	3,319,000	1,390	3	.042	.1100	.0011	.96	26.0	213	0
Aug.	3,164,000		0					112	1,610	0
Sept.	18,178,000	26,700	4	.147	.6232	.0011	18.4	204	2,920	0
Oct.	6,253,000	5,000	10	.080	.1828	.0011	3.4	74.9	753	0
Nov.	2,921,000	0	0	π 0	0	0	0	2.1	40.7	0
Dec.	3,493,000	0	0	π 0	0	0	0	1.3	33.7	0
Yearly	105,966,000		26			0		560.5	3,156.57	11.12

Sampling and analyses by Mexican Section, Method B # Some months missing π Estimated

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1977

The following tables show the results of chemical analyses of individual samples or of composite samples representative of the river flow at Rio Grande and tributary stations. For some stations, all year, and for others, after May, only one individual sample per month was analyzed. The monthly composites were made by the United States Section of the Commission by taking from each independent water sample an amount of water volumetrically proportional to the river flow represented by that sample. For the Rio Grande at Fort Quitman, Foster Ranch, Laredo, Below Anzalduas Dam, and Brownsville, where electrical conductivity data for daily samples was available, the monthly total dissolved solids and yearly and period values shown were determined from these daily conductivities and relationship curves developed from chemical analyses of individual samples. The chemical analyses and relationship curves used were made by the U. S. Geological Survey, Water Resources Division, Austin, Texas. All other data were computed by the United States Section of the Commission.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20.04; Mg, 12.16; Na, 22.99; (CO_3 plus HCO_3) expressed as CO_3, 30.00; SO_4, 48.03; Cl, 35.45; NO_3, 62.00. 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 $EC \times 10^6$ at 25°C, is a relative measure of the total salt concentration.

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

Rio Grande at American Dam at El Paso, Texas

Sampling by U. S. Section

Jan.	18	2.09	16,000	2,320	0.40	8.2	67	34	5.49	2.55	16.10	4.26	11.66	8.18	0
Feb.	18	2.44	10,900	2,660	.48	7.9	69	37	5.49	2.80	18.70	4.75	12.91	10.16	0
Mar.	20	.98	30,300	1,100	.19	8.3	53	27	4.04	1.32	6.09	3.44	5.00	3.10	.02
Apr.	21	1.16	26,300	1,320	.22	7.9	57	32	4.34	1.56	7.83	3.77	5.41	4.23	0
May	19	1.26	23,600	1,460	.24	8.2	57	31	4.69	1.65	8.26	3.93	6.25	4.51	.01
June 21	1	.84		1,010	.18	7.9	48	23	3.89	1.23	4.78	3.44	4.16	2.31	
July 21	1	1.01		1,190	.22	7.7	55	26	4.04	1.40	6.52	3.61	5.41	3.10	0
Aug. 22	1	.94		1,100	.21	7.5	53	26	3.79	1.32	5.66	3.44	4.79	2.82	0
Sept.22	1	1.92		2,140		7.7	61	31	5.99	2.47	13.48	4.75	10.62	7.05	
Oct. 17	1	2.07		2,340		8.2	63	32	5.99	2.72	15.22	5.24	11.24	7.90	
Nov. 18	1	2.23		2,430		8.3	63	32	6.49	2.80	16.10	5.57	12.28	8.46	
Dec. 19	1	2.73		2,960		8.1	69	35	6.99	2.80	22.18	6.06	14.57	11.00	

Rio Grande at Fort Quitman, Texas near Colonia Luis Leon, Chihuahua

Sampling by U. S. Geological Survey

Jan. 18	1	4.02	15,000	4,480		8.0	64	54	11.98	4.85	29.58	5.70	16.66	25.95	
Feb. 21	1	8.08	10,500	8,790		7.8	67	63	20.96	11.51	65.25	5.77	31.23	62.06	
Mar. 22	1		7,480	9,020		7.8									
Apr. 19	1	8.85	4,860	9,560		8.0	67	65	23.95	12.34	73.95	5.90	31.23	67.70	
May 24	1	9.01	4,860	9,670		7.8	67	63	22.95	11.51	69.60	5.41	33.31	64.88	
June 20	1	10.02	1,140	10,800		7.8	70	66	22.95	13.98	86.99	2.79	37.48	78.98	
July	0		120												
Aug.	0		117												
Sept.		No Flow	0												
Oct. 10	1	8.58	203	9,310		8.1	67	66	21.96	12.34	69.60	3.77	31.23	67.70	
Nov. 9	1	4.45	3,970	5,130		8.2	66	59	11.48	6.09	34.80	5.24	16.66	31.03	
Dec. 13	1	5.22	4,520	6,020		8.2	67	58	13.47	6.99	42.19	5.74	20.82	36.67	
Mean ⊕		5.82	∅ 52,770	6,450									22.63	41.41	
Period Avg.		2.20	239,000	2.090									9.51	15.67	
Tons of Constituents				1977									18,100	13,400	
Avg. Tons, Period				1938-1977									67,500	82,100	

** Percent of total cations *** Percent of total anions ⊕ Weighted mean ∅ Total

Tons and annual mean values determined from conductivity of daily samples and relationship curves developed from results of chemical analyses of individual samples

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1977

Month or Day	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 ***	Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande above Rio Conchos near Presidio, Texas and Ojinaga, Chihuahua

Sampling by U. S. Section

Jan.	4	3.75	26,500	4,280		7.8	67		10.48	4.52	30.02	4.43		23.13	
Feb.	4	4.21	16,500	4,600		8.2	66		10.98	5.02	31.76	4.26		26.24	
Mar.	6	3.51	5,600	3,820	0.53	7.8	65	52	9.48	4.20	25.66	4.10	15.20	20.88	0.02
Apr.	5	1.74	1,110	1,910		7.9	57		5.99	2.22	10.88	3.44		6.77	
May	5	1.10	2,120	1,140		8.2	49		4.79	1.15	5.66	3.12		1.44	
June 27	1	1.05		1,140		7.8	48		4.99	1.07	5.66	3.12		1.61	
July 25	1	.99		1,080		8.0	49		4.54	.99	5.22	2.95		1.47	
Aug. 18	1	.95		1,050		7.7	55		3.64	.90	5.66	2.46		1.33	
Sept 12	1	1.32		1,380		7.3	48	16	5.99	1.40	6.96	2.79	9.79	2.40	
Oct. 17	1	1.27		1,380		8.0	52	18	5.49	1.40	7.40	2.95	8.74	2.51	
Nov. 16	1	1.26		1,330		8.0	53	17	4.99	1.56	7.40	3.12	8.74	2.51	
Dec.															

Rio Conchos near Ojinaga, Chihuahua

Sampling by Mexican Section

Jan.	9	1.22	17,600	1,350		8.2	57		4.54	1.40	7.83	3.12		2.76	
Feb.	8	1.35	13,800	1,430		8.0	55		5.49	1.40	8.26	3.61		3.10	
Mar.	11	1.09	68,400	1,130	0.32	7.6	54	13	4.34	1.15	6.52	3.28	7.08	1.50	0.02
Apr.	12	1.09	95,300	1,140		8.0	53		4.54	1.23	6.52	3.28		1.41	
May	13	1.09	94,400	1,160		8.0	55		4.24	1.15	6.52	3.12		1.38	
June 29	1	1.14		1,230		7.8	54		4.84	1.15	6.96	3.28		1.86	
July 25	1	1.00		1,100		8.0	48		4.69	.99	5.22	2.95		1.47	
Aug. 18	1	1.03		1,130		7.8	56		3.79	1.07	6.09	2.62		1.47	
Sept 12	1	1.09		1,140		7.2	40	12	5.99	.99	4.78	2.13	8.74	1.44	
Oct. 17	1	1.30		1,380		8.2	52	17	5.49	1.48	7.83	3.28	8.74	2.51	
Nov. 16	1	1.25		1,350		8.2	49	17	5.49	1.48	6.96	3.44	8.33	2.48	
Dec. 19	1	1.21		1,340		8.1	54	19	4.84	1.40	7.40	3.28	7.91	2.60	

Rio Grande at Johnson Ranch near Castolon, Texas and Santa Elena, Chihuahua

Sampling by U. S. Section

Jan.	4	2.02	48,400	2,270		8.1	60		6.99	2.14	13.92	3.61		8.75	
Feb.	4	2.23	33,700	2,390		7.7	60		7.48	2.47	15.22	3.44		9.31	
Mar.	5	1.25	67,800	1,310	.32	8.1	55	18	4.69	1.32	7.40	3.28	7.70	2.43	.04
Apr.	5	1.12	96,100	1,190		8.0	55		4.49	1.32	6.96	3.12		1.72	
May	4	1.13	101,000	1,200		7.7	58		4.44	1.23	7.83	2.95		1.66	

** Percent of total cations *** Percent of total anions

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1977

Month or Day	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 ***	Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande at Foster Ranch near Langtry, Texas and Rancho Santa Rosa, Coahuila

Sampling by U. S. Geological Survey

Jan. 26	1	1.41	59,800	1,590		7.8	55	33	4.99	2.22	8.70	3.47	7.50	5.36	
Feb. 23	1	1.34	43,000	1,530		8.1	53	33	4.99	2.22	8.26	3.21	7.08	5.08	
Mar. 23	1		63,200	1,160		7.9									
Apr. 26	1	1.04	84,400	1,140		7.9	50	14	4.19	1.40	5.65	3.08	6.66	1.64	
May 25	1	1.03	90,300	1,120		8.0	54	14	3.94	1.23	6.09	2.95	6.66	1.50	
June 22	1	1.01	58,000	1,110		8.0	49	15	4.49	1.40	5.65	2.95	6.66	1.66	
July 27	1		60,600	1,090		8.2									
Aug. 23	1	1.02	63,700	1,090		8.3	51	13	4.24	1.15	5.65	2.79	6.87	1.41	
Sep. 21	1	1.10	46,100	1,180		8.1	43	16	5.49	1.56	5.22	3.11	7.08	1.89	
Oct. 18	1	1.09	29,300	1,180		8.2	48	21	4.14	1.89	5.65	2.79	6.87	2.51	
Nov. 9	1	.94	28,800	1,020		8.2	46	18	3.89	1.73	4.78	3.11	5.83	1.95	
Dec. 6	1	.99	31,200	1,100		8.0	46	18	4.34	1.81	5.22	3.11	6.66	2.17	
Mean ●		1.00	∅ 658,400	1,140									6.18	2.26	
Period Avg.		0.90	957,000	969									5.24	1.58	
Tons of Constituents,				1977									265,000	71,500	
Avg. Tons, Period				1968-1977									364,000	80,000	

Pecos River near Langtry, Texas

Sampling by U. S. Section

Jan. 26	1	2.92		3,470		7.9	59	64	7.98	6.00	20.01	3.28	9.16	22.57	
Feb. 23	1	3.13		3,600		8.1	61	65	8.48	6.25	22.62	3.15	9.58	23.70	
Mar. 23	1			3,770		8.0									
Apr. 26	1	2.64		3,060		7.9	59	64	7.49	5.02	18.27	3.08	7.70	19.18	
May 25	1	2.41		2,880		8.2	60	63	5.99	4.85	16.53	2.79	7.29	17.21	
June 22	1	2.04		2,430		8.2	60	66	5.49	4.03	14.35	2.46	5.83	16.08	
July 27	1			2,160		8.2									
Aug. 23	1	1.67		2,020		8.3	58	63	4.54	3.54	11.31	2.46	4.79	12.13	
Sep. 21	1	1.63		1,990		8.1	58	63	4.49	3.54	10.87	2.46	4.37	11.85	
Oct. 18	1	1.75		2,060		8.1	58	60	4.79	3.78	11.74	2.79	5.00	11.85	
Nov. 9	1	1.94		2,320		7.9	55	63	5.49	4.77	12.61	2.79	5.83	14.39	
Dec. 6	1	2.20		2,590		7.6	57	62	6.49	4.93	15.22	2.95	7.08	16.08	

Rio Grande below Amistad Dam near Cd. Acuna, Coahuila and Del Rio, Texas

Sampling by U. S. Section

Jan.	13	0.85	93,200	999	0.16	8.1	48	35	3.79	1.48	4.78	2.62	3.75	3.39	0.01
Feb.	11	.87	73,800	1,010	.16	8.0	48	35	3.69	1.48	4.78	2.62	3.75	3.39	.01
Mar.	13	.91	56,200	1,020	.16	7.7	48	33	3.74	1.48	4.78	2.62	4.16	3.39	0
Apr.	12	.91	124,000	1,060	.17	8.0	52	35	3.74	1.56	5.66	2.62	4.16	3.67	.02
May	13	.90	456,000	1,070	.17	8.0	47	34	3.99	1.40	4.78	2.62	4.37	3.67	.01
June 22	1	.89		1,080	.18	7.6	48	34	4.04	1.56	5.22	2.62	4.58	3.67	0
July 20	1	.88		1,070	.18	7.9	51	35	3.54	1.56	5.22	2.30	4.37	3.67	0
Aug. 17	1	.91		1,110	.18	7.6	47	36	3.84	1.56	4.78	2.62	3.96	3.67	
Sep. 21	1	.93		1,090		7.5	48	33	4.09	1.65	5.22	2.62	4.79	3.67	
Oct. 19	1	.90		1,090		8.0	49	34	3.74	1.65	5.22	2.79	4.37	3.67	
Nov. 16	1	.89		1,070		8.0	46	34	3.69	1.73	4.78	2.46	4.58	3.67	
Dec. 21	1	.87		1,060		8.0	50	35	3.54	1.65	5.22	2.30	4.37	3.67	

** Percent of total cations *** Percent of total anions ● Weighted mean ∅ Total

Tons and annual mean values determined from conductivity of daily samples and relationship curves developed from results of chemical analyses of individual samples

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1977

Month or Day	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 ***	Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande at Nuevo Laredo, Tamaulipas and Laredo, Texas

Sampling by Laredo Water Plant

Jan. 10	1	0.74	149,000	865		8.3	38	29	4.09	1.32	3.31	2.95	3.33	2.60	
Feb. 14	1	.82	125,000	924		7.9	40	30	4.24	1.40	3.70	3.02	3.54	2.82	
Mar. 14	1		91,400	930		8.1									
Apr. 11	1	.85	130,000	969		8.1	43	32	4.09	1.64	4.35	2.77	3.96	3.10	
May 9	1	.91	550,000	1,040		8.1	46	36	4.09	1.56	4.78	2.72	4.16	3.95	
June 6	1	.86	161,000	1,000		7.8	47	35	3.74	1.56	4.78	2.46	3.96	3.39	
July 11	1		98,100	936		7.7									
Aug. 15	1	.86	77,200	993		7.7	40	34	4.19	1.64	3.91	2.46	4.16	3.39	
Sep. 12	1	.88	241,000	1,030		7.8	44	31	3.89	1.56	4.35	2.79	4.16	3.10	
Oct. 17	1	.85	96,900	1,000		7.9	47	27	3.84	1.64	4.78	2.79	4.79	2.82	
Nov. 7	1	.80	63,700	947		7.9	43	28	4.14	1.48	4.18	2.95	4.16	2.82	
Dec. 5	1	.83	66,800	910		7.9	44	32	3.99	1.64	4.35	2.62	3.96	3.10	
Mean ⊕		0.81	ø1,850,100	969									3.87	3.13	
Period Avg.		0.73	1,631,000	838										2.37	
Tons of Constituents, 1977													578,000	345,000	
Avg. Tons, Period 1968-1977														255,000	

Río Salado near Las Tortillas, Tamaulipas

Sampling by Mexican Section

Jan.	1	0.86	51,400	929		7.9	33		4.64	1.89	3.22	3.28		2.06	
Feb.	1	1.12	59,800	1,180		7.9	37		4.99	2.39	4.35	2.95		3.39	
Mar.	1	2.37	43,300	2,270		7.6	45		8.48	5.43	11.31	3.12		7.05	
Apr.	1	3.47	36,100	3,160		7.7	47	29	10.98	7.90	16.96	2.13	22.90	10.16	0.15
May	1	4.13	41,400	3,770		7.6	45		13.97	9.87	19.58	2.62		11.57	
June 1	1	3.70	34,100	3,440		7.6	45		13.47	8.23	17.40	2.79		10.16	
July 6	1	3.63	25,800	3,310		7.8	43		12.97	9.05	16.53	2.79		8.46	
Aug. 4	1	4.54	21,100	4,100		7.5	40		15.47	14.81	20.44	2.30		11.00	
Sep. 6	1	3.40	21,600	3,320		7.4	44	23	12.97	9.05	17.40	2.62	27.07	9.03	
Oct. 4	1	4.01	94,000	3,680		7.9	44	20	15.47	10.69	20.44	3.12	33.31	9.03	
Nov. 8	1	4.26	21,000	3,910		7.8	40	22	16.47	12.34	19.14	2.95	35.39	11.00	
Dec. 1	1	4.72	22,500	4,320		7.7	43	22	17.47	13.16	23.06	2.79	39.56	11.85	
Mean ⊕		2.22	ø 472,100	1,200		7.8	39		8.72	5.47	10.22	2.98		5.84	
Period Avg.		1.07	394,000	1,060			38		† 7.21		4.42	2.57		2.94	
Tons of Constituents, 1977									50,500	19,200	67,900	25,800		59,800	
Avg. Tons, Period 1955-1977											50,700	38,500		52,100	

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

Sampling by U. S. Section

Jan.	8	0.71	162,000	843	0.17	8.1	43	29	3.49	1.23	3.61	2.30	3.75	2.48	0
Feb.	11	.73	147,000	841	.17	7.6	43	31	3.24	1.32	3.48	2.30	3.33	2.57	0
Mar.	13	.76	108,000	850	.17	7.8	43	29	3.49	1.40	3.65	2.30	3.75	2.48	0
Apr.	13	.76	298,000	866	.17	8.1	43	30	3.49	1.48	3.74	2.46	3.54	2.60	0
May	11	.78	440,000	911	.18	7.8	43	29	3.79	1.48	3.92	2.46	3.96	2.62	.01
June 20	1	.77		939	.20	8.1	43	30	3.79	1.48	3.92	2.29	3.96	2.82	.08
July 21	1	.75		963	.20	7.8	46	30	3.39	1.48	4.13	2.30	4.16	2.82	0
Aug. 15	1	.81		982	.21	7.4	46	34	3.44	1.56	4.18	2.13	3.75	3.10	.01
Sep. 19	1	.79		1,000		7.4	46	33	3.39	1.65	4.26	1.97	4.37	3.10	
Oct. 17	1	.85		1,020		8.0	51	34	3.39	1.65	5.22	1.97	4.58	3.39	
Nov. 29	1	.88		1,030		8.0	47	32	3.64	1.81	4.78	2.13	5.00	3.39	
Dec. 19	1	.91		1,060		7.8	46	31	3.64	1.89	4.78	2.13	5.41	3.39	

** Percent of total cations *** Percent of total anions ⊕ Weighted mean ø Total

Tons and annual mean values determined from conductivity of daily samples and relationship curves developed from results of chemical analyses of individual samples † Sum of calcium and magnesium

‡ Tonnage figures based on total release from reservoir

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1977

Rio Grande at Los Ebanos, Texas near Cd. Diaz Ordaz, Tamaulipas

Sampling by U. S. Section

Month or Day	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 ***	Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.															
Feb.															
Mar.															
Apr.															
May															
June 22	1	0.89		1,060		7.8	48		3.99	1.56	5.22	2.46		3.67	
July 18	1	.87		1,060		7.8	47		3.64	1.65	4.78	2.30		3.67	
Aug. 15	1	.85		1,030		7.7	46		4.44	1.73	4.35	2.13		3.39	
Sep. 19	1	.98		1,210		7.2	45	38	4.09	2.14	5.22	2.13	5.21	4.51	
Oct. 17	1	.87		1,080		7.9	50	35	3.44	1.65	5.22	2.13	4.58	3.67	
Nov. 21	1	1.07		1,260		7.7	49	37	4.09	2.14	6.09	2.30	5.83	4.80	
Dec. 19	1	.99		1,140		7.7	50	33	3.84	1.89	5.66	2.13	5.83	3.95	

Rio Grande at Rio Grande City, Texas near Camargo, Tamaulipas

Sampling by U. S. Section

Month or Day	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 ***	Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	6	0.75	237,000	883	0.19	7.8	44	31	3.74	1.32	3.92	2.46	3.54	2.71	0.01
Feb.	6	.77	225,000	877	.18	8.0	44	31	3.39	1.40	3.70	2.46	3.54	2.76	.01
Mar.	4	.81	134,000	906	.19	8.0	44	31	3.64	1.48	3.96	2.46	3.75	2.82	.01
Apr.	7	.78	302,000	884	.19	7.9	44	30	3.49	1.48	3.83	2.46	3.75	2.68	.01
May	7	.80	466,000	931	.19	7.6	43	30	3.79	1.48	4.00	2.46	3.96	2.71	0
June 20	1	.82		992	.22	7.7	45	32	3.69	1.56	4.26	2.46	4.16	3.10	0
July 18	1	.81		996	.22	7.9	45	32	3.79	1.48	4.35	2.13	4.37	3.10	0
Aug. 15	1	.81		990	.22	7.6	47	36	3.24	1.56	4.26	1.97	3.96	3.39	0
Sep. 19	1	.86		1,070		7.2	44	35	3.64	1.98	4.35	1.97	4.79	3.67	
Oct. 17	1	.86		1,030		7.8	51	36	3.29	1.65	5.22	1.97	4.58	3.67	
Nov. 21	1	.89		1,060		7.7	46	34	3.64	1.81	4.78	2.13	5.00	3.67	
Dec. 19	1	.89		1,070		7.8	46	34	3.64	1.81	4.78	2.13	5.00	3.67	

Morillo Drain in Mexico, 8.4 River Miles above Anzaldúas Dam

Sampling by Mexican Section

Month or Day	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 ***	Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	31	No flow to river		11,310	5.5	7.8	74	65	16.97	13.16	87.00	2.79	37.48	76.17	0.12
Feb.	28	No flow to river		11,720	5.7	7.9	75	68	17.46	14.81	95.70	2.30	37.48	84.63	.12
Mar.	31	No flow to river		9,430	4.7	7.7	74	63	13.97	11.52	73.95	2.79	33.31	62.06	.08
Apr.	30	6.38	25,800	6,980	3.4	7.7	74	61	11.98	8.23	56.55	3.28	24.98	45.14	.13
May	31	5.81	55,600	6,380	3.3	8.0	72	60	10.98	7.40	47.85	3.28	22.90	39.49	.08
June 18	1	7.17		7,880	4.1	7.8	75	59	12.48	8.23	60.90	4.10	29.15	47.95	.03
July 28	1	6.53		7,180	3.6	7.7	72	64	12.48	8.23	52.20	3.93	22.90	47.95	.01
Aug. 15	1	5.51		6,160	3.0	7.2	71	58	10.48	7.08	43.50	3.77	22.90	36.67	0
Sep. 19	1	8.34		9,710		7.3	73	62	14.97	11.52	73.95	4.59	33.31	62.06	
Oct. 17	1	5.85		6,570		7.7	73	57	11.98	7.16	52.20	4.43	24.98	39.49	
Nov. 21	1	7.74		8,400		7.7	72	57	14.47	10.69	65.25	4.26	35.39	53.60	
Dec. 19	1	9.44		9,400		7.7	76	56	15.47	12.34	87.00	4.59	43.72	62.06	

** Percent of total cations *** Percent of total anions

CHEMICAL ANALYSES OF WATER SAMPLES FROM THE RIO GRANDE AND TRIBUTARIES - 1977

Month or Day	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 ***	Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3

Rio Grande below Anzalduas Dam, Texas near Reynosa, Tamaulipas and Mission, Texas

Sampling by U. S. Section

Jan.	31	0.82	265,000	970	0.21	8.1	45	36	3.64	1.56	4.22	2.30	3.75	3.39	0.04
Feb.	28	.85	222,000	971	.22	8.0	45	35	3.74	1.56	4.26	2.46	3.75	3.39	.04
Mar.	31	.98	98,500	1,100	.25	8.2	47	36	4.14	1.73	5.22	2.62	4.37	3.95	.03
Apr.	30	.88	268,000	1,040	.24	8.0	46	36	3.94	1.73	4.78	2.46	4.16	3.67	.02
May	31	.86	371,000	1,070	.26	8.0	47	35	3.79	1.56	4.78	2.46	4.37	3.67	.01
June 18	1	.99	162,000	1,190		8.0	52	40	3.99	1.73	6.09	2.29	5.00	4.80	
July 17	1	1.02	98,600	1,220		7.8	47	35	4.39	1.89	5.65	2.62	5.21	4.23	
Aug. 15	1	.87	86,900	1,070		7.8	48	35	3.54	1.73	4.78	2.13	4.58	3.67	
Sep. 19	1	.82	91,000	987		7.4	48	40	3.64	1.40	4.78	1.97	3.96	3.95	
Oct. 17	1	.92	64,200	1,130		7.9	51	36	3.49	1.89	5.65	2.13	4.78	3.95	
Nov. 21	1	1.00	78,500	1,180		8.0	48	35	3.99	2.06	5.65	2.13	5.62	4.23	
Dec. 19	1	1.04	89,700	1,230		7.7	49	35	4.04	2.06	6.09	2.29	5.62	4.23	
Mean ●		0.91	ø1,895,400	1,060									4.74	3.92	
Period Avg.		0.91	1,866,000	1,070									4.15	3.99	
Tons of Constituents, 1977													645,000	394,000	
Avg. Tons, Period 1959-1977													506,000	359,000	

Rio Grande near Brownsville, Texas and Matamoros, Tamaulipas

Sampling by U. S. Geological Survey

Jan. 11	1		289,000	931		8.0									
Feb. 15	1	0.94	224,000	1,080		7.9	44	36	4.19	1.81	4.78	2.65	4.37	3.95	
Mar. 15	1	1.06	64,500	1,180		8.2	43	36	4.84	2.14	5.22	3.08	4.79	4.51	
Apr. 12	1	1.08	184,000	1,200		7.9	40	34	5.49	2.22	5.22	3.95	4.79	4.51	
May 10	1		307,000	1,020		7.6									
June 7	1	.93	108,000	1,100		7.8	48	37	3.89	1.73	5.22	2.46	4.37	3.95	
July 12	1	1.52	30,000	1,720		7.4	49	40	5.99	2.96	8.70	4.26	6.25	7.05	
Aug. 16	1	1.20	11,300	1,390		7.2	45	37	5.49	2.38	6.52	3.77	5.41	5.36	
Sep. 13	1	1.03	78,500	1,230		7.9	57	44	3.69	1.56	6.96	2.29	4.58	5.36	
Oct. 18	1	1.65	8,310	1,680		7.2	44	39	7.49	3.62	8.70	5.08	7.29	7.90	
Nov. 8	1	1.23	42,100	1,470		8.1	50	43	4.89	2.55	7.39	2.46	5.83	6.21	
Dec. 6	1	1.32	22,000	1,550		8.0	47	39	5.49	2.71	7.39	3.11	6.45	6.21	
Mean●		0.92	ø1,368,710	1,090									4.36	4.01	
Period Avg.															
Tons of Constituents, 1977													424,000	288,000	

** Percent of total cations *** Percent of total anions ● Weighted mean ø Total

Tons and annual means values determined from conductivity of daily samples and relationship curves developed from results of chemical analyses of individual samples

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1977

The following tables show electrical conductivity, expressed in mhos per centimeter 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 the 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 percent 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 American Dam 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		November	
4	2,330	15	2,580	29	1,110	5	1,410	17	1,210	4	1,070	26	2,300	9	2,490
5	2,290	16	2,760	30	1,090	6	1,410	22	1,050	5	1,070	27	2,260	10	2,590
6	2,300	17	2,750	April		9	1,380	23	1,040	8	1,070	28	2,180	11	2,580
7	2,260	18	2,710	1	1,320	10	1,450	24	1,030	9	1,050	29	2,160	15	2,570
10	2,240	22	2,450	4	1,320	11	1,550	28	1,030	10	1,050	30	2,180	16	2,580
11	2,240	23	2,710	5	1,320	12	1,560	29	1,040	11	1,040	October		17	2,580
12	2,230	24	2,720	6	1,320	13	1,780	July		12	1,050	3	2,200	21	2,590
13	2,290	25	2,860	7	1,320	16	1,780	5	989	15	1,050	4	2,190	22	2,590
14	2,350	28	2,890	8	1,310	17	1,680	6	1,060	16	1,120	5	2,180	23	2,640
17	2,280	March		11	1,310	18	1,690	7	1,190	17	1,130	6	2,290	25	2,650
18	2,270	1	2,900	12	1,320	19	1,690	8	1,290	18	1,140	7	2,340	28	2,660
19	2,230	2	2,880	13	1,320	20	1,630	11	1,120	21	1,300	11	2,320	29	2,640
20	2,370	3	2,870	14	1,310	23	1,680	12	1,360	22	1,130	12	2,370	30	2,710
21	2,280	8	1,180	15	1,320	24	1,260	13	1,390	23	1,220	13	2,410	December	
24	2,320	9	1,120	18	1,310	25	1,270	14	1,410	24	1,230	14	2,410	1	2,720
26	2,360	10	1,120	19	1,360	26	1,270	15	1,200	25	1,220	18	2,470	2	2,710
28	2,540	11	1,020	20	1,360	June		18	1,200	30	1,290	20	2,470	5	2,700
31	2,380	14	1,020	21	1,360	1	1,270	20	1,210	September		25	2,510	6	2,790
February		15	1,010	22	1,360	2	1,220	21	1,210	2	1,320	26	2,520	7	2,840
1	2,510	16	1,020	25	1,410	3	1,220	22	950	6	1,320	27	2,490	8	2,870
2	2,490	17	1,030	26	1,300	6	1,220	26	951	7	1,310	28	2,510	9	2,850
3	2,390	18	1,030	27	1,300	8	1,230	27	1,260	8	1,310	31	2,480	13	2,850
4	2,540	21	1,020	28	1,300	9	1,230	28	1,260	9	1,300	November		14	3,040
7	2,590	22	1,020	29	1,280	10	1,180	29	1,120	13	1,310	1	2,430	15	3,040
8	2,590	23	1,020	May		13	1,180	August		14	1,600	2	2,390	16	3,030
9	2,650	24	1,020	2	1,400	14	1,210	1	1,120	15	1,640	3	2,380	20	3,140
10	2,600	25	1,050	3	1,420	15	1,220	2	1,070	16	1,770	4	2,380	21	3,160
14	2,650	28	1,100	4	1,430	16	1,220	3	1,070	22	2,180	7	2,410	22	3,140
										23	2,200	8	2,440	23	3,120

Sampling by U. S. Section

Rio Grande at Fort Quitman, Texas near Colonia Luis Leon, Chihuahua

January		February		March		April		May					
5	4,520	2	7,290	10	8,270	7	8,630	2	9,940				

Sampling by U. S. Geological Survey

Rio Grande near Candelaria, Texas and San Antonio del Bravo, Chihuahua

January		January		February		March		March		April		July		September	
6	3,810	12	4,250	3	4,690	2	6,920	17	7,160	1	7,370	1	861	16	688
		19	4,440	16	6,500	8	7,340	23	7,060	18	6,560	2	696		

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1977

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 above Rio Conchos near Presidio, Texas and Ojinaga, Chihuahua

January		February		April		May		June		August		September		November	
3	4,160	22	4,650	1	3,810	16	1,170	27	1,140	1	1,210	12	1,370	1	1,350
10	4,170	March		4	2,540	23	1,160	July		8	1,220	19	1,550	7	1,420
17	4,410	1	5,020	11	1,440	31	1,140	1	1,170	15	1,180	26	1,410	15	1,380
24	4,240	4	4,740	18	2,330	June		5	1,200	22	1,180	30	1,420	21	1,360
February		7	4,490	25	1,150	2	1,180	11	1,030	29	1,150	October		28	1,340
1	4,690	14	4,320	May		6	1,370	18	1,230	September		3	1,450	December	
7	4,570	21	2,990	3	1,140	13	1,290	25	1,080	1	1,170	11	1,300	1	1,340
14	4,690	28	2,330	9	1,140	20	1,230			9	1,230	17	1,390	5	1,350
												25	1,390		

Sampling by U. S. Section

Rio Conchos near Ojinaga, Chihuahua

January		March		April		May		July		August		September		October	
3	1,370	4	1,450	15	1,150	23	1,180	1	1,230	8	1,200	19	1,490	31	1,390
6	1,370	7	1,440	18	1,160	25	1,170	4	1,210	10	1,160	21	1,400	November	
10	1,280	10	1,340	20	1,130	27	1,170	6	1,130	12	1,180	23	1,470	3	1,440
13	1,280	14	1,060	22	1,130	30	1,170	8	1,210	15	1,170	26	1,510	14	1,340
17	1,330	16	1,120	25	1,140	June		11	910	17	1,110	28	1,560	18	1,370
20	1,350	18	1,070	27	1,140	1	1,290	13	1,560	19	1,160	October		21	1,350
24	1,380	21	1,120	29	1,130	3	1,180	15	1,200	24	1,160	3	1,500	24	1,370
27	1,380	23	1,130	May		6	1,410	18	1,160	26	1,110	5	1,460	28	1,370
31	1,400	25	1,130	2	1,150	8	1,240	20	1,190	29	1,160	7	967	December	
February		28	1,130	4	1,150	10	1,270	22	1,220	31	1,160	9	1,290	1	1,370
3	1,410	30	1,130	6	1,150	13	1,300	25	1,050	September		12	1,380	4	1,390
7	1,430	April		9	1,150	15	1,390	27	930	2	1,170	14	1,300	9	1,360
10	1,430	1	1,170	11	1,160	17	1,280	29	1,120	5	1,320	17	1,350	12	1,390
14	1,430	4	1,150	13	1,150	20	1,250	August		7	1,340	19	1,350	15	1,370
17	1,430	6	1,150	16	1,160	22	1,160	1	1,220	12	1,160	21	1,360	19	1,390
21	1,440	11	1,140	18	1,150	24	916	3	1,190	14	1,370	23	1,160	22	1,410
24	1,450	13	1,140	20	1,170	27	1,120	5	1,240	16	1,250	26	1,370	26	1,370
28	1,460													29	1,360

Sampling by Mexican Section

Rio Grande below Rio Conchos near Presidio, Texas and Ojinaga, Chihuahua

January		March		April		June		July		August		October		November	
3	2,360	1	2,100	11	1,160	2	1,410	5	1,290	22	1,190	3	1,700	21	1,540
10	2,340	7	2,000	18	1,330	6	1,570	11	1,050	24	1,200	11	1,490	28	1,500
17	2,300	14	1,240	25	1,150	9	1,490	18	1,270	29	1,180	17	1,590	December	
24	2,400	17	1,190	May		13	1,490	25	1,060	September		25	1,100	1	1,500
February		21	1,180	3	1,170	15	1,520	August		1	1,160	November		5	1,480
1	2,510	28	1,220	9	1,180	20	1,390	1	1,220	9	1,510	1	1,620	12	1,480
7	2,550	April		16	1,180	27	1,250	8	1,230	12	1,400	7	1,590	15	1,440
14	2,390	1	1,180	23	1,200	July		11	1,210	19	1,520	9	1,570	19	1,520
16	2,350	4	1,190	31	1,190	1	1,350	15	1,250	24	1,720	15	1,520	27	1,500
22	2,240									30	1,620				

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
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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 and Santa Elena, Chihuahua

January		February		March		March		April		May		June		June	
3	2,210	2	2,460	1	2,200	29	1,170	11	1,180	2	1,170	1	1,230	27	1,070
11	2,300	8	2,460	7	2,130	April		19	1,190	10	1,200	7	1,560	July	
18	2,300	15	2,400	15	1,300	1	1,190	25	1,170	16	1,170	13	1,400	1	1,280
24	2,250	22	2,250	22	1,190	5	1,220			24	1,220	20	1,500		

