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WATER BULLETIN NUMBER 68

**Flow of the Rio Grande
and
Related Data**

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

1998

STORAGE IN MAJOR RESERVOIRS

SOURCES OF RIVER FLOW

DIVERSIONS

QUALITY OF WATER

CLIMATOLOGICAL DATA

DRAINAGE BASIN AND IRRIGATED AREAS

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

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FOREWORD

This bulletin presents the sixty-eighth 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 streamflow 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 information for the year 1998.

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 1998 the United States Section of the Commission operated the stream-gaging stations on the Rio Grande at El Paso, Below American Dam, Fort Quitman, Candelaria, Above Rio Conchos, Below Rio Conchos, Johnson Ranch, Foster Ranch, Del Rio, El Indio, Laredo, 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, and Below Anzalduas Dam. The station at Below 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.

In 1976 the names of several gaging stations were changed, pursuant to agreement between the two Sections of the Commission. Where it was decided that some confusion might result from this change, a note giving the former name was added to the descriptive heading of the gaging station.

The total drainage area within the outer rim of the Rio Grande Basin is 868,945 square kilometers. However, about half of this area yields no runoff to the river, the estimated productive area of the watershed being 456,701 square kilometers. Major reservoirs in the basin have a total storage capacity of approximately 15,228,700 thousand cubic meters, in addition to the International Amistad and Falcon Reservoirs, which have a combined conservation capacity of 7,160,512 thousand cubic meters. In the Rio Grande basin, a total area of 567,703 hectares is irrigated below Elephant Butte Dam on the Rio Grande and above Girvin in Texas on the Pecos River. The flow of the Rio Grande to the Gulf of Mexico below Brownsville prior to construction of Falcon Dam averaged 3,207,068 thousand cubic meters per year for the period 1934-1952. For the period 1954-1998, this flow has averaged 861,762 thousand cubic meters annually.

The mean sea level datum, referred to as the U. S. C. & G. S. in the description of the stream-gaging stations, is the National Geodetic Vertical Datum of 1929.

Acknowledgments

Other agencies which have contributed to some part of the data published herein include: the Natural Resource Conservation Service of the U. S. Department of Agriculture; the Bureau of Reclamation, the National Park Service, 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 Natural Resource Conservation Commission; the Middle Rio Grande Conservancy District; the Red Bluff Water Power Control District; State of Colorado, Division of Water Resources; the Rio Grande Compact Commission; the Delta Lake Irrigation District; 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 City of El Paso; the Maverick County Control and Improvement District No. 1; the Ministry of Agriculture and Hydraulic Resources of Mexico; the National Water Commission of Mexico; the Meteorological Service of Mexico; the Meteorological Service of the State of Chihuahua, Mexico; Federal Power Commission of Mexico; Potable Water Board of Piedras Negras, Coahuila; 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 International 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

This Bulletin is published in System International (SI) units which are based on the metric system. The following conversion constants may be used to convert to the English system of measurement. Data collected by the Mexican Section are computed and published in a Spanish version of the water bulletin in metric units.

METRIC TO ENGLISH CONVERSION CONSTANTS

METRIC UNITSENGLISH UNITSLENGTH

1	Millimeter	x	0.03937	=	Inch
1	Meter	x	3.28084	=	Feet
1	Kilometer	x	0.62137	=	Mile

AREA

1	Square Meter	x	10.76391	=	Square Feet
1	Hectare	x	2.47105	=	Acre
1	Square Kilometer	x	0.38610	=	Square Mile

VOLUME

1	Cubic Meter	x	35.31467	=	Cubic Feet
1,000	Cubic Meters	x	0.81071	=	Acre-Feet

WEIGHT

1	Kilogram	x	2.20462	=	Pounds
1	Megagram	x	1.10231	=	Tons (2,000 lbs.)

TEMPERATURE

$$\text{Degrees Celsius} \quad x \quad 1.8 \quad + \quad 32 \quad = \quad \text{Degrees Fahrenheit}$$

GENERAL HYDROLOGIC CONDITIONS FOR 1998

Along and Adjacent to the International Portion of the Rio Grande

During the year 1998, temperatures were about two degrees Celsius above average on the watershed of the Rio Grande below El Paso, Texas. Evaporation was 127% of average. Precipitation was 60% of average from El Paso to Amistad Dam, 120% of average from Amistad Dam to Falcon Dam, 131% of average from Falcon Dam to Rio Grande City, and 88% of average in the lower Rio Grande Valley on the United States side.