Sampling by U. S. Section

Rio Grande at Foster Ranch near Langtry, Texas and Rancho Santa Rosa, Coahuila

January		February		March		May		June		August		September		November	
1	1,630	11	1,540	28	* 1,110	9	654	21	1,030	6	995	23	1,100	12	1,040
2	1,600	12	1,530	29	1,110	9	* 604	22	1,080	7	1,010	24	1,160	13	1,050
3	1,620	13	1,580	30	1,110	10	1,040	23	1,290	8	998	25	1,120	14	1,090
3	* 1,590	14	1,460	31	1,110	11	1,100	24	1,350	9	945	26	1,090	15	1,120
4	1,580	14	* 1,540	April		12	954	25	1,010	10	1,060	27	1,090	16	1,140
5	1,640	15	1,550	1	1,110	13	1,090	26	1,200	11	1,060	28	1,070	17	1,150
6	1,630	17	1,530	2	1,120	14	964	27	1,100	12	1,100	29	1,090	18	1,150
7	1,630	19	1,520	3	1,110	15	1,130	27	* 1,210	13	1,160	30	1,050	19	1,150
8	1,620	20	1,550	4	1,110	16	1,190	28	1,100	14	1,260	October		20	1,140
9	1,620	21	1,560	4	* 1,120	16	* 1,170	29	983	15	1,250	1	1,060	21	1,130
10	1,600	22	1,490	5	1,120	17	920	30	1,060	16	1,140	2	1,070	22	1,140
10	* 1,580	22	* 1,540	6	1,120	18	877	July		17	1,170	4	1,010	23	1,130
11	1,600	23	1,530	7	1,130	19	824	1	1,010	18	1,200	5	1,080	25	1,130
12	1,590	24	1,500	8	1,120	20	1,050	2	1,010	19	904	6	1,060	26	1,150
13	1,590	25	1,460	9	1,080	21	1,120	3	1,030	20	928	7	1,090	27	1,130
14	1,590	26	1,470	10	1,120	22	1,130	4	941	21	1,160	8	1,070	28	1,120
15	1,600	27	1,430	11	1,120	23	1,120	5	1,050	22	1,100	9	1,100	29	1,110
16	1,620	28	1,430	11	* 1,110	23	* 1,130	6	1,120	23	1,110	10	1,150	30	1,120
17	1,630	28	* 1,410	12	1,110	24	1,130	7	1,010	24	1,110	11	1,120	December	
17	* 1,580	March		13	1,100	25	1,130	8	932	25	1,070	12	1,150	1	1,120
18	1,530	1	1,430	14	1,110	26	1,130	9	771	26	1,130	13	1,180	2	1,130
19	1,600	2	1,400	15	1,100	27	1,120	10	893	27	1,160	14	974	3	1,140
20	1,610	3	1,390	16	1,100	28	1,130	11	1,090	28	1,130	15	1,270	4	1,130
21	1,570	4	1,370	17	1,160	29	1,120	11	* 969	29	878	16	1,240	5	1,120
22	1,560	5	1,360	18	963	30	1,160	12	1,010	30	1,160	17	1,270	6	1,130
23	1,570	6	1,370	18	* 908	31	1,034	14	1,140	31	1,100	18	1,230	7	1,120
24	1,580	7	1,290	19	1,080	31	* 864	15	1,180	September		19	1,150	8	1,130
25	1,580	7	* 1,350	20	1,110	June		16	1,190	1	1,070	20	1,140	9	1,120
25	* 1,570	8	1,340	21	1,100	1	1,120	17	1,170	2	1,120	21	1,100	10	1,120
26	1,560	9	1,350	22	1,090	2	1,120	18	1,140	3	1,090	22	1,020	11	1,120
27	1,560	10	1,300	23	1,110	3	1,140	19	1,060	4	1,100	23	1,120	12	1,120
28	1,530	11	1,310	24	1,120	4	1,140	20	1,040	5	1,100	24	633	13	1,120
29	1,510	12	1,310	25	1,170	5	1,070	21	989	6	1,110	25	1,070	14	1,130
30	1,480	13	1,310	25	* 1,140	6	1,110	22	985	7	1,100	26	1,130	15	1,160
31	1,490	14	1,350	26	1,110	6	* 1,110	23	1,020	8	1,080	27	700	16	1,230
31	* 1,510	14	* 1,330	27	1,100	7	1,090	24	1,030	9	1,110	28	1,150	17	1,230
February		15	1,350	28	1,090	8	1,070	25	1,140	10	1,040	29	1,210	18	1,230
1	1,520	16	1,340	29	1,060	9	1,100	26	1,040	11	954	30	1,220	19	1,180
2	1,520	17	1,480	30	933	11	1,100	27	1,200	12	738	31	1,070	20	1,140
3	1,540	18	1,860	May		12	1,200	28	1,190	13	1,010	November		21	1,140
4	1,690	19	1,500	1	1,070	13	1,250	29	1,140	14	1,040	1	877	22	1,100
5	1,640	20	1,240	2	1,080	13	* 1,210	30	1,100	15	920	2	990	23	1,090
6	1,550	21	1,170	2	* 1,110	14	1,280	31	1,170	16	1,160	3	1,140	24	1,100
7	1,520	21	* 1,160	3	1,100	15	1,230	August		17	884	4	1,140	26	1,130
7	* 1,530	22	1,100	4	920	16	1,290	1	1,110	18	1,160	5	1,090	27	1,120
8	1,510	23	1,150	5	1,060	17	1,210	2	1,090	19	1,140	6	1,090	28	1,100
9	1,520	25	1,130	6	1,080	18	1,080	3	1,100	20	1,080	8	1,040	29	1,100
10	1,450	26	1,120	7	1,090	19	1,190	4	1,020	21	1,200	10	1,100	30	1,080
		28	1,110	8	1,080	20	1,200	5	1,050	22	1,210	11	1,090	31	1,100

Sampling by U. S. Geological Survey except where marked by *, which was by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
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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

Pecos River near Langtry, Texas

January		February		April		May		July		August		October		November	
3	3,260	22	3,640	4	3,910	16	3,200	5	2,290	15	2,070	3	2,040	14	2,600
10	3,250	28	3,690	11	4,120	23	2,960	11	2,250	22	2,060	11	2,090	21	2,770
24	4,220	March		18	1,820	31	2,760	18	2,200	29	2,060	17	2,170	28	2,730
31	3,540	7	3,660	25	2,930	June		25	2,140	September		25	2,140	December	
February		14	3,680	May		6	2,710	August		6	2,030	31	2,380	5	2,720
7	3,580	21	3,730	2	3,330	13	2,550	1	2,110	12	2,010	November		19	2,780
14	3,570	28	3,060	9	3,290	20	2,470	8	2,140	19	2,050	7	2,410	27	2,860
						27	2,370			26	2,040				

Sampling by U. S. Section

Devils River at Pafford Crossing near Comstock, Texas

January		February		April		June		July		August		October		November	
3	420	22	413	16	374	1	396	18	373	29	373	2	367	14	335
17	425	March		18	264	13	343	August		September		17	349	21	410
24	417	7	419	May		July		1	369	6	375	November		December	
31	424	April		2	398	5	364	15	371	19	373	1	391	8	423
		4	387	16	383									19	408

Sampling by U. S. Section

Rio Grande below Amistad Dam near Cd. Acuna, Coahuila and Del Rio, Texas

January		February		April		May		July		August		October		November	
3	1,010	16	994	4	1,020	18	1,070	1	1,060	17	1,090	3	1,090	14	1,100
5	1,020	18	992	6	988	20	1,080	5	1,050	19	1,090	5	1,080	16	1,100
7	993	22	1,030	8	1,040	23	1,070	8	1,060	22	1,090	7	1,090	18	1,090
10	992	24	979	11	1,080	25	1,080	11	1,060	24	1,090	11	1,080	21	1,100
12	1,020	28	1,000	13	1,070	27	1,070	13	1,060	26	1,090	13	1,080	25	1,080
14	1,000	March		15	1,050	31	1,070	15	1,060	29	1,090	14	1,080	28	1,090
17	995	2	1,030	18	1,040	June		18	1,060	31	1,090	17	1,090	30	1,080
19	998	4	1,010	20	1,050	1	1,060	20	1,060	September		19	1,090	December	
21	1,010	7	1,020	22	1,040	3	1,050	22	1,060	2	1,090	21	1,090	2	1,080
24	990	9	1,020	25	1,030	6	1,070	25	1,060	6	1,090	25	1,080	5	1,090
26	1,030	11	1,030	27	1,070	8	1,060	27	1,070	7	1,090	26	1,080	7	1,080
28	966	14	1,030	29	1,070	10	1,080	29	1,060	9	1,090	28	1,080	9	1,080
31	978	16	1,020	May		13	1,050	August		12	1,090	31	1,080	14	1,080
February		18	1,030	2	1,080	15	1,050	1	1,060	14	1,070	November		16	1,080
2	1,020	21	1,020	4	1,080	17	1,070	3	1,060	16	1,090	2	1,090	19	1,070
5	1,010	23	1,030	6	1,050	20	1,080	5	1,060	19	1,080	4	1,090	21	1,060
7	1,020	25	1,020	9	1,060	22	1,070	8	1,090	21	1,090	7	1,110	23	1,060
9	1,020	28	1,010	11	1,060	24	1,060	10	1,100	23	1,100	9	1,110	27	1,080
11	1,030	30	1,020	13	1,070	27	1,060	12	1,080	26	1,080	11	1,090	29	1,080
14	992			16	1,080	29	1,060	15	1,090	28	1,090			30	1,090

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1977

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* Rio Grande near Jimenez, Coahuila and Quemado, 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	
1	981	15	985	1	942	16	1,030	1	1,000	16	979	1	1,030	16	1,030
2	966	16	977	2	937	17	1,090	2	1,010	17	978	2	1,040	17	1,030
3	1,010	17	980	3	989	18	1,080	3	966	18	1,010	3	956	18	1,030
4	989	18	980	4	956	19	1,100	4	1,040	19	999	4	944	19	1,020
5	988	19	974	5	932	20	1,070	5	982	20	1,020	5	980	20	1,030
6	1,030	20	964	6	975	21	1,080	6	993	21	1,020	6	973	21	1,020
7	994	21	964	7	996	22	1,060	7	1,010	22	1,020	7	973	22	1,010
8	978	22	1,000	8	1,090	23	1,060	8	996	23	1,010	8	1,050	23	1,030
9	1,010	23	1,010	9	1,020	24	1,070	9	1,020	24	1,050	9	1,010	24	1,030
10	981	24	1,020	10	987	25	1,070	10	993	25	1,050	10	1,030	25	1,020
11	979	25	956	11	979	26	1,080	11	1,040	26	1,050	11	1,010	26	998
12	984	26	956	12	999	27	1,040	12	1,050	27	1,090	12	1,040	27	998
13	986	27	973	13	1,000	28	1,060	13	1,480	28	1,150	13	992	28	1,010
14	994	28	971	14	997	29	1,060	14	1,020	29	1,100	14	1,020	29	997
15	989	March		15	998	30	1,070	15	1,010	30	1,080	15	1,020	30	1,010
16	992	1	995	16	969	31	1,040	16	1,040	31	1,080	16	1,030	December	
17	1,000	2	974	17	963	June		17	1,010	September		17	1,030	1	1,020
18	995	3	960	18	967	1	1,030	18	1,010	1	948	18	1,020	2	972
19	992	4	953	19	967	2	981	19	1,020	2	978	19	1,010	3	976
20	983	5	935	20	966	3	1,020	20	1,020	3	1,010	20	1,020	4	1,050
21	1,010	6	975	21	988	4	1,010	21	1,010	4	970	21	999	5	1,030
22	996	7	935	22	994	5	998	22	1,020	5	1,010	22	898	6	994
23	991	8	958	23	992	6	1,010	23	1,020	6	1,010	23	645	7	1,000
24	975	9	987	24	987	7	1,040	24	1,020	7	1,000	24	900	8	983
25	1,000	10	971	25	995	8	996	25	1,020	8	1,050	25	995	9	1,000
26	973	11	1,000	26	981	9	1,020	26	1,010	9	1,060	26	994	10	992
27	1,010	12	1,010	27	1,030	10	1,030	27	1,040	10	1,040	27	999	11	1,010
28	994	13	998	28	1,050	11	968	28	1,020	11	1,010	28	991	12	1,020
29	954	14	993	29	1,060	12	944	29	1,010	12	1,030	29	1,000	13	1,020
30	954	15	994	30	1,040	13	1,040	30	1,020	13	1,050	30	997	14	1,000
31	996	16	1,020	May		14	1,050	31	1,020	14	1,050	31	999	15	1,010
February		17	1,010	1	983	15	1,030	August		15	1,070	November		16	1,000
1	971	18	981	2	991	16	1,050	1	1,030	16	1,080	1	947	17	1,080
2	954	19	1,050	3	1,000	17	1,060	2	949	17	1,070	2	930	18	1,120
3	947	20	989	4	1,010	18	1,060	3	1,020	18	1,080	3	943	19	1,040
4	970	21	989	5	1,000	19	1,060	4	1,020	19	1,070	4	950	20	1,040
5	954	22	987	6	1,030	20	1,060	5	1,000	20	1,070	5	961	21	1,010
6	958	23	982	7	1,020	21	1,050	6	1,010	21	1,070	6	959	22	1,010
7	983	24	989	8	1,010	22	1,040	7	987	22	1,060	7	935	23	1,010
8	1,000	25	996	9	1,080	23	1,030	8	996	23	1,070	8	926	24	1,020
9	1,000	26	987	10	978	24	1,100	9	1,030	24	1,070	9	1,070	25	1,030
10	995	27	1,000	11	1,060	25	1,020	10	968	25	1,070	10	1,050	26	1,030
11	1,010	28	942	12	1,010	26	1,010	11	940	26	1,070	11	1,010	27	1,030
12	981	29	985	13	1,030	27	1,010	12	962	27	1,060	12	1,010	28	1,010
13	983	30	978	14	1,040	28	1,010	13	974	28	1,070	13	1,110	29	1,020
14	1,000	31	992	15	1,040	29	1,040	14	968	29	1,070	14	1,030	30	1,030
						30	1,040	15	977	30	1,070	15	1,010	31	1,030

Sampling by Maverick County Water Control and Improvement District #1

* Samples collected at the Maverick Canal Headgate

Rio Grande near El Indio, Texas and Villa Guerrero, Coahuila

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		September		November	
5	912	16	933	13	1,000	8	1,000	20	947	26	801	28	1,100	23	987
19	922	March		May		22	1,030	August		31	1,090	October		December	
February		2	930	11	1,040	July		3	971	September		12	1,030	7	984
2	909	16	956	25	1,060	6	1,020	17	971	14	1,050	November		21	1,010
		30	982									9	982		

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
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Rio Grande at Nuevo Laredo, Tamaulipas and Laredo, 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	
1	712	15	896	1	983	16	1,020	1	951	16	1,030	1	1,090	16	971
2	659	16	912	2	950	17	999	2	871	17	1,030	2	1,060	17	983
3	850	17	859	3	944	18	962	3	838	18	1,030	3	1,090	18	987
4	775	18	849	4	1,000	19	976	4	969	19	1,040	4	1,100	19	995
5	886	19	867	5	1,000	20	1,020	5	916	20	1,040	5	1,060	20	1,000
6	882	20	918	6	988	21	1,030	7	970	21	1,010	6	1,100	21	999
7	779	21	847	7	932	22	990	8	951	22	984	7	1,100	22	981
8	804	22	882	8	1,010	23	819	9	970	23	962	8	1,120	23	985
9	822	23	845	9	940	24	990	10	968	24	980	9	1,120	24	988
10	800	24	852	10	984	25	982	11	972	25	951	10	1,100	25	999
11	875	25	924	11	984	26	1,020	12	936	26	966	11	1,040	26	984
12	879	26	848	12	992	27	1,010	13	963	27	973	12	1,030	27	1,000
13	797	27	913	13	970	28	1,030	14	952	28	981	13	1,050	28	1,000
14	818	28	940	14	987	29	1,060	15	967	29	979	14	1,070	29	1,000
15	818	March		15	995	30	1,030	16	971	30	964	15	1,050	30	1,020
16	907	1	886	16	988	31	1,000	17	970	31	958	16	1,010	December	
17	844	2	901	17	1,080	June		18	986	September		17	1,050	1	1,020
18	801	3	980	18	1,040	1	1,020	19	1,000	1	1,050	18	1,010	2	1,020
19	904	4	876	19	1,120	2	1,030	20	1,010	2	1,060	19	1,050	3	990
20	908	5	911	20	1,040	3	1,030	21	1,010	3	1,060	20	999	4	1,010
21	847	6	822	21	978	4	1,040	22	1,040	4	1,030	21	1,040	5	1,020
22	834	7	811	22	891	5	1,030	23	1,040	5	1,040	22	1,030	6	995
23	852	8	866	23	871	6	1,040	24	1,000	6	1,060	23	1,040	7	1,020
24	874	9	827	24	946	7	1,020	25	962	7	1,010	24	1,010	8	1,010
25	866	10	895	25	862	8	963	26	951	8	1,000	25	984	9	1,020
26	859	11	852	26	908	9	955	27	942	9	1,030	26	740	10	1,030
27	883	12	920	27	941	10	982	28	928	10	1,010	27	533	11	1,020
28	904	13	923	28	927	11	981	29	999	11	988	28	756	12	1,010
29	904	14	945	29	937	12	988	30	954	12	1,010	29	685	13	1,010
30	909	15	871	30	948	13	940	31	952	13	1,040	30	735	14	1,020
31	878	16	956	May		14	968	August		14	1,070	31	823	15	1,020
February		17	888	1	982	15	976	1	946	15	1,060	November		16	1,030
1	853	18	957	2	1,050	16	1,060	2	1,000	16	1,050	1	945	17	1,040
2	861	19	934	3	1,030	17	967	3	956	17	1,020	2	952	18	1,050
3	859	20	897	4	1,000	18	985	4	953	18	1,050	3	991	19	1,030
4	883	21	907	5	996	19	961	5	965	19	1,030	4	987	20	1,030
5	843	22	917	6	1,030	20	991	6	962	20	1,060	5	1,020	21	1,040
6	890	23	932	7	1,020	21	1,010	7	971	21	1,070	6	1,000	22	1,030
7	850	24	932	8	1,020	22	999	8	971	22	1,030	7	938	23	1,040
8	865	25	934	9	1,030	23	1,010	9	980	23	1,050	8	982	24	1,040
9	796	26	926	10	1,030	24	1,050	10	965	24	1,060	9	979	25	1,040
10	798	27	989	11	1,010	25	1,040	11	958	25	1,060	10	1,000	26	1,050
11	792	28	983	12	1,050	26	1,050	12	983	26	1,050	11	1,000	27	1,040
12	795	29	933	13	1,000	27	1,050	13	1,010	27	1,070	12	940	28	1,040
13	829	30	981	14	1,010	28	1,090	14	1,020	28	1,040	13	981	29	1,040
14	841	31	938	15	1,030	29	1,080	15	1,020	29	1,070	14	981	30	1,050
						30	1,010			30	1,050	15	960	31	1,050

Sampling by Laredo Water Plant

Río Salado near Las Tortillas, Tamaulipas

January		February		April		May		June		August		September		November	
5	932	8	1,180	5	3,150	4	3,780	1	3,440	4	4,100	6	3,410	8	4,100
		March						July				October		December	
		3	2,280					6	3,310			4	3,710	1	4,440

Sampling by Mexican Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
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Rio Grande below Falcon Dam, Texas–U. S. Tailrace

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		June		July		August		October		November	
14	849	2	845	15	865	1	944	15	958	26	988	7	1,010	18	1,070
17	841	4	845	18	867	3	946	18	963	29	990	10	1,020	21	1,080
19	840	7	845	20	871	6	937	20	961	31	985	12	1,010	23	1,070
21	842	9	848	22	867	8	937	22	959	September		14	1,030	25	1,070
24	840	11	846	25	870	10	940	25	962	2	996	17	1,020	28	1,060
26	840	14	850	27	872	13	929	27	959	5	992	19	1,030	30	1,070
28	840	16	849	29	876	15	937	29	963	7	988	21	1,050	December	
31	840	18	848	May		17	937	August		9	994	25	1,050	2	1,080
February		21	848	4	843	22	941	1	966	12	1,000	26	1,050	5	1,070
2	842	23	847	6	896	24	939	3	968	14	1,000	28	1,050	7	1,060
4	840	25	850	9	902	27	943	5	968	16	1,000	31	1,050	9	1,070
7	841	28	853	11	900	29	943	8	968	19	1,010	November		12	1,070
9	838	30	853	13	899	July		10	968	21	1,010	2	1,060	14	1,070
11	837	April		16	902	1	941	12	976	23	1,010	4	1,040	16	1,080
14	838	1	857	18	912	5	949	15	976	26	1,010	7	1,050	19	1,080
16	838	4	859	20	912	6	952	17	973	28	1,010	9	1,060	21	1,070
18	840	6	855	23	920	8	951	19	979	30	1,010	11	1,050	23	1,080
23	840	8	863	25	922	11	958	22	983	October		14	1,060	27	1,080
25	842	11	857	27	924	13	952	24	984	3	1,020	16	1,060	28	1,090
28	844	13	866							5	1,030			30	1,080

Sampling by U. S. Section

Rancherías Drain in Mexico, 69.3 River Miles above Anzaldúas Dam

January		March		April		June		July		August		October		November	
4	7,940	1	7,590	13	7,760	1	6,020	13	9,750	24	6,600	13	5,530	23	6,350
19	7,640	7	7,590	20	4,920	8	5,710	20	7,210	31	6,320	19	6,530	30	6,520
26	7,700	15	7,640	27	4,700	15	6,610	27	6,400	September		26	6,470	December	
February		22	8,010	May		22	6,890	August		7	6,210	November		7	6,540
16	7,530	29	7,010	4	5,880	29	7,020	4	6,580	23	6,760	3	6,530	14	6,470
21	7,590	April		11	5,690	July		10	6,800	October		10	6,600	21	6,370
		5	6,860	18	5,240	6	6,920	17	5,380	5	5,320	16	6,540	28	6,510

Sampling by Mexican Section

Río San Juan at Camargo, Tamaulipas

January		February		May		June		August		September		October		November	
4	910	14	953	6	# 1,260	29	# 1,720	4	# 1,840	14	1,060	19	# 1,070	23	# 1,040
12	884	21	939	June		July		10	# 1,780	21	1,010	26	# 1,210	December	
26	906	March		1	* 1,470	6	# 2,610	17	# 1,690	October		November		8	1,020
February		29	# 1,050	8	* 1,550	13	# 1,710	24	# 1,750	5	# 1,120	3	# 1,080	14	1,020
2	929	April		15	* 1,690	20	# 2,710	31	# 1,590	13	# 1,080	10	# 1,030	21	1,020
7	967	4	# 1,060	22	# 1,690	27	# 1,860					16	# 1,180	28	1,090

Sampling by Mexican Section # Below Marte R. Gomez Dam * 4 miles below Marte R. Gomez Dam

Rio Grande at Rio Grande City, Texas near Camargo, Tamaulipas

January		February		April		May		July		August		October		November	
7	890	22	869	18	873	31	939	18	1,010	22	995	4	1,020	11	1,230
14	912	28	892	19	881	June		22	1,050	26	1,010	6	1,040	14	1,090
17	865	March		25	876	2	953	25	998	29	1,100	11	1,050	18	1,220
21	879	7	953	29	886	13	1,050	29	992	September		14	1,040	December	
27	860	21	873	May		17	998	August		1	1,220	17	1,040	8	1,140
31	896	25	910	2	939	27	1,860	1	1,000	13	1,130	25	1,070	12	1,070
February		28	887	6	912	July		5	989	16	964	28	1,070	16	1,270
4	863	April		16	922	5	1,430	8	992	19	1,110	31	1,080	19	1,080
7	876	4	892	20	927	11	1,020	12	995	23	1,120	November		23	1,090
14	864	8	899	23	925	12	990	15	998	26	1,090	4	1,370	30	1,130
18	860	11	876	27	936	15	999	19	995	30	1,060	7	1,330		

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1977

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

Puertecitos Drain in Mexico, 46.8 River Miles above Anzalduas 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		June		August		October		November	
4	4,480	1	4,310	13	3,840	18	4,170	29	4,270	10	3,080	5	3,430	23	3,070
19	4,440	7	4,390	20	3,970	June		July		25	3,570	13	3,620	30	3,590
26	4,460	22	4,280	27	3,590	1	3,860	6	4,130	September		26	2,960	December	
February		29	4,020	May		8	4,020	14	4,030	7	3,890	November		7	3,110
14	4,310	April		4	3,530	15	4,260	28	3,730	14	3,870	3	3,830	14	3,900
21	4,290	5	4,150	11	4,190	22	4,270	August		23	3,940	10	3,780	21	3,900
								4	3,630			16	3,690	28	3,930

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		March		April		May		June		August		October		November	
4	2,700	1	2,730	13	2,760	18	2,330	29	2,950	10	2,790	5	2,740	23	2,850
19	2,680	7	2,770	20	2,200	June		July		25	2,760	13	2,720	30	2,750
26	2,670	22	2,740	27	2,490	1	2,430	6	2,750	September		26	2,730	December	
February		29	2,720	May		8	2,910	14	2,730	7	2,900	November		7	2,750
14	2,760	April		4	2,830	15	2,920	28	2,810	14	2,480	3	2,750	14	2,700
21	2,710	5	2,790	11	2,760	22	3,070	August		23	2,830	10	2,710	21	2,650
								4	2,770			16	2,740	28	2,630

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		January		January		February		March		March		April		April	
4	3,970	19	3,880	26	3,880	14	3,870	1	3,740	22	3,510	5	3,050	20	3,070
						21	3,840	7	3,760	29	3,260	13	2,950	27	3,370

Sampling by Mexican Section

Rio Grande at Los Ebanos, Texas near Cd. Diaz Ordaz, Tamaulipas

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		June		July		August		September		October		November	
3	928	18	1,080	1	955	20	1,040	22	1,060	24	1,200	27	1,350	29	1,310
5	956	21	948	3	972	21	1,050	23	1,040	25	1,320	28	1,440	30	1,230
8	913	23	989	6	967	22	1,090	24	1,030	26	1,310	29	1,260	December	
10	940	25	1,070	8	997	23	1,170	25	1,020	27	1,250	30	1,300	1	1,500
12	981	28	996	10	979	24	1,180	26	1,030	28	1,100	31	1,260	2	1,500
14	985	30	979	13	993	25	1,050	27	1,030	29	1,090	November		3	1,630
17	913	April		15	1,060	26	1,070	28	1,030	30	1,100	1	1,230	4	1,660
19	908	1	934	17	1,080	27	1,050	29	998	October		2	1,250	5	1,710
21	933	4	1,140	20	1,140	28	1,050	30	1,010	1	1,110	3	1,300	6	1,540
24	1,210	6	981	24	1,260	29	1,040	31	1,110	2	1,120	4	1,590	7	1,380
26	927	8	949	27	1,980	30	1,030	September		3	1,070	5	1,710	8	1,280
28	923	11	961	28	2,260	31	1,020	1	1,250	4	1,070	6	1,900	9	1,290
31	940	13	920	29	2,250	August		2	1,500	5	1,080	7	1,750	10	1,350
February		15	901	30	1,830	1	1,010	3	1,250	6	1,040	8	1,580	11	1,420
2	923	18	907	July		2	1,020	4	811	7	1,070	9	1,540	12	1,150
4	969	20	911	1	1,740	3	1,030	5	701	8	1,070	10	1,460	13	1,070
7	934	22	917	2	1,610	4	1,040	6	1,010	9	1,070	11	1,440	14	1,170
9	993	25	923	3	1,870	5	1,030	7	1,400	10	1,060	12	1,490	15	1,230
11	976	27	920	4	1,830	6	1,020	8	1,730	11	1,060	13	1,500	16	1,250
14	925	29	920	5	1,740	7	1,010	9	1,480	12	1,060	14	1,170	17	1,460
16	948	May		6	1,500	8	999	10	1,170	13	1,080	15	1,090	18	1,400
18	940	2	927	7	1,500	9	1,020	11	1,320	14	1,070	16	1,140	19	1,240
21	929	4	928	8	1,510	10	1,010	12	1,300	15	1,080	17	1,210	20	1,200
23	934	6	936	9	1,180	11	1,020	13	1,220	16	1,070	18	1,260	21	1,200
25	936	9	931	10	1,160	12	1,010	14	1,190	17	1,080	19	1,300	22	1,220
28	969	11	943	11	1,160	13	1,030	15	1,180	18	1,080	20	1,390	23	1,250
March		13	964	12	1,180	14	1,020	16	819	19	1,080	21	1,280	24	1,410
2	1,070	16	942	13	1,140	15	1,040	17	949	20	1,070	22	1,250	25	1,420
4	1,230	18	945	14	1,130	16	1,020	18	1,050	21	1,070	23	1,270	26	1,240
7	1,040	20	962	15	1,150	17	1,040	19	1,210	22	1,070	24	1,420	27	1,210
9	1,050	23	961	16	1,170	18	1,050	20	1,230	23	1,070	25	1,630	28	1,190
11	1,050	25	861	17	1,140	19	1,070	21	1,290	24	1,060	26	1,530	29	1,190
14	1,060	27	966	18	1,210	20	1,070	22	1,230	25	1,150	27	1,470	30	1,200
16	1,070	30	951	19	1,030	21	1,060	23	1,210	26	1,260	28	1,470	31	1,180

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1977

Rio Grande at Penitas, Texas and Reynosa Diaz, Tamaulipas

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	1,010	16	960	1	995	16	945	1	1,160	17	1,060	3	1,130	16	1,160
5	1,150	18	970	4	1,020	18	972	4	1,690	19	1,090	5	1,100	18	1,240
7	988	21	987	6	1,050	20	958	6	1,990	22	1,080	7	1,100	21	1,470
10	1,780	23	993	8	968	23	973	8	1,732	24	1,130	10	1,080	23	1,300
12	1,080	25	1,000	11	982	25	887	11	1,220	26	1,080	12	1,110	25	1,360
14	1,110	28	1,010	13	1,010	27	960	13	1,160	29	1,200	14	1,110	28	1,690
17	1,940	March		15	912	30	951	15	1,170	31	1,210	17	1,110	30	1,430
19	1,230	2	1,010	18	909	June		18	1,210	September		19	1,140	December	
21	1,290	4	1,030	20	909	1	960	20	1,170	2	1,220	21	1,140	2	1,320
24	1,210	7	1,140	22	907	3	967	22	1,100	5	1,220	24	1,100	5	1,330
26	1,090	9	1,110	25	910	6	969	25	1,240	7	1,190	26	1,080	7	1,340
28	1,100	11	1,120	27	913	8	993	27	1,110	9	1,220	28	1,400	9	4,060
31	1,210	14	1,100	29	916	10	979	29	1,110	12	1,690	31	1,370	12	1,370
February		16	1,120	May		13	1,020	August		14	1,280	November		14	1,130
2	1,020	18	1,160	2	931	15	1,200	1	1,070	16	1,400	2	1,330	16	1,220
4	1,040	21	1,010	4	933	17	999	3	1,080	19	1,340	4	1,430	19	1,430
7	1,130	23	974	6	937	20	1,290	5	1,110	21	1,350	7	1,420	21	1,230
9	1,150	25	1,120	9	938	22	1,150	8	1,040	23	1,300	9	1,430	23	1,230
11	1,160	28	1,070	11	958	24	1,130	10	1,050	26	1,370	11	3,530	26	1,500
14	1,330	30	1,040	13	974	27	1,140	12	1,070	28	1,330	14	2,240	28	1,220
						29	1,160	15	1,040	30	1,110			30	1,190

Sampling by U. S. Section

Rio Grande above Anzalduas Dam, South of Abram, Texas

January		January		February		March		April		April		May		June	
3	969	29	932	18	955	11	1,090	1	988	25	913	16	948	6	1,010
5	936	31	962	21	964	14	1,100	4	1,030	27	916	18	954	8	973
7	926	February		23	967	16	1,110	6	1,060	29	914	20	959	10	980
12	1,050	2	974	25	974	18	1,140	8	976	May		23	958	13	1,020
14	1,070	4	967	28	990	21	1,060	11	1,020	2	935	25	865	15	1,240
17	938	7	988	March		23	1,030	13	1,010	4	933	27	951	17	1,170
19	921	9	977	2	1,010	25	1,110	15	907	6	927	30	951	20	1,170
21	945	11	1,040	4	1,210	28	1,090	18	907	9	940	June		22	1,210
23	1,100	14	983	7	1,100	30	1,120	20	915	11	960	1	961	24	1,220
26	1,000	16	941	9	1,080			22	910	13	947	3	970	27	1,210

Sampling by U. S. Section

Morillo Drain in Mexico, 8.4 River Miles above Anzaldúas Dam

January		February		March		April		May		June		June		August	
1 a)	11,300	1 a)	11,320	4 a)	11,700	3 a)	8,580	3	6,810	2	6,360	23 a)	6,740	18 a)	6,170
2 a)	11,370	2 a)	11,520	5 a)	11,980	4 a)	9,040	4	6,380	3	6,300	23	6,740	25 a)	7,080
3 a)	11,370	3 a)	11,810	6 a)	10,830	5 a)	8,880	5	6,850	4	6,670	24 a)	8,310	September	
4 a)	11,490	4 a)	11,940	7 a)	10,060	6 a)	7,820	6	6,420	5	5,760	24	8,310	1 a)	6,520
5 a)	11,460	5 a)	11,940	8 a)	10,340	7 a)	8,820	7	6,000	6	5,760	25 a)	8,710	8 a)	8,840
6 a)	11,400	6 a)	11,810	9 a)	10,500	8 a)	7,220	8	6,270	7	5,760	25	8,710	15 a)	8,910
7 a)	11,660	7 a)	11,680	10 a)	10,810	9 a)	7,530	9	5,760	8	5,760	26	9,060	19 a)	9,350
8 a)	11,730	8 a)	11,540	11 a)	9,100	10 a)	7,630	10	6,320	9	6,320	27 a)	9,150	22 a)	9,440
9 a)	11,540	9 a)	10,950	12 a)	10,620	11 a)	6,870	11	6,350	10	6,580	27	9,150	29 a)	2,410
10 a)	11,420	10 a)	11,480	13 a)	9,630	12 a)	6,600	12	6,070	11	6,490	28 a)	9,350	October	
11 a)	11,420	11 a)	12,450	14 a)	10,790	13 a)	6,940	13	6,300	12	6,560	29 a)	9,190	6 a)	6,240
12 a)	11,320	12 a)	12,630	15 a)	9,940	14 a)	6,910	14	6,340	13 a)	6,730	30 a)	9,250	13 a)	4,990
13 a)	11,420	13 a)	12,630	16 a)	10,410	15 a)	7,300	15	6,350	13	6,730	July		17	6,460
14 a)	11,580	14 a)	12,630	17 a)	10,260	16	4,700	16	6,250	14 a)	7,060	1 a)	9,150	20 a)	6,380
15 a)	11,460	15 a)	12,310	18 a)	10,260	17	6,280	17	6,480	14	7,060	2 a)	8,680	25	2,250
16 a)	11,560	16 a)	12,340	19 a)	8,190	18	6,640	18	6,730	15 a)	6,480	3 a)	9,390	26	5,060
17 a)	11,440	17 a)	12,230	20 a)	7,840	19	6,850	19	6,120	15	6,480	4 a)	9,490	27 a)	6,400
18 a)	11,460	18 a)	12,220	21 a)	7,820	20	4,700	20	6,350	16 a)	7,020	5 a)	9,580	27	6,580
19 a)	11,460	19 a)	12,340	22 a)	8,380	21	7,490	21	6,430	16	7,020	6 a)	9,580	28	7,460
20 a)	11,630	20 a)	11,970	23 a)	9,450	22	5,440	22	5,980	17 a)	7,530	7 a)	9,580	November	
21 a)	11,630	21 a)	12,100	24 a)	8,820	23	6,850	23	5,940	17	7,530	8 a)	9,790	3 a)	9,080
22 a)	11,570	22 a)	12,240	25 a)	8,780	24	7,880	24	6,120	18 a)	7,860	9 a)	9,230	10 a)	9,040
23 a)	11,570	23 a)	12,100	26 a)	8,740	25	7,830	25	6,250	18	7,860	10 a)	9,200	17 a)	8,650
24 a)	11,650	24 a)	11,940	27 a)	8,320	26	8,560	26	6,170	19 a)	8,020	11 a)	9,350	21 a)	8,510
25 a)	11,850	25 a)	12,180	28 a)	8,580	27	8,490	27	6,020	19	8,020	12 a)	9,370	24 a)	9,090
26 a)	11,730	26 a)	12,180	29 a)	9,310	28	8,220	28	5,990	20 a)	8,020	21 a)	8,500	December	
27 a)	11,730	27 a)	11,930	30 a)	9,000	29	7,560	29	5,840	20	8,020	28 a)	7,330	2 a)	9,120
28 a)	11,580	28 a)	11,670	31 a)	8,580	30	7,720	30	5,460	21 a)	8,260	August		8 a)	9,730
29 a)	11,520	March		April		May		31	6,130	21	8,260	4 a)	6,970	15 a)	8,730
30 a)	11,750	1 a)	11,770	1 a)	8,190	1	8,050	June		22 a)	8,390	11 a)	6,740	19	9,540
31 a)	11,460	2 a)	11,930	2 a)	8,510	2	6,950	1	6,540	22	8,390	15 a)	6,160	22 a)	9,640
		3 a)	12,070											29 a)	7,500