The yearly volume of flow of the Rio Grande was above average from El Paso to the confluence of the Rio Conchos with the Rio Grande, and below average from the Rio Conchos confluence to the Gulf of Mexico. In the reach between El Paso and the confluence of the Rio Conchos, the flow was 108% of average, ranging from 80% of average at Rio Grande above Rio Conchos to 121% at Fort Quitman; in the reach between the confluence of the Rio Conchos and Amistad Reservoir, where most of the flows normally originate from releases from Luis Leon Reservoir (El Granero) on the Rio Conchos, the flow was 26% of average; and in the reach between Amistad Dam and Falcon Reservoir, where flows mostly originate from releases from Amistad Reservoir, the flow was 78% of average. Most of the flows passing the Rio Grande stations below Falcon Dam originated from releases from Falcon Reservoir, which in 1998 amounted to 1,841,709 thousand cubic meters, or 63% of the average for the forty-five years of operation, 1954-1998. The estimated volume of flow passing to the Gulf of Mexico was 100,072 thousand cubic meters, which is 12% of the average for this forty-four year period.

The total annual flow of all measured tributaries below Fort Quitman was 46% of average. The total flow of these tributaries in the United States was 809,082 thousand cubic meters, or 112% of average. For Mexico, the measured tributary flow, excluding Rio Alamo and Rio San Juan, was 399,047 thousand cubic meters, or 25% of average. The flows of the Rio Alamo and Rio San Juan were 38% and 7.9% of their respective averages.

Return flow to the Rio Grande at Maverick Power Plant near Eagle Pass was 808,194 thousand cubic meters, or 92% of the thirty-one year average. Return flow to the Rio Grande through various drains in the Maverick County Irrigation District, excluding storm inflow, amounted to 27,602 thousand cubic meters, or 24% of the thirty-one year average.

Significant flooding occurred on the Rio Grande in August 1998. Runoff from heavy rains on August 23-24 from the remnants of Tropical Storm Charlie resulted in high flows on the Devils River, San Felipe and Pinto Creeks, and the Arroyo de Las Vacas and Rio San Diego. The highest peak flows recorded on the Rio Grande were at Piedras Negras (Eagle Pass), 6,600 cubic meters per second; and Rio Grande near El Indio, 6,150 cubic meters per second.

For all reservoirs in the Rio Grande basin having a capacity greater than 18,500 thousand cubic meters, excepting Amistad and Falcon International Reservoirs, the average amount of water in storage in 1998 was 5,929,300 thousand cubic meters, or 106% of the average 5,579,600 thousand cubic meters. In the United States, stored water in these reservoirs was 151% of average, while in Mexico it was 73% of average.

In International Amistad Reservoir, there was a decrease in storage during the year of 125,300 thousand cubic meters. Storage ranged from a high of 1,833,700 thousand cubic meters on January 6, to a low of 941,300 thousand cubic meters on August 4 and averaged 1,493,500 thousand cubic meters during the year, or 44% of the average for the period 1969 through 1998. In International Falcon Reservoir, there was an increase in storage during the year of 96,500 thousand cubic meters. The storage ranged from a high of 810,800 thousand cubic meters on November 25 to a low of 272,200 thousand cubic meters on May 12 and averaged 577,800 thousand cubic meters during the year, or 26% of the average for the period 1954 through 1998.

Diversions from the Rio Grande in the United States were 86% of average. Diversions into the American Canal were 111% of average, into the Maverick Canal 79% of average, and in the United States below Falcon Dam, 86% of the average for the forty-one years, 1958 - 1998. In Mexico, diversions were 55% of average. Diversions into the Acequia Madre were 119% of average, while diversions through the Anzalduas Canal in Mexico were 51% of the 1952 - 1998 average.