Sampling by Mexican Section

a) Morillo Drain Diversion Canal

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1977

Rio Grande below Anzalduas Dam near Reynosa, Tamaulipas and Mission, 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	
1	1,010	15	958	1	1,150	16	1,090	1	1,390	16	1,050	1	1,120	16	1,330
2	1,000	16	946	2	1,040	17	1,090	2	1,490	17	1,050	2	1,180	17	1,200
3	996	17	979	3	948	18	1,100	3	1,610	18	1,090	3	1,090	18	1,160
4	953	18	956	4	947	19	1,100	4	2,130	19	1,100	4	1,080	19	1,140
5	941	19	950	5	987	20	1,100	5	2,320	20	1,090	5	1,060	20	1,250
6	984	20	945	6	1,140	21	1,110	6	2,180	21	1,090	6	1,160	21	1,240
7	952	21	949	7	1,130	22	1,110	7	2,010	22	1,070	7	1,060	22	1,280
8	948	22	949	8	1,100	23	1,100	8	1,900	23	1,060	8	1,130	23	1,320
9	946	23	946	9	1,040	24	1,090	9	1,980	24	1,060	9	1,130	24	1,360
10	973	24	973	10	1,000	25	1,050	10	1,930	25	1,140	10	1,090	25	1,460
11	1,000	25	1,010	11	1,010	26	929	11	1,780	26	1,080	11	1,080	26	1,460
12	1,080	26	998	12	1,010	27	1,070	12	1,530	27	1,060	12	1,060	27	1,420
13	1,100	27	908	13	990	28	1,060	13	1,280	28	1,100	13	1,090	28	1,380
14	1,100	28	944	14	968	29	1,050	14	1,250	29	1,060	14	1,140	29	1,620
15	1,090	March		15	925	30	1,180	15	1,210	30	1,080	15	1,110	30	1,750
16	1,010	1	1,030	16	985	31	1,050	16	1,170	31	1,040	16	1,100	December	
17	966	2	1,030	17	1,020	June		17	1,230	September		17	1,110	1	1,610
18	956	3	1,060	18	1,020	1	1,070	18	1,240	1	1,010	18	1,080	2	1,490
19	945	4	1,110	19	1,010	2	1,080	19	1,230	2	1,350	19	1,090	3	1,520
20	948	5	1,140	20	1,020	3	1,090	20	1,200	3	1,470	20	1,080	4	1,780
21	947	6	1,310	21	1,050	4	1,100	21	1,090	4	1,540	21	1,090	5	2,380
22	962	7	1,250	22	1,040	5	1,100	22	1,260	5	1,220	22	1,080	6	2,500
23	1,020	8	1,120	23	1,010	6	1,100	23	1,160	6	1,110	23	1,090	7	2,180
24	1,040	9	1,070	24	1,010	7	1,110	24	1,150	7	1,060	24	1,120	8	1,820
25	1,140	10	1,080	25	1,020	8	1,130	25	1,150	8	1,030	25	1,250	9	1,770
26	1,140	11	1,090	26	1,020	9	1,120	26	1,220	9	994	26	1,220	10	1,660
27	954	12	1,100	27	1,030	10	1,120	27	1,170	10	1,050	27	1,190	11	1,760
28	928	13	1,110	28	1,030	11	1,120	28	1,150	11	1,250	28	1,360	12	1,770
29	923	14	1,120	29	1,020	12	1,140	29	1,160	12	1,580	29	1,440	13	1,440
30	958	15	1,120	30	1,010	13	1,190	30	1,160	13	1,830	30	1,510	14	1,330
31	965	16	1,110	May		14	1,110	31	1,150	14	1,440	31	1,580	15	1,210
February		17	1,120	1	1,050	15	1,280	August		15	1,290	November		16	1,150
1	978	18	1,140	2	1,050	16	1,440	1	1,080	16	1,190	1	1,470	17	1,160
2	960	19	1,190	3	1,030	17	1,260	2	1,070	17	1,140	2	1,470	18	1,150
3	942	20	1,180	4	1,040	18	1,200	3	1,070	18	1,020	3	1,550	19	1,230
4	939	21	1,150	5	1,050	19	1,230	4	1,120	19	974	4	1,410	20	1,340
5	1,000	22	1,070	6	1,050	20	1,280	5	1,140	20	1,050	5	1,480	21	1,500
6	1,030	23	1,010	7	1,060	21	1,290	6	1,100	21	1,170	6	1,780	22	1,300
7	971	24	1,030	8	1,060	22	1,350	7	1,100	22	1,240	7	2,490	23	1,200
8	956	25	1,130	9	1,070	23	1,310	8	1,020	23	1,310	8	2,530	24	1,230
9	992	26	1,170	10	1,080	24	1,300	9	1,000	24	1,310	9	2,300	25	1,230
10	1,030	27	1,160	11	1,110	25	1,450	10	1,010	25	1,310	10	2,100	26	1,230
11	1,060	28	1,120	12	1,100	26	1,360	11	1,030	26	1,320	11	2,120	27	1,290
12	1,024	29	1,080	13	1,110	27	1,370	12	1,040	27	1,320	12	2,000	28	1,390
13	1,020	30	1,100	14	1,110	28	1,340	13	1,060	28	1,420	13	2,090	29	1,270
14	993	31	1,100	15	1,100	29	1,370	14	1,070	29	1,350	14	2,160	30	1,230
						30	1,350	15	1,050	30	1,170	15	1,870	31	1,210

Sampling by U. S. Section

North Floodway near Sebastian, Texas

January		February		May		May		June		June		June		
7	5,530	14	7,940	6	5,540	9	5,030	7	3,740	16	3,880	17	4,460	

Sampling by U. S. Section

Arroyo Colorado South of Harlingen, Texas

January		February		March		April		May		June		July		
7	5,600	14	5,650	3	5,560	22	2,730	13	5,400	6	3,490	24	1,130	

Sampling by U. S. Section

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1977

Rio Grande at Mercedes Irrigation District Pumps near Mercedes, Texas and Rio Rico, Tamaulipas

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	1,020	15	1,060	1	1,150	16	1,110	1	1,520	16	1,150	1	1,510	16	2,070
2	1,030	16	1,020	2	1,180	17	1,080	2	1,500	17	1,170	2	1,600	17	2,070
3	1,020	17	990	3	1,020	18	1,080	3	1,540	18	1,200	3	1,590	18	1,570
4	1,020	18	989	4	1,050	19	1,090	4	1,520	19	1,160	4	1,270	19	1,390
5	1,020	19	1,010	5	1,030	20	1,090	5	1,540	20	1,170	5	1,250	20	1,360
6	987	20	1,010	6	1,070	21	1,090	6	1,740	21	1,180	6	1,250	21	1,370
7	987	21	1,010	7	1,040	22	1,110	7	2,160	22	1,210	7	1,220	22	1,330
8	999	22	1,010	8	1,190	23	1,110	8	2,110	23	1,140	8	1,210	23	1,300
9	989	23	1,010	9	1,240	24	1,100	9	2,190	24	1,130	9	1,250	24	1,310
10	996	24	1,010	10	1,140	25	1,120	10	2,170	25	1,110	10	1,260	25	1,390
11	1,030	25	1,030	11	1,140	26	1,060	11	2,050	26	1,110	11	1,200	26	1,430
12	1,040	26	1,050	12	1,060	27	953	12	1,920	27	1,130	12	1,190	27	1,430
13	1,030	27	996	13	1,080	28	1,010	13	2,030	28	1,180	13	1,160	28	1,470
14	1,080	28	1,040	14	1,040	29	1,080	14	1,890	29	1,200	14	1,150	29	1,470
15	1,080	March		15	1,020	30	1,040	15	1,660	30	1,060	15	1,140	30	1,580
16	1,080	1	1,040	16	1,010	31	1,040	16	1,370	31	1,150	16	1,200	December	
17	1,080	2	1,070	17	1,020	June		17	1,310	September		17	1,210	1	1,490
18	1,060	3	1,100	18	1,020	1	1,060	18	1,240	1	1,110	18	1,140	2	1,490
19	1,040	4	1,150	19	1,030	2	1,060	19	1,240	2	1,110	19	1,130	3	1,760
20	966	5	1,160	20	1,040	3	1,070	20	1,320	3	1,090	20	1,150	4	1,630
21	987	6	1,150	21	1,040	4	1,080	21	1,280	4	995	21	1,150	5	1,600
22	996	7	1,200	22	1,040	5	1,110	22	1,280	5	1,320	22	1,160	6	1,580
23	988	8	1,350	23	1,050	6	1,100	23	1,160	6	1,380	23	1,110	7	2,020
24	985	9	1,370	24	1,050	7	1,100	24	1,150	7	1,440	24	1,050	8	2,300
25	962	10	1,270	25	1,050	8	1,100	25	1,200	8	1,220	25	1,120	9	2,350
26	975	11	1,210	26	1,040	9	1,110	26	1,180	9	1,310	26	1,200	10	2,370
27	1,020	12	1,250	27	1,050	10	1,140	27	1,210	10	1,310	27	1,240	11	2,360
28	1,040	13	1,250	28	1,050	11	1,130	28	1,300	11	1,300	28	1,610	12	2,030
29	988	14	1,250	29	1,040	12	1,130	29	1,250	12	1,280	29	1,320	13	1,880
30	985	15	1,190	30	1,050	13	1,090	30	1,210	13	1,270	30	1,310	14	1,830
31	988	16	1,200	May		14	1,140	31	1,210	14	1,290	31	1,310	15	1,740
February		17	1,260	1	1,040	15	1,150	August		15	1,740	November		16	1,590
1	982	18	1,260	2	1,040	16	1,250	1	1,210	16	1,400	1	1,390	17	1,540
2	995	19	1,270	3	1,040	17	1,120	2	1,180	17	1,380	2	1,520	18	1,510
3	1,000	20	1,230	4	1,040	18	1,330	3	1,130	18	1,370	3	1,630	19	1,510
4	1,030	21	1,230	5	1,030	19	1,330	4	1,120	19	1,350	4	1,520	20	1,380
5	1,030	22	1,240	6	1,040	20	1,330	5	1,110	20	1,270	5	1,540	21	1,240
6	1,030	23	1,220	7	1,040	21	1,250	6	1,130	21	1,040	6	1,520	22	1,300
7	1,030	24	1,180	8	1,040	22	1,320	7	1,170	22	1,150	7	1,510	23	1,400
8	1,030	25	1,130	9	1,040	23	1,280	8	1,190	23	1,240	8	1,520	24	1,550
9	1,040	26	1,080	10	1,050	24	1,270	9	1,140	24	1,350	9	1,990	25	1,470
10	1,050	27	1,120	11	1,060	25	1,330	10	1,080	25	1,360	10	2,540	26	1,490
11	1,080	28	1,210	12	1,070	26	1,330	11	1,080	26	1,390	11	2,590	27	1,480
12	1,100	29	1,210	13	1,080	27	1,320	12	1,070	27	1,470	12	2,480	28	1,290
13	1,080	30	1,170	14	1,110	28	1,370	13	1,080	28	1,460	13	2,320	29	1,270
14	1,050	31	1,150	15	1,110	29	1,400	14	1,150	29	1,460	14	2,240	30	1,350
						30	1,440	15	1,220	30	1,460	15	2,180	31	1,410

Sampling by U. S. Section

Rio Grande near San Benito, Texas and Ramirez, Tamaulipas

January		January		February		March		March		April		May		June	
7	977	27	1,160	22	990	10	1,340	25	1,260	19	1,040	2	1,050	9	1,160
10	956	February		24	983	14	1,230	April		26	1,080	5	1,070	13	1,130
17	1,080	3	990	28	1,010	17	1,160	1	1,130	26	1,070	13	1,110	20	1,490
20	989	4	985	March		18	1,420	4	1,120	28	1,040	16	1,140	27	1,370
24	1,000	14	1,060	7	1,140	24	1,260	12	1,160	28	1,060	June		July	
								15	1,040			6	1,140	5	1,450

Sampling by U. S. Section

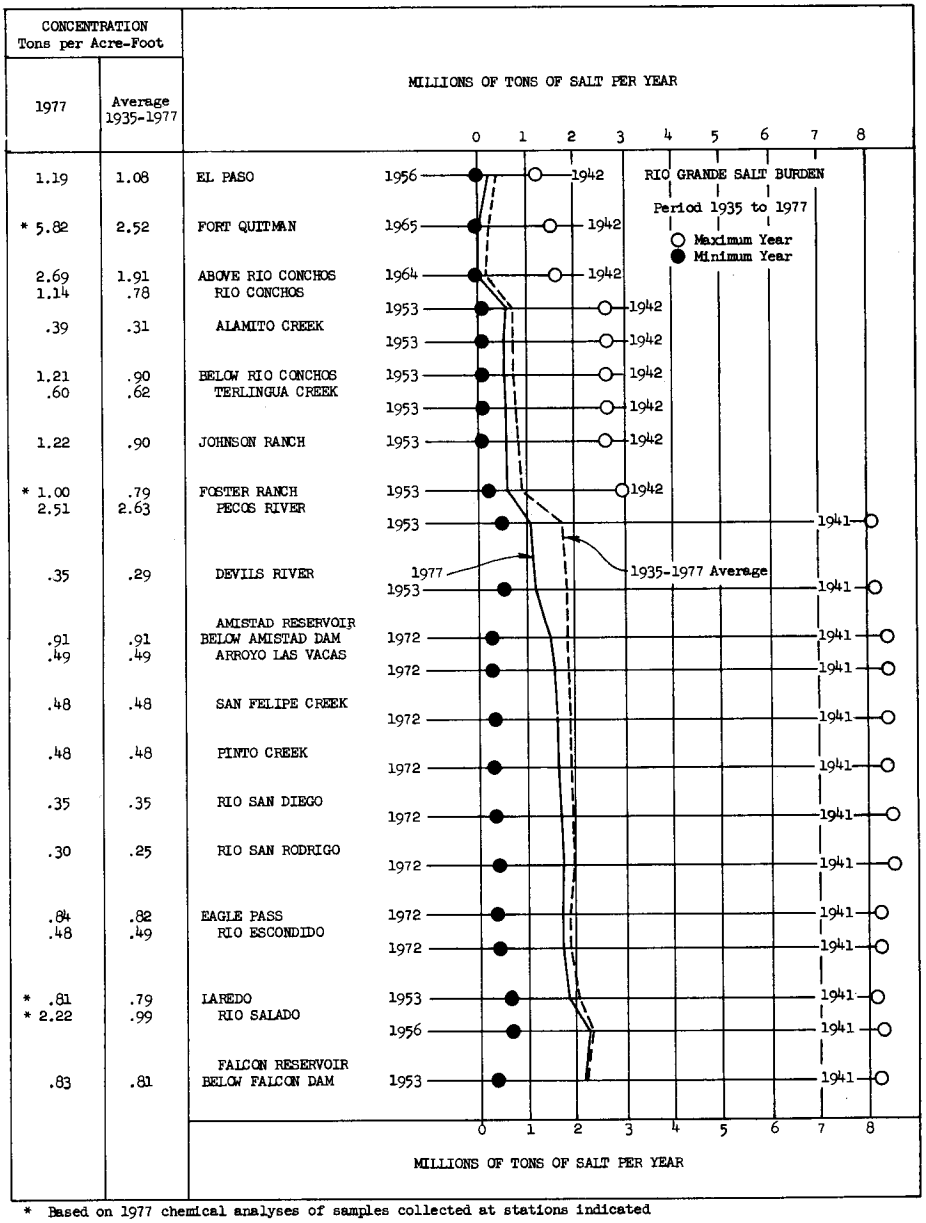
Rio Grande near Brownsville, Texas and Matamoros, Tamaulipas

January		January		February		March		March		April		May		June	
3	1,020	20	995	14	1,120	4	1,080	22	1,360	28	1,040	16	1,150	13	1,140
7	1,000	25	998	22	986	10	1,290	31	1,280	May		19	1,120	20	1,310
10	982	27	1,090	25	994	14	1,310	April		2	1,070	June		24	1,300
18	1,090	February		26	994	17	1,370	5	1,230	5	1,080	7	1,160	30	1,450
		3	1,010	28	1,030	18	1,370	21	1,070	13	1,100	9	1,130		

Sampling by U. S. Section

RIO GRANDE SALT BURDEN

The term "salt", as used herein, means total dissolved solids. The 1977 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 1977 are the weighted means of the values determined for the 43-year period indicated.



* Based on 1977 chemical analyses of samples collected at stations indicated

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 with averages for their periods of record. With the exception of Las Cruces, New Mexico, all stations are located in Texas. 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 135 through 138 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 the 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 1970 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 26, and Supplement 40A.

	Las Cruces, New Mexico		American Dam		Clint * Station		Acala ** Station		Fort Hancock Bridge	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.74	0.63	0.70	0.38	0.23	0.31	0.31	0.31	0.69	0.37
Feb.	T	.31	.02	.37	0	.28	0	.21	0	.30
Mar.	.32	.29	.20	.33	0	.22	.18	.25	.19	.25
Apr.	.21	.25	.15	.19	0	.14	0	.18	.52	.26
May	.11	.26	.06	.23	0	.30	0	.34	.15	.47
June	.30	.41	.46	.56	0	.48		.56	.27	.82
July	1.23	1.56	.74	1.56	.34	1.05		1.15	.57	1.34
Aug.	2.74	2.12	.55	1.27	.81	1.15		1.25	.51	1.62
Sept.	1.67	1.67	.52	1.12	.19	.86	.39	.90	.20	1.23
Oct.	1.20	0.92	1.57	.71	.33	.66	.61	.86	2.20	1.00
Nov.	.12	.41	.05	.25	.03	.23	0	.26	.04	.33
Dec.	.33	.36	.22	.39	.13	.37	.36	.33	.28	.41
Yearly	8.97	9.19	5.24	7.36	2.06	6.05		6.60	5.62	8.40

	Guayuco Arroyo		Fort Quitman		Neely Ranch		96 Ranch Headquarters		Guest Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.17	0.29	0.23	0.37	0.27	0.32	0.30	0.43		
Feb.	.08	.19	0	.24	.01	.18	.10	.53		
Mar.	.39	.23	.04	.22	.10	.18	.30	.38		
Apr.	.08	.19	T	.21	.05	.14	.20	.03		
May	0	.45	0	.38	0	.36	T	.75		
June	.15	.57	0	.77	.06	.75	2.50	2.40		
July	.61	1.43	.70	1.49	.60	1.73	1.90	6.05		
Aug.	.83	1.75	.59	1.66	1.09	1.80	2.20	2.98	.11	
Sept.	.08	1.07	.15	1.03	.57	1.32	.50	5.52	.72	
Oct.	.98	1.02		.85	1.55	1.04	1.90	1.32	0	
Nov.	.08	.21		.30	.16	.22	1.50	.57		
Dec.	.08	.37	.29	.37	.18	.40	.20	.63		
Yearly	3.53	7.77		7.89	4.64	8.44	11.60	21.59		

	La Nutria, Station		La Macolla Farm		Bill Shannon Ranch		Adobes Ranch		Shafter	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	T	0.08			0.30	0.43	0	0.32	0	0.09
Feb.	0	.23			0	.36	0	.23	0	.37
Mar.	.15	.18			0	.36	0	.17	0	.36
Apr.	.20	.13	.03		.20	.13	0	.11	0	.30
May	T	.26	1.01		.60	.72	0	.66	3.20	.94
June	.65	.81	1.19		1.25	1.48	1.49	1.31	1.22	2.76
July	1.50	1.65	1.27		2.20	2.42	.33	2.04	2.70	4.08
Aug.	.75	2.05	1.65		.20	2.21	1.52	1.82	.50	3.50
Sept.	1.20	1.75	.55		2.10	2.38	1.20	2.23	0	3.80
Oct.	1.15	1.07	1.23		1.05	1.13	.76	.69	1.20	1.22
Nov.	.20	.35	.14		0	.37	0	.26	0	.42
Dec.	0	.24	0		0	.40	0	.26	0	.23
Yearly	5.80	8.80			7.90	12.39	5.30	10.10	8.82	18.07

T Trace * Formerly Island Station ** Formerly County Line Station

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

	Shafter No. 2		Presidio (IB&WC Gage)		Quebec Ranch		Bloys Camp		Kerr Mitchell Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0	0.26	0	0.24	0.60	0.42	0.79	0.68	0.15	0.45
Feb.	.20	.11	T	.21	0	.32	0	.63	0	.34
Mar.	.07	.04	T	.18	.30	.30	.35	.54	.38	.21
Apr.	.05	.02	.55	.19	.60	.25	.90	.44	.80	.44
May	2.69	1.86	0	.51	.50	.81	.55	1.38	.42	1.09
June	1.56	2.96	1.20	1.22	2.73	1.70	2.25	2.45	2.32	1.77
July	2.44	3.45	.10	1.50	2.00	2.69	3.01	3.71	1.05	2.11
Aug.	.80	1.01	T	1.10	.60	2.43	1.22	3.89	3.37	2.27
Sept.	.31	1.20	.10	1.38	1.25	2.28	1.32	2.84	0	1.99
Oct.	1.80	1.42	.45	.60	1.75	.87	1.65	1.52	1.22	1.26
Nov.	.20	.64	.05	.29	0	.33	.87	.63	.42	.35
Dec.	.06	.96	0	.24	0	.32	T	.57	0	.37
Yearly	10.18	13.93	2.45	7.66	10.33	12.72	12.91	19.28	10.13	12.65

	H. T. Fletcher Ranch		Plata		Casa Piedra		H. M. Greenwood (Cienega Ranch)		La Mota Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0	0.72				0.26	0.20	0.55		
Feb.	0	.32				.28	2.00	.39		
Mar.	.16	.37				.41	0	.34		
Apr.	.20	.42				.29		.51		
May	0	1.07				.41		.82		
June	2.50	1.60				1.62		2.08		
July	3.25	3.08	1.10	1.10	.50	1.79		2.53	.30	
Aug.	1.55	2.91	2.08	2.08	0	2.25		2.39	0	
Sept.	1.55	2.35	0	0	.50	1.36		2.73	0	
Oct.	1.70	1.47	1.22	1.22	1.40	1.08		1.41	.05	
Nov.	0	.43	0	0	0	.59		.62	0	
Dec.	0	.40	0	0	0	.22		.59	0	
Yearly	10.91	15.14				10.56		14.96		

	Redford		Lajitas		Earl Hammond Ranch		Study Butte		Terlingua Creek Texas Hwy. Dept. Camp	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0	0.27	0	0.06	0	0.17			0	0.11
Feb.	T	.21	0	.27	0	.42			0	.27
Mar.	.15	.24	0	.28	0	.37			0	.20
Apr.	.55	.25	1.25	.50	0	.33			T	.23
May	.20	.48	.20	.65	1.05	.64			0	.60
June	1.75	.88	1.20	1.29	1.40	1.29			1.44	1.09
July	.75	1.43	0	1.06	.65	2.38	3.43			1.67
Aug.	T	1.13	.42	1.32	.32	2.43	1.55			1.30
Sept.	.20	1.67	0	2.12	0	2.38	.27			2.05
Oct.	.40	.75	1.52	.75	1.30	1.27	.22			.70
Nov.	.10	.35	0	.19	0	.42	.04			.25
Dec.	0	.23	0	.29	.30	.51	0			.28
Yearly	4.10	7.89	4.59	8.78	5.02	12.61				8.76

	Villa de la Mina		Terlingua Creek Station		Castolon		Johnson Ranch		J. F. Woodward Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0	0.09	T	0.21	0.10	0.21	T	0.31	0.10	0.44
Feb.	0	.16	0	.22	.03	.33	0	.24	.16	.38
Mar.	0	.58	.10	.16	T	.29	0	.19	.30	.21
Apr.	1.05	.35	.50	.32	1.64	.37	.20	.39	.49	.51
May	0	.26	.15	.65	.39	.87	.25	1.01	1.53	1.01
June	.91	1.23	.90	.99	.71	1.29	T	1.01	4.07	1.93
July	3.50	3.51	T	1.10	1.86	1.95	2.05	1.13	2.01	2.27
Aug.	.60	1.18	1.70	1.16	.83	1.79	T	.84	1.79	2.90
Sept.	0	.76	1.40	1.26	1.61	2.00	T	1.28	.54	2.14
Oct.	0	.33	.60	.68	.11	.82	.10	.65	1.85	1.04
Nov.	0	.14	T	.17	.08	.18	T	.19	0	.59
Dec.	0	.55	T	.28	.04	.25	T	.30	0	.27
Yearly	6.06	9.14	5.35	7.20	7.40	10.35	2.60	7.54	12.84	13.69

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

	Yarborough Ranch		Elephant Mountain Ranch		Buttrill Ranch		A. M. Potter Ranch		Nitaville Mercantile	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0	0.18	0.05	0.43	0	0.48	0.32	0.34	0	0.17
Feb.	.17	.40	0	.30	0	.18	0	.44	0	.18
Mar.	.11	.28	0	.17	0	.18	0	.20	0	.15
Apr.	.48	.29	.08	.46	2.05	.55	1.10	.25	0	.16
May	1.04	.84	1.00	.82	1.25	1.12	1.20	1.00	0	.60
June	2.64	1.65	2.55	1.35	1.47	1.39	2.31	1.15	.10	.10
July	.92	2.88	.60	1.85	1.75	1.56	1.29	1.45		1.52
Aug.	1.18	2.86	1.50	1.75	1.00	1.50	0	1.57		1.33
Sept.	.63	2.96	.40	1.73	.30	1.93	.18	1.80		2.10
Oct.	2.94	1.17	.50	.96	.88	.94	.84	.58		.52
Nov.	.07	.55	0	.30	0	.27	0	.37		.53
Dec.	0	.47	1.00	.49	0	.25	0	.43		.71
Yearly	10.18	14.53	7.68	10.61	8.70	10.35	7.24	9.58		8.07

	Ernest Wright Ranch		Black Gap Game Refuge - Hdqtrs.		Black Gap Game Refuge-Shirley House		Harold Wynne Ranch Headquarters		Stillwell Crossing	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.			0	0.41			0	0.25	0.83	0.36
Feb.			.10	.46			0	.10	0	.40
Mar.			0	.27	.50		0	.25	0	.32
Apr.			1.90	.41	2.55		2.50	.80	.13	.24
May			2.45	1.41	3.50		.30	.72	1.38	.88
June			0	1.21	0		3.30	1.12	.37	.99
July	.42		0	1.72	2.10		1.60	2.38	1.27	2.04
Aug.	.33		0	1.28	0		.60	2.58	1.00	1.37
Sept.	.75		1.30	2.22	1.55		.20	2.60	2.00	2.63
Oct.	.57		.35	1.10	1.50		.50	1.15	.93	.87
Nov.	.02		.25	.34	.85		0	.32	.65	.27
Dec.	T		0	.36	.65		0	.60	0	.33
Yearly			6.35	11.19			9.00	12.87	8.56	10.70

	Persimmon Gap Ranger Station		Sheep Pasture		Heath Crossing		Dove Mountain Ranch		Slaughter Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.03	0.50	0.65	0.26	0.11	0.20	0.65	0.44	0.46	0.41
Feb.	.15	.52	0	.39	0	.43	.50	.37	.28	.50
Mar.	0	.35	0	.36	.08	.30	0	.23	.18	.47
Apr.	1.03	.45	1.65	.33	1.64	.42	2.55	.47	1.95	.79
May	1.51	.92	3.65	1.51	2.13	.98	2.15	1.06	2.00	1.26
June	1.12	1.22	0	1.35	1.14	1.20	1.58	1.13	3.16	1.27
July	1.62	1.48	0	1.96	.54	1.47	.57	1.95	.60	1.12
Aug.	0	.97	0	1.41	1.74	1.50	0	1.23	2.38	2.36
Sept.	.02	1.28	1.50	2.92	1.37	2.56	1.06	1.55	.69	2.40
Oct.	1.36	1.11	1.80	1.57	.69	.89	1.27	1.32	.39	1.55
Nov.	.22	.27	.25	.43	.59	.31	0	.32	.56	.65
Dec.	.06	.30	.50	.46	0	.29	0	.38	.11	.42
Yearly	7.12	9.37	10.00	12.95	10.03	10.55	10.33	10.45	12.76	13.20

	Slaughter Ranch Martin Pens		Slaughter Ranch Keith Mill		Slaughter Ranch Ten Section		Slaughter Ranch Cow Creek		Steve Stumberg Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.40		0.40		0.40		0.40	0.55	0	0.48
Feb.	.20		.20		.20		.20	.28	0	.39
Mar.	.20		.20		.20		.20	.15	0	.43
Apr.	2.20		1.70		1.90		1.80	.61	1.63	.69
May	1.70		2.10		1.90		2.10	1.09	2.72	1.40
June	1.20		2.00		1.80		2.30	1.02	.85	1.66
July	.50		0		.70		.80	.73	.60	2.07
Aug.	1.20		1.40		1.70		2.80	1.06	1.22	1.81
Sept.	.70	2.55	1.30	3.15	.90	2.95	1.00	1.36	.43	2.21
Oct.	.70	1.30	0	.90	.50	.80	.50	1.15	.68	1.51
Nov.	1.10	.55	.70	.35	.70	.35	.60	.19	.20	.45
Dec.	.10	.45	.10	.45	.10	.45	.10	.18	0	.46
Yearly	10.20		10.10		11.00		12.80	8.37	8.33	13.56

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

	C. F. Cox Ranch Headquarters		McGonagill Ranch Headquarters		McGonagill East Mill		E. W. Hardgrave Ranch		Lewis James Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.70		0	0.30	0	0.31	0.45	0.49	0	0.30
Feb.	.30		0	.51	0	.24	0	.61	0	.56
Mar.	.90		.30	.46	.30	.53	.80	.37	.92	.41
Apr.	3.20		1.40	.51	1.30	.66	2.90	1.34	2.68	.91
May	2.62		1.20	1.21	.20	1.21	.20	1.41	.43	1.27
June	1.04		2.40	1.91	3.80	1.88	2.20	1.55	1.90	1.05
July	0		1.60	2.27	0	1.57	T	1.26	0	1.61
Aug.	.49		1.00	1.64	1.20	1.84	0	1.48	.17	1.95
Sept.	.53		1.40	2.49	1.80	2.41	2.87	2.85	.11	3.50
Oct.	1.75		2.70	1.14	1.60	1.13	0	1.68	.48	1.54
Nov.	0		.30	.22	0	.20	0	.56	.50	.56
Dec.	0		0	.14	0	.20	0	.35	0	.35
Yearly	11.53		12.30	12.80	10.20	12.18	9.42	13.95	7.19	14.01

	Dryden		Bricker Ranch		Ross Foster Ranch		W. A. Arledge Ranch		Hoffman Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.10	0.49	0.32	0.35	0.30	0.42	0.58	0.63	0.30	0.43
Feb.	.52	.51	.58	.60	.50	.50	.50	.55	.08	.40
Mar.	.47	.43	1.03	.45	.30	.29	1.05	.46	.91	.36
Apr.	1.15	.91	1.20	.97	.55	.82	2.76	1.30	0	.29
May	1.00	1.65	.28	1.22	.20	1.27	.45	1.83	2.02	1.07
June		1.10	0	1.25	.10	1.03	.08	1.60	1.73	1.93
July		1.15	0	.74	T	.74	.07	1.30	3.32	2.49
Aug.		1.33	0	1.05	0	1.33	0	1.31	.72	2.23
Sept.		2.13	1.45	2.19	.05	1.92	.40	2.10	.66	2.19
Oct.		1.35	1.12	1.05	.75	1.09	2.03	1.62	1.71	1.14
Nov.		.43	.45	.39	0	.23	.57	.47	.49	.39
Dec.		.45	0	.39	0	.33	0	.50	.50	.31
Yearly		11.93	6.43	10.65	2.75	9.97	8.49	13.67	12.44	13.23

	Owens Ranch		Terrell Plant (E. P. N. G. Co.)		Calvin Hutto Ranch		Latham Ranch		Prosser Ranch No. 3	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.90	0.35	0.58	0.38	0.70	0.35	0	0.34	0.80	0.36
Feb.	.60	.66	.40	.80	.30	.15	.50	.96	.90	.84
Mar.	1.20	.92	.62	.60	1.00	.50	1.20	.64	.80	.62
Apr.	5.80	1.82	4.33	1.78	1.30	1.80	3.60	1.79	3.10	1.50
May	3.30	1.91	2.98	1.79	T	1.65	2.00	3.00	1.60	2.05
June	3.60	1.55		1.37	.40	1.05	0	1.71	.30	1.09
July	.40	1.33		1.21	.30	1.63	0	3.48	0	1.75
Aug.	.50	1.77		1.36	0	1.88	0	3.08	T	2.39
Sept.	T	2.68		3.69	1.50	2.63	0	3.87	.04	4.04
Oct.	3.20	2.40		1.81	2.30	2.77	1.50	2.05	2.10	2.02
Nov.	.60	1.39		.56	0	.80	0	.91	.50	.53
Dec.	0	.53		.34	0	.50	0	.60	T	.30
Yearly	20.10	17.31		15.69	7.80	15.71	8.80	22.43	10.14	17.49

	Ranchita (Continental)		Rio Grande near Dryden		Pecos River near Langtry Station		Dead Mans Canyon near Comstock		Prosser Ranch No. 1	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.90	0.33	0.20		0.62	0.25	0.80	0.32	0.80	0.31
Feb.	1.40	.86	.10		1.20	.74	1.50	.72	1.10	.75
Mar.	.50	.74	.30		.50	.54	.60	.64	.40	.50
Apr.	1.07	1.13	.50		.40	.98	1.40	1.19	1.90	1.45
May	1.27	1.82	1.80	1.05	.40	1.11	.90	1.96	1.10	2.02
June	1.20	1.90	0	.52	1.40	1.53	1.68	1.83	.30	1.40
July	0	1.79	0	1.44	0	1.71	.13	2.68	0	2.54
Aug.	0	2.90	T	0	0	1.83	0	2.10	.10	2.25
Sept.	0	3.04	0	.38	.07	2.76	.31	2.98	0	3.58
Oct.	1.20	2.39	.10	.64	.80	1.40	.94	2.17	.90	1.93
Nov.	.60	.71	0	.18	0	.50	.55	.53	.55	.55
Dec.	.10	.44	0	.25	0	.29	0	.41	T	.34
Yearly	8.24	18.05	3.00		5.39	13.64	8.81	17.53	7.15	17.62

Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

	Continental Ranch		Martin King Ranch		Brotherton Ranch		Walker Ranch		Zuberbueler Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.90	0.52	0.50	0.50	0.56	0.68	0.40	0.26	0.55	0.38
Feb.	1.50	.96	1.08	.76	1.21	.91	1.30	.76	1.45	.95
Mar.	.30	.68	.60	.36	.57	.62	.40	.66	1.55	.54
Apr.	1.90	1.40	.92	.90	1.13	1.03	1.40	1.14	1.47	1.40
May	1.40	2.53	.84	1.48	1.03	1.46	1.90	2.11	.72	1.83
June	1.30	1.83	.22	1.52	.10	1.71	.60	1.80	1.10	.77
July	0	2.74	.06	1.47	0	1.62	0	2.30	.11	4.60
Aug.	.20	2.67	0	1.44	0	1.93	.30	1.35	0	.15
Sept.	0	4.25	.54	2.71	.35	2.82	.10	4.24	.22	1.23
Oct.	1.70	2.60	1.14	2.27	1.09	2.02	1.60	2.34	.61	1.53
Nov.	.60	.69	.43	.47	.49	.44	.50	.55	.12	.29
Dec.	.10	.43	0	.44	0	.32	.05	.39	.55	.64
Yearly	9.90	21.30	6.33	14.32	6.53	15.56	8.55	17.90	8.45	14.31

	P. W. Kelly Ranch		Comstock		Cow Creek near Comstock		Amistad Reservoir near Comstock		Feely	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.73	0.49	0.57	0.59	0.60	0.34	0.42	0.28	0.80	0.44
Feb.	1.25	.81	1.45	.82	.90	.61	.78	.41	.90	.78
Mar.	2.25	.95	1.05	.62	.50	.46	1.15	.64	.30	.54
Apr.	.89	1.24	2.31	1.44	2.05	1.21	4.08	1.59	3.95	1.52
May	.45	2.03	1.48	1.88	.60	1.13	1.49	1.11	.55	1.81
June	0	1.94	.51	2.09	.80	1.38	.57	1.22	.80	1.85
July	0	2.48	.17	1.35	.05	1.92	.33	1.73	.25	1.61
Aug.	0	2.22	.02	1.86	.10	2.30	.20	1.83	0	2.06
Sept.	.12	3.05	1.95	2.42	.95	2.43	T	2.17	0	2.47
Oct.	1.32	1.88	.71	1.90	.70	1.83	.10	2.46	1.20	2.31
Nov.	.66	.71	.96	.56	.60	.50	0	.16	.40	.33
Dec.	0	.29	0	.65	.03	.32	T	.26	0	.36
Yearly	7.67	18.09	11.18	16.18	7.88	14.43	9.12	13.86	9.15	16.08

	* Line Store		W. E. Sawyer Ranch		Whitehead Brothers Ranch		Prosser Ranch No. 2		Devils River at Cauthorn Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.82	0.54	1.10	0.43	0.94	0.52	0.50	0.35	0.60	
Feb.	.02	.91	.96	.93	.70	.72	1.00	.90	1.15	
Mar.	.67	.63	1.25	.91	1.30	.84	.40	.71	.50	
Apr.	3.49	1.98	3.65	2.15	2.54	1.91	2.20	1.47	.70	1.74
May	6.78	2.40	3.30	2.15	1.30	2.55	.60	1.97	1.20	2.16
June	2.55	1.48	1.60	1.58	2.10	1.39	.40	1.31	.10	
July	.46	2.30	.05	2.60	0	2.33	0	2.20	0	
Aug.	.35	2.54	2.55	3.37	.40	2.52	0	2.67	0	0
Sept.	.79	4.10	.30	3.65	.40	3.26	.10	4.06	.90	.74
Oct.	1.05	2.04	.95	2.40	2.65	3.03	.96	2.09	.45	1.39
Nov.	.50	.81	.58	.59	.50	.67	.45	.59	.11	.23
Dec.	0	.33	0	.52	0	.41	T	.32	0	.30
Yearly	17.48	20.06	16.29	21.28	12.83	20.15	6.61	18.64	5.71	

	Bakers Crossing		Erekson Ranch		Vinegarone		Eugene Miller Ranch		Dolan Springs	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.47	0.74	0	0.86	0.86	0.53	0.41	0.20	1.16	0.51
Feb.	1.18	.97	2.00	1.25	.55	.82	.30	.15	1.15	.82
Mar.	.55	.77	3.15	.98	1.80	.94	.57	.46	2.20	.94
Apr.	5.21	1.33	5.21	2.28	4.10	1.95	3.35	2.70	2.47	1.88
May	2.03	2.50	.35	2.55	1.35	2.55	2.63	2.55	1.70	2.02
June	.09	1.93	1.05	2.78	.80	1.51	.82	.58	1.20	1.69
July	T	1.76	0	2.46	0	2.71	.82	6.78	0	2.47
Aug.	0	2.16	0	2.36	.05	3.03	.38	1.46	1.00	3.36
Sept.		3.75	1.30	3.07	1.90	3.07	.67	3.29	1.20	3.52
Oct.		1.85	.76	2.60	2.00	2.96	2.37	2.60	3.40	2.70
Nov.		.56	1.15	.80	.60	.72	.55	.80	.90	.64
Dec.	0	.63	0	.50	0	.45	0	.18	0	.41
Yearly		18.95	14.97	22.49	14.01	21.24	12.87	21.75	16.38	20.96

T Trace

* Formerly Lock Store

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	H. K. Fawcett Ranch		Ed Crane Ranch		H. T. Miers Ranch Headquarters		H. T. Miers Ranch No. 2		A. A. Baker Ranch	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.90	0.72	0.92	0.82	0.90	0.63	1.11	0.49	0.70	0.41
Feb.	1.00	.77	1.09	1.19	.95	1.10	.88	.91	1.10	.75
Mar.	.50	.80	.98	.64	1.90	.82	2.09	.99	1.44	.60
Apr.	3.50	1.90	1.85	1.81	4.80	1.85	2.12	1.52	2.04	1.41
May	1.48	2.28	1.99	2.63	1.16	2.69	1.52	2.39	.82	1.68
June	.57	1.43	1.32	1.90	1.60	2.70	1.36	1.97	.93	1.69
July	.34	1.83	0	2.08	0	1.92	.12	1.65	.61	1.84
Aug.	1.46	2.50	.15	1.02	0	2.23	.18	2.89	.19	2.10
Sept.	1.60	3.49	.84	2.84	2.60	2.89	1.57	3.23	2.35	3.36
Oct.	1.35	2.48	2.27	2.13	2.15	3.01	1.57	2.27	1.50	1.98
Nov.	1.60	.60	.55	.72	.70	.72	.67	.70	.62	.53
Dec.	.05	.44	0	.62	0	.55	.06	.59	0	.38
Yearly	14.35	19.24	11.96	18.40	16.76	21.11	13.25	19.60	12.30	16.73

Month	Harlow Ranch		Gillis Ranch		Goldwire Ranch		Pafford Crossing		Big Satan Creek Station	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.65	0.31	0.87	0.51	1.20	0.60	1.00	0.53	0.66	0.55
Feb.	1.00	.55	1.04	.92	1.30	.73	1.10	.80	.65	.66
Mar.	.30	.41	1.63	.81	2.35	.89	2.20	.57	2.10	1.16
Apr.	2.30	1.43	2.53	1.88	3.25	1.64	2.90	1.40	2.72	1.89
May	1.10	2.01	1.39	2.12	1.90	2.50	2.25	1.85	3.48	2.15
June	0	1.68	1.78	1.49	1.40	1.88	2.05	1.98	2.60	1.59
July	0	1.89	.42	2.01	0	3.22	0	2.02	0	2.83
Aug.	0	1.90	0	1.78	T	4.05	.15	2.22	T	3.85
Sept.	.79	3.18	.34	3.48	1.50	3.03	.50	3.40	1.10	2.93
Oct.	1.01	2.37	2.45	2.70	2.40	2.76	3.10	2.35	3.25	2.95
Nov.	0	.41	.76	.81	.90	.67	1.25	.53	1.10	.65
Dec.	.03	.31	0	.63	0	.41	0	.47	0	.52
Yearly	7.18	16.45	13.21	19.14	16.20	22.38	16.50	18.12	17.66	21.73

Month	Cliff Lowry Ranch		Lowry Ranch No. 2		Tuffy Whitehead Ranch		Stewart Ranch		Rough Canyon near Del Rio	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.66	0.41	0.62	0.35	0.80	0.34	0.68	0.41	0.80	0.33
Feb.	.97	1.08	1.22	.92	1.10	.78	.99	.88	1.20	.92
Mar.	2.78	.82	2.09	.91	1.45	.67	2.37	.64	2.80	.85
Apr.	3.18	1.99	1.38	1.92	3.06	1.55	3.69	1.90	2.70	1.71
May	2.28	2.50	.93	2.07	1.01	1.52	1.98	1.67	1.65	1.77
June	1.50	1.96	2.31	1.80	.63	1.68	1.77	2.16	3.00	1.81
July	.35	2.07	.12	2.31	.17	1.59	.41	2.06	.20	2.96
Aug.	1.18	2.57	.73	2.92	1.32	1.74	.48	2.00	.36	2.98
Sept.	2.75	3.44	1.92	2.66	.55	3.12	2.47	2.79	1.59	2.54
Oct.	4.75	2.46	2.91	2.22	1.30	2.04	3.81	2.31	4.70	3.01
Nov.	.72	.73	.83	.70	.89	.54	.65	.66	.70	.69
Dec.	.05	.48	.03	.50	0	.43	.04	.50	0	.51
Yearly	21.17	20.51	15.09	19.28	12.28	16.00	19.34	17.98	19.70	20.08

Month	Devils Lake		Sellers Ranch		Evans Creek near Comstock		J. G. Brite Ranch		Hutto Ranch No. 1	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.61	0.64	0.60	0.38	0.62	0.23	0.69	0.36	0.77	0.53
Feb.	1.04	.86	.80	.71	.90	.74	1.04	.92	.98	.92
Mar.	2.03	.63	2.00	.59	2.30	.86	2.14	.78	1.52	.64
Apr.	2.79	1.70	1.75	1.47	1.80	1.37	1.45	1.72	2.91	2.18
May	1.50	1.83	.90	1.46	1.20	1.09	1.31	2.00	1.78	1.77
June	3.09	2.24	2.07	2.11	1.20	1.48	2.90	1.78	1.26	1.95
July	.38	1.38	.02	1.49	.01	2.62	.35	1.80	1.01	2.48
Aug.	.48	1.89	.10	2.10	.10	3.48	.42	2.48	.33	2.48
Sept.	1.46	2.42	.45	2.65	.28	3.26	1.07	3.44	1.20	2.97
Oct.	3.11	2.00	1.90	2.10	.92	2.58	2.41	2.31	3.58	2.53
Nov.	.93	.64	1.50	.54	1.25	.60	1.09	.65	.72	.71
Dec.	0	.69	0	.45	0	.36	0	.48	.05	.51
Yearly	17.42	16.92	12.09	16.05	10.58	18.67	14.87	18.72	16.11	19.67

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

	Hutto Ranch No. 2		Middle Fork San Pedro		North Fork San Pedro		Long Ranch		Buoy No. 11	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.74	0.51	1.00	0.46	0.90	0.41	0.90	0.47	0.53	0.37
Feb.	1.55	1.01	1.70	.86	1.10	.74	1.49	.74	.97	.44
Mar.	1.52	.64	1.70	.75	1.80	.80	1.58	.83	1.20	.69
Apr.	3.22	2.30	3.45	2.04	4.50	2.05	2.67	2.00	4.33	1.74
May	2.59	1.67	2.20	2.05	2.30	1.82	2.70	1.78	1.17	1.30
June	1.96	1.98	1.50	1.82	1.95	1.89	1.71	1.52	.83	1.62
July	.47	2.43	.68	3.68	.76	3.57	.41	3.11	.48	2.55
Aug.	.40	2.34	.19	2.90	.31	2.87	.22	1.89	0	2.27
Sept.	1.16	3.69	.96	1.63	1.54	2.13	.89	2.31	.20	2.66
Oct.	3.27	2.29	3.76	3.51	3.90	3.16	3.97	2.78	.90	2.34
Nov.	.55	.79	.80	.78	.70	.80	.50	.45	.85	.28
Dec.	.05	.44	0	.59	0	.54	.04	.50	T	.40
Yearly	17.48	20.09	17.94	21.07	19.76	20.78	17.08	18.38	11.46	16.66

	Amistad Raft		Amistad Dam		Laughlin Air Force Base		Gillis Headquarters		Lewis Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.81	0.45	0.88	0.45	1.17	0.52	1.01	0.53	1.02	0.62
Feb.	1.03	.49	1.19	.84	1.04	.95	1.13	1.04	.95	1.12
Mar.	1.00	.64	2.51	.78	.52	.43	2.35	.87	1.25	.72
Apr.	3.75	1.79	3.33	2.00	3.53	2.20	3.92	2.52	2.35	2.47
May	.82	1.58	1.19	1.88	3.22	1.91	2.42	2.32	1.40	2.34
June	1.90	1.83	1.97	1.71	1.92	2.62	2.19	2.38	1.90	2.34
July	T	3.05	.14	2.16	1.04	2.81	.65	3.38	0	1.92
Aug.	.07	3.53	.10	2.43	.15	2.05	.62	3.55	0	2.69
Sept.	.83	2.50	.76	4.00	.15	2.73	1.36	2.15	.40	3.42
Oct.	2.52	3.04	2.34	2.09	7.96	2.92	3.26	3.16	3.65	3.13
Nov.	.80	.62	.90	.62	1.29	.79	.71	.90	.75	.76
Dec.	T	.45	.03	.52	.05	.56	0	.60	0	.62
Yearly	13.53	19.97	15.34	19.48	22.04	20.49	19.62	23.40	13.67	22.15

	Maverick County Canal Headgate		Wardlaw Standart Ranch		Pinto Creek Station		Las Moras Creek		Wipff Ranch	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.90	0.57			1.10	0.58	1.48	0.73	1.15	0.70
Feb.	.70	.99			.85	.80	.96	1.06	.55	.83
Mar.	.65	.57			.90	.47	.35	.58	.25	.55
Apr.	3.55	1.65	3.63	3.63	2.30	1.52	2.11	1.53	3.80	1.77
May	1.20	2.10	1.45	1.45	.45	1.92	1.51	2.20	3.20	2.26
June	1.50	2.10	1.80	1.80	1.10	2.43	.20	2.64	1.00	2.32
July	0	1.88	0	0	0	1.64	.10	1.36	0	1.79
Aug.	.30	1.62	0	0	.30	1.76	.30	2.13	.30	2.01
Sept.	1.10	2.82	.96	.96	.80	3.09	.23	3.57	.05	2.94
Oct.	3.45	2.23	3.99	3.99	2.60	2.24	2.62	2.74	3.20	2.47
Nov.	2.00	.74	2.00	2.00	1.00	.81	1.00	.99	.85	.94
Dec.	0	.56	.04	.04	.65	.56	.12	.63	.20	.56
Yearly	16.35	17.83			12.05	17.82	10.98	20.16	14.55	19.14

	Lateral No. 2 Spill		Normandy		Lateral No. 12 Headgate		Lateral 15 Spill		Maverick Power Plant	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.25	0.63	1.21	0.76	1.00	0.60	0.95	0.61	1.21	0.71
Feb.	.90	.75	.87	.76	.65	.63	.75	.67	.75	.78
Mar.	.30	.64	.25	.72	.15	.60	.15	.53	.46	.79
Apr.	4.50	1.78	3.89	1.92	4.10	1.73	3.55	1.52	3.89	1.88
May	3.45	2.61	4.66	2.82	4.60	2.71	3.50	2.56	3.20	2.69
June	.65	2.35	.38	2.05	.55	1.88	.55	1.86	.73	2.20
July	T	2.06	.07	2.30	T	1.83	T	2.16	.11	1.80
Aug.	.30	2.19	.15	2.28	.30	1.88	.25	1.78	.78	1.98
Sept.	.35	3.18	.28	3.14	.10	2.97	1.10	2.45	.47	2.69
Oct.	3.00	2.43	4.02	2.69	4.30	2.86	3.85	2.82	5.05	2.68
Nov.	.50	.84	.49	.84	.50	.67	.30	.60	.31	.68
Dec.	T	.49	.08	.68	.05	.52	.05	.53	.12	.59
Yearly	15.20	19.95	16.35	20.96	16.30	18.88	15.00	18.09	17.08	19.47

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Cooper Ranch		Coal Mine		Elm Creek Station		Chittim Ranch		Eagle Pass	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.25	0.51	1.05	0.59	1.25	0.52	1.00	0.56	1.24	0.69
Feb.	.60	.71	.50	.77	.50	.67	.40	.81	.57	.92
Mar.	.35	.69	.31	.75	.15	.53	.20	.60	.22	.86
Apr.	3.10	1.63	3.46	1.76	3.65	1.75	4.45	1.91	3.86	1.77
May	2.10	2.41	1.98	2.75	2.70	2.96	3.15	3.10	4.80	3.78
June	2.50	2.31	1.21	1.59	.65	2.04	1.55	2.01	1.58	2.73
July	T	2.15	0	2.46	T	2.17	0	2.24	T	2.26
Aug.	.25	2.04	.34	1.78	.35	2.24	.40	2.25	.71	3.17
Sept.	.35	3.41	.10	3.28	.45	2.95	.10	2.98	.28	3.53
Oct.	2.70	2.67	2.88	2.68	2.10	2.74	1.60	2.91	2.30	2.75
Nov.	.60	.76	.22	.64	.20	.57	.20	.61	.23	.66
Dec.	.10	.55	.12	.45	.10	.54	.10	.57	.13	.75
Yearly	13.90	19.84	12.17	19.50	12.10	19.68	13.15	20.55	15.92	23.87

Month	Canon Diablo		Rosita Creek Siphon		Weyrich Farm		Trees Farm		Rosita Creek Station	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.00	0.55	1.10	0.49	1.10	0.52	0.78	0.53	1.10	0.45
Feb.	.50	.76	.46	.77	.40	.79	.28	.81	.60	.71
Mar.	.15	.70	.15	.63	.10	.51	.12	.47	.15	.51
Apr.	3.25	2.05	3.35	1.80	3.30	1.79	2.64	1.88	2.30	1.86
May	2.75	3.76	3.45	2.84	2.55	3.26	4.23	3.04	2.80	2.59
June	1.30	2.48	1.20	2.10	1.90	1.89	.97	1.66	.90	2.04
July	0	1.57	0	2.04	0	1.36	0	1.91	0	1.46
Aug.	.55	2.54	.75	1.86	.40	1.98	.58	1.79	.60	1.81
Sept.	0	3.73	.15	2.97	.15	2.96	1.14	2.90	.80	3.06
Oct.	1.75	2.50	1.70	2.49	1.50	1.97	3.55	3.28	2.75	2.91
Nov.	.15	.69	.15	.70	0	.66	.15	.67	.10	.67
Dec.	.10	.56	.10	.62	T	.57	.11	.61	.15	.57
Yearly	11.50	21.89	12.56	19.31	11.40	18.26	14.55	19.55	12.25	18.64

Month	Farias Ranch		Indio Ranch		El Indio		Van Dalsem Farm		Wuensche Farm	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.26	0.64	1.20	0.62	0.75	0.73	1.00	0.52	1.20	0.65
Feb.	.45	1.06	.60	.86	.53	.93	.61	.89	.62	.96
Mar.	.05	.53	.10	.56		.55	.10	.51	.10	.60
Apr.	4.16	2.04	3.58	2.10	4.93	1.77	3.15	1.89	3.03	1.73
May	3.03	3.04	3.45	2.60	3.52	3.24	5.85	2.84	5.05	2.77
June	1.22	1.94	.89	2.30	.75	1.93	1.00	1.34	.67	2.11
July	.09	2.38	0	2.12	0	1.33	.0	1.73	0	1.40
Aug.	.50	2.19	.58	1.70	.73	2.00	.30	1.61	.38	1.79
Sept.	.21	3.94	.11	3.71	.23	3.23	.35	3.51	.93	3.17
Oct.	3.23	3.20	2.68	2.88	2.61	2.40	2.35	2.71	2.37	2.37
Nov.	.17	.81	.05	.79	.04	.72	.10	.70	.14	.71
Dec.	.23	.76	.22	.64	.21	.63	.10	.62	.20	.59
Yearly	14.60	22.53	13.46	20.88		19.46	14.91	18.87	14.69	18.85

Month	Keisling Farm		Cuervo Creek Station		Apache Ranch		Laredo Water Plant		Fort McIntosh (Laredo)	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.05	0.56	0.95	0.61	0.50	0.63	1.67	0.76	1.79	0.73
Feb.	.62	.90	.48	.73	0	.91	.24	.79	.57	.86
Mar.	.13	.68	.10	.42	0	.41	T	.59	.01	.70
Apr.	2.53	1.85	4.50	1.64	1.70	1.55	3.43	1.15	4.76	1.32
May	4.50	2.66	3.50	2.26	4.00	2.49	6.17	2.45	7.93	2.70
June	1.11	2.44	.50	2.08	0	1.81	.02	2.16	.10	2.25
July	0	1.54	0	1.37	0	2.17	0	1.27	0	1.47
Aug.	.38	1.82	.35	1.67	0	2.09	2.29	1.87	2.37	1.94
Sept.	.39	2.97	.20	3.17	0	3.44	T	3.15	.06	2.97
Oct.	2.00	2.64	1.80	2.46	2.00	2.43	1.85	1.81	2.32	1.79
Nov.	.02	.65	T	.68	0	.72	.06	.89	.06	1.15
Dec.	.24	.79	.15	.54	0	.75	.61	.86	.47	.86
Yearly	12.97	19.50	12.53	17.63	8.20	19.40	16.34	17.75	20.44	18.74

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Corralitos Ranch		Huisache Ranch		Zapata Water Plant		Arroyo Tigre Chiquito		Falcon Dam	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.20	0.60	1.15	0.69	1.15	0.76	0.08	0.73	1.37	0.81
Feb.	.57	.78	.57	.95	.50	.85	1.10	.88	.84	.88
Mar.	0	.46	0	.52	0	.51	0	.33	.15	.65
Apr.	.50	1.09	1.13	1.24	.70	1.47	0	1.09	.12	1.15
May	3.40	1.89	3.00	2.17	1.50	2.60	1.30	2.31	1.39	2.28
June	0	2.42	0	2.53	0	2.20	.30	2.24	2.44	2.75
July	0	1.21	0	1.28	0	1.35	.70	1.27	.73	1.22
Aug.	1.30	1.94	1.30	1.59	1.65	1.84	2.45	2.22	1.31	2.50
Sept.	2.40	3.54	2.10	4.53	1.10	4.81	1.90	4.82	2.94	4.64
Oct.	1.30	1.88	2.50	2.20	4.30	1.90	.65	2.06	.72	2.17
Nov.	0	.91	0	.94	0	1.01	T	1.12	.10	1.19
Dec.	.20	.48	0	.63	0	.59	.15	.52	.47	.63
Yearly	10.97	17.20	11.75	19.27	10.90	19.89	8.63	19.59	12.58	20.87

Month	Roma International Bridge		Garciasville		Los Ebanos		HCWCID #6 Goodwin Pump No. 4B		HCWCID #6 Goodwin Pump No. 3	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.22	0.83	1.10	0.87	0.80	0.99	2.00	1.20	1.41	1.23
Feb.	.68	1.02	.88	.91	1.30	.83	.95	.93	1.12	1.03
Mar.	.04	.65	0	.46	0	.45	0	.49	0	.63
Apr.	0	1.39	.67	1.11	.70	1.58	.20	1.06	.79	1.30
May	.73	1.69	1.23	2.09	.60	1.85	1.05	2.06	.55	2.21
June	2.30	2.18	1.45	2.38	2.26	2.29	3.30	2.43	4.00	2.50
July	.89	1.20	1.33	1.43	1.00	1.32	0	1.30	1.05	1.68
Aug.	1.54	2.05	2.66	2.04	3.30	2.13	2.65	1.55	4.10	1.72
Sept.	4.36	4.67	3.81	3.76	3.05	3.41	3.17	3.61	4.33	3.44
Oct.	.40	2.06	.67	2.15	.68	2.23	1.50	2.76	.85	2.91
Nov.	0	.81	0	.95	0	.58	0	1.01	0	.94
Dec.	0	.45	.02	.63	.01	.64	0	.75	0	.87
Yearly	12.16	19.00	13.82	18.78	13.70	18.35	14.82	19.15	18.20	20.46

Month	HCWCID #6 Goodwin Pump No. 5		HCWCID #6 Goodwin Pump No. 3A		HCWCID #6 Goodwin Pump No. 4		Penitas (Edinburg Pumping Plant)		New Mission Pumping Plant	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.81	1.24	2.07	1.19	1.92	1.61	1.44	1.23	1.85	0.81
Feb.	1.43	1.03	1.58	1.05	1.22	1.00	1.05	.96	2.20	.82
Mar.	0	.64	0	.61	0	.56	0	.52	0	.74
Apr.	.59	1.29	1.20	1.62	.90	1.35	1.05	1.02	2.70	1.50
May	1.59	2.52	1.23	2.05	1.74	2.27	1.08	2.20	2.25	2.37
June	3.50	2.42	3.00	2.67	4.40	2.91	2.88	2.98	2.18	2.89
July	0	1.32	0	1.64	.10	1.79	.63	1.56	.15	1.74
Aug.	7.72	2.49	5.21	2.05	5.22	1.93	4.75	2.19	0	1.78
Sept.	5.92	4.43	2.70	3.52	1.95	3.92	3.87	3.83	4.59	3.17
Oct.	1.07	2.74	1.37	2.93	.89	3.00	1.30	2.81	.65	2.35
Nov.	.25	1.02	0	.93	0	.98	0	1.00	0	.67
Dec.	0	.83	0	.78	0	.96	0	.92	0	.71
Yearly	22.88	21.97	18.36	21.15	18.34	22.28	18.05	21.22	16.57	19.55

Month	O. C. Dale Farm		HCWCID #15 (Edinburg Office)		Edinburg Filtration Plant		La Feria Pumping Plant		La Feria Materials Yard	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	2.54	1.61	1.57	1.34	1.68	1.42	3.03	1.63	1.77	1.29
Feb.	1.78	1.20	1.38	1.06	1.75	1.14	.22	1.62	.50	1.32
Mar.	.13	.82	.11	.64	.15	.73	0	.82	.10	.90
Apr.	.89	1.71	1.04	1.62	.71	1.55	6.00	2.26	2.90	1.62
May	1.26	2.14	1.10	2.25	.87	2.18	1.10	3.13	1.20	2.99
June	4.67	3.13	5.43	2.53	4.50	2.78	7.80	3.68	8.77	4.05
July	.16	1.71	.44	1.58	.30	1.40	.50	2.46	0	2.09
Aug.	7.49	2.31	.65	2.09	1.77	2.03	0	3.50	.50	2.99
Sept.	3.16	4.13	1.97	4.56	2.83	3.88	2.90	7.03	3.30	5.38
Oct.	1.10	3.19	1.27	2.68	2.45	2.64	1.00	4.25	2.70	3.34
Nov.	.90	1.28	.42	1.08	1.02	1.16	2.50	2.00	3.80	1.57
Dec.	.03	1.04	0	.87	0	.96	0	1.47	0	1.51
Yearly	24.11	24.27	15.38	22.30	18.03	21.87	25.05	33.85	25.54	28.95

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	CCWCID #19 (Adams Gardens)		San Benito Pump		Whipple Farm		* CCWID #11 (Bayview Dist. Office)			
	1977	Average	1977	Average	1977	Average	1977	Average		
Jan.	2.71	1.24	1.74	1.34	2.15	1.83	0.67	1.41		
Feb.	2.07	1.25	1.70	.97	1.55	1.86	2.39	1.73		
Mar.	.34	.76	.21	.81	0	.67	0	.68		
Apr.	3.18	1.57	4.89	1.33	4.17	2.02	5.23	1.92		
May	.87	2.49	1.67	2.51	.85	3.05	.92	2.64		
June	7.35	2.93	4.52	2.58	6.05	3.57	1.54	2.38		
July	.06	1.65	.77	1.75	2.45	2.36	0	1.83		
Aug.	.03	2.76	.28	2.17	1.75	3.21	1.80	2.65		
Sept.	4.06	4.26	2.60	4.44	2.03	5.93	1.70	5.36		
Oct.	2.61	2.96	2.31	2.68	.90	3.22	0	2.33		
Nov.	4.12	1.57	1.86	1.12	4.37	1.65	3.30	1.55		
Dec.	.13	1.07	.19	1.26	.30	1.51	0	1.33		
Yearly	27.53	24.51	22.74	22.96	26.57	30.88	17.55	25.81		

* 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 139 through 142 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 of the Commission.

Detailed listings of the months and years for which records are available through 1970 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 22, 26, and Supplement 40A.

	Juarez, Chihuahua		El Sauzal D. B., Chihuahua		Garita Km. 28, Chihuahua		Samalayuca, Chihuahua		San Agustin, Chihuahua	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.67	0.40	0.47	0.50	0.94	0.56	0.79	0.40	0.67	0.38
Feb.	0	.44	0	.43	0	.40	0	.52	0	.35
Mar.	.24	.37	.28	.12	0	.29	.47	.36	0	.25
Apr.	.16	.29	.12	.08	.28	.10	.24	.13	0	.11
May	.04	.33	.04	.25	.28	.24	.08	.16	0	.28
June	.12	.64	.20	.47	.51	.77	.24	.79	.20	.60
July	1.42	1.61	1.10	1.32	1.18	1.92	.91	2.13	.87	1.66
Aug.	.75	1.43	1.30	1.14	1.02	1.64	.47	1.76	.79	1.15
Sept.	.63	1.41	.28	1.88	.08	1.72	.71	2.01	.35	1.38
Oct.	1.93	.99	2.28	1.02	.55	.90	2.83	.67	2.68	.75
Nov.	.08	.50	0	.21	2.76	.54	0	.36	.04	.29
Dec.	.24	.53	.20	.44	.39	.60	.28	.45	.16	.51
Yearly	6.28	8.94	6.27	7.86	7.99	9.68	7.02	9.74	5.76	7.71

	Guadalupe, Chihuahua		Tinajas, Chihuahua		Praxedis Guerrero, Chihuahua		Porvenir, Chihuahua		Vado de Cedillos, Chihuahua	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.43	0.37		0.31	0.24	0.30	0.39	0.36	0.35	0.38
Feb.	.08	.37		.29	0	.24	0	.37	0	.33
Mar.	.08	.36		.36	0	.24	0	.25	.20	.23
Apr.	1.22	.15		.06	.43	.07	.47	.12	.67	.18
May	.35	.27		.30	0	.26	0	.41	.47	.39
June	0	.73	.16	.63	.04	.58	.43	.83	.31	1.03
July	1.50	1.96	1.02	1.83	1.42	1.96	1.69	1.85	.75	1.84
Aug.	.43	1.43		1.64	.39	1.25	0	1.73	.75	1.73
Sept.	.20	1.37		1.65	1.38	1.38	.16	1.59	.35	1.66
Oct.	2.24	.97	2.36	1.02	1.93	.84	1.73	.94	1.85	1.06
Nov.	.35	.36	.39	.39	.28	.34	.35	.45	.35	.40
Dec.	.39	.34	.71	.36	0	.37	.28	.49	.67	.54
Yearly	7.27	8.68		8.84	6.11	7.83	5.50	9.39	6.72	9.77

	Los Barriles, Chihuahua		Banderas, Chihuahua		Luis L. Leon, Chihuahua		El Cuervo, Chihuahua		Carichic, Chihuahua	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.16	0.34	0.08	0.14	0.31	0.37	0.16	0.22	0.98	0.42
Feb.	0	.23	0	.28	0	.27	0	.31	0	.50
Mar.	.08	.22	0	.19	.08	.22	T	.12	.59	.16
Apr.	0	.11	0	.10	.12	.16	.12	.14	T	.15
May	0	.38	0	.24	0	.40	0	.42	.59	.39
June	.31	1.10	0	.83	.24	1.19	2.36	1.37	2.13	1.71
July	.63	2.05	.31	1.32	1.73	2.00	3.39	2.59	9.06	6.45
Aug.	.43	2.13	.43	1.97	.71	2.09	.87	2.37	3.74	4.84
Sept.	1.10	1.63	.43	1.47	0	1.47	1.38	2.37	1.97	3.30
Oct.	.71	1.10	2.87	.96	1.89	1.14	1.18	.87	2.80	1.18
Nov.	.16	.49	.24	.33	.24	.42	.08	.24	.16	.59
Dec.	.12	.33		.25	.63	.39	T	.15	T	.61
Yearly	3.70	10.11		8.08	5.95	10.12	9.54	11.17	22.02	20.30

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Siquirichic, Chihuahua		El Vergel, Chihuahua		El Sitio, Chihuahua		La Boquilla, Chihuahua		San Antonio, Durango	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.79	1.09	0.63	1.33	0	0.18	0.16	0.29	0.59	0.30
Feb.	T	.62	.08	.77	0	.36	0	.19	0	.16
Mar.	0	.44	.24	.52	0	.12	T	.15	0	.08
Apr.	T	.19	T	.41	0	.16	.08	.18	.31	.24
May	0	.50	.43	.73	0	.37	.35	.55	.79	.59
June	3.78	1.72	5.55	3.13	3.27	1.72	1.85	1.42	3.15	2.00
July	9.37	5.72	5.79	6.93	5.71	4.58	4.72	3.01	8.31	4.64
Aug.	1.97	5.57	8.62	6.65	2.20	4.67	1.50	2.95	4.33	3.98
Sept.	.24	3.14	2.64	4.58	.39	3.41	.08	2.93	.87	4.25
Oct.	1.38	1.22	3.78	1.82	2.87	.85	1.65	.89	.59	1.17
Nov.	0	.42	T	.70	0	.41	T	.33	0	.28
Dec.	.59	1.05	.04	1.37	0	.35	0	.36	0	.26
Yearly	18.12	21.68	27.80	28.94	14.44	17.18	10.39	13.25	18.94	17.95

Month	Estacion Rosario, Durango		Ojo Caliente, Chihuahua		Villa Coronado, Chihuahua		Santa Barbara, Chihuahua		Valle Allende, Chihuahua	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.39	0.24	0.04	0.18	0.67	0.27	0	0.24	0.39	0.19
Feb.	0	.34	0	.23	0	.33	0	.52	0	.21
Mar.	0	.13	0	.16	0	.17	0	.21	0	.07
Apr.	.35	.18	.08	.16	1.54	.35	0	.11	.55	.20
May	.51	.84	.28	.51	2.80	.67	.16	.78	.55	.60
June	2.60	2.49	2.56	1.66	4.53	2.95	.63	2.35	2.05	1.75
July	3.23	4.60	5.94	3.44	3.58	4.23	6.89	4.39	3.07	4.06
Aug.	3.50	5.07	2.32	2.70	5.63	4.68	6.93	5.54	4.06	4.51
Sept.	.87	5.23	.87	2.60	2.52	3.71	2.48	4.52	1.30	3.79
Oct.	.35	1.13	2.32	1.12	.51	1.14	0	.86	1.22	.97
Nov.	0	.41	0	.20	0	.46	0	.39	T	.32
Dec.	0	.43	0	.26	0	.44	0	.34	T	.33
Yearly	11.80	21.09	14.41	13.22	21.78	19.40	17.09	20.25	13.19	17.00

Month	Escalon, Chihuahua		Jimenez, Chihuahua		Parral, Chihuahua		Camargo, Chihuahua		Victoria, Chihuahua	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.12	0.32	0.35	0.21	0.24	0.20	0.08	0.32	0.20	0.26
Feb.	0	.19	0	.16	T	.22	0	.31	0	.66
Mar.	T	.10	0	.08	0	.10	0	.12	T	.16
Apr.	1.18	.30	.28	.12	.04	.20	.08	.16	.71	.25
May	.12	.59	.51	.43	.04	.43	.24	.60	T	.82
June	2.91	1.66	4.41	1.24	1.97	1.75	2.05	1.56	2.99	2.02
July	1.73	2.58	3.07	3.43	2.28	4.38	4.96	3.41	1.65	3.25
Aug.	2.05	2.84	1.18	2.32	2.95	4.30	1.18	2.68	2.40	2.90
Sept.	.20	2.71	.35	2.32	.55	4.27		2.67	2.13	2.81
Oct.	1.14	1.15	.71	1.28		1.16	2.20	1.00	.55	.64
Nov.	0	.26	0	.26		.50	0	.37	.24	.22
Dec.	0	.34	0	.25		.39	T	.36	T	.33
Yearly	9.45	13.04	10.86	12.10		17.90		13.56	10.87	14.32

Month	Tacubaya, Chihuahua		Rosetilla, Chihuahua		Noncava, Chihuahua		El Maguey, Chihuahua		San Lorenzo, Chihuahua	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.20	0.20	0.20	0.35	0.55	0.14	0.16	0.21	0.16	0.15
Feb.	0	.58	T	.17	0	.42	0	.35	0	.20
Mar.	0	.12	0	.10	.24	.19	0	.12	.12	.02
Apr.	.24	.16	.12	.26	.04	.14	.16	.13	0	.06
May	0	1.00	.08	.34	.51	.40	0	.34	0	.49
June	2.05	1.63	3.15	1.14	2.56	2.04	3.74	1.60	3.23	1.70
July	2.80	4.37	4.65	2.85	7.60	5.89	5.83	3.74	5.98	4.27
Aug.	2.60	2.19	1.14	2.73	3.07	3.03	1.77	3.98	1.46	4.28
Sept.	1.89	3.03	.79	2.16	.16	2.48	.47	3.42	.91	4.45
Oct.	.47	.62	3.82	.86	2.56	1.16	1.38	.86	2.99	.92
Nov.	.04	.25	T	.21	0	.45	0	.26	0	.45
Dec.	0	.56	0	.35	0	.35	0	.30	0	.43
Yearly	10.29	14.71	13.95	11.52	17.29	16.69	13.51	15.31	14.85	17.42

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Villalba, Chihuahua		Las Virgenes, Chihuahua		Km. 135, Chihuahua		Km. 99, Chihuahua		Delicias, Chihuahua	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.28	0.30	0.24	0.24	0.16	0.08	0.28	0.10	0.20	0.31
Feb.	0	.15	0	.13	0	.24	0	.24	0	.16
Mar.	0	.06	0	.05	0	.09	0	.08	0	.11
Apr.	.12	.16	.16	.19	.04	.25		.18	.43	.26
May	.39	.37	.12	.33	.08	.57		.51	.12	.33
June	4.45	1.24	3.46	1.12	2.80	1.22		1.34	1.73	1.16
July	3.86	3.65	3.46	2.68	3.27	2.58		2.95	2.91	2.56
Aug.	1.18	2.93	1.10	2.52	1.02	2.45		2.61	.71	2.44
Sept.	1.26	2.74	1.42	2.29	1.61	3.02		2.64	.43	2.14
Oct.	2.56	.96	2.64	.83	3.23	.92		.75	2.09	.80
Nov.	0	.28	0	.23	0	.25		.25	0	.25
Dec.	0	.37	0	.34		.32		.37	0	.37
Yearly	14.10	13.21	12.60	10.95		11.99		12.02	8.62	10.89

Month	Meoqui, Chihuahua		Las Burras, Chihuahua		Ciudad Guerrero, Chihuahua		Bachiniva, Chihuahua		La Trasquila, Chihuahua	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.28	0.14	0.20	0.21	0.94	0.59	1.02	0.42	0.39	0.28
Feb.	0	.22	0	.20	.04	.41	0	.18	.04	.32
Mar.	T	.08	0	.12	.16	.20	.12	.31	0	.11
Apr.	.20	.38	.08	.17	.08	.19	.08	.10	.04	.12
May	.12	.51	.24	.40	.12	.30	0	.22	0	.34
June	2.17	1.18	2.60	1.06	2.56	1.54	1.81	1.43	1.85	1.41
July	3.54	2.84	4.53	2.93	7.52	4.90	4.72	5.71	2.64	3.70
Aug.	.67	2.46	1.34	2.50	3.82	5.22	2.13	4.50	2.09	2.65
Sept.	.20	2.14	.31	2.32	1.97	3.07	.75	2.54	.67	3.20
Oct.	3.27	1.01	2.13	.75	2.24	1.20	3.35	1.20	2.48	.80
Nov.	T	.20	.04	.19	.20	.51	.12	.35	.20	.33
Dec.	T	.35	0	.34	T	.68	0	.39	0	.30
Yearly	10.45	11.50	11.47	11.19	19.65	18.81	14.10	17.35	10.40	13.56