In 1998, the total reported irrigated area from the Rio Grande and its tributaries below Caballo Dam showed a 20% increase from the previous year. On the United States side, there was an increase of about 1.3% above Falcon Dam and a decrease of about 0.2% below Falcon Dam, for an overall average increase of 0.2%. On the Mexican side, there was a decrease of about 2% reported above Falcon Dam and an increase of about 181% below Falcon Dam, for an overall increase of 81%.

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

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08-3610.00 RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

DESCRIPTION: Concrete wall control, bubbler gage, water-stage recorder, and data collection platform located on the left bank 30 meters upstream from the cableway at latitude $33^{\circ}08'55''$, longitude $107^{\circ}12'20''$, and river kilometer 2,236; 1.6 river kilometers downstream from Elephant Butte Dam, 2.4 river kilometers upstream from Cuchillo Negro River, and 217 river kilometers upstream from the American Dam at El Paso, Texas. The zero of the gage is 1,292.68 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 21 current-meter measurements during the year and a continuous record of gage heights. Records were furnished by the United States Geological Survey. Records available: 1915 through 1998.

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. The data collection platform is operated by U. S. Geological Survey and relays gage height data by radio via satellite.

EXTREME FLOWS FROM RECORDS:

Average Flow in Cubic Meters per Second									
Daily:	Max.	233	May 22, 1942				Min.	0	Occasionally
Monthly:	Max.	215	May 1942				Min.	0.03	Nov. 1971
Yearly:	Max.	71.1	1942				Min.	7.16	1964

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.54	10.5	40.5	52.7	* 43.0	63.7	73.1	48.4	* 50.4	40.5	1.93	* 0.20
2	.68	10.5	40.8	52.7	40.8	* 62.3	71.9	49.0	49.0	38.8	.31	.21
3	.82	5.75	* 41.1	52.4	40.5	66.0	65.1	* 48.4	17.7	36.8	.31	.21
4	.95	3.03	43.3	52.7	41.1	66.0	65.4	47.6	14.8	37.1	.31	.21
5	1.02	3.12	44.7	52.7	41.9	66.3	65.1	47.3	15.0	31.2	.37	.21
6	1.13	* 10.9	45.0	52.7	41.9	66.3	65.7	47.3	15.4	26.8	.40	.20
7	1.19	19.4	45.0	49.6	44.5	66.3	65.4	47.9	15.5	18.5	.31	.20
8	1.27	19.4	44.7	44.2	45.6	66.0	66.0	47.6	14.8	16.9	.34	.20
9	1.36	19.5	44.7	44.2	45.9	66.0	65.7	47.0	20.7	16.7	.34	.20
10	1.42	19.5	47.9	44.2	46.2	65.7	65.7	46.4	21.5	16.8	.37	.18
11	1.53	19.6	50.4	44.2	45.9	53.2	65.4	45.9	17.2	16.7	.37	.15
12	1.59	19.7	50.4	44.2	45.3	45.9	65.7	60.3	17.6	16.9	.37	.10
13	* 1.76	19.7	* 50.4	* 44.5	45.0	45.6	66.3	65.1	17.9	10.8	* .34	.10
14	* 1.76	19.8	50.7	44.7	* 45.0	45.3	64.9	58.9	* 18.0	.74	.31	.10
15	1.78	19.9	50.7	42.5	45.0	45.9	66.0	44.7	18.2	* .74	.31	.15
16	1.84	19.9	50.1	41.1	45.0	* 53.8	66.0	44.7	18.0	.71	.31	.16
17	1.87	20.0	50.4	41.1	45.0	64.0	* 57.8	44.7	21.5	.74	.28	.16
18	1.90	33.1	53.0	41.1	45.3	64.9	60.9	* 45.0	18.1	.79	.28	.16
19	1.95	39.9	54.9	41.3	45.3	64.9	60.6	45.3	18.0	.85	.27	.17
20	2.21	* 40.2	54.9	41.1	45.3	63.7	59.8	45.6	18.0	.79	.27	.16
21	6.94	40.5	54.9	42.8	45.3	63.2	57.8	45.6	14.0	.79	.27	.16
22	9.63	38.2	54.7	46.2	45.3	63.7	60.0	45.9	24.5	.51	.26	.15
23	* 9.63	40.2	59.8	45.9	45.3	64.3	64.6	46.2	26.8	.31	.25	.16
24	9.69	40.5	62.3	45.3	45.3	64.6	65.7	45.9	25.6	.31	.24	.16
25	9.74	40.5	62.0	45.0	45.8	65.4	66.8	55.8	39.4	.34	.24	.15
26	9.83	40.2	62.0	45.3	45.6	65.4	66.0	71.1	47.3	.34	.23	.16
27	6.71	40.5	56.9	44.7	52.1	65.7	67.4	70.5	47.3	.40	.22	.16
28	2.63	40.5	52.7	44.2	61.7	65.1	55.8	69.7	47.0	.31	.22	.16
29	2.72		52.4	44.2	64.3	69.7	45.9	68.5	46.2	.31	.22	.16
30	7.25		52.7	44.2	64.0	79.6	47.9	66.8	* 43.3	.34	.20	.16
31	10.4		* 52.7		63.7	48.4	57.2			.31		.16
Sum			694.50	1,371.7	1,868.5	1,620.3		334.13			5.17	
113.72			1,576.7	1,461.7	1,948.8	778.7		10.45				