Month	Cuauhtemoc, Chihuahua		Colonia Anahuac, Chihuahua		Presa Chihuahua, Chihuahua		Chihuahua, Chihuahua		Majalca, Chihuahua	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.24	0.28	0	0.26	0.83	0.19	0.16	0.26	0.39	0.30
Feb.	0	.15	0	.31	0	.24	T	.20	0	.37
Mar.	T	.11	0	.10	.12	.13	.08	.19	.28	.22
Apr.	0	.19	.12	.20	.43	.20	.55	.19	.39	.32
May	0	.36	.12	.58	0	.96	T	.45	0	.77
June	2.83	1.50	4.72	1.63	4.88	2.29	4.65	1.49	5.24	2.65
July	5.35	4.73	6.14	5.01	2.17	4.68	4.41	3.58	7.24	6.77
Aug.	1.69	4.11	2.05	4.56	1.38	4.10	3.27	3.32	3.39	5.75
Sept.	1.30	2.66	1.50	3.64	1.26	3.18	.98	2.83	1.61	4.01
Oct.	5.87	1.18	3.31	1.08	2.36	.90	2.68	.83	3.39	1.02
Nov.	.08	.31	.04	.34	0	.33	T	.42	.20	.39
Dec.	0	.37	0	.23	0	.32	T	.35	0	.35
Yearly	17.36	15.95	18.00	17.94	13.43	17.52	16.78	14.11	22.13	22.92

Month	Planta Zootecnica, Chihuahua		Villa Aldama, Chihuahua		La Campana, Chihuahua		Presa Luis L. Leon, Chihuahua		Maclovio Herrera, (Falomir), Chihuahua	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.16	0.22	0.24	0.17	0.35	0.24	0	0.05	0.04	0.30
Feb.	0	.24	T	.20	0	.36	0	.12	0	.20
Mar.	.08	.14	.12	.16	0	.16	.04	.12	0	.14
Apr.	T	.26	T	.18	.04	.25	.71	.22	.04	.29
May	0	.64	T	.46	0	.26	0	.26	.31	.59
June	2.13	1.49	2.13	1.72	1.57	1.47	3.03	1.10	2.05	1.16
July	1.73	3.60	3.35	3.12	4.61	3.59	5.51	2.58	1.10	2.91
Aug.	.91	3.69	1.61	2.67	1.97	2.93	2.64	2.41	1.38	2.51
Sept.	.39	2.68	.55	3.12	.24	3.15	.94	2.46	.87	3.14
Oct.	2.17	1.05	2.83	.70	3.27	1.06	1.46	.59	1.06	.76
Nov.	T	.36	.08	.32	.20	.30	0	.22	0	.30
Dec.	0	.33	T	.35	T	.29	0	.30	0	.59
Yearly	7.57	14.70	10.91	13.17	12.25	14.06	14.33	10.43	6.85	12.89

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Parrita, Chihuahua		Maijoma, Chihuahua		Coyame, Chihuahua		Gallego, Chihuahua		El Sueco, Chihuahua	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.24	0.14	0.12	0.37	0.12	0.15	0.39	0.31	0.35	0.40
Feb.	0	.26	0	.35	0	.35	0	.39	0	.44
Mar.	0	.08	T	.17	0	.16	.16	.16	.16	.24
Apr.	.08	.40	.24	.23	.20	.23	.67	.18	.59	.19
May	0	.30	.20	.79	.24	.59	T	.29	T	.30
June	2.28	1.86	2.40	1.60	4.13	1.41	1.69	.98	1.57	.82
July	2.91	2.65	3.62	3.18	1.61	2.69	3.03	3.34	4.13	3.18
Aug.	3.19	2.92	1.54	3.13	.98	1.73	1.85	2.97	2.20	3.28
Sept.	1.22	3.01	1.30	2.60	.28	2.54	.94	2.50	1.18	2.79
Oct.	2.09	.98	.59	.93	.28	.76	2.44	1.33	2.68	1.20
Nov.	.04	.26	0	.34	0	.36	.24	.30	.28	.43
Dec.	0	.18	0	.39	0	.17	.12	.25	.12	.31
Yearly	12.05	13.04	10.01	14.08	7.84	11.14	11.53	13.00	13.26	13.58

Month	Ojinaga (IB&WC), Chihuahua		Ojinaga (M.S. of Mexico), Chihuahua		Manuel Benavides, Chihuahua		Ejido Eutimias, Coahuila		Ejido La Rosita, Coahuila	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0	0.30	T	0.29	T	0.14	0	0.24	0.08	0.06
Feb.	T	.25	T	.24	T	.25	0	.19	0	0
Mar.	T	.19	T	.21	0	.29	0	.02		.08
Apr.	.31	.23	.20	.25	.87	.25	0	.17	.31	.55
May	.08	.45	T	.59	.83	1.09		.71	1.10	.55
June	1.22	1.27	.75	1.09	2.01	1.32	.83	.78	1.02	.72
July	.31	1.79	.67	1.64	.47	2.33	2.44	2.37	2.44	1.16
Aug.	.79	1.47	.55	1.52	.16	2.35	.71	.26	0	.46
Sept.	.08	1.59	T	1.58	.63	2.78	.98	1.13	.24	.64
Oct.	.43	.96	1.54	.99	.51	.87	.20	.44	.43	.82
Nov.	T	.38	T	.38	.08	.24	T	.22	.12	.25
Dec.	T	.31	.20	.41	.08	.33	0	.72		1.68
Yearly	3.22	9.19	3.91	9.19	5.64	12.24		7.25		6.97

Month	Santa Rosa, Coahuila		San Fernando, Coahuila		Hacienda San Miguel, Coahuila		Rancho La Chuparrosa, Coahuila		Presa Centenario, Coahuila	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.43	0.73		0.28	1.30	0.34	0.41	0.16	0.98	0.57
Feb.	.83	.89	0.47	.62	.98	.63	.75	.42	.87	.84
Mar.	.31	.60	.16	.40	.83	.53	1.07	.60	.35	.45
Apr.	1.30	1.01	1.46	1.06	4.37	1.92	2.17	1.19	3.86	1.68
May	.94	1.33	.75	1.26	4.53	2.42	1.13	1.14		1.69
June	.39	1.69	.12	1.08	0	1.87	.34	1.22		2.05
July	0	1.56	0	1.31	0	1.93	.20	2.57	0	1.71
Aug.	0	1.72	.08	1.53	0	1.67	0	2.15	.16	2.79
Sept.	.12	2.58	.39	3.06	.79	3.20	.21	2.61	.20	4.16
Oct.	.91	2.35	1.38	1.90	.47	1.74	.14	2.44	6.57	2.91
Nov.	.47	.78	0	.39	.91	.55	.73	.25	1.18	.62
Dec.	0	.43	0	.38	0	.32	T	.27	0	.53
Yearly	5.70	15.67		13.27	14.18	17.12	7.15	15.02		20.20

4.81 10.17

Month	Amistad Res. near Tlaloc, Coahuila		La Amistad, Coahuila		Represa Amistad, Coahuila		Ciudad Acuna, Coahuila		Presa Cabeceras, Coahuila	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.05	0.44			0.47	0.30	1.02	0.55	1.30	0.57
Feb.	1.30	.66	1.06		.98	.57	.94	.88	.47	.74
Mar.	2.00	.88	1.46		2.09	.81	.55	.69	.39	.54
Apr.	2.65	1.55	3.23		2.20	1.39	3.86	1.69	4.72	1.82
May	.90	1.56	.75		.08	.94	1.81	2.24	1.27	2.53
June	1.55	1.89	2.13		1.46	.91	.47	2.16	0.44	2.24
July	0	3.46	.12		.39	2.77	.16	1.82	0	3.15
Aug.	.05	2.97	.35		.12	2.03	.31	1.96	.20	3.24
Sept.	.25	3.61	.75		.71	2.87	1.18	3.22	.35	4.93
Oct.	2.62	2.25	3.23		2.83	2.97	4.37	2.59	3.07	3.20
Nov.	.99	.33	.51		.79	.59	.71	.59	.98	.87
Dec.	0	.41	.04		0	.31	T	.54	0	.47
Yearly	13.36	20.01			12.12	16.46	15.38	18.93	13.24	24.30

T Trace

11.48

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Presa San Miguel, Coahuila		Palestina, Coahuila		Chupadero, Coahuila		Ejido San Miguel, Coahuila		Emiliano Zapata, Coahuila	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.10	0.50	0.87	0.88	1.26	0.52	0.31		1.42	
Feb.	.63	.80	.71	.97	0	.90	0	0	.91	
Mar.	.79	.56	.59	.65	.55	.51	.08	.04	1.06	.53
Apr.	3.19	1.39	7.24	1.85	1.97	1.92			2.09	3.52
May		2.44		2.36	.79	2.05				
June		2.12	.31	2.24	0	2.20	1.65	1.24		
July	0	2.00	.04	2.07	0	2.19			0	7.54
Aug.	.08	2.69	0	2.25	0	2.15			.28	.65
Sept.	.35	4.03	.43	3.20	.71	3.50			.28	1.40
Oct.	2.76	2.51	9.37	2.29	1.42	2.20			2.44	3.58
Nov.	1.06	.72	1.38	.74	.79	.71			.94	1.00
Dec.	.08	.44	0	.75	0	.52			.24	1.12
Yearly		20.20	22.51	20.25	7.49	19.37				

Month	Jimenez, Coahuila		El Remolino, Coahuila		Piedras Negras, Coahuila		Zaragoza, Coahuila		Allende, Coahuila	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.69	0.70	0	0.34	1.14	0.73			T	0.59
Feb.	.67	.92	0	.63	.63	.99			.28	.95
Mar.	.55	.71	2.05	.42	.31	.67			0	.42
Apr.	2.44	1.81	2.44	1.44	4.25	2.02			.98	1.09
May	.91	2.49	1.46	2.35	7.28	3.38			11.30	2.62
June	1.18	2.61	.39	3.32	.91	2.32			0	2.19
July	.31	1.77	0	2.72	.04	2.29				1.91
Aug.	.20	1.81	0	1.80	.71	2.66	.31			2.74
Sept.	.24	3.12	0	3.73	.20	3.24	.31			3.70
Oct.	2.83	2.71	1.14	3.08	2.91	3.08	2.56			2.16
Nov.	.79	.87	0	.58	.16	.73	.24			.74
Dec.	.24	.64	0	.42	.16	.66				.66
Yearly	12.05	20.16	7.48	20.83	18.70	22.77				19.77

Month	* Guerrero, Coahuila		Rancho San Diego, Coahuila		Villa Hidalgo, Coahuila		Colombia (IB&WC), Nuevo Leon		Colombia (S.A.R.H.), Nuevo Leon	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.87	0.57	0.39	0.26	1.22	0.75	1.38	0.32	1.89	
Feb.	0	.74	0	.53	.35	.96	0	.67	.35	
Mar.	0	.44	0	.36	.12	.59	0	.59	.04	
Apr.	3.31	1.55	.59	1.13	2.95	1.58	3.74	1.59	2.72	
May	4.33	2.57	1.38	2.64	6.57	2.86	5.51	3.01		
June	.83	2.39	1.18	1.80	0	2.16	T	1.72	0	
July	0	1.78	0	1.22	0	1.15	0	1.13	0	
Aug.	0	2.17	0	1.37	.59	2.00	2.64	2.68		
Sept.	0	3.82	.08	3.22	.08	3.50	1.57	4.11		
Oct.	2.28	2.93	.79	1.44	3.31	2.17	2.36	2.08		
Nov.	0	.63	0	.71	.12	1.00	0	1.12		
Dec.	0	.57	0	.52	0	.75	.98	.64		
Yearly	11.62	20.16	4.41	15.20	15.31	19.47	18.18	19.66		

Month	** Rancho Vidrios, Tamaulipas		Nv. Laredo (M. S. of Mexico), Tamps.		Nv. Laredo (IB&WC), Tamaulipas		Nuevo Laredo (Sur), Tamaulipas		Nuevo Laredo Km. 26 SSW, Tamaulipas	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.57	0.76	1.42	0.80	1.61	0.66	0.83	0.54	1.57	0.70
Feb.	0	.90	.20	.91	.55	.93	.47	.24	.08	1.08
Mar.	0	.49	0	.62	T	.45	0	.44	0	.45
Apr.	3.15	1.44	3.66	1.21	4.53	1.29	3.82	3.07	3.07	1.72
May	6.89	3.12	8.58	2.53	9.29	2.87	7.20	5.05	3.94	2.75
June	.39	1.93	.08	2.26	.51	2.64	.08	1.52	T	2.14
July	0	1.53	0	1.34	T	1.42	.63	4.93	0	1.91
Aug.	2.60	2.08	1.69	1.65	2.36	2.38	1.30	1.04	1.18	2.37
Sept.		3.60	0	3.01	T	3.47	.51	2.52	.20	3.73
Oct.		2.61	4.33	1.66	2.76	2.08	3.35	3.78	3.54	2.28
Nov.	0	1.21	0	.98	T	1.02	T	1.09	0	1.07
Dec.	.75	.92	.43	.87	.43	.73	.47	.32	.79	.67
Yearly		20.59	20.39	17.84	22.04	19.94	18.66	24.54	14.37	20.87

T Trace * Formerly Villa Guerrero, Coahuila ** Formerly Rancho Los Vidrios, Tamaulipas

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Rancho Las Espuelas, Tamaulipas		San Ignacio, Tamaulipas		El Treinta, Coahuila		Mizquiz, Coahuila		Sabinas, Coahuila	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.89	0.78	1.18	0.60	0.47	0.28	0.08	0.74	0.47	0.57
Feb.	.91	1.00	.08	.96	.39	.49	.59	.58	.35	.70
Mar.	0	1.22	0	.40	.79	.51	0	.80	0	.38
Apr.	1.42	1.24	1.18	1.35	4.13	1.36	1.26	1.03	1.85	1.18
May	4.49	3.88	3.66	2.80	1.38	2.40	.51	3.72	1.10	2.43
June	0	2.65	.39	2.20	1.65	3.01	.20	3.37	.83	2.02
July	0	3.83	0	1.31	.67	3.04	1.73	2.80	1.10	1.41
Aug.	.98	1.34	1.57	2.28	.31	1.92	.83	2.44	.35	2.15
Sept.	3.90	4.72	.79	4.05	0	4.09	1.57	4.96	.79	3.34
Oct.	2.52	2.42	6.69	2.70	2.91	1.92		2.25	1.77	1.79
Nov.	0	1.19	0	1.10	.28	.41		1.12	0	.62
Dec.	.79	.77	.87	.69	0	.31		.87	.08	.51
Yearly	16.90	25.04	16.41	20.44	12.98	19.74		24.68	8.69	17.10

Month	Juarez, Coahuila		Cuatro Cienegas, Coahuila		San Buenaventura, Coahuila		Monclova, Coahuila		Progreso, Coahuila	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0	0.55	0.08	0.31	0.16	0.58	0.28	0.46		0.48
Feb.	0	.52	0	.36	.35	.50	.39	.49	0.31	.53
Mar.	.59	.40	0	.12	0	.37	0	.30	T	.38
Apr.	.91	1.21	1.77	.32	3.54	.80	1.54	.64	1.02	1.13
May	2.56	1.96	1.10	.80	.43	1.45	1.14	1.42	.55	2.08
June	0	1.66	1.18	.72	.28	1.57	1.06	1.39	.04	1.64
July	0	1.04	.43	.82	2.20	1.62	.20	1.70	.67	1.09
Aug.	0	1.33	1.57	1.06	1.73	1.81	1.81	1.57	.91	1.85
Sept.	.55	3.24	2.52	1.46	.31	2.42	.79	2.94	.16	3.00
Oct.	3.78	1.75	.63	.78	.55	1.34	.94	1.25	2.95	1.87
Nov.	0	.63	0	.41	0	.58	.04	.61	.04	.60
Dec.		.44	0	.44	0	.66	0	.57	0	.50
Yearly		14.73	9.28	7.60	9.55	13.70	8.19	13.34		15.15

Month	Presa Carranza, Coahuila		Laguna de Salinillas, Nuevo Leon		Candela, Coahuila		Lampazos, Nuevo Leon		Anahuac, Nuevo Leon	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.55	0.70	0.63	0.62	0.31	0.25	1.18	0.59	1.26	0.69
Feb.	.51	.65	.35	.63	0	.55	.20	.86	.59	.63
Mar.	.08	.49	0	.56	.12	.18	.16	.54	.08	.50
Apr.	2.01	1.22	.94	1.05	.43	.59	.28	1.06	1.65	1.17
May	.67	2.07		2.18		1.22	.31	2.33	.87	2.22
June	0	1.76	.59	1.76	0	1.76	.28	2.85	.24	1.84
July	.43	1.02	0	.98	.79	2.96	.20	2.14	0	1.44
Aug.	.87	1.99	1.18	2.40	1.30	1.31	1.22	1.62	2.05	2.20
Sept.	T	2.99	.47	3.34	.08	3.07	.83	5.31	2.80	3.34
Oct.	3.07	1.73	4.25	1.97	.71	1.14	4.88	1.98	2.83	1.71
Nov.	0	.59	.04	.74	0	.56	.20	.74	T	.67
Dec.	.04	.64	.16	.59		.61	.04	.59	.16	.72
Yearly	8.23	15.85		16.82		14.20	9.78	20.61	12.53	17.13

Month	Rio Salado, Carr. 85, N. L.		Bustamante, Nuevo Leon		Sabinas Hidalgo, Nuevo Leon		Garza Ayala, Nuevo Leon		Vallecillo, Nuevo Leon	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.34	0.49	0.51	0.56	0.71	0.47	0.47	0.26	1.65	0.56
Feb.	.59	.82	1.18	.86	1.50	.87	.71	.54	1.34	.82
Mar.	0	.42	.12	.48	.24	.77	.24	.60	.20	.52
Apr.	.67	1.14	.16	1.00	1.34	1.18	.71	1.36	1.26	1.76
May	.98	2.32	.28	1.43	.87	2.35	.20	1.14	.55	1.83
June	0	2.93	.94	3.42	.24	4.35	.75	1.84	.24	3.20
July	1.02	2.15	.20	2.00	.91	3.14	0	6.83	0	1.88
Aug.	1.65	1.52	1.77	3.26	0	2.45	.71	2.55	1.42	1.89
Sept.	.31	4.78	1.77	5.93	3.19	7.06	2.95	4.99	1.34	4.40
Oct.	1.61	1.85	2.52	2.20	1.30	2.75	.31	4.28	.67	2.30
Nov.	0	.81	0	.90	0	1.14	0	3.72	0	.99
Dec.	.24	.61	0	.63	.31	.57	0	.37	.75	.67
Yearly	8.41	19.84	9.45	22.67	10.61	27.10	7.05	28.48	9.42	20.82

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

	Las Tortillas, Tamaulipas		Rancho Bonanza, Tamaulipas		Rancho San Rafael Bustamante, Tamps.		Rio Salado Riberena, Tamaulipas		Aniego 166, Tamaulipas	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.18	0.56	0.79	0.79	1.18	0.66	0.83	0.57	1.50	0.76
Feb.	.20	1.07	.51	1.04	.20	1.32	.08	.98	.47	1.01
Mar.	0	.57	0	1.19	0	.63	0	.56	.08	.58
Apr.	.98	1.41	1.38	.60	1.10	1.12	.39	1.12	T	1.07
May	2.76	3.12	1.81	3.36	2.44	2.90	1.57	2.62	2.05	3.07
June	2.76	3.21	0	2.51	.39	3.42	.79	2.44	1.81	3.05
July	.59	1.23	0	4.50	0	2.02	0	1.68	1.30	1.33
Aug.	2.76	2.03	2.20	1.70	1.61	2.85	1.38	2.47	1.89	2.43
Sept.	.20	4.31	3.31	4.22	.20	4.85	.39	5.43	1.14	6.12
Oct.	1.77	1.86	2.52	2.57	3.54	3.67	2.83	2.19	2.52	1.95
Nov.	0	1.23	0	1.02	0	1.37	0	1.07	.39	1.19
Dec.	.98	.79	.47	.60	.98	.55	.71	.81	.63	.56
Yearly	14.18	21.39	12.99	24.10	11.64	25.36	8.97	21.94	13.78	23.12

	La Bandera, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas		Hacienda El Alamo, Nuevo Leon		General Trevino, Nuevo Leon		Paras, Nuevo Leon	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.34	0.73	1.81	0.92	2.99	0.90	1.22		1.26	0.37
Feb.	.47	.86	.31	.90	.71	.99	.63		.55	.48
Mar.	.08	.72	.08	.56	.12	.37	.28		.39	.68
Apr.	.12	1.41	.16	1.21	1.46	1.08	.24		.28	.69
May	2.17	2.95	1.26	2.08	.31	2.04			2.40	1.31
June	1.26	3.53	.87	2.76	.20	4.01	1.50		.12	2.84
July	.75	1.96	.24	1.30	.47	3.04	.39		0	1.72
Aug.	3.19	2.42	2.01	2.08	2.95	3.09	1.65		.67	1.76
Sept.	1.34	5.63	2.13	4.41	2.56	5.36	4.41		2.48	3.92
Oct.	1.73	1.91	2.60	2.13	0	3.00	.43	1.85	.83	2.48
Nov.	.31	1.12	.20	1.08	.20	1.14	0	2.28	0	.85
Dec.	.51	.65	.55	.56	.59	.68	.47	.84	.47	.40
Yearly	13.27	23.89	12.22	19.99	12.56	25.70			9.45	17.50

	San Javier, Nuevo Leon		Cd. Mier, Km. 8 SW, Tamaulipas		Cd. Mier, Tamaulipas		Miguel Aleman, Tamaulipas		Parras, Coahuila	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.14	0.74	1.22	0.75	0.63	0.96	1.54	0.86	0.91	0.48
Feb.	.51	1.01	.55	1.08	.63	1.16	.67	1.01	T	.36
Mar.	.16	.70	.12	.72	.20	.66	.04	.39	0	.34
Apr.	.08	1.66	.12	1.33	T	1.32	.16	1.73	.94	.28
May	1.30	3.49	.94	2.82	1.77	2.52	1.10	2.00	1.73	1.03
June	0	3.56	0	3.13	0	2.43	2.68	2.37	1.02	1.79
July	1.14	2.29	.94	1.89	.67	1.15	.47	1.77	1.34	2.71
Aug.	2.05	3.12	2.83	2.86	1.22	2.60	2.17	2.35	1.42	3.03
Sept.	2.68	6.04	2.48	5.48	3.07	5.02	5.16	6.61	2.87	2.84
Oct.	2.83	2.41	4.21	2.61	.63	2.22	.31	1.75	1.14	1.25
Nov.	0	1.19	0	1.16	0	1.20	.04	1.00	T	.61
Dec.	.47	.68	.55	.66	.71	.65	.20	.57	T	.79
Yearly	12.36	26.89	13.96	24.49	9.53	21.89	14.54	22.41	11.37	15.51

	General Cepeda, Coahuila		Reata, Coahuila		Saltillo, Coahuila		Ramos Arizpe, Coahuila		Carbonera, Nuevo Leon	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.02	0.47	0.39	0.26	0.79	0.57	0.47	0.47	0.83	0.78
Feb.	.04	.48	0	.23	.08	.55	0	.37	.12	.65
Mar.	0	.29	0	.28	.08	.41	0	.30	0	.62
Apr.	.75	.40	.51	.37	2.01	.79	.91	.46	1.89	.87
May	.24	.84	1.14	.80	1.10	1.17	.55	.85	1.77	1.95
June	1.54	2.15	1.02	1.04		2.19	.87	1.06	3.19	2.36
July	2.09	3.27	.20	1.15	1.73	2.61	.20	1.40	1.34	2.97
Aug.	1.77	3.09	2.76	1.57	1.30	2.52	.31	1.35	2.76	3.31
Sept.	2.05	2.80	.67	1.53	1.77	2.71	1.93	1.76	1.54	2.92
Oct.	.39	1.26	.35	.70	.16	1.25	.08	.74	.67	1.58
Nov.	0	.51	0	.54	T	.83	0	.49	T	.99
Dec.	0	.55	T	.37	.04	.64	0	.51		.98
Yearly	9.89	16.11	7.04	8.84		16.24	5.32	9.76		19.98

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Icamole, Nuevo Leon		Mina, Nuevo Leon		La Popa, Nuevo Leon		La Arena, Nuevo Leon		Cienega de Flores, Nuevo Leon	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.51	0.26	0.47	0.44	0.67	0.43	0.55	0.72	3.43	1.27
Feb.	T	.27	.24	.42	0	.83	.91	.99	1.97	1.01
Mar.	.08	.13	0	.11	0	.26	.35	.71	.71	1.10
Apr.	.55	.27	.43	.59	.35	.51	1.10	1.13	1.57	1.53
May	.51	.79	.12	.60	.24	1.01	.67	2.05	1.73	2.63
June	.63	.99	.39	1.68	.31	1.82	2.72	3.96	2.68	3.42
July	.16	.62	0	1.30	0	1.37	T	4.30	2.44	2.37
Aug.	.31	1.01	.75	1.48	1.06	2.00	2.28	4.27	5.51	4.39
Sept.	1.65	2.23	1.61	3.30	1.69	3.31	3.23	5.80	3.07	5.98
Oct.	.31	.90	1.06	1.11	.08	.77	4.96	3.16	2.05	2.71
Nov.	0	.61	T	.80	0	.72	T	1.04	.24	1.23
Dec.	.16	.45	.08	.48	.16	.64	.12	.49	1.06	1.15
Yearly	4.87	8.53	5.15	12.31	4.56	13.67	16.89	28.62	26.46	28.79

Month	Hacienda Mamulique, Nuevo Leon		Topo Chico, Nuevo Leon		Higueras, Nuevo Leon		Sombreretillo, Nuevo Leon		Los Ramones, Nuevo Leon	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.91	0.65	1.02	0.40	1.42	0.66	1.34	1.82	0.67	0.66
Feb.	.87	.29	.98	.55	.71	.58	.91	2.05	1.22	.75
Mar.	.20	.33	.31	.46	.16	.66	.51	1.16	.24	.64
Apr.	.35	.94	1.02	.96	.31	1.27	1.61	1.90	.24	1.58
May		.88		1.37	.98	1.95	.75	4.71	4.53	2.64
June	2.91	2.68	.47	2.40	1.73	2.75	.67	6.28	1.65	3.31
July	1.22	5.23	.08	1.56	.75	2.30	.04	4.12	1.06	2.02
Aug.	3.86	2.25	4.29	3.00	4.57	3.33	.43	3.26	1.38	3.52
Sept.	3.50	5.22	4.53	4.64	.47	4.87	2.44	12.14	4.65	5.41
Oct.	.87	1.26	5.39	2.64	2.20	1.82	1.54	7.28	3.46	2.87
Nov.	0	1.78	0	.75	.59	.82	.55	1.97	T	.75
Dec.	.43	.65	.16	.44	1.02	.69	0	1.47	.39	.48
Yearly		22.16		19.17	14.91	21.70	10.79	48.16	19.49	24.63

Month	Cerro Prieto, Nuevo Leon		Los Herrera, (La Tableta), N.L.		Madero (Los Aldamas), Nuevo Leon		Rinconada, Nuevo Leon		Santa Catarina, Nuevo Leon	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.20	0.32	0.71	0.57	1.10	1.00	0.20	0.27	1.06	0.64
Feb.	.63	.66	.71	.66	.28	.95	.08	.28	.39	.43
Mar.	.12	.51	.24	.66	.59	1.03	0	.20	.20	.31
Apr.	1.93	1.16	.24	1.28	.04	.65	.08	.42	.55	.64
May	4.09	4.54	5.04	2.78	7.60	3.06	1.10	.54	.71	.90
June	.79	3.84	.20	2.71	1.18	4.72	1.06	1.10	.87	2.04
July	2.24	2.62	.43	1.86	0	2.45	.31	.58	.08	1.24
Aug.	.87	3.01	3.70	2.77	3.58	5.56	1.26	1.24	2.20	2.81
Sept.	6.46	4.92	5.71	4.92	2.28	6.30	3.66	1.81	4.45	4.12
Oct.	.51	2.53	1.02	2.40	.79	2.07	0	.86	2.17	1.71
Nov.	1.50	.65	.08	.70	.28	.69	0	.40	.04	.57
Dec.	.31	.40	.31	.48	.63	.60	0	.33	T	.51
Yearly	19.65	25.16	18.39	21.79	18.35	29.08	7.75	8.03	12.72	15.92

Month	Monterrey, Nuevo Leon		Apodaca, Nuevo Leon		Agua Blanca Canoas, Nuevo Leon		Pajonal, Nuevo Leon		Cadereyta, Nuevo Leon	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.98	0.61	0.55	0.59	1.89	0.72	0.63	0.53	0.87	0.72
Feb.	.51	.69	1.54	.88	.91	.47	.43	.60	1.81	.92
Mar.	.24	.72	.20	.59	0	.30	T	.24	.47	1.15
Apr.	.75	1.12	1.34	1.06	.75	.66	.08	.65	.75	2.00
May	1.10	1.56	.67	1.91	0	1.41	.94	1.70	1.18	2.45
June	.31	2.82	2.17	3.05	1.10	2.46	1.42	2.44	.55	3.60
July	.28	2.47	.08	2.56	.71	2.68	2.40	2.42	T	2.64
Aug.	2.48	3.18	2.76	3.59	2.01	3.31	8.74	4.00	2.36	3.56
Sept.	5.47	5.98	3.15	6.01	5.04	4.59	7.56	4.79	4.37	5.34
Oct.	5.16	3.20	2.28	2.16	2.13	2.33	1.54	1.87	3.94	3.29
Nov.	T	1.22	.39	.88	.20	.92	0	.48	.87	1.22
Dec.	.28	.68	.24	.58	.16	.55	0	.55	.24	.71
Yearly	17.56	24.25	15.37	23.86	14.90	20.40	23.74	20.27	17.41	27.60

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

	La Cruz, Nuevo Leon		Tunel San Francisco, Nuevo Leon		Las Comitas, Nuevo Leon		* Presa La Boca, Nuevo Leon		Las Enramadas, Nuevo Leon	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	2.24	0.68	1.34	0.89	0.39	0.31	0.71	0.88	0.67	0.85
Feb.	.91	.47	2.09	1.25	.28	.39	.87	1.00	.94	.71
Mar.	T	.25	.67	1.58	0	.25	.31	1.12	0	.76
Apr.	.71	.60	1.93	2.02	.47	.70	2.20	1.69	2.40	1.84
May	0	1.40	3.74	2.99	.43	.98	2.28	2.59	3.07	2.88
June	1.18	2.41	3.15	7.01	.16	2.50	2.01	5.68	.35	3.46
July	1.46	3.07	1.57	4.32	1.97	1.90	1.26	3.85	0	2.37
Aug.	2.48	3.73	9.76	7.56		3.33	7.36	6.24		3.78
Sept.	5.08	4.65	8.50	11.14	11.77	4.81	8.39	9.38	6.54	6.36
Oct.	2.13	2.19	7.24	5.66	1.26	1.81	7.60	5.01	2.48	2.66
Nov.	.12	.92	.16	1.91	0	.54	.31	1.42	0	.81
Dec.	.08	.35	.04	.95	T	.36	.04	.85	.28	.71
Yearly	16.39	20.72	40.19	47.28		17.88	33.34	39.71		27.19

	Adjuntas, Nuevo Leon		Villa Allende, Nuevo Leon		San Juan, Nuevo Leon		Laguna de Sanchez, Nuevo Leon		Cerritos, Nuevo Leon	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.43	0.39	1.50	0.95	0.71	0.49	0.94	0.62	0.51	0.52
Feb.	.79	.56	1.54	1.27	1.26	.93	.08	.60	1.06	1.03
Mar.	.24	.43	.12	1.33	.63	.72	0	.45	0	.48
Apr.	1.42	1.22	2.76	2.50	2.17	1.95	1.34	1.20	.94	.99
May	4.72	2.98	3.35	3.62	1.26	2.48	1.54	1.91	2.28	3.31
June	4.76	8.77	2.80	5.34	2.91	3.16	1.97	3.53	1.50	7.80
July	1.89	6.10	1.73	3.63	.12	2.25	1.06	2.65	.04	7.58
Aug.	13.15	5.45	7.56	5.66	2.28	3.69	6.61	4.45	8.86	5.28
Sept.	15.47	11.65	6.97	8.71	4.09	5.54	13.11	5.88		11.73
Oct.	5.59	4.55	4.09	5.51	4.76	3.16		2.72	8.70	4.15
Nov.	.08	1.02	.94	1.69	.55	1.00	.67	.67	0	.58
Dec.	T	.42	.12	.93	.31	.54	0	.58	.16	.30
Yearly	48.54	43.54	33.48	41.14	21.05	25.91		25.26		43.75

	Casillas, Nuevo Leon		Cienega del Toro, Nuevo Leon		Potrero Redondo, Nuevo Leon		Mimbres, Nuevo Leon		Rusio, Nuevo Leon	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.		0.52	2.36	0.91	0.75	0.85	1.81	1.33	0.35	0.70
Feb.		.75	0	.42	0	1.45	1.14	1.30	.91	.62
Mar.		.65	0	.84	.20	1.20	0	1.26	0	.53
Apr.		.83	5.59	1.27	0	2.39	4.49	1.52	1.69	1.09
May		1.99	4.53	2.32	1.97	3.82	3.94	2.19	2.17	1.86
June	3.86	3.42	.59	2.45	1.26	8.00	1.50	2.94	1.61	2.02
July	2.32	2.51	2.01	3.23	.71	5.71	2.64	3.04		1.24
Aug.	3.78	2.91	3.78	2.84	5.35	7.89	2.64	3.49	0	1.35
Sept.	7.76	4.25	3.98	3.50	7.99	12.08	1.54	3.85	1.02	1.76
Oct.	1.34	2.31	1.50	2.12	5.20	5.03	1.30	1.95	.31	1.21
Nov.	.16	.71	.55	.89	.47	3.64	.51	1.27	.08	.74
Dec.	0	.56	0	.67	0	.87	0	1.26	.16	.81
Yearly		21.41	24.89	21.46	23.90	52.93	21.51	25.40		13.93

	Rayones, Nuevo Leon		Santa Rosa, Nuevo Leon		Potosi, Nuevo Leon		Galeana, Nuevo Leon		Iturbide, Nuevo Leon	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.75	0.32	0.20	0.30	0.63	0.92	0.63	0.19	0.35	0.55
Feb.	.16	.41	.04	.13	.24	.72	.20	.50	.31	.65
Mar.	0	.30	0	.28	0	.41	0	.36	.04	.60
Apr.	2.24	1.02		.29	2.40	1.31	3.90	1.10	2.17	1.13
May	1.42	1.79	4.61	2.33	.59	1.58	3.86	1.43	3.03	1.95
June	.94	2.12		1.06	1.22	1.39	1.26	1.87	2.01	3.56
July	.55	1.12	.39	1.69	1.06	1.48	1.46	1.62	1.22	2.68
Aug.	4.45	2.76		1.50	.16	1.66	3.58	2.48	5.31	4.14
Sept.	9.53	3.22		1.71	4.02	1.72	5.12	2.75	11.57	5.75
Oct.	2.60	1.54		.33	.47	1.39	1.38	1.24	2.05	2.50
Nov.	T	.43		.54	.20	1.44	.04	.30	.04	.57
Dec.	0	.32		.55	.12	1.85	0	.45	.31	.48
Yearly	22.64	15.35		10.71	11.11	15.87	21.43	14.29	28.41	24.56

T Trace

* Formerly La Boca, Nuevo Leon

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Cabezones, Nuevo Leon		Linares, Nuevo Leon		Montemoreles, Nuevo Leon		Gral. Teran Exprmt. Station, Nuevo Leon		El Realito, Nuevo Leon	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.94	0.77	0.94	0.88	1.18	0.77	0.43	0.60	1.14	0.62
Feb.	.91	.91	.87	.86	1.14	.99	.98	.86	1.42	.64
Mar.	.24	1.25	.39	1.09	.39	1.16	.31	1.32	.43	.73
Apr.	4.92	2.49	3.03	2.29	1.06	2.18	1.57	1.40	2.99	1.10
May	4.17	3.70	3.54	3.65	5.16	3.27	3.35	2.96	1.50	2.49
June	.08	4.64	1.57	3.85	1.81	4.09		4.44	.75	2.91
July	2.68	3.54	.16	2.76	4.17	2.30		2.71	0	3.29
Aug.	3.03	5.44	1.22	3.80	6.73	4.35		3.80	.31	3.94
Sept.	10.47	8.39	7.64	6.42	8.43	6.10		7.67	7.09	6.80
Oct.	1.77	3.42	2.28	3.36	3.66	3.94		4.10	.67	1.95
Nov.	.08	1.09	.75	1.17	.12	1.62		1.16	.04	.63
Dec.	.31	.70	.67	1.01	.08	.86		.63	.28	.52
Yearly	29.60	36.34	23.06	31.14	33.93	31.63		31.65	16.62	25.62