Current Year 1998**Period 1938-1998**

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Total	Average	Maximum	Minimum
	High	Low	Day	High	Day	Low					
Jan.			31	10.4	1	0.54	3.67	9,825	30,488	147,406	247
Feb.			121	40.5	4	3.03	24.8	60,005	52,383	207,297	232
Mar.			24	62.3	1	40.5	50.9	136,227	91,213	174,074	1,261
April			11	52.7	116	41.1	45.7	118,515	105,901	199,454	13,824
May			29	64.3	3	40.5	47.2	126,291	117,159	576,485	632
June			30	79.6	14	45.3	62.3	161,438	129,187	447,576	20,862
July			1	73.1	29	45.9	62.9	168,376	123,951	305,796	51,006
Aug.			26	71.1	115	44.7	52.3	139,994	93,390	178,200	11,761
Sept.			1	50.4	21	14.0	26.0	67,280	43,885	159,174	201
Oct.			1	40.5	123	31	10.8	28,869	19,861	154,731	183
Nov.			1	1.93	30	20	.35	903	16,855	195,408	91,5
Dec.			1	2.21	112	.10	.17	447	23,288	160,055	112
Yearly				79.6		0.10	32.3	1,018,170	847,561	2,243,367	226,236

* Discharge measurement made on this day

φ Mean daily

† And other days

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

08-3625.00 RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

DESCRIPTION: Cableway, gravity well, water-stage recorder, and data collection platform located on the left bank at latitude $32^{\circ}53'05''$, longitude $107^{\circ}17'30''$, and river kilometer 2,190; 1.3 river kilometers downstream from Caballo Dam, about 5.0 kilometers northeast of Arrey, New Mexico, 8.0 kilometers south of Caballo, New Mexico, and 172 river kilometers upstream from the American Dam at El Paso, Texas. The zero of the gage is 1,262.15 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 82 current-meter 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 1998.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 1,408 TCM of water were diverted in 1998 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 2.4 kilometers downstream from this station. Small accretions to the river take place between the station and Percha Dam. The data collection platform is operated by U. S. Bureau of Reclamation and relays gage heights and flow data by radio via satellite.