Month	San Rafael, Nuevo Leon		El Cuchillo, Nuevo Leon		Gral. Bravo, Nuevo Leon		Cerralvo, Nuevo Leon		Comales, Tamaulipas	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	0.67	0.79	0.87	0.61	1.10	0.74	1.14	0.67	1.30	0.84
Feb.	.31	.94	.79	.55	.71	.55	1.22	.63	.63	.74
Mar.	0	.67	T	.51	.35	.57	.16	.54	.04	.65
Apr.	2.68	.81	2.17	1.28	.98	1.43	.55	1.82	.20	1.47
May	1.38	1.61	2.36	2.24	1.69	2.86	4.29	3.01	.24	1.99
June	1.50	2.09	.75	2.59	.59	2.69	.83	3.26	2.28	2.15
July	1.06	2.62	.12	1.97	.47	2.27	.79	1.87	.08	1.36
Aug.	2.40	2.61	5.00	2.88	3.78	2.73	4.09	3.42	2.17	2.72
Sept.	1.89	2.35	4.06	4.42	5.43	4.45	3.90	5.32	4.06	4.28
Oct.	.43	1.36	.83	1.98	1.34	2.05	1.06	2.65	.51	2.33
Nov.	.12	1.00	.31	.57	.04	.87	.28	.74	0	.74
Dec.	.04	.84	.24	.47	.20	.71	.47	.47	.28	.70
Yearly	12.48	17.69	17.50	20.07	16.68	21.92	18.78	24.40	11.79	19.97

Month	Camargo, Tamaulipas		Valadeces, Tamaulipas		Bajo Rio San Juan, Tamps., No. 2-29		Cd. Diaz Ordaz, Tamaulipas		Reynosa Km. 22 S.W., Tamaulipas	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.26	0.97	1.38	1.13	1.42	1.19	1.57	0.90	1.97	1.03
Feb.	.79	.92	.91	.93	1.02	.92	.94	.90	.20	.77
Mar.	.08	.54	0	.57	0	.47	0	.54	0	.64
Apr.	.28	1.65	1.42	1.62	2.64	1.63	1.46	1.61	1.77	1.49
May	.83	2.14	1.10	2.75	.87	3.38	.94	2.37	.39	2.52
June	.67	2.42	1.06	3.35	1.02	2.86	1.65	2.35	5.51	3.00
July	.31	1.53	.39	1.85	0	1.61	.39	1.38	.39	2.18
Aug.	2.44	2.17	2.99	2.63	1.38	2.93	2.48	2.16	6.30	2.51
Sept.	3.50	4.94	2.87	4.94	3.62	4.84	2.68	3.98	1.97	4.63
Oct.	1.73	1.96	1.42	2.42	1.30	2.50	.79	2.64	.79	2.05
Nov.	0	1.10	0	1.23	0	.99	0	1.00	2.76	1.16
Dec.	.08	.68	.08	.77	0	.79	0	.79	.39	1.10
Yearly	11.97	21.02	13.62	24.19	13.27	24.11	12.90	20.62	22.44	23.08

Month	Bajo Rio San Juan, Tamps., No. 2-38		Bajo Rio San Juan, Tamps., No. 2-33		Arguelles, Tamaulipas		Presa Anzalduas, Tamaulipas		Reynosa, Tamaulipas	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	2.05	1.16	1.69	1.20	0.79	1.10	0.79	0.66	1.61	1.05
Feb.	1.02	.85	1.18	.92	.39	1.10	.83	.52	1.46	.87
Mar.	0	.50	0	.50	.04	.54	.08	.55	.04	.70
Apr.	2.28	1.40	2.56	1.63	1.57	1.49	2.24	1.51	2.60	1.29
May	.71	3.49	1.02	3.66	.39	2.60	.87	2.34	1.22	2.18
June	1.89	3.30	2.36	3.06	1.57	2.63	4.76	2.51	3.90	2.26
July	0	2.00	.39	2.04	.39	1.75	.20	1.70	0	1.54
Aug.	1.69	3.44	3.39	3.15	5.51	1.92	8.35	2.20	1.14	1.60
Sept.	1.85	4.22	4.25	4.77	.59	4.22	2.36	3.85	3.78	3.56
Oct.	.87	1.82	1.22	2.42	.79	1.70	1.46	2.29	1.38	2.22
Nov.	0	1.21	0	1.08	.98	1.13	.31	.67	.16	.93
Dec.	.08	.80	.04	.98	.39	1.08	T	.65	0	.75
Yearly	12.44	24.19	18.10	25.41	13.40	21.26	22.25	19.45	17.29	18.95

T Trace

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

	Bajo Rio San Juan, Tamps. No. 3-55		Bajo Rio San Juan, Tamps., No. 3-58		Bajo Rio San Juan, Tamps., No. 3-60		Bajo Rio San Juan, Tamps., No. 3-47		Bajo Rio San Juan, Tamps., No. 3-63	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.97	1.68	1.77	1.46	1.89	1.34	1.77	1.75	1.81	1.48
Feb.	1.22	1.26	1.57	1.14	1.34	1.16	.94	1.12	1.42	1.33
Mar.	.08	.69	.08	.68	.16	.66	0	.60	.20	.69
Apr.	3.19	2.33	2.76	1.85	3.50	1.73	2.28	1.90	3.70	1.48
May	1.42	2.46	1.85	2.41	.59	2.31	1.02	3.29	2.28	2.34
June	5.67	3.68	4.45	3.16	5.39	3.46	5.51	3.81	6.77	3.65
July	2.09	3.51	2.87	3.59	1.42	2.64		3.12	0	2.80
Aug.	1.81	2.72	1.65	2.89	3.39	2.56	1.77	2.45	2.36	2.89
Sept.	3.23	4.41	5.67	4.84	2.17	4.57	2.76	4.93	2.32	4.86
Oct.	2.87	3.39	1.65	3.05	2.60	3.15	1.22	2.71	2.40	2.63
Nov.	.98	.92	.94	1.12	.47	1.13	1.10	1.13	.47	.92
Dec.	0	.76	0	.82	.35	.76	0	.85	0	.67
Yearly	24.53	27.81	25.26	27.01	23.27	25.47		27.66	23.73	25.74

	Rio Bravo, Tamaulipas		Retamal, Tamaulipas		Bajo Rio Bravo, Tamps., No. 3-15		Bajo Rio Bravo, Tamps., No. 4-16		Bajo Rio Bravo, Tamps. No. 3-14	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	2.01	1.15	2.83	0.98	2.09	1.62	1.54	1.36	2.05	1.35
Feb.	1.46	1.15	1.69	.90	1.61	1.41	1.06	1.16	1.22	.95
Mar.	.08	.68	.04	.69	.63	.87	.24	.77	.16	.56
Apr.	3.46	1.79	3.43	1.55	5.59	2.32	4.96	2.02	2.95	1.52
May	1.06	2.28	.87	2.28	1.81	2.70	1.77	2.66	1.50	2.71
June	4.88	2.93	5.00	2.81	8.82	4.08	8.46	3.97	7.09	3.07
July	.24	2.42	.55	1.69	3.11	3.25	1.77	2.74	.24	2.81
Aug.	2.28	2.57	1.34	2.47	1.10	3.04	2.48	3.80	1.65	2.55
Sept.	4.65	4.93	4.69	3.41	1.85	4.08	2.20	4.65	2.13	4.00
Oct.		2.90	1.85	2.54	4.96	3.02	.31	2.61	.94	2.62
Nov.	2.36	1.24	2.91	1.26	3.03	1.39	3.03	1.62	1.69	1.00
Dec.	0	.81	0	.88	.16	1.12	.08	.99	0	.87
Yearly		24.85	25.20	21.46	34.76	28.90	27.90	28.35	21.62	24.01

	Bajo Rio Bravo, Tamps., No. 3-17		Bajo Rio Bravo, * Tamps., No. 4-8		Bajo Rio Bravo, Tamps., No. 2-6		Bajo Rio Bravo, † Tamps., No. 4-10		Valle Hermoso, Tamaulipas	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.85	1.58	2.05	1.45	2.13	2.04	1.81	1.39	2.20	1.12
Feb.	.91	1.25	1.10	1.24	1.30	1.36	.87	1.68	1.22	1.20
Mar.	.79	.73	.28	.96	.39	.93	.51	1.21	.16	.73
Apr.	4.09	1.66	6.89	2.51	2.13	1.71	6.30	2.10	5.04	1.95
May	1.77	2.68	1.89	2.87	1.97	2.88	2.01	2.51	1.30	2.61
June	5.43	3.20	7.87	3.35	7.83	3.11	8.82	3.40	6.57	3.22
July	2.76	3.15	.91	3.60	.31	3.10	.28	3.16	.43	2.21
Aug.	1.54	3.32	2.48	4.17	.94	3.25	2.17	2.93	4.88	2.29
Sept.	2.56	4.96	2.68	5.68	1.69	4.86	2.48	5.28	1.97	5.34
Oct.	1.50	2.74	2.48	3.03	2.28	2.77	2.01	2.40	3.46	2.57
Nov.	2.24	1.39	2.20	1.65	3.15	1.53	.63	1.32	1.54	1.49
Dec.	0	1.06	.12	1.07	.12	1.06	0	.87	.12	.91
Yearly	25.44	27.72	30.95	31.58	24.24	28.60	27.89	28.25	28.89	25.64

	Control, Tamaulipas		Bajo Rio Bravo, Tamps., No. 2-5		Bajo Rio Bravo, Tamps., No. 2-11		Bajo Rio Bravo, Tamps., No. 1-2		Bajo Rio Bravo, Tamps. No. 2-7	
Month	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	1.73	1.25	2.13	1.80	1.81	1.52	1.54	1.62	2.28	1.46
Feb.	.94	1.04	1.10	1.33	1.14	1.05	.94	1.78	1.18	1.20
Mar.	.24	.63	.20	1.21	.24	.71	0	.51	.12	.76
Apr.	3.07	1.64	2.36	1.89	4.29	2.54	3.70	1.50	8.07	2.69
May	1.18	2.78	1.10	2.54	1.26	2.86	.47	3.13	1.30	2.86
June	5.75	3.12	7.40	3.46	9.17	4.36	8.15	4.09	6.34	3.55
July	2.36	1.70	.31	2.47	.31	3.05	1.73	2.13	.91	2.63
Aug.	1.85	2.99	2.17	3.46	4.33	3.71	.47	3.51	1.34	3.76
Sept.	1.65	5.08	1.42	4.93	3.35	5.39	2.83	5.28	2.91	5.06
Oct.	2.28	2.70	2.36	2.65	.43	3.03	3.07	3.03	2.48	2.50
Nov.	2.76	1.27	2.40	1.48	2.36	1.31	2.56	1.44	.59	1.55
Dec.	.08	.90	.12	1.13	0	1.18	.12	.89	.08	1.05
Yearly	23.89	25.10	23.07	28.35	28.69	30.71	25.58	28.91	27.60	29.07

T Trace

* Formerly Bajo Rio Bravo, Tamaulipas No. 2-8

† Formerly Bajo Rio Bravo, Tamaulipas No. 2-10

RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO

In Inches

Month	Bajo Rio Bravo, Tamps., No. 1-4		Bajo Rio Bravo, Tamps., No. 1-18		Bajo Rio Bravo, Tamps., No. 1-3		Bajo Rio Bravo, Tamps., No. 1-13		Bajo Rio Bravo, Tamps. No. 1-12	
	1977	Average	1977	Average	1977	Average	1977	Average	1977	Average
Jan.	2.01	1.76	2.13	1.50	1.77	1.51	1.54	1.40	2.09	1.77
Feb.	1.30	1.20	1.10	1.27	1.73	1.21	.87	1.17	.94	1.40
Mar.	.20	.78	.12	.47	.20	.54	.08	.61	.12	.56
Apr.	2.13	1.99	9.84	2.04	2.48	1.78	5.12	1.84	4.92	1.82
May	1.46	2.59	.79	2.47	.71	2.51	1.02	1.79	.79	2.94
June	7.13	3.64	4.80	3.70	6.69	3.53	6.54	3.76	5.87	3.38
July	.59	1.94	.16	2.34	.47	2.15	.39	2.13	.24	2.26
Aug.	1.34	3.25	2.17	3.28	.67	2.69	3.27	3.23	.94	2.49
Sept.	2.13	5.17	1.61	4.35	2.40	5.06	1.89	5.28	3.46	5.25
Oct.	1.65	2.75	4.17	3.48	2.28	3.00	1.93	2.49	3.62	3.68
Nov.	1.65	1.31	2.05	1.43	1.69	1.61	1.34	1.18	3.66	1.43
Dec.	.12	1.10	.12	1.12	0	1.02	.16	.97	.16	1.15
Yearly	21.71	27.48	29.06	27.45	21.09	26.61	24.15	25.85	26.81	28.13

Month	Matamoros, Tamaulipas									
	1977	Average								
Jan.	1.81	1.74								
Feb.	2.01	1.80								
Mar.	.12	.56								
Apr.	9.17	2.20								
May	.51	2.55								
June	7.52	4.05								
July	0	2.22								
Aug.	1.30	3.80								
Sept.	2.28	6.04								
Oct.	3.19	3.87								
Nov.	1.18	1.37								
Dec.	.16	1.52								
Yearly	29.25	31.72								

AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED

With Averages for the 107 Years 1871-1977, 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, 26, and Supplement 40A.

Month	El Paso to Fort Quitman (2,677 Square Miles)		Fort Quitman to Above Rio Conchos (3,022 Square Miles)		* Above Rio Conchos to Johnson Ranch (3,816 Square Miles)		Johnson Ranch to Foster Ranch (12,982 Square Miles)	
	1977	Period Average	1977	Period Average	1977	Period Average	1977	Period Average
Jan.	0.47	0.44	0.16	0.39	0.04	0.34	0.17	0.48
Feb.	.01	.37	0	.27	.04	.28	.07	.37
Mar.	.16	.33	.12	.25	.03	.20	.16	.41
Apr.	.29	.26	.16	.34	.56	.39	.92	.80
May	.09	.40	.17	.60	.53	.77	1.08	1.50
June	.24	.80	.73	1.19	1.82	1.12	.90	1.70
July	1.06	2.31	1.58	2.98	1.56	1.89	1.32	1.89
Aug.	.64	1.89	.86	2.39	.64	1.87	.48	2.09
Sept.	.43	1.41	1.09	1.93	.65	1.56	.60	2.20
Oct.	1.71	.92	1.25	1.03	.65	.84	.66	1.21
Nov.	.37	.43	.17	.41	.05	.33	.24	.57
Dec.	.30	.58	.08	.53	.04	.41	.04	.54
Yearly	5.77	10.14	6.37	12.31	6.61	10.00	6.64	13.76

Month	Pecos River below Sheffield (3,390 Square Miles)		# Foster Ranch to Amistad Dam (2,799 Square Miles)		Devils River (4,305 Square Miles)		‡ Amistad Dam to Eagle Pass (1,625 Square Miles)	
	1977	Period Average	1977	Period Average	1977	Period Average	1977	Period Average
Jan.	0.52	0.69	0.86	0.51	0.78	0.67	1.20	0.75
Feb.	.42	.87	.82	.64	.81	.72	.86	.91
Mar.	1.12	.77	.77	.76	1.54	1.06	.84	.99
Apr.	3.11	1.86	2.49	1.35	3.75	1.80	3.08	1.72
May	2.17	1.81	1.90	1.96	2.80	2.59	2.02	2.90
June	1.66	2.43	.35	2.18	1.38	2.63	1.31	2.47
July	.30	1.88	.04	1.27	.10	1.82	.12	1.92
Aug.	.53	1.99	.05	1.64	.64	2.14	.24	1.98
Sept.	.44	2.50	.51	2.37	.62	3.00	.57	3.09
Oct.	2.13	1.86	1.11	1.48	1.77	2.22	3.66	2.10
Nov.	.49	.92	.51	.74	.70	1.50	.78	1.01
Dec.	.03	.72	T	.62	.02	.98	.10	.86
Yearly	12.92	18.30	9.41	15.52	14.91	21.13	14.78	20.70

Month	● Eagle Pass to Laredo (3,795 Square Miles)		δ Laredo to Falcon Dam (3,369 Square Miles)		† Falcon Dam to Rio Grande City (468 Square Miles)		United States Side below Rio Grande City (986 Square Miles)	
	1977	Period Average	1977	Period Average	1977	Period Average	1977	Period Average
Jan.	0.80	0.72	1.32	0.75	0.75	0.89	1.67	1.25
Feb.	.15	.80	.40	.80	.96	.83	1.51	1.08
Mar.	.03	.92	.01	.79	.06	.94	.08	1.04
Apr.	2.35	1.59	1.95	1.40	.08	1.20	2.42	1.38
May	4.86	3.13	4.04	3.20	1.21	2.42	1.11	2.79
June	.47	2.43	.33	1.98	1.20	2.13	4.54	2.56
July	.01	1.47	.14	2.10	.66	1.93	.60	1.81
Aug.	.59	2.29	1.88	1.86	2.33	2.16	2.48	2.33
Sept.	.34	3.05	.84	3.11	2.91	3.61	3.57	4.40
Oct.	2.11	1.91	2.83	1.67	.87	1.97	1.53	2.56
Nov.	.03	.96	.03	1.55	.02	.80	1.43	1.38
Dec.	.18	.97	.44	.82	.20	.66	.10	1.23
Yearly	11.92	20.24	14.21	20.03	11.25	19.54	21.04	23.81

* Excluding Rio Conchos, Alamito Creek, and Terlingua Creek
# Excluding Pecos and Devils Rivers
‡ Excluding Arroyo Las Vacas, San Felipe Creek, Pinto Creek, Rio San Diego, and Rio San Rodrigo
● Excluding Rio Escondido
δ Excluding Rio Salado above Old Cd. Guerrero
† Excluding Rio Alamo and Rio San Juan

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

The precipitation records of stations listed below began on the date shown and extend through 1977. 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, 26, and Supplement 40A. With the exception of Las Cruces, New Mexico, 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
Acala Station *	R	31° 23'	105° 59'	3,550	# 1938	El Paso - Fort Quitman	I. B. & W. C.
Adobes Ranch	S	29° 46'	104° 34'	2,550	1950	Fort Quitman - Above Rio 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	Foster Ranch - Amistad Dam	I. B. & W. C.
Amistad Raft	C	29° 27'	101° 03'	††	#Dec. 1968	Foster Ranch - Amistad Dam	I. B. & W. C.
Amistad Reservoir near Comstock	C	29° 33'	101° 13'	1,130	# 1970	Foster Ranch - Amistad Dam	I. B. & W. C.
Apache Ranch	C	27° 56'	99° 56'	500	# 1953	Eagle Pass - Laredo	Ranch Foreman
Arledge, W. A. Ranch	S	29° 58'	101° 38'	1,950	#June 1933	Foster Ranch - Amistad Dam	W. A. Arledge
Arroyo Tigre Chiquito	C	26° 41'	99° 07'	314	#Apr. 1954	Laredo - Falcon Dam	I. B. & W. C.
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
Big Satan Creek Station	C	29° 40'	100° 58'	1,150	Nov. 1968	Devils River	I. B. & W. C.
Black Gap Game Refuge Headquarters	S	29° 34'	102° 57'	2,325	# 1952	Johnson Ranch - Foster Ranch	Texas Parks & Wildlife
Black Gap Game Refuge - Shirley House	S	29° 48'	103° 03'	2,592	Mar. 1977	Johnson Ranch - Foster Ranch	C. A. Haynes
Bloys Camp	S	30° 33'	104° 07'	5,650	# 1941	Alamito Creek	George Knight
Bricker Ranch	S	29° 59'	101° 52'	1,680	#May 1952	Johnson Ranch - Foster Ranch	Lenamae Bricker
Brite, J. G. Ranch	R	29° 33'	101° 01'	1,150	#Sep. 1962	Devils River	I. B. & W. C.
Brotherton Ranch	V	29° 42'	101° 19'	1,400	1961	Foster Ranch - Amistad Dam	Perry Calk
Buoy No. 11	C	29° 31'	101° 10'	††	#Dec. 1969	Foster Ranch - Amistad Dam	I. B. & W. C.
Buttrill Ranch	S	30° 00'	103° 16'	3,500	Mar. 1952	Johnson Ranch - Foster Ranch	Tom B. Leary
Canon 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
Castolon	S	29° 08'	103° 31'	2,100	#Mar. 1953	Above Rio 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	Amistad Dam - Eagle Pass	I. B. & W. C.
Clint Station **	R	31° 32'	106° 14'	3,630	# 1939	El Paso - Fort Quitman	I. B. & W. C.
Coal Mine	R	28° 48'	100° 28'	770	#Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Comstock	R	29° 41'	101° 10'	1,530	May 1939	Foster Ranch - Amistad Dam	I. B. & W. C.
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	Amistad Dam - Eagle Pass	I. B. & W. C.
Corralitos Ranch	C	27° 07'	99° 25'	346	1953	Laredo - Falcon Dam	I. B. & W. C.
Cow Creek near Comstock	C	29° 37'	101° 12'	1,310	Apr. 1965	Foster Ranch - Amistad Dam	I. B. & W. C.
Cox, C. F. Ranch Headquarters	V	30° 09'	102° 46'	3,500	1977	Johnson Ranch - Foster Ranch	C. F. Cox
Crane, Ed Ranch	S	29° 51'	101° 05'	1,630	# 1955	Devils River	Ed Crane
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	Sep. 1967	Pecos River below Sheffield	I. B. & W. C.
Devils Lake	R	29° 35'	100° 59'	1,158	#May 1939	Devils River	I. B. & W. C.
Devils River at Cauthorn Ranch	S	30° 05'	101° 07'	1,656	#Apr. 1976	Devils River	I. B. & W. C.
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 - Foster Ranch	Sam Cavness
Dryden	S	30° 03'	102° 07'	2,130	# 1931	Johnson Ranch - Foster Ranch	Lewis Cash
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
Elephant Mountain Ranch	S	30° 01'	103° 34'	4,150	# 1952	Johnson Ranch - Foster Ranch	R. Schoenfeldt
El Indio	S	28° 31'	100° 19'	725	# 1941	Eagle Pass - Laredo	Glen Stidham

S Standard R Recording C Cumulative V Visual †† Reservoir surface
Some months or years missing * Formerly County Line Station ** Formerly Island Station

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
Elm Creek Station	C	28° 46'	100° 30'	720	1959	Amistad Dam - Eagle Pass	I. B. & W. C.
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	C	29° 52'	100° 54'	1,550 #	1941	Devils River	H. K. Fawcett
Feely	C	29° 34'	101° 07'	1,250 #	Apr. 1965	Foster Ranch - 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 Rio Conchos	I. B. & W. C.
Foster, Ross Ranch	C	29° 47'	101° 45'	1,230	May 1961	Johnson Ranch - Foster Ranch	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 #	1965	Devils River	Walter Gillis
Goldwire Ranch	C	29° 44'	100° 57'	1,685	Nov. 1968	Devils River	Jake Schiller
Greenwood, H. M. (Cienega 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.
Guest Ranch	S	30° 38'	104° 53'	3,145	Aug. 1977	Fort Quitman - Above Rio Conchos	Ranch Foreman
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 - Foster Ranch	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 #	1954	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 - Foster Ranch	Dow Chemical
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, Calvin Ranch	S	30° 04'	101° 49'	1,990	July 1975	Pecos River Below Sheffield	I. B. & W. C.
Hutto Ranch No. 1	R	29° 30'	100° 50'	1,240	1964	Devils River	I. B. & W. C.
Hutto Ranch No. 2	R	29° 29'	100° 54'	1,210	1964	Devils River	I. B. & W. C.
Indio Ranch	S	28° 31'	100° 22'	700	1959	Eagle Pass - Laredo	Earnest Scales
James, Lewis Ranch	S	30° 11'	102° 07'	2,275	1966	Johnson Ranch - Foster Ranch	Lewis James
Johnson Ranch	C	29° 01'	103° 23'	2,050 #	July 1933	Johnson Ranch - Foster Ranch	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	Foster Ranch - Amistad Dam	Bobby Kelly
King, Martin Ranch	R	29° 44'	101° 22'	1,460	Nov. 1954	Foster Ranch - Amistad Dam	I. B. & W. C.
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
Lajitas	S	29° 16'	103° 48'	2,320 #	June 1967	Above Rio Conchos - Johnson Ranch	Ben Simmons
La Macolla Farm	S	30° 00'	104° 41'	2,750	Apr. 1977	Fort Quitman - Above Rio Conchos	Tom Pelton
La Mota Farm	S	29° 33'	103° 59'	3,854	July 1977	Alamito Creek	John Rice
La Nutria Station	C	30° 14'	104° 43'	2,880 #	Mar. 1967	Fort Quitman - Above Rio Conchos	I. B. & W. C.
Laredo Water Plant	S	27° 33'	99° 31'	410 #	1930	Eagle Pass - Laredo	Laredo Water Plant
Las Cruces, New Mexico	S	32° 19'	106° 47'	3,893	1975	Caballo Dam - El Paso	I. B. & W. C.
Las Moras Creek	S	29° 00'	100° 38'	800	1958	Amistad Dam - Eagle Pass	Lou McGee
Lateral No. 2 Spill	C	28° 56'	100° 38'	760	Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Lateral No. 12 Headgate	C	28° 54'	100° 34'	800	1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Lateral 15 Spill	C	28° 51'	100° 34'	740 #	1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Latham Ranch	S	30° 13'	101° 22'	2,120 #	1965	Pecos River Below Sheffield	John and Bob Latham
Laughlin Air Force Base	S	29° 21'	100° 47'	1,080	Dec. 1958	Amistad Dam - Eagle Pass	U. S. A. F.
Lewis, Billie C., Jr. Ranch	S	29° 33'	100° 40'	1,400 #	1964	Amistad Dam - Eagle Pass	Billie C Lewis, Jr.

S Standard C Cumulative R Recording V Visual # Some months 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
Line Store *	S	30° 40'	100° 57'	2,400	#Oct. 1962	Devils River	Claud Ward
Long Ranch	R	29° 28'	100° 57'	1,140	Oct. 1971	Devils River	I. B. & W. C.
Los Ebanos	C	26° 14'	98° 34'	150	#Apr. 1957	Lower Rio Grande Valley	I. B. & W. C.
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	Amistad Dam - Eagle Pass	MCWCID #1
Maverick Power Plant	S	28° 50'	100° 33'	800	June 1952	Amistad Dam - Eagle Pass	C. P. & L. Co.
McGonagill Ranch - Headquarters	V	30° 20'	102° 58'	4,150	Apr. 1952	Johnson Ranch - Foster Ranch	W.E. McGonagill
McGonagill Ranch - East Mill	V	30° 21'	102° 55'	4,050	#May 1952	Johnson Ranch - Foster Ranch	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	H. T. Miers
Miller, Eugene Ranch	S	30° 25'	101° 10'	2,150	July 1975	Devils River	I. B. & W. C.
Mitchell, Kerr Ranch	S	30° 13'	104° 00'	4,450	# 1941	Alamito Creek	Mrs. K. Mitchell
Neely Ranch	S	30° 59'	105° 32'	3,350	#Aug. 1941	Fort Quitman - Above Rio Conchos	Mrs. Tom Neely
New Mission Pumping Plant	S	26° 11'	98° 24'		#Aug. 1961	Lower Rio Grande Valley	HCWCID #14
96 Ranch Headquarters	V	30° 40'	104° 50'	3,870	1972	Fort Quitman - Above Rio Conchos	Walter Paschal
Nitaville Mercantile	S	29° 37'	103° 34'	3,332	Mar. 1973	Terlingua Creek	W. Tennison
Normandy	S	28° 55'	100° 36'	780	Dec. 1958	Amistad Dam - Eagle Pass	Fannin G. Love
North Fork San Pedro	C	29° 31'	100° 53'	1,144	June 1969	Devils River	I. B. & W. C.
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 - Foster Ranch	National Park Service
Pinto Creek Station	C	29° 09'	100° 43'	870	#Dec. 1958	Amistad Dam - Eagle Pass	I. B. & W. C.
Plata	S	29° 52'	104° 02'	3,750	July 1977	Alamito Creek	Mrs. Ed Hamilton
Potter, A. M. Ranch	S	29° 46'	103° 25'	3,440	# 1952	Johnson Ranch - Foster Ranch	A. M. Potter
Presidio (IB&WC Gage)	C	29° 34'	104° 23'	2,550	Oct. 1949	Above Rio 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	Pablo Vasquez
Ranchita (Continental)	S	29° 50'	101° 20'	1,540	1969	Pecos River Below Sheffield	Julio Crowder
Redford	C	29° 29'	104° 13'	2,500	July 1954	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Rio Grande near Dryden	S	29° 49'	102° 09'	1,350	May 1976	Johnson Ranch - Foster Ranch	I. B. & W. C.
Roma (International 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 nr. 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. 1933	Lower Rio Grande Valley	I. B. & W. C.
Sawyer, W. E. Ranch	S	30° 28'	100° 47'	2,100	#July 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 Rio Conchos - Johnson Ranch	Rosa Munoz
Shafter No. 2	S	29° 49'	104° 18'	3,850	1976	Above Rio Conchos - Johnson Ranch	Raymond Wylie
Shannon, Bill Ranch	C	29° 57'	104° 40'	2,680	#July 1956	Fort Quitman - Above Rio Conchos	Bill Shannon
Sheep Pasture	S	29° 33'	102° 55'	2,210	#May 1965	Johnson Ranch - Foster Ranch	Texas Parks & Wildlife
Slaughter Ranch	V	29° 57'	102° 41'	2,560	# 1965	Johnson Ranch - Foster Ranch	Mike Wood
Slaughter Ranch - Cow Creek	V	29° 56'	102° 39'	2,600	# 1949	Johnson Ranch - Foster Ranch	Mike Wood
Slaughter Ranch - Keith Mill	V	29° 58'	102° 38'	2,610	Sep. 1976	Johnson Ranch - Foster Ranch	Mike Wood
Slaughter Ranch - Martin Pens	V	29° 55'	102° 44'	2,820	Sep. 1976	Johnson Ranch - Foster Ranch	Mike Wood
Slaughter Ranch - Ten Section	V	29° 59'	102° 40'	2,750	Sep. 1976	Johnson Ranch - Foster Ranch	Mike Wood

S Standard C Cumulative R Recording V Visual # Some months missing
* Formerly Lock Store

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
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	#Apr. 1960	Johnson Ranch - Foster Ranch	David Adams
Study Butte	S	29° 19'	103° 32'	2,550	July 1977	Terlingua Creek	Shirley Willard
Stumberg, Steve Ranch	R	30° 11'	102° 53'	4,300	# 1943	Johnson Ranch - Foster Ranch	I. B. & W. C.
Terlingua Creek Station	C	29° 12'	103° 36'	2,215	Mar. 1952	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Terlingua Creek, Texas Highway Dept. Camp	S	29° 19'	103° 32'	2,550	#Aug. 1967	Terlingua Creek	M. Hernandez
Terrell Plant (El Paso Natural Gas Company)	R	30° 22'	101° 50'	2,510	#July 1962	Pecos River Below Sheffield	Bob Norred
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.
Villa de la Mina	S	29° 19'	103° 40'	3,274	Sep. 1974	Terlingua Creek	Glenn Pepper
Vinegarone	C	29° 57'	100° 46'	1,780	May 1966	Devils River	I. B. & W. C.
Walker Ranch	C	29° 50'	101° 14'	1,530	July 1969	Devils River	I. B. & W. C.
Wardlaw Stanfort Ranch	S	29° 19'	100° 38'	1,070	Apr. 1977	Pinto Creek	Hadley Wardlaw
Weyrich Farm	C	28° 40'	100° 24'	760	Sep. 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	C	30° 02'	100° 52'	1,900	May 1966	Devils River	I. B. & W. C.
Whitehead, Tuffy Ranch	R	29° 38'	101° 07'	1,420	July 1962	Devils River	I. B. & W. C.
Wipff Ranch	C	29° 00'	100° 35'	840	Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Woodward, J. F. Ranch	S	30° 08'	103° 36'	4,750	1954	Johnson Ranch - Foster Ranch	J. F. Woodward
Wright, Ernest Ranch	S	29° 33'	103° 32'	3,350	July 1977	Terlingua Creek	E. Wright
Wuensche Farm	S	28° 24'	100° 19'	670	# 1952	Eagle Pass - Laredo	I. B. & W. C.
Wynne, Harold Ranch Headquarters	S	29° 29'	103° 23'	3,610	1974	Johnson Ranch - Foster Ranch	H. Wynne
Yarborough Ranch	S	30° 06'	103° 36'	4,550	# 1966	Johnson Ranch - Foster Ranch	F. L. Hillhouse
Zapata Water Plant	S	26° 54'	99° 16'	380	#May 1953	Laredo - Falcon Dam	Zapata Water Plant
Zuberbueler Ranch	S	29° 41'	101° 14'	1,460	Feb. 1975	Foster Ranch - Amistad Dam	J.U. Zuberbueler

S Standard R Recording C Cumulative # Some months 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 Leon	S	25° 32'	100° 30'	†	# 1958	Rio San Juan	S. A. R. H.
Adjuntas, Nuevo Leon	S	25° 18'	100° 08'	†	# 1958	Rio San Juan	S. A. R. H.
Allende, Coahuila	S	28° 21'	100° 51'	1,170	# 1947	Eagle Pass - Laredo	S. A. R. H.
Amistad Reservoir near Tlaloc, Coahuila	C	29° 26'	101° 07'	1,250	1970	Foster Ranch - Amistad Dam	I. B. & W. C.
Anahuac, Nuevo Leon	S	27° 15'	100° 08'	656	#June 1933	Rio Salado	S. A. R. H.
Aniego 166, Tamaulipas	C	26° 46'	99° 15'	310	1964	Laredo - Falcon Dam	I. B. & W. C.
Apodaca, Nuevo Leon	S	25° 46'	100° 11'	1,330	#Feb. 1964	Rio San Juan	S. A. R. H.
Arguelles, 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 Rio Conchos	Meteor. Service of Mexico
Bajo Rio Bravo, Tamaulipas							
No. 1-2	S	25° 56'	97° 46'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-3	S	25° 50'	97° 42'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-4	S	25° 51'	97° 45'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-12	S	25° 56'	97° 38'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-13	S	25° 44'	97° 40'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-18	S	25° 49'	97° 42'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-5	S	25° 48'	97° 49'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-6	S	25° 44'	97° 53'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-7	S	25° 39'	97° 42'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-8	S	25° 40'	97° 55'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-10	S	25° 36'	97° 52'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-11	S	25° 35'	97° 46'	†	# 1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-14	S	25° 56'	97° 59'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-15	S	25° 46'	98° 01'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-17	S	25° 49'	97° 58'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-16	S	25° 35'	98° 00'	†	1964	Lower Rio Grande Valley	S. A. R. H.
Bajo Rio San Juan, Tamaulipas							
No. 2-29	S	26° 10'	98° 38'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-33	S	26° 10'	98° 28'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-38	S	26° 06'	98° 34'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-47	S	25° 58'	98° 07'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-55	S	25° 52'	98° 12'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-58	S	25° 50'	98° 11'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-60	S	25° 46'	98° 10'	†	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-63	S	25° 41'	98° 06'	†	1964	Lower Rio Grande Valley	S. A. R. H.
Banderas, Chihuahua	S	31° 01'	105° 35'	†	# 1963	Fort Quitman - Above Rio Conchos	S. A. R. H.
Bustamente, Nuevo Leon	S	26° 32'	100° 31'	1,450	# 1958	Rio Salado	S. A. R. H.
Cabezones, Nuevo Leon	S	24° 59'	99° 45'	†	# 1962	Adjacent to Rio San Juan	S. A. R. H.
Cadereyta, Nuevo Leon	S	25° 35'	100° 00'	1,180	#Sept. 1904	Rio San Juan	S. A. R. H.
Camargo, Chihuahua	S	27° 42'	105° 10'	3,950	#Oct. 1956	Rio Conchos	S. A. R. H.
Camargo, Tamaulipas	S	26° 19'	98° 50'	230	# 1953	Falcon Dam - Rio Grande City	S. A. R. H.
Candela, Coahuila	S	26° 50'	100° 40'	†	# 1970	Rio Salado	S. A. R. H.
Carbonera, Nuevo Leon	S	24° 49'	100° 47'	†	# 1958	Rio San Juan	S. A. R. H.
Carichic, Chihuahua	S	27° 55'	107° 04'		#May 1961	Rio Conchos	Meteor. Service of Chihuahua
Casillas, Nuevo Leon	S	25° 12'	100° 12'	4,060	# 1958	Rio San Juan	S. A. R. H.
Cd. Acuna, Coahuila	S	29° 20'	100° 57'	900	1951	Amistad Dam - Eagle Pass	I. B. & W. C.
Cd. Diaz Ordaz	S	26° 14'	98° 36'	130	# 1953	Lower Rio Grande Valley	S. A. R. H.
Cd. Guerrero, Chihuahua	S	28° 33'	107° 29'	6,560	#May 1903	Adjacent to Rio 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	Rio Alamo	I. B. & W. C.
Cerralvo, Nuevo Leon	R	26° 05'	99° 37'	1,130	#Nov. 1938	Rio San Juan	S. A. R. H.
Cerritos, Nuevo Leon	S	25° 31'	100° 12'	†	# 1958	Rio San Juan	S. A. R. H.
Cerro Prieto, Nuevo Leon	S	25° 56'	99° 23'	890	#May 1958	Rio San Juan	S. A. R. H.
Chihuahua, Chihuahua	S	28° 38'	106° 04'	4,690	# 1900	Rio Conchos	Meteor. Service of Mexico
Chupadero, Coahuila	S	29° 05'	100° 51'	980	# 1961	Rio San Diego	F. Jakubesch
Cienega de Flores, Nuevo Leon	R	25° 57'	100° 10'	1,770	Apr. 1938	Rio San Juan	S. A. R. H.
Cienega del Toro, Nuevo Leon	S	25° 05'	100° 20'	7,010	# 1958	Rio San Juan	S. A. R. H.
Colombia, Nuevo Leon	C	27° 42'	99° 46'	†	# 1964	Eagle Pass - Laredo	I. B. & W. C.
Colombia, Nuevo Leon	S	27° 42'	99° 45'	†	#Sept. 1976	Eagle Pass - Lareo	S. A. R. H.
Colonia Anahuac, Chihuahua	S	28° 29'	106° 44'	6,550	1961	Rio Conchos	Celulosa de Chihuahua, S.A.
Comales, Tamaulipas	R	26° 11'	98° 55'	260	#Mar. 1938	Rio San Juan	S. A. R. H.
Control, Tamaulipas	S	25° 58'	97° 49'	59	#June 1942	Lower Rio Grande Valley	S. A. R. H.
Coyame, Chihuahua	S	29° 28'	105° 06'	†	#Nov. 1961	Rio Conchos	Meteor. Service of Chihuahua
Cuatro Cienegas, Coahuila	S	26° 59'	102° 04'	2,430	#June 1923	Rio Salado	S. A. R. H.
Cuauhtemoc, Chihuahua	S	28° 24'	106° 52'	7,250	#June 1923	Adjacent to Rio 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
Delicias, Chihuahua	S	28° 11'	105° 28'	3,710	#Aug. 1933	Rio Conchos	S. A. R. H.
Ejido Eutimias, Coahuila	S	28° 20'	102° 45'	3,440	#Apr. 1972	Johnson Ranch - Foster Ranch	S. A. R. H.
Ejido La Rosita, Coahuila	S	28° 27'	103° 18'	3,440	# 1974	Johnson Ranch - Foster Ranch	S. A. R. H.
Ejido San Miguel, Coahuila	S	29° 02'	100° 58'	†	#Feb. 1976	Eagle Pass - Laredo	S. A. R. H.
El Cuchillo, Nuevo Leon	S	25° 43'	99° 16'	590	#June 1938	Rio San Juan	S. A. R. H.
El Cuervo, Chihuahua	S	30° 15'	105° 08'	3,840	# 1961	Adjacent to Ft. Quitman Above Rio Conchos	Meteor. Service of Chihuahua
El Maguey, Chihuahua	S	27° 35'	106° 07'	4,380	#July 1955	Rio Conchos	Meteor. Service of Chihuahua
El Realito, Nuevo Leon	S	25° 18'	99° 21'	†	# 1970	Rio San Juan	S. A. R. H.
El Remolino, Coahuila	S	28° 45'	101° 05'	1,310	June 1958	Rio San Rodrigo	I. B. & W. C.
El Sauzal D.B., Chihuahua*	S	31° 35'	106° 18'	3,650	July 1970	El Paso - Ft. Quitman	S. A. R. H.
El Sitio, Chihuahua	S	27° 34'	106° 16'	†	July 1955	Rio Conchos	Meteor. Service of Chihuahua
El Sueco, Chihuahua	S	29° 54'	106° 24'	5,090	# 1958	Adjacent to Rio Conchos	Meteor. Service of Chihuahua
El Treinta, Coahuila	S	28° 19'	101° 24'	†	1961	Rio Salado	I. B. & W. C.
El Vergel, Chihuahua	S	26° 22'	106° 30'	7,350	# 1957	Rio Conchos	Meteor. Service of Mexico
Emiliano Zapata, Coahuila	S	29° 01'	100° 49'	†	#Mar. 1976	Eagle Pass - Laredo	S. A. R. H.
Escalon, Chihuahua	S	26° 45'	104° 20'	4,160	# 1957	Adjacent to Rio Conchos	Meteor. Service of Mexico
Estacion Rosario, Durango	S	26° 30'	105° 38'	†	July 1962	Rio Conchos	S. A. R. H.
Galeana, Nuevo Leon	S	24° 50'	100° 04'	5,430	# 1958	Adjacent to Rio San Juan	Meteor. Service of Mexico
Gallego, Chihuahua	S	29° 50'	106° 23'	5,100	1958	Adjacent to Rio 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.
Garza Ayala, Nuevo Leon	S	26° 29'	100° 03'	†	# 1968	Rio Salado	S. A. R. H.
General Trevino, Nuevo Leon	S	26° 13'	99° 29'	†	Oct. 1976	Rio Alamo	S. A. R. H.
Gral. Bravo, Nuevo Leon	S	25° 48'	99° 11'	590	#Sept. 1906	Rio San Juan	S. A. R. H.
Gral. Cepeda, Coahuila	S	25° 23'	101° 29'	4,920	#Aug. 1926	Rio San Juan	S. A. R. H.
Gral. Teran (Experiment Station), Nuevo Leon	S	25° 16'	99° 38'	1,090	# 1958	Rio San Juan	Agriculture and Livestock Dept.
Guadalupe, Chihuahua	S	31° 23'	106° 06'	3,650	1958	El Paso - Ft. Quitman	I. B. & W. C.
Guerrero, Coahuila **	S	28° 19'	100° 23'	690	#June 1958	Eagle Pass - Laredo	I. B. & W. C.
Hacienda El Alamo, Nuevo Leon	S	26° 29'	99° 46'	†	# 1968	Rio Alamo	I. B. & W. C.
Hacienda Mamulique, Nuevo Leon	S	26° 07'	100° 14'	†	#Sept. 1973	Rio San Juan	S. A. R. H.
Hacienda San Miguel, Coahuila	S	29° 13'	101° 30'	†	# 1961	Foster Ranch - Amistad Dam	I. B. & W. C.
Higueras, Nuevo Leon	S	25° 58'	100° 01'	1,640	#Sept. 1906	Rio San Juan	Meteor. Service of Mexico
Icamole, Nuevo Leon	S	25° 55'	100° 43'	4,900	# 1958	Rio San Juan	S. A. R. H.
Iturbide, Nuevo Leon	S	24° 44'	99° 54'	†	1941	Adjacent to Rio San Juan	S. A. R. H.
Jimenez, Chihuahua	S	27° 08'	104° 55'	4,490	# 1951	Rio Conchos	S. A. R. H.
Jimenez, Coahuila	S	29° 04'	100° 40'	810	# 1951	Amistad Dam - Eagle Pass	I. B. & W. C.
Juarez, Chihuahua	S	31° 44'	106° 28'	3,740	# 1903	El Paso - Ft. Quitman	I. B. & W. C.
Juarez, Coahuila	S	27° 37'	100° 44'	1,000	# 1943	Rio Salado	S. A. R. H.
Km. 99, Chihuahua	S	28° 08'	105° 35'	3,940	# 1962	Rio Conchos	S. A. R. H.
Km. 135, Chihuahua	S	28° 22'	105° 37'	3,940	# 1962	Rio Conchos	S. A. R. H.
La Amistad, Coahuila	S	29° 27'	101° 05'	†	Feb. 1977	Amistad Dam - Eagle Pass	I. B. & W. C.
La Arena, Nuevo Leon	S	25° 46'	100° 01'	†	# 1968	Rio San Juan	S. A. R. H.
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	Rio Conchos	Electric Industry of Mexico
La Campana, Chihuahua	S	29° 20'	106° 20'	4,820	# 1958	Rio Conchos	Meteor. Service of Mexico
La Cruz, Nuevo Leon	S	25° 28'	100° 26'	†	# 1958	Rio San Juan	S. A. R. H.
La Popa, Nuevo Leon	S	26° 10'	100° 50'	3,230	# 1958	Rio San Juan	S. A. R. H.
La Trasquila, Chihuahua	S	29° 08'	107° 08'	†	# 1962	Adjacent to Rio Conchos	S. A. R. H.
Laguna de Salinillas, Nuevo Leon	S	27° 26'	100° 23'	750	# 1940	Rio Salado	S. A. R. H.
Laguna de Sanchez, Nv. Leon	R	25° 22'	100° 17'	6,500	Apr. 1941	Rio San Juan	S. A. R. H.
Lampazos, Nuevo Leon	S	27° 02'	100° 30'	1,120	# 1958	Rio Salado	Meteor. Service of Mexico
Las Burras, Chihuahua	S	28° 31'	105° 26'	3,590	July 1949	Rio Conchos	S. A. R. H.
Las Comitas, Nuevo Leon	S	25° 30'	100° 24'	1,670	# 1940	Rio San Juan	S. A. R. H.
Las Enramadas, Nuevo Leon	S	25° 30'	99° 31'	730	#Sept. 1926	Rio San Juan	S. A. R. H.
Las Tortillas, Tamaulipas	C	26° 50'	99° 34'	360	#May 1961	Laredo - Falcon Dam	I. B. & W. C.
Las Virgenes, Chihuahua	S	28° 10'	105° 38'	4,070	# 1943	Rio Conchos	S. A. R. H.
Linares, Nuevo Leon	R	24° 52'	99° 34'	1,180	# 1900	Adjacent to Rio San Juan	S. A. R. H.
Los Barriles, Chihuahua	S	30° 55'	105° 45'	4,860	July 1958	El Paso - Ft. Quitman	I. B. & W. C.
Los Herrera (La Tableta), Nuevo Leon	R	25° 54'	99° 24'	820	#Sept. 1939	Rio San Juan	S. A. R. H.
Los Ramones, Nuevo Leon	R	25° 42'	99° 38'	260	#Sept. 1939	Rio San Juan	S. A. R. H.
Luis L. Leon, Chihuahua	S	31° 05'	105° 38'	3,460	Apr. 1958	El Paso - Ft. Quitman	I. B. & W. C.

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* Formerly Loma Blanca, Chihuahua ** Formerly Villa Guerrero, Coahuila

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
Maclovio Herrera (Falomir), Chihuahua	S	29° 04'	105° 09'	3,220	# 1924	Rio Conchos	Meteor. Service of Mexico
Madero (Los Aldama), Nuevo Leon	S	26° 02'	99° 12'	†	#May 1970	Rio San Juan	S. A. R. H.
Maijoma, Chihuahua	S	28° 55'	104° 21'	4,270	Aug. 1955	Rio Conchos	Meteor. Service of Chihuahua
Majalca, Chihuahua	S	28° 53'	106° 21'	6,860	June 1963	Rio Conchos	Meteor. Service of Mexico
Manuel Benavides, Chihuahua	S	29° 06'	103° 54'	†	#Oct. 1961	Above Rio Conchos - Johnson Ranch	Meteor. Service of Chihuahua
Matamoros, Tamaulipas	S	25° 52'	97° 30'	33	# 1958	Lower Rio Grande Valley	Meteor. Service of Mexico
Meoqui, Chihuahua	S	28° 16'	105° 29'	3,790	1961	Rio Conchos	Meteor. Service of Chihuahua
Miguel Aleman, Tamaulipas	S	26° 24'	99° 02'	180	1964	Falcon Dam - Rio Grande City	S. A. R. H.
Mimbres, Nuevo Leon	S	24° 58'	100° 16'	†	# 1958	Rio San Juan	S. A. R. H.
Mina, Nuevo Leon	S	26° 00'	100° 32'	†	# 1958	Rio San Juan	S. A. R. H.
Monclova, Coahuila	S	26° 54'	101° 25'	1,920	# 1897	Rio Salado	S. A. R.HH.
Montemorelos, Nuevo Leon	S	25° 12'	99° 50'	1,420	#Aug. 1904	Rio San Juan	S. A. R. H.
Monterrey, Nuevo Leon	S	25° 40'	100° 18'	1,740	# 1896	Rio San Juan	S. A. R. H.
Muzquiz, Coahuila	S	27° 53'	101° 31'	1,650	# 1923	Rio Salado	S. A. R. H.
Noncava, Chihuahua	S	27° 29'	106° 44'	†	# 1963	Rio Conchos	Meteor. Service of Chihuahua
Nueva Cd. Guerrero, Tamaulipas	S	26° 34'	99° 14'	350	#May 1954	Laredo - Falcon Dam	I. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 30'	99° 30'	430	1950	Eagle Pass - Laredo	I. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 30'	99° 30'	430	# 1909	Eagle Pass - Laredo	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 (Sur), Tamaulipas	S	27° 26'	99° 32'	413	#May 1975	Laredo - Falcon Dam	I. B. & W. C.
Ojinaga, Chihuahua	S	29° 34'	104° 24'	2,590	#Apr. 1954	Rio Conchos	I. B. & W. C.
Ojinaga, Chihuahua	S	29° 34'	104° 25'	2,620	#Nov. 1906	Rio Conchos	Meteor. Service of Mexico
Ojo Caliente, Chihuahua	S	27° 41'	105° 12'	4,010	1942	Rio Conchos	S. A. R. H.
Pajonal, Nuevo Leon	S	25° 29'	100° 23'	5,020	1958	Rio San Juan	S. A. R. H.
Palestina, Coahuila	S	29° 09'	100° 59'	1,080	# 1931	Rio San Diego	S. A. R. H.
Paras, Nuevo Leon	S	26° 30'	99° 31'	541	# 1958	Rio Alamo	S. A. R. H.
Parral, Chihuahua	S	26° 56'	105° 39'	5,740	# 1903	Rio Conchos	Meteor. Service of Mexico
Parras, Coahuila	S	25° 27'	102° 10'	5,510	1958	Adjacent to Rio San Juan	S. A. R. H.
Parrita, Chihuahua	S	29° 25'	106° 29'	†	# 1958	Adjacent to Rio Conchos	S. A. R. H.
Piedras Negras, Coahuila	S	28° 43'	100° 31'	820	# 1951	Amistad Dam - Eagle Pass	Meteor. Service of Mexico
Planta Zootecnica, Chihuahua	S	28° 41'	106° 04'	4,740	# 1957	Rio Conchos	Meteor. Service of Mexico
Porvenir, Chihuahua	S	31° 14'	105° 52'	3,530	1958	El Paso - Ft. Quitman	I. B. & W. C.
Potosi, Nuevo Leon	S	24° 51'	100° 19'	6,260	# 1958	Adjacent to Rio San Juan	S. A. R. H.
Potrero Redondo, Nuevo Leon	S	25° 16'	100° 10'	†	# 1958	Rio San Juan	S. A. R. H.
Praxedis G. Guerrero, Chihuahua	S	31° 22'	106° 00'	3,560	1958	El Paso - Ft. Quitman	I. B. & W. C.
Presa Anzalduas, 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	Amistad Dam - Eagle Pass	S. A. R. H.
Presa Carranza, Coahuila	S	27° 31'	100° 37'	790	#June 1927	Rio Salado	S. A. R. H.
Presa Centenario, Coahuila	S	29° 13'	100° 57'	†	# 1964	Arroyo Las Vacas	S. A. R. H.
Presa Chihuahua, Chihuahua	S	28° 34'	106° 10'	5,230	Oct. 1961	Rio Conchos	S. A. R. H.
Presa La Boca, Nuevo Leon*	S	25° 25'	100° 09'	1,460	# 1932	Rio San Juan	S. A. R. H.
Presa Luis L. Leon, Chihuahua	S	28° 57'	105° 17'	†	Oct. 1964	Rio Conchos	S. A. R H.
Presa San Miguel, Coahuila	S	29° 02'	100° 57'	1,000	# 1964	Rio San Diego	S. A. R. H.
Progreso, Coahuila	S	27° 25'	101° 00'	1,210	#Feb. 1943	Rio Salado	S. A. R. H.
Ramos Arizpe, Coahuila	S	25° 32'	100° 57'	4,590	#Apr. 1907	Rio San Juan	Meteor. Service of Mexico
Rancho Bonanza, Tamaulipas	S	26° 50'	99° 26'	†	1973	Laredo - Falcon Dam	Delfino Garcia P.
Rancho La Chuparrosa, Coahuila	R	29° 30'	101° 15'	1,150	# 1970	Foster Ranch - Amistad Dam	I. B. & W. C.
Rancho Las Espuelas, Tamaulipas	S	27° 07'	99° 27'	†	Nov. 1971	Laredo - Falcon Dam	Delfino Garcia P.
Rancho 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 San Diego, Coahuila	S	28° 03'	100° 35'	†	May 1959	Eagle Pass - Laredo	I. B. & W. C.
Rancho San Rafael Bustamante, Tamaulipas	C	26° 54'	99° 30'	†	Nov. 1967	Rio Salado	I. B. & W. C.
Rayones, Nuevo Leon	S	25° 01'	100° 05'	1,970	#Oct. 1926	Rio San Juan	S. A. R. H.
Reata, Coahuila	S	26° 08'	101° 05'	3,070	#July 1944	Rio San Juan	S. A. R. H.
Represa Amistad, Coahuila	R	29° 26'	101° 02'	918	#June 1969	Amistad Dam - Eagle Pass	I. B. & W. C.
Retamal, Tamaulipas	S	26° 02'	98° 03'	82	Oct. 1949	Lower Rio Grande Valley	I. B. & W. C.

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In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Reynosa, Tamaulipas	R	26° 06'	98° 19'	130	# 1941	Lower Rio Grande Valley	S. A. R. H.
Reynosa Km. 22, SW, Tamaulipas	C	26° 00'	98° 30'	†	# 1962	Lower Rio Grande Valley	I. B. & W. C.
Rinconada, Nuevo Leon	S	25° 41'	100° 42'	4,790	#Apr. 1944	Rio San Juan	S. A. R. H.
Rio Bravo, Tamaulipas	S	25° 59'	98° 06'	85	#Sept.1950	Lower Rio Grande Valley	S. A. R. H.
Rio Salado Carr. 85, Nuevo Leon	S	26° 53'	99° 49'	390	#May 1958	Rio Salado	I. B. & W. C.
Rio Salado Riberena, Tamaulipas	S	26° 48'	99° 25'	330	July 1964	Laredo - Falcon Dam	I. B. & W. C.
Rosetilla, Chihuahua	S	28° 15'	105° 18'	3,780	1940	Rio Conchos	Electric Industry of Mexico
Rusio, Nuevo Leon	S	24° 42'	100° 26'	6,570	#June 1956	Adjacent to Rio San Juan	S. A. R. H.
Sabinas, Coahuila	S	27° 51'	101° 07'	1,120	#May 1922	Rio Salado	S. A. R. H.
Sabinas Hidalgo, Nuevo Leon	S	26° 30'	100° 10'	1,030	May 1958	Rio Salado	I. B. & W. C.
Saltillo, Coahuila	S	25° 26'	101° 00'	5,280	# 1886	Rio San Juan	S. A. R. H.
Samalayuca, Chihuahua	S	31° 21'	106° 28'	4,180	1958	El Paso - Ft. Quitman	Meteor. Service of Mexico
San Agustin, Chihuahua	S	31° 31'	106° 15'	3,650	1958	El Paso - Ft. Quitman	I. B. & W. C.
San Antonio, Durango	S	26° 25'	105° 21'	5,430	# 1943	Rio Conchos	S. A. R. H.
San Buenaventura, Coahuila	S	27° 04'	101° 33'	2,300	#Dec. 1926	Rio Salado	Meteor. Service of Mexico
San Fernando, Coahuila	S	29° 25'	101° 43'	†	Aug. 1961	Foster Ranch - 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 Leon	C	26° 16'	99° 25'	†	1962	Rio Alamo	I. B. & W. C.
San Juan, Nuevo Leon	S	25° 33'	99° 50'	880	#Nov. 1943	Rio San Juan	S. A. R. H.
San Lorenzo, Chihuahua	S	28° 10'	106° 29'	3,770	# 1961	Rio Conchos	S. A. R. H.
San Rafael, Nuevo Leon	S	25° 02'	100° 33'	†	# 1959	Adjacent to Rio San Juan	S. A. R. H.
Santa Barbara, Chihuahua	S	26° 48'	105° 49'	6,460	# 1964	Rio Conchos	S. A. R. H.
Santa Catarina, Nuevo Leon	R	25° 40'	100° 29'	2,230	#Oct. 1937	Rio San Juan	S. A. R. H.
Santa Rosa, Coahuila	V	29° 38'	101° 28'	†	# 1958	Foster Ranch - Amistad Dam	Ind. Co-operator
Santa Rosa, Nuevo Leon	S	24° 10'	100° 18'	†	1970	Adjacent to Rio San Juan	S. A. R. H.
Siquirichic, Chihuahua	S	27° 09'	107° 12'	7,610	#July 1956	Adjacent to Rio Conchos	Meteor. Service of Mexico
Sombreretillo, Nuevo Leon	S	26° 18'	99° 58'	†	# 1970	Rio Alamo	S. A. R. H.
Tacubaya, Chihuahua	S	28° 08'	104° 23'	5,150	#July 1962	Adjacent to Rio Conchos	Meteor. Service of Mexico
Tinajas, Chihuahua	S	31° 08'	106° 05'	4,210	# 1958	El Paso - Ft. Quitman	I. B. & W. C.
Topo Chico, Nuevo Leon	R	25° 44'	100° 20'	1,640	#Aug. 1939	Rio San Juan	S. A. R. H.
Tunel San Francisco Nuevo Leon	S	25° 25'	100° 10'	†	# 1958	Rio San Juan	S. A. R. H.
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	S. A. R. H.
Vallecillo, Nuevo Leon	S	26° 40'	99° 59'	900	#June 1958	Rio Salado	S. A. R. H.
Valle Allende, Chihuahua	S	26° 56'	105° 23'	†	#Mar. 1962	Rio Conchos	Meteor. Service of Chihuahua
Valle Hermoso, Tamaulipas	S	25° 41'	97° 48'	52	#June 1949	Lower Rio Grande Valley	S. A. R. H.
Victoria, Chihuahua	S	27° 58'	104° 33'	4,810	June 1963	Adjacent to Rio Conchos	Meteor. Service of Mexico
Villa Aldama, Chihuahua	S	28° 50'	105° 55'	4,140	1961	Rio Conchos	Meteor. Service of Mexico
Villa Allende, Nuevo Leon	S	25° 17'	100° 01'	2,210	#Nov. 1938	Rio San Juan	S. A. R. H.
Villa Coronado, Chihuahua	S	26° 44'	105° 08'	4,790	#Aug. 1964	Rio Conchos	S. A. R. H.
Villa Hidalgo, Coahuila	S	27° 47'	99° 52'	660	1951	Eagle Pass - Laredo	I. B. & W. C.
Villalba, Chihuahua	S	27° 59'	105° 47'	3,940	Oct. 1940	Rio Conchos	S. A. R. H.
Zaragoza, Coahuila	S	28° 29'	100° 55'	†	Aug. 1977	Eagle Pass - Laredo	S. A. R. H.

R Recording C Cumulative S Standard V Visual † Not available
Some months or years missing

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 the 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 135 through 138 in this bulletin.

Records were obtained by means of:

1. Standard National Weather Service 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 and Eagle Pass.

3. An evaporometer, developed by the United States Section of the 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. On October 1, 1971, the Wardlaw Ranch station was relocated to the Long Ranch, about 1.5 miles west, where an evaporometer was installed to replace the pan at the former location.

Month	Presidio		Johnson Ranch		Martin King Ranch		Long Ranch	
	1977	Average 1950-1977	1977	Average 1950-1977	1977	#Average 1956-1977	1977	Average October 1971-1977
Jan.	2.65	3.81	1.94	3.30	2.79	3.02	1.85	2.32
Feb.	4.41	5.15	3.78	4.83	3.53	3.64	2.80	3.07
Mar.	6.68	8.20	6.96	8.17	5.70	6.16	4.31	4.78
Apr.	8.70	10.02	8.67	10.40	6.21	7.29	4.21	5.26
May	10.33	11.77	10.58	11.82	5.23	8.12	2.98	5.15
June	11.05	12.74	10.05	12.13	8.86	10.01	7.18	7.52
July	10.98	11.87	9.27	11.98	10.89	10.98	9.46	7.55
Aug.	11.08	11.16	10.62	11.12	13.84	10.50	9.80	7.16
Sept.	9.00	9.37	8.98	8.94	8.71	7.48	8.02	6.00
Oct.	8.11	7.49	7.26	7.07	7.34	5.38	4.17	3.31
Nov.	4.62	4.80	3.96	4.47	4.95	3.83	2.83	2.98
Dec.	3.93	3.58	3.22	3.29	4.30	3.12	2.76	2.17
Total	91.54	99.96	85.29	97.52	82.35	79.53	60.37	57.27

Month	Amistad Dam		Eagle Pass		Falcon Dam				Brownsville	
					2-Foot Pan		4-Foot Pan			
	1977	Average March 1963-1977	1977	#Average 1964-1977	1977	#Average 1950-1977	1977	#Average 1956-1977	1977	#Average 1958-1977
Jan.	2.81	3.96	2.49	3.17	2.50	3.48	2.42	4.03	2.76	2.61
Feb.	5.25	5.02	2.55	3.64	3.89	4.44	5.12	5.47	2.74	3.45
Mar.	7.59	8.55	4.77	5.62	5.30	6.60	7.19	8.40	5.30	4.48
Apr.	9.40	10.10	7.31	6.63	7.22	7.86	9.10	10.41	4.60	5.40
May	6.42	10.68	7.50	7.04	7.49	9.23	10.11	11.90	5.49	5.20
June	13.55	13.24	9.39	9.48	8.97	10.81	12.34	13.42	6.55	5.86
July	14.45	14.84	10.58	10.69	12.40	12.53	15.00	15.36	6.11	6.39
Aug.	15.40	13.49	11.29	9.64	11.76	11.32	14.41	14.11	6.81	6.16
Sept.	13.11	9.71	8.30	7.12	7.94	8.00	9.65	9.93	4.06	4.87
Oct.	7.42	7.09	6.37	5.83	6.01	6.40	6.81	7.41	4.90	4.26
Nov.	5.61	4.80	4.87	3.81	5.45	4.81	5.63	5.34	3.46	3.37
Dec.	4.80	3.81	3.90	3.46	3.96	3.72	4.52	4.00	3.30	2.78
Total	105.81	105.29	79.32	76.13	82.89	89.20	102.30	109.78	56.08	54.83

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 the Commission. Eight stations are along the Rio Grande from Cd. Acuna, Coahuila to Retamal, Tamaulipas and one is located on the Rio 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 Rio 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 139 through 142 in this bulletin.

The type of pan used at all these stations was a standard National Weather Service-type 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 No. 47 published by the Mexican Section of the Commission.

	Ojinaga, Chihuahua		Cd. Acuna, Coahuila		La Amistad, Coahuila		Jimenez, Coahuila		Hidalgo, Coahuila	
Month	1977	#Avg. April 1954-1977	1977	# Average 1951-1977	1977		1977	# Average 1951-1977	1977	# Average 1951-1977
Jan.	3.50	3.76	2.52	3.49			2.48	3.61	2.13	3.95
Feb.	5.35	5.16	4.25	4.75	5.16		4.84	4.63	4.37	5.30
Mar.	8.03	8.74	6.61	7.89	8.78		6.22	7.14	7.05	8.05
Apr.	10.47	11.17	6.57	8.87	9.33		7.56	7.84	8.27	10.02
May	13.35	13.36	4.96	9.76	6.61		5.39	8.83	7.60	11.77
June	13.19	13.87	10.98	11.72	13.66		9.13	10.80	12.60	13.63
July	13.31	12.95	13.03	13.14	14.13		11.22	11.97	14.57	15.09
Aug.	13.11	11.43	12.44	11.98	16.06		10.31	10.92	12.56	13.78
Sept.	10.43	9.08	10.59	8.67	13.07		9.37	7.84	9.96	9.90
Oct.	7.40	7.28	5.28	6.09	7.44		7.87	5.50	9.49	7.42
Nov.	4.96	4.51	4.02	3.97	5.94		5.00	3.69	4.92	4.78
Dec.	4.13	3.43	3.54	3.17	5.35		4.69	3.15	4.17	3.73
Total	107.23	104.74	84.79	93.50			84.08	85.92	97.69	107.42

	Nuevo Laredo, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas		Cd. Mier, Tamaulipas		Retamal, Tamaulipas	
Month	1977	Avg. Aug. 1964-1977	1977	#Avg. June 1954-1977	1977	#Avg. Oct. 1955-1977	1977	# Average 1951-1977
Jan.	2.76	4.03	1.93	3.49	2.05	3.69	3.90	4.11
Feb.	5.47	5.29	4.13	4.48	4.80	4.94	4.33	4.79
Mar.	8.82	8.25	6.42	7.18	7.32	7.86	6.57	6.58
Apr.	10.35	10.01	7.72	8.95	8.90	9.61	6.65	7.89
May	9.61	10.82	8.31	10.36	10.20	10.96	6.81	8.41
June	13.11	12.67	11.26	11.51	12.44	12.23	7.80	9.02
July	15.43	13.70	12.91	13.14	13.39	14.10	11.10	9.88
Aug.	15.55	12.84	12.52	12.15	13.82	13.00	8.50	9.66
Sept.	11.93	9.85	8.98	8.85	10.28	9.66	8.23	7.39
Oct.	7.91	7.35	6.22	6.55	6.61	7.32	6.81	6.03
Nov.	6.42	5.06	4.72	4.64	5.63	4.91	4.65	4.42
Dec.	4.80	3.99	3.74	3.47	4.33	3.74	3.90	3.84
Total	112.16	103.86	88.86	94.77	99.77	102.02	79.25	82.02

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 National Weather Service evaporation station.

Temperature - Degrees Fahrenheit

In United States

Month	Amistad Dam, Texas				Eagle Pass, Texas				Falcon Dam, Texas			
	Mean 1977	Average March 1963-1977	1977 Max.	1977 Min.	Mean 1977	#Average 1964-1977	1977 Max.	1977 Min.	Mean 1977	Average July 1950-1977	1977 Max.	1977 Min.
Jan.	45.6	50.3	77	24	47.3	51.4	82	23	46.2	55.9	82	29
Feb.	55.0	53.7	87	34	56.9	55.5	90	34	55.8	59.8	99	38
Mar.	61.9	62.7	88	35	64.5	64.2	92	37	64.4	67.0	93	39
Apr.	68.0	71.3	88	48	69.4	72.8	90	43	70.0	74.9	95	45
May	74.4	76.4	92	58	75.4	77.2	93	60	76.9	79.7	103	65
June	82.0	82.1	100	64	83.6	82.8	100	65	80.5	83.7	103	69
July	85.0	84.4	102	69	87.2	85.2	104	73	83.5	85.5	103	72
Aug.	87.5	83.5	106	73	88.5	84.5	108	74	85.3	85.4	106	74
Sept.	84.6	78.3	104	68	85.9	78.9	104	70	81.6	81.0	103	67
Oct.	71.7	69.3	100	42	72.9	69.5	100	45	73.1	73.2	100	46
Nov.	61.5	59.7	89	33	62.9	60.4	92	32	65.0	63.7	92	40
Dec.	54.9	51.9	87	32	56.3	53.8	94	29	56.8	57.4	94	31
Yearly	69.3	68.6	106	24	70.9	69.7	108	23	69.9	72.3	106	29

In Mexico

Month	Cd. Juarez, Chihuahua				Ojinaga, Chihuahua				Cd. Acuna, Coahuila			
	Mean 1977	#Average July 1960-1977	1977 Max.	1977 Min.	Mean 1977	#Average April 1954-1977	1977 Max.	1977 Min.	Mean 1977	#Average April 1951-1977	1977 Max.	1977 Min.
Jan.	46.4	45.3	66	21	50.0	49.4	73	25	44.6	49.5	84	16
Feb.	51.8	50.0	81	27	55.4	54.2	90	28	53.6	54.8	93	23
Mar.	55.4	57.0	81	23	59.0	61.6	90	27	60.8	63.3	93	23
Apr.	66.2	64.3	91	37	71.6	71.0	95	37	66.2	72.0	93	36
May	73.4	73.3	99	50	80.6	79.4	106	57	75.2	78.3	95	52
June	84.2	81.3	111	63	87.8	85.2	109	66	82.4	84.5	106	59
July	84.2	82.9	104	66	87.8	85.5	106	70	86.0	87.1	106	66
Aug.	86.0	80.8	104	68	89.6	84.3	106	70	87.8	86.7	111	68
Sept.	82.4	75.2	100	61	86.0	79.8	106	68	86.0	81.3	109	63
Oct.	66.2	64.8	93	45	75.2	70.5	104	50	71.6	71.2	104	34
Nov.	57.2	52.6	84	30	60.8	58.1	90	28	60.8	58.9	90	23
Dec.	51.8	46.7	77	21	53.6	50.7	84	23	53.6	51.4	90	21
Yearly	67.1	64.5	111	21	71.4	69.1	109	23	69.0	69.9	111	16

Month	Chupadero, Coahuila				El Remolino, Chihuahua				Piedras Negras, Coahuila			
	Mean 1977	#Average 1961-1977	1977 Max.	1977 Min.	Mean 1977	Average June 1958-1977	1977 Max.	1977 Min.	Mean 1977	#Average April 1951-1977	1977 Max.	1977 Min.
Jan.	41.0	48.2	70	19	57.2	56.9	90	25	46.4	51.1	79	21
Feb.	50.0	53.4	84	28	60.8	60.1	91	34	57.2	55.9	91	32
Mar.	57.2	62.6	84	28	66.2	66.1	102	34	57.2	62.9	91	36
Apr.	66.2	71.4	84	37	71.6	74.6	102	37	69.8	71.8	91	43
May	71.6	76.0	88	64	80.6	79.2	100	61	77.0	77.5	97	57
June	80.6	82.1	102	63	84.2	84.2	109	61	84.2	83.7	100	66
July	84.2	84.9	104	66	86.0	86.1	109	64	87.8	86.1	106	72
Aug.	86.0	83.9	106	66	84.2	85.5	109	61	89.6	85.6	108	73
Sept.	82.4	79.1	102	59	82.4	81.8	109	55	87.8	79.8	106	72
Oct.	69.8	69.4	97	37	69.8	73.8	97	45	75.2	70.3	99	43
Nov.	57.2	58.6	81	32	71.6	67.2	99	41	62.6	59.2	88	30
Dec.	50.0	51.6	88	23	64.4	60.3	95	34	57.2	52.8	93	27
Yearly	66.4	68.4	106	19	73.2	73.0	109	25	71.0	69.7	108	21

Some months missing

TEMPERATURE, HUMIDITY, AND WIND

Temperature - Degrees Fahrenheit

In Mexico

Month	Guerrero, Coahuila				Villa Hidalgo, Coahuila				Nuevo Laredo, Tamps., C.I.L.A.			
	Mean 1977	#Average 1958-1977	1977 Max.	1977 Min.	Mean 1977	#Average August 1951-1977	1977 Max.	1977 Min.	Mean 1977	Average August 1964-1977	1977 Max.	1977 Min.
Jan.	48.2	51.2	86	23	44.6	53.5	79	19	51.8	55.0	95	28
Feb.	66.2	56.1	93	32	53.6	57.8	88	28	62.6	59.7	93	41
Mar.	66.2	65.9	88	39	68.0	65.7	95	34	69.8	69.1	100	45
Apr.	73.4	73.3	93	43	68.0	75.1	93	36	77.0	77.1	102	50
May	80.6	79.0	95	66	77.0	79.9	91	52	84.2	81.4	99	66
June	86.0	83.8	102	68	82.4	85.5	100	63	87.8	85.4	106	72
July		85.4			86.0	86.7	104	68	91.4	87.4	108	75
Aug.		85.7			86.0	87.2	106	70	93.2	87.4	109	73
Sept.	89.6	81.0	108	75	84.2	82.6	104	64	89.6	83.4	108	73
Oct.	77.0	70.9	102	43	73.4	73.8	100	36	78.8	75.2	104	50
Nov.	68.0	61.7	95	37	62.6	61.3	86	39	62.6	65.7	99	41
Dec.	60.8	54.5	97	30	55.4	56.0	88	32	62.6	59.5	99	36
Yearly		70.7		23	70.1	72.1	106	19	76.0	73.9	109	28