EXTREME FLOWS FROM RECORDS:

				Average Flow in Cubic Meters per Second					
Daily:	Max.	217	May 20, 1942		Min. 0	1954, 1955 and 1972			
Monthly:	Max.	190	May 1942		Min. 0	Nov. 1955			
Yearly:	Max.	70.2	1942		Min. 8.04	1964			

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.03	8.67	29.8	48.9	* 34.2	55.6	* 74.1	54.4	* 52.7	39.2	0.20	0.03
2	.03	8.69	29.8	48.7	31.0	* 59.7	65.3	* 51.5	48.1	* 34.0	.14	.03
3	.03	7.53	* 33.0	* 42.9	30.8	60.7	* 58.2	51.4	47.9	29.3	.08	.03
4	.03	4.45	37.0	37.1	30.8	60.9	54.5	* 49.1	* 45.3	29.7	.08	.03
5	.03	4.28	37.1	37.1	* 39.0	60.9	54.7	46.4	43.3	29.3	.08	.03
6	.03	5.83	39.5	37.2	47.0	60.5	* 54.8	42.1	43.2	* 28.9	.08	.03
7	.03	* 9.26	* 44.9	* 40.2	46.7	60.8	* 52.3	39.0	42.9	27.9	.08	.03
8	.03	9.80	44.9	* 43.6	44.4	61.9	50.3	* 44.3	* 42.6	27.7	.08	.03
9	.03	9.71	44.9	39.7	* 42.0	68.5	47.3	47.4	42.2	* 31.5	.08	.03
10	.03	* 9.20	* 47.6	* 37.6	42.3	* 62.8	44.8	49.4	41.9	37.8	.06	.03
11	.03	8.98	50.4	38.4	* 45.3	* 51.1	* 59.2	* 41.8	37.5	.06	.03	
12	.03	8.78	50.4	38.7	* 45.2	* 42.1	65.7	* 41.8	* 32.0	.06	.03	
13	.03	9.20	* 50.6	38.3	47.9	43.4	54.1	60.0	41.7	16.8	.06	.03
14	.03	9.32	50.9	* 41.0	47.7	43.3	* 65.1	* 50.3	34.4	.85	.06	.03
15	.03	9.46	50.9	42.8	* 42.9	47.1	74.7	* 40.2	.23	.06	.03	
16	3.09	9.32	51.9	42.5	38.4	* 58.8	72.2	45.6	* 41.6	.23	.06	.03
17	*	7.02	* 15.1	* 52.8	* 38.3	38.4	* 68.6	45.6	* 46.6	.23	.03	.03
18	7.48	20.1	52.8	33.8	38.5	66.6	68.1	* 51.9	* 41.8	.14	.03	.03
19	7.45	* 21.9	52.8	34.0	* 40.6	66.8	67.2	56.9	34.7	.11	.03	.03
20	*	7.84	* 21.5	* 53.0	34.0	43.2	* 64.3	67.3	56.5	33.3	.06	.03
21	8.30	20.3	52.7	* 39.2	43.6	62.6	* 70.0	* 57.9	32.9	.08	.03	.03
22	*	8.33	20.4	55.8	45.1	40.8	62.6	72.4	59.1	* 35.7	.06	.03
23	8.38	20.5	* 58.0	45.5	* 37.2	* 66.9	65.8	59.1	38.2	.06	.03	.03
24	8.44	24.0	* 62.0	* 44.5	37.1	72.2	* 54.7	58.9	37.9	.03	.03	.03
25	8.47	* 26.6	65.4	* 41.4	37.2	72.2	* 47.7	* 62.6	* 34.4	.03	.03	.03
26	8.61	26.8	60.4	41.0	* 42.4	* 76.8	45.2	65.5	31.7	.14	.03	.03
27	8.69	* 27.3	* 53.3	39.4	47.7	81.8	42.6	65.5	31.8	.20	.03	.03
28	8.69	28.8	50.0	* 39.6	50.6	81.5	* 46.7	61.5	32.0	.20	.03	.03
29	*	8.69	50.0	40.8	* 54.4	81.2	51.7	* 58.1	* 35.8	.20	.03	.03
30	8.69	49.8	38.9	54.9	79.2	51.7	58.1	39.0	.20	.03	.03	
31	8.69	* 49.2			54.8	* 54.7	58.1			.20		
Sum		405.78		1,210.2		1,893.9		1,676.7		404.85		0.93
	127.31	1,511.6		1,314.1		1,802.0		1,197.4		1.74		