Month	Nuevo Laredo, Tamps., M.S. of M.				El Treinta, Coahuila				Sabinas Hidalgo, Nuevo Leon			
	Mean 1977	#Average 1945-1977	1977 Max.	1977 Min.	Mean 1977	Average 1961-1977	1977 Max.	1977 Min.	Mean 1977	Average October 1961-1977	1977 Max.	1977 Min.
Jan.	50.0	56.0	81	25	42.8	49.7	77	18	55.4	57.0	81	27
Feb.	51.8	60.5	86	37	50.0	54.8	91	28	59.0	60.6	95	34
Mar.	68.0	67.7	93	45	62.6	64.3	95	32	69.8	67.4	95	39
Apr.	71.6	75.4	97	46	66.2	73.0	95	39	73.4	75.5	102	50
May	80.6	80.7	93	64	73.4	77.2	99	48	86.0	79.9	108	64
June	86.0	84.6	100	72	82.4	81.3	102	59	86.0	84.1	102	64
July	87.8	87.5	104	75	82.4	82.6	108	63	86.0	84.4	108	57
Aug.	89.6	87.2	108	73	86.0	82.8	109	68	86.0	84.6	106	63
Sept.	82.4	81.4	102	73	84.2	78.0	108	63	77.0	80.0	95	54
Oct.	68.0	72.9	100	46	68.0	69.2	102	39	71.6	73.7	91	50
Nov.	66.2	64.2	86	37	60.8	59.1	93	36	68.0	64.8	86	39
Dec.	59.0	50.6	90	34	53.6	51.8	97	25	62.6	59.4	88	39
Yearly	71.8	72.4	108	25	67.7	68.6	109	18	73.4	72.6	108	27

Month	Nueva Cd. Guerrero, Tamaulipas				Cd. Mier, Tamaulipas				Retamal, Tamaulipas			
	Mean 1977	Average 1958-1977	1977 Max.	1977 Min.	Mean 1977	#Average October 1955-1977	1977 Max.	1977 Min.	Mean 1977	#Average 1951-1977	1977 Max.	1977 Min.
Jan.	50.0	55.4	82	30	50.0	55.2	82	30	51.8	60.1	82	32
Feb.	60.8	59.3	99	39	60.8	59.6	99	37	62.6	63.1	90	36
Mar.	68.0	66.9	91	41	66.2	67.3	93	39	66.2	69.4	86	45
Apr.	71.6	75.8	93	46	73.4	75.6	95	45	73.4	76.4	93	54
May	80.6	80.5	97	66	82.4	80.3	97	64	80.6	79.8	93	64
June	86.0	84.6	102	68	86.0	84.4	100	70	80.6	83.5	93	66
July	87.8	85.9	104	72	87.8	86.0	104	72	80.6	85.0	88	68
Aug.	87.8	86.1	106	75	89.6	86.2	104	70	82.4	85.9	97	70
Sept.	84.2	82.0	102	66	84.2	81.9	102	70	84.2	82.9	95	70
Oct.	77.0	74.5	99	46	77.0	74.2	99	43	80.6	76.8	93	64
Nov.	69.8	65.3	91	41	69.8	64.8	93	39	68.0	67.9	91	39
Dec.	59.0	57.8	93	30	60.8	58.1	95	28	62.6	61.9	90	30
Yearly	73.6	72.8	106	30	74.0	72.8	104	28	72.8	74.4	97	30

Some months missing

TEMPERATURE, HUMIDITY, AND WIND

Mean Wind Speed – Miles Per Hour
In United States

Month	Martin King Ranch, Texas		Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1977	Average 1957-1977	1977	#Average March 1963-1977	1977	#Average December 1963-1977	1977	#Average July 1950-1977
Jan.	3.8	3.8	3.2	3.3	1.7	2.3	2.7	3.8
Feb.	4.2	4.6	3.3	3.8	1.8	2.9	3.2	4.5
Mar.	5.4	6.1	3.7	4.7	2.2	3.3	3.4	4.9
Apr.	5.8	6.2	4.0	4.7		3.4	4.3	5.5
May	6.9	6.7	4.0	4.6		3.3	5.0	5.5
June	6.4	7.1	4.1	5.0	3.7	3.4	4.6	5.8
July	6.6	6.7	4.0	4.6	5.1	3.3	5.4	6.1
Aug.	6.8	5.9	4.1	4.1	5.2	3.0	4.8	5.1
Sept.	5.8	5.1	3.5	3.7	4.0	2.6	3.4	4.0
Oct.	4.8	4.7	3.1	3.4	3.3	2.1	2.5	3.5
Nov.	4.0	4.0	3.1	3.2	3.3	2.0	2.9	3.7
Dec.	3.6	3.5	2.6	3.1	2.9	2.0	3.0	3.5
Yearly	5.3	5.4	3.6	4.0		2.8	3.8	4.7

Mean Relative Humidity-Percent
In United States

Month	Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1977	Average March 1963-1977	1977	#Average 1964-1977	1977	Average July 1950-1977
Jan.	71.1	60.7	71.5	63.8	69.2	66.2
Feb.	60.5	58.9	60.6	60.6	58.2	63.0
Mar.	51.5	54.0	55.0	57.8	52.7	61.3
Apr.	64.2	58.7	58.9	61.7	53.0	61.3
May	84.1	65.1	70.5	68.1	59.6	64.0
June	63.0	62.0	60.5	65.0	54.7	63.1
July	57.7	60.0	56.3	62.2	48.4	60.0
Aug.	56.8	60.7	57.4	63.7	49.4	60.8
Sept.	54.1	66.6	58.3	70.5	59.0	65.7
Oct.	66.6	67.2	64.0	69.8	56.1	66.2
Nov.	61.2	63.8	59.8	67.8	51.2	65.8
Dec.	54.5	61.8	56.6	65.1	56.7	64.6
Yearly	62.1	61.6	60.8	64.7	55.7	63.5

In Mexico

Month	Nueva Cd. Guerrero, Tamaulipas	
	1977	Average August 1961-1977
Jan.	80	79
Feb.	75	77
Mar.	68	73
Apr.	66	73
May	70	78
June	64	77
July	59	74
Aug.	60	74
Sept.	61	79
Oct.	60	78
Nov.	60	77
Dec.	61	78
Yearly	65	76

Some months missing

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries – 1977

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 runoff to the Rio Grande. Such noncontributing areas constitute about 47 percent 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.

On the United States side only the areas irrigated in 1977 are shown, except that, in the reaches below Falcon Dam, the figures shown represent acreages which were subject to irrigation in 1977 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 1977. The irrigated area data tabulated are the best data that could be obtained.

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	92,191	0	92,191
Above El Paso Gaging Station	29,267	0	29,267	92,191	0	92,191
El Paso Station to American Dam	4	0	4	12,861	0	12,861
Above American Dam	29,271	0	29,271	105,052	0	105,052
American Dam to Clint Station	187	285	472	31,486	5,792	37,278
Above Clint Gaging Station	29,458	285	29,743	136,538	5,792	142,330
Clint Station to Acala Station	485	259	744	0	0	0
American Dam to Acala Station - Total	672	544	1,216	31,486	5,792	37,278
Above Acala Gaging Station	29,943	544	30,487	136,538	5,792	142,330
Acala Station to Fort Quitman Station	663	794	1,457	10,730	0	10,730
Above Fort Quitman Gaging Station	30,606	1,338	31,944	147,268	5,792	153,060
Fort Quitman Station to Above Presidio Station	1,621	1,401	3,022	a) 593	a) 1,080	1,673
Above Presidio Station above Rio Conchos	32,227	2,739	34,966	147,861	6,872	154,733
Rio Conchos above Boquilla Dam	0	8,131	8,131	0	b) 12,355	12,355
Rio Conchos above Luis L. Leon Dam	0	22,992	22,992	0	379,657	379,657
Rio Conchos - Total	0	26,404	26,404	0	392,012	392,012
Alamito Creek above Gaging Station	1,504	0	1,504	240	0	240
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - excluding above tributaries	367	98	465	2,836	198	3,034
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - Total	1,871	26,502	28,373	3,076	392,210	395,286
Above Presidio Station below Rio Conchos	34,098	29,241	63,339	150,937	399,082	550,019
Terlingua Creek above Gaging Station	1,070	0	1,070	c) 1,150	0	1,150
Presidio Station below Rio Conchos to Johnson Ranch Station - excluding Terlingua Creek	1,093	2,258	3,351	1,084	1,853	2,937
Presidio Station below Rio Conchos to Johnson Ranch Station - Total	2,163	2,258	4,421	2,234	1,853	4,087
Above Johnson Ranch Gaging Station	36,261	31,499	67,760	153,171	400,935	554,106
Johnson Ranch Station to Foster Ranch Station	6,412	6,570	12,982	d) 3,515	0	3,515
Above Foster Ranch Gaging Station	42,673	38,069	80,742	156,686	400,935	557,621
Foster Ranch Station to Langtry Station	182	505	687	0	0	0
Above Langtry Gaging Station (Discontinued)	42,855	38,574	81,429	156,686	400,935	557,621
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

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries – 1977

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	156,686	400,935	557,621
Amistad Dam to Below Amistad Dam Gaging Station	55	4	9	0	0	0
Above the Below Amistad Dam Gaging Station	82,690	40,453	123,143	156,686	400,935	557,621
Below Amistad Dam Station to Del Rio Station	60	100	160	472	0	472
Above Del Rio Gaging Station	82,750	40,553	123,303	157,158	400,935	558,093
Arroyo Las Vacas above Gaging Station	0	350	350	0	445	445
San Felipe Creek above Gaging Station	46	0	46	2,300	0	2,300
Pinto Creek above Gaging Station	249	0	249	400	0	400
Rio San Diego above Gaging Station	0	853	853	0	11,280	11,280
Rio San Diego - Total	0	859	859	0	12,624	12,624
Del Rio Station to Jimenez Station - excluding above tributaries	669	110	779	e) 38,995	1,903	40,898
Del Rio Station to Jimenez Station - Total	964	1,319	2,283	41,695	14,972	56,667
Above the Jimenez Gaging Station	83,714	41,872	125,586	198,853	415,907	614,760
Rio San Rodrigo above Gaging Station	0	1,049	1,049	0	5,560	5,560
Rio San Rodrigo - Total	0	1,049	1,049	0	5,560	5,560
Jimenez Station to Maverick Power Plant - excluding Rio San Rodrigo	287	114	401	1,540	0	1,540
Jimenez Station to Maverick Power Plant - Total	287	1,163	1,450	1,540	5,560	7,100
Above Maverick Power Plant	84,001	43,035	127,036	200,393	421,467	621,860
Maverick Power Plant to Piedras Negras Station	244	32	276	200	509	709
Above Piedras Negras Gaging Station	84,245	43,067	127,312	200,593	421,976	622,569
Rio Escondido above Gaging Station	0	1,459	1,459	0	10,630	10,630
Rio Escondido - Total	0	1,471	1,471	0	10,630	10,630
Piedras Negras Station to El Indio Station - excluding Rio Escondido	237	206	443	250	371	621
Piedras Negras Station to El Indio Station-Total	237	1,677	1,914	250	11,001	11,251
Above El Indio Gaging Station	84,482	44,744	129,226	200,843	432,977	633,820
El Indio Station to Villa Hidalgo Station	629	1,683	2,312	1,383	1,223	2,606
Above Villa Hidalgo Gaging Station	85,111	46,427	131,538	202,226	434,200	636,426
Villa Hidalgo Station to Nuevo Laredo Station	607	433	1,040	4,639	2,911	7,550
Above Nuevo Laredo Gaging Station	85,718	46,860	132,578	206,865	437,111	643,976
Rio Salado above Venustiano Carranza Dam	0	15,831	15,831	0	61,282	61,282
Rio Salado above Las Tortillas Gaging Station	0	23,155	23,155	0	119,564	119,564
Rio Salado above River Road Crossing	0	23,323	23,323	0	119,564	119,564
Nuevo Laredo Station to Falcon Dam - excluding Rio Salado	2,042	1,327	3,369	f) 8,507	3,376	11,883
Nuevo Laredo Station to Falcon Dam - Total	2,042	24,650	26,692	8,507	122,940	131,447
Amistad Dam to Falcon Dam - excluding above tributaries	4,780	4,009	8,789	55,986	10,293	66,279
Above Falcon Dam	87,760	71,510	159,270	215,372	560,051	775,423
Rio Alamo above Gaging Station	0	1,675	1,675	0	7,660	7,660
Rio San Juan above Marte Gomez Dam	0	12,745	12,745	0	102,549	102,549
Rio San Juan - Marte Gomez Dam to Camargo Gaging Station	0	195	195	0	147,499	147,499
Rio San Juan - Total	0	12,949	12,949	0	250,048	250,048
Falcon Dam to Rio Grande City Station - excluding above tributaries	222	246	468	5,925	2,572	8,497
Falcon Dam to Rio Grande City Station - Total	222	14,870	15,092	5,925	260,280	266,205
Above Rio Grande City Gaging Station	87,982	86,380	174,362	221,297	820,331	1,041,628
Rio Grande City Station to Anzalduas Dam	952	798	1,750	178,387	471,514	649,901
Above Anzalduas Dam	88,934	87,178	176,112	399,684	1,291,845	1,691,529
Anzalduas Dam to Progreso Station	13	163	176	140,407	4,426	144,833
Above Progreso Gaging Station	88,947	87,341	176,288	540,091	1,296,271	1,836,362
Progreso Station to San Benito Station	7	9	16	314,037	1,707	315,744
Above San Benito Gaging Station	88,954	87,350	176,304	854,128	1,297,978	2,152,106
San Benito Station to Brownsville Station	14	15	29	100,191	1,680	101,871
Falcon Dam to Brownsville Station - excluding Rio Alamo and Rio San Juan	1,208	1,231	2,439	738,947	481,899	1,220,846
Above Brownsville Gaging Station	88,968	87,365	176,333	954,319	1,299,658	2,253,977
Brownsville Station to Gulf of Mexico				4,212	12	4,224

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries – 1977

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Falcon Dam to Gulf of Mexico - excluding Rio Alamo and Rio San Juan				743,159	481,911	1,225,070
Amistad Dam to Gulf of Mexico - excluding above tributaries				799,145	492,204	1,291,349
Above Gulf of Mexico				958,531	1,299,670	2,258,201

a) Total area irrigated from the Rio Grande at least once during the year; additional irrigations from this source dependent on availability of river water in this reach
b) Includes area above Madero Reservoir
c) Includes 1,000 acres irrigated by spreader dams
d) Includes 3,360 acres irrigated by spreader dams
e) Includes 36,762 acres irrigated from the Maverick Canal below Mile 13 gaging station
f) Includes 110 acres irrigated from small reservoirs

SUPPLEMENTARY DATA–INTERNATIONAL AMISTAD RESERVOIR

Deduced Inflows

Considering that a knowledge of the mean daily inflows reaching the International Amistad Reservoir would serve a useful purpose, such data have been deduced for 1977 showing the flows as close as they can be approximated. These data are based on the daily operation of the International Amistad Reservoir, taking into account: a) record of gage heights at the dam; b) releases; c) elevation-area-capacity tables based on 1961 survey; and d) rate of evaporation measured at the dam.

Flow contributions from different sources, leakage, 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 Foster Ranch, Pecos River near Langtry, and Devils River at Pafford Crossing.

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 Amistad Reservoir.

Mean Daily Discharge in Second-Feet 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,800	586	858	3,030	3,960	3,400	2,340	1,740	2,800	1,790	2,010	1,390
2	1,680	2,740	2,710	3,120	3,670	3,020	2,380	2,620	2,310	3,600	1,370	1,540
3	1,700	2,370	1,790	2,840	5,230	2,720	2,620	2,200	2,160	1,150	1,450	1,290
4	1,990	2,210	1,190	3,510	3,310	3,140	4,030	2,000	2,520	604	1,470	1,830
5	2,420	2,210	2,420	2,260	3,380	2,700	4,100	953	3,110	1,350	1,350	2,500
6	1,740	1,750	1,130	1,910	4,450	2,680	3,460	1,720	2,740	936	1,320	2,150
7	1,880	5,090	1,730	2,980	3,600	2,970	3,050	1,190	2,080	2,010	3,570	1,800
8	1,660	2,480	1,750	3,640	3,600	2,120	2,000	1,430	1,860	2,070	2,460	1,510
9	1,980	1,390	2,150	2,460	4,310	2,100	2,240	1,810	3,210	689	1,570	1,230
10	1,480	1,890	1,980	2,680	4,240	3,100	1,990	2,010	2,320	2,500	671	939
11	1,900	2,280	1,770	2,010	3,960	2,120	2,370	1,910	3,090	689	367	809
12	2,180	2,100	2,170	3,280	4,240	2,850	1,700	2,280	2,770	855	1,080	1,130
13	2,370	2,180	1,660	2,680	3,190	2,050	2,210	2,480	2,190	448	1,090	1,570
14	1,790	2,190	2,700	6,110	4,590	1,860	2,820	2,330	1,990	1,030	1,290	1,430
15	2,270	1,430	2,330	5,470	4,520	1,970	2,120	1,920	1,680	1,850	1,910	2,590
16	1,910	1,740	1,600	9,530	4,030	2,700	2,190	2,490	1,600	639	2,230	1,740
17	1,840	1,870	3,670	6,110	3,640	2,760	2,040	3,070	2,080	1,390	1,640	1,790
18	1,180	2,430	2,430	5,220	3,530	1,880	2,100	2,930	2,080	1,490	1,400	1,780
19	2,440	2,220	2,860	4,630	3,180	1,730	1,380	2,990	2,620	1,550	1,850	1,890
20	1,250	1,270	2,250	3,880	4,380	1,560	1,900	2,790	1,730	1,560	1,840	1,010
21	2,680	2,130	3,570	3,290	2,790	2,020	2,300	2,780	2,130	2,480	1,000	844
22	2,790	2,230	2,200	3,070	3,810	2,860	1,850	2,250	1,580	3,330	1,050	526
23	2,200	2,900	2,090	3,070	3,370	3,250	2,080	2,920	2,360	2,120	1,630	1,760
24	2,650	2,130	2,890	3,480	4,100	2,530	2,230	2,500	2,310	1,170	1,620	1,660
25	1,680	2,160	3,190	3,090	2,870	3,420	2,730	2,170	2,560	1,900	1,460	851
26	2,720	2,130	10,600	3,050	3,810	3,460	2,530	1,570	1,400	1,990	1,400	1,400
27	2,580	1,760	2,420	3,990	2,730	2,990	2,430	3,110	1,840	2,030	1,690	989
28	3,100	1,590	2,770	4,380	3,010	2,830	2,330	2,470	1,780	2,050	1,490	1,290
29	1,950		3,600	5,190	3,010	4,060	2,330	3,110	1,430	1,140	657	1,310
30	1,350		3,220	6,500	4,450	3,420	1,500	3,070	1,800	1,790	957	1,330
31	996		2,780		3,310		2,210	3,530		1,450		1,350
Sum	62,156	59,456	80,478	116,460	116,270	80,270	73,560	72,343	66,130	49,650	44,892	45,228

Month	Current Year 1977 Extreme Gage Feet High	Extreme Gage Feet Low	∅ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1973-1977 Acre-Feet Average	Maximum	Minimum
Jan.			28	3,100	31	996	2,000	123,251	102,583	136,708	72,708
Feb.			7	5,090	1	586	2,120	117,921	110,445	172,088	73,688
Mar.			26	10,600	1	858	2,600	159,655	163,446	304,417	93,840
Apr.			16	9,530	6	1,910	3,880	231,030	162,536	231,030	86,703
May			3	5,230	27	2,730	3,740	230,589	168,564	230,589	103,515
June			29	4,060	20	1,560	2,680	159,206	135,320	159,206	103,948
July			5	4,100	19	1,380	2,370	145,856	280,060	689,085	97,790
Aug.			31	3,530	5	953	2,330	143,446	228,202	294,793	143,446
Sept.			9	3,210	26	1,400	2,200	131,202	594,768	2,091,428	131,202
Oct.			2	3,600	13	448	1,600	98,505	247,239	695,340	98,505
Nov.			7	3,570	11	367	1,500	89,027	125,999	242,434	67,616
Dec.			15	2,590	22	526	1,460	89,721	110,929	163,332	58,459
Yearly				10,600		367	2,380	1,719,409	2,430,091	4,328,998	1,614,745
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				301		10.4	67.3	2,120,870	2,997,486	5,339,762	1,991,767

∅ Mean daily

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 1977 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 1971-1972 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 Rio 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 1977 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4,270	3,990	1,640	1,440	8,580	7,560	1,790	848	5,760	5,900	1,940	1,360
2	5,230	4,170	3,330	1,780	8,480	6,960	1,900	1,600	3,960	5,790	2,060	724
3	5,160	4,240	4,200	2,370	8,830	5,970	1,990	1,640	4,270	10,700	1,630	1,130
4	5,190	3,430	2,500	1,960	8,160	5,370	2,450	1,770	3,110	4,590	360	2,260
5	5,120	3,500	2,830	1,230	7,770	4,840	1,570	145	2,720	4,100	953	2,320
6	4,200	3,600	1,980	932	9,990	3,340	2,810	780	3,530	4,410	968	1,160
7	3,270	3,180	1,410	1,210	8,790	3,510	3,110	1,950	1,520	2,940	1,090	593
8	4,060	3,080	1,390	1,680	10,000	2,790	1,210	727	1,560	3,220	837	1,190
9	3,270	3,500	1,730	1,890	13,100	2,170	3,040	1,060	2,340	2,030	883	1,790
10	2,340	3,100	2,240	519	11,700	4,200	2,640	1,360	3,640	1,290	713	1,710
11	3,020	4,380	2,390	1,440	9,850	2,920	2,180	1,700	4,170	1,050	614	1,400
12	3,640	4,480	2,220	1,400	10,300	4,660	2,840	692	4,910	466	1,540	381
13	3,990	4,560	2,380	1,920	9,890	4,270	3,160	1,250	6,250	473	1,670	985
14	4,910	4,560	2,030	2,230	10,200	3,090	2,870	1,080	11,600	491	992	975
15	3,920	4,060	3,080	4,410	10,000	2,500	2,150	501	5,330	1,700	1,780	334
16	4,130	4,130	2,030	2,710	9,780	2,250	2,680	689	4,310	1,610	2,140	2,180
17	3,300	4,130	2,400	1,900	9,850	2,820	1,700	1,180	4,940	1,150	1,570	1,700
18	2,110	4,660	2,240	1,390	8,400	2,790	3,740	777	5,400	1,620	1,400	1,440
19	2,930	5,050	2,920	4,200	9,990	3,670	1,590	1,140	5,050	1,590	1,890	3,170
20	3,270	4,200	2,670	3,150	10,600	2,720	1,650	1,220	5,260	1,300	2,140	1,540
21	4,030	3,520	2,570	3,310	11,500	3,030	2,000	858	5,370	1,810	1,750	816
22	3,850	3,740	1,680	3,090	15,400	1,320	1,440	696	4,410	1,820	256	544
23	4,240	5,650	1,240	3,670	29,500	562	1,740	2,100	4,170	1,110	1,260	777
24	5,160	3,640	1,080	2,790	24,300	1,080	1,520	1,090	5,540	5,330	1,170	1,340
25	3,920	3,850	1,320	2,810	13,800	1,930	579	537	5,160	3,880	1,470	1,420
26	4,170	3,570	1,540	2,910	10,200	2,290	682	1,790	4,870	2,550	1,190	1,640
27	3,050	2,590	1,460	2,590	9,500	2,160	784	2,840	4,480	2,200	1,090	1,560
28	5,330	1,150	2,070	2,500	9,750	2,790	152	2,410	4,130	1,700	929	1,220
29	3,740		2,830	9,820	8,190	1,360	3,500	3,180	5,510	2,160	604	1,080
30	4,770		2,850	8,720	7,130	1,410	1,350	4,770	4,770	2,200	685	2,070
31	4,130		1,690		6,570		579	6,040		1,570		1,790
Sum	107,710			81,971		96,332		48,420		82,750		42,599
	123,720		67,940		340,100		61,396		138,040		37,574	

Month	Current Year 1977 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 1968-1977 Acre-Feet Average	Maximum	Minimum
Jan.			28	5,330	18	2,110	3,990	245,376	109,405	245,376	50,635
Feb.			23	5,650	28	1,150	3,850	213,638	162,252	453,053	54,934
Mar.			3	4,200	24	1,080	2,190	134,739	131,474	243,527	53,064
Apr.			29	9,820	10	519	2,730	162,667	129,855	351,929	49,911
May			23	29,500	31	6,570	11,000	674,606	259,403	674,606	101,854
June			1	7,560	23	562	3,210	191,084	226,463	770,709	46,609
July			18	3,740	28	152	1,980	121,768	325,228	1,056,340	33,481
Aug.			31	6,040	5	145	1,560	96,032	285,954	1,023,293	64,413
Sept.			14	11,600	7	1,520	4,590	273,835	509,156	1,442,682	137,408
Oct.			3	10,700	12	466	2,670	164,137	412,843	1,365,884	122,189
Nov.			†16	2,140	22	256	1,250	74,533	179,962	538,929	45,260
Dec.			19	3,170	15	334	1,370	84,500	124,794	281,211	42,870
Yearly				29,500		145	3,370	2,436,915	2,856,789	6,234,950	1,280,067
	Meters			Cubic Meters per Second				Thousands of Cubic Meters			
				834		4.10	95.3	3,005,902	3,523,812	7,690,727	1,578,946

Ø Mean daily † And other days

CORRECTIONS TO PREVIOUS WATER BULLETINS

Water Bulletin and Page Numbers	Heading	Reference	Published As	Correction
20-10	Rio Grande at Island Station	Annual Summary Total Acre-Feet	54,538	54,418
39-37 40-37 41-41 42-41 43-37 44-43 45-41 46-42	Rio Grande at Del Rio, Texas	EXTREME FLOWS FROM RECORDS paragraph, Momentary minimum from records	176 second-feet on July 13, 1968 with a gage height of 1.31 feet 142 second-feet on Aug. 14, 1971 with a gage height of 1.27 feet	124 second-feet on March 5 and 6, 1969 with a gage height of 1.24 feet
44-86 45-84 46-88	Stored Water in Large Reservoirs of the Rio Grande	Storrie Reservoir	1974 July-Dec. 0.4 Yearly Avg. 1.9 Avg. 1939-1974 Dec. 7.5 1975 Jan. and Feb. .4 Aug.-Dec. .4 Yearly Avg. 1.2 Avg. 1939-1975 Aug. 8.7 Nov. 7.9 Avg. 1939-1976 Oct. 7.5	1974 July-Dec. 0 Yearly Avg. 1.7 Avg. 1939-1974 Dec. 7.4 1975 Jan. and Feb. 0 Aug.-Dec. 0 Yearly Avg. .9 Avg. 1939-1975 Aug. 8.6 Nov. 7.8 Avg. 1939-1976 Oct. 7.4
46-93	Suspended Silt in the Rio Grande and Tributaries	Rio Grande near Ojinaga, Chihuahua Average for Period of Record	Feb. .17 Mar. .25 Apr. .62 May 27.6 June 124 July 210 Aug. 370 Sept. 898 Oct. 546 Nov. 4.3 Dec. 1.1 Yearly 2,182.04	.21 .31 .76 34.1 154 260 458 1,110 676 5.4 1.4 2,700.18

In Water Bulletin No. 46 on page 83, "Outfalls from Sewers into the Rio Grande," the textual heading over the first table (which is incorrectly titled NUEVO LAREDO SEWAGE OUTFALLS), should read as follows:

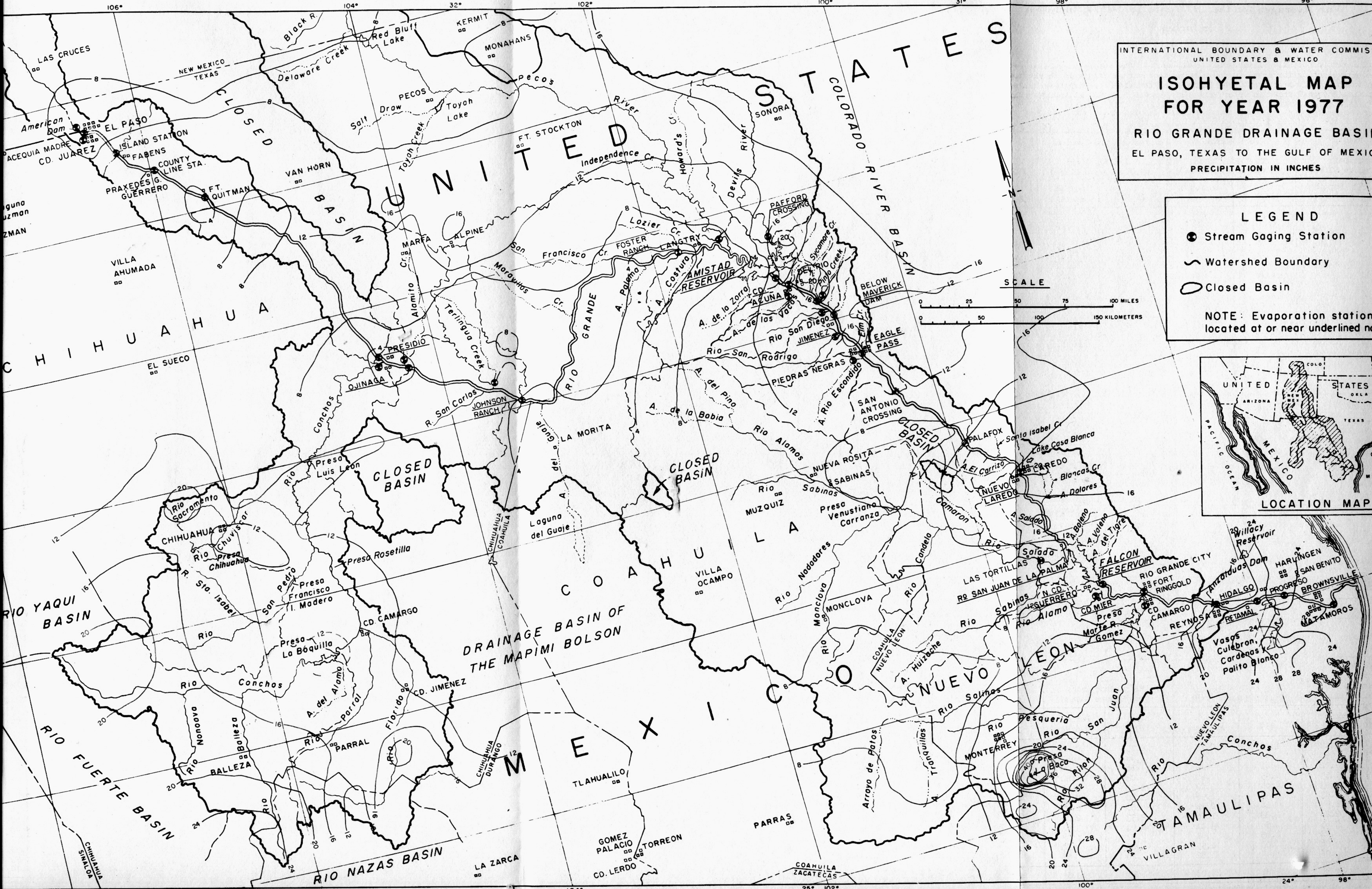
EL PASO SEWAGE OUTFALL

This sewage enters the Rio Grande through the outfalls of the El Paso and Ascarate Sewage Plants, located 7.1 and 8.7 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 17.6 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.

The textual heading over the fourth table (which is correctly titled NUEVO LAREDO SEWAGE OUTFALLS), should read as follows:

NUEVO LAREDO SEWAGE OUTFALLS

These sewage outfalls enter the Rio Grande 892.7 and 893.7 river miles downstream from the American Dam at El Paso, Texas and 2.2 and 3.2 miles downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The records are computed by the International Boundary and Water Commission based on current meter measurements, the weir discharge table, and a continuous record of gage heights.



INTERNATIONAL BOUNDARY & WATER COMMIS
UNITED STATES & MEXICO
ISOHYETAL MAP FOR YEAR 1977
RIO GRANDE DRAINAGE BASI
EL PASO, TEXAS TO THE GULF OF MEXIC
PRECIPITATION IN INCHES
LEGEND
Stream Gaging Station
Watershed Boundary
Closed Basin
NOTE: Evaporation station
located at or near underlined n
SCALE
0 25 50 75 100 MILES
0 50 100 150 KILOMETERS
LOCATION MAP
UNITED STATES
MEXICO
PACIFIC OCEAN
UNITED STATES
MEXICO
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMAULIPAS
CLOSED BASIN
COLORADO RIVER BASIN
RIO YAQUI BASIN
RIO FUERTE BASIN
RIO NAZAS BASIN
DRAINAGE BASIN OF THE MAPIMI BOLSON
LAS CRUCES
NEW MEXICO
TEXAS
American Dam
Acequia Madre
EL PASO
CD. JUAREZ
ISLAND STATION
FABENS
COUNTY LINE STA.
PRAXEDES G. GUERRERO
FT. QUITMAN
VAN HORN
VILLA AHUMADA
EL SUECO
KERMIT
MONAHANS
Red Bluff Lake
Black R.
Delaware Creek
PECOS
Toyah Lake
Salt Draw
Toyah Creek
FT. STOCKTON
Pecos River
Independence Cr.
SONORA
Howard's Cr.
Devils River
PAFFORD CROSSING
Sycamore Cr.
DEL RIO
Pinto Creek
MARFA
ALPINE
Alamito Cr.
San Francisco Cr.
Maravillas Cr.
Lozier Cr.
FOSTER RANCH
LANGTRY
AMISTAD RESERVOIR
CD. ACUÑA
BELOW MAVERICK DAM
Terlingua Creek
PRESIDIO
OJINAGA
R. San Carlos
JOHNSON RANCH
RIO GRANDE
A. Costura
A. de la Zorra
A. de las Vacas
Rio San Diego
JIMENEZ
Rio San Rodrigo
EAGLE PASS
PIEDRAS NEGRAS
A. del Pino
A. de la Babia
A. Rio Escondido
SAN ANTONIO CROSSING
Rio Alamos
LA MORITA
Conchos
Presa Luis Leon
CLOSED BASIN
NUEVA ROSITA
SABINAS
Rio Sabinas
MUZQUIZ
Presa Venustiano Carranza
PALAFOX
Santa Isabel Cr.
Lake Casa Blanca
LAREDO
NUEVO LAREDO
A. El Carrizo
Blancas Cr.
A. Dolores
Camaron
A. Salado
Rio Salado
A. Boleno
A. Valeno
A. del Tigre
FALCON RESERVOIR
LAS TORTILLAS
Ro SAN JUAN DE LA PALMA
N. CD. GUERRERO
CD. MIER
RIO GRANDE CITY
FORT RINGGOLD
CD CAMARGO
REYNOSA
Presa Marte R. Gomez
Rio Alamo
Willacy Reservoir
Anzalduas Dam
HARLINGEN
SAN BENITO
HIDALGO
RETAMAL
PROGRESO
BROWNSVILLE
MATAMOROS
Vasos Culebron, Cardenas y Palito Blanco
Rio Sacramento
CHIHUAHUA
Rio Chuviscar
Presa Chihuahua
R. Sta. Isabel
Rio San Pedro
Presa Francisco I. Madero
Presa Rosetilla
Laguna del Guaje
VILLA OCAMPO
Rio Nadadores
Rio Monclova
MONCLOVA
Rio Candela
CD. CAMARGO
Presa La Boquilla
Rio Conchos
A. del Alamo
Parral
Rio Florido
CD. JIMENEZ
PARRAL
Rio Nonoava
Balleza
BALLEZA
CHIHUAHUA DURANGO
TLAHUALILO
GOMEZ PALACIO
TORREON
CD. LERDO
LA ZARCA
PARRAS
COAHUILA ZACATECAS
CHIHUAHUA SINALOA
COAHUILA NUEVO LEON
A. Huizache
Rio Salinas
Pesqueria
Rio San Juan
MONTERREY
Presa La Boca
Rio Pilon
Arroyo de Patos
Tanquillas
Rio Conchos
NUEVO LEON TAMAULIPAS
VILLAGRAN
106° 104° 102° 100° 98° 96°
32° 31° 26° 25° 24°
108°

Flow of the Rio Grande and Related Data

1977

UNITED STATES OF AMERICA
DEPARTMENT OF STATE

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

WATER BULLETIN NUMBER 47

COVER PHOTOGRAPH

International highway bridges across the Rio Grande joining Laredo, Texas and Nuevo Laredo, Tamaulipas. In the foreground is the Juarez-Lincoln Bridge inaugurated November 1976 and in the background, located a short distance upstream, is International Bridge I.

These two bridges are of major importance to United States-Mexico border trade.