Current Year 1998 Period 1938-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second		Average	Volume-Thousand Cubic Meters					
	High	Low	Day	Φ High	Day	Total	Average	Maximum	Minimum		
Jan.			!27	8.69	! 1	0.03	4.11	11,000	5,559	146,403	23.7
Feb.			28	28.8	5	4.28	14.5	35,059	17,764	138,207	14.4
Mar.			25	65.4	! 1	29.8	48.8	130,602	113,029	200,839	30,675
April			1	48.9	18	33.8	40.3	104,561	100,969	261,905	31,417
May			30	54.9	! 3	30.8	42.4	113,538	101,700	508,691	92.8
June			27	81.8	12	42.1	63.1	163,633	136,844	436,371	31,193
July			15	74.7	27	42.6	58.1	155,693	144,729	309,079	34,748
Aug.			12	65.7	7	39.0	54.1	144,867	128,133	220,412	25,320
Sept.			1	52.7	26	31.7	39.9	103,455	66,387	223,812	8,335
Oct.			1	39.2	124	.03	13.1	34,979	12,111	151,369	19.1
Nov.			1	.20	117	.03	.06	150	3,672	101,642	8.8
Dec.			! 1	.03	! 1	.03	.03	80.4	5,013	180,557	7.5
Yearly				81.8		0.03	31.6	997,617	835,890	2,215,231	254,198

* Discharge measurement made on this day

Φ Mean daily

! And other days

08-3640.00 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 kilometer 2,021; 8.9 river kilometers upstream from the Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua and 2.7 kilometers upstream from the American Dam at El Paso, Texas. Medium to high flow measurements are made from a cableway located about 60 meters upstream from the bridge. The zero of the gage is 1,134.56 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 23 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1998.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 680 CMS 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 382 CMS on September 3, 1925.

Average Flow in Cubic Meters per Second

Daily	Max.	671	June 12, 1905	Min.	0	Occasionally
Monthly	Max.	405	June 1905	Min.	0	Occasionally
Yearly	Max.	78.7	1905	Min.	1.99	1902

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.86	9.93	13.5	20.8	21.2	26.0	38.3	29.8	31.5	18.4	8.27	* 4.64
2	3.82	* 9.93	17.9	19.3	21.7	* 25.4	43.2	35.8	30.7	15.3	* 8.43	4.60
3	3.82	10.1	* 19.5	17.3	19.2	25.7	48.2	* 37.4	27.1	16.8	7.66	4.69
4	3.85	10.2	18.1	18.4	16.9	26.4	35.3	31.7	24.4	19.6	7.40	4.70
5	4.21	10.0	16.2	18.9	15.1	26.7	30.7	32.0	* 20.0	7.27	4.67	
6	4.09	7.91	14.3	17.8	14.8	30.2	35.1	32.6	27.7	20.4	7.03	4.51
7	3.87	6.63	15.6	* 19.5	14.9	34.7	* 33.8	28.6	27.8	18.8	6.95	4.31
8	3.75	6.19	18.7	17.3	17.7	34.6	36.2	26.4	28.1	14.0	6.44	4.10
9	3.60	6.32	24.2	18.8	17.9	34.2	32.1	25.1	* 25.4	10.1	6.15	4.01
10	3.45	8.08	25.1	23.7	19.6	36.1	30.1	30.0	21.7	9.37	5.82	4.00
11	3.23	8.21	22.3	20.4	20.6	40.0	29.8	30.3	18.8	9.84	5.82	3.79
12	3.10	8.69	23.6	21.9	* 19.9	* 32.7	27.6	30.3	19.0	14.6	5.84	3.76
13	3.07	6.97	23.5	24.2	18.5	23.8	35.2	33.4	18.7	13.0	5.73	3.68
14	2.96	6.47	23.6	24.6	17.0	19.8	34.2	* 52.1	20.1	13.8	5.64	3.62
15	2.83	6.49	25.8	21.8	15.6	20.8	31.4	34.7	21.0	14.8	5.68	* 3.64
16	2.87	* 6.62	28.6	19.1	18.9	21.1	34.9	31.7	18.6	15.5	5.48	3.55
17	2.70	* 7.14	27.8	19.4	22.6	21.1	35.9	28.7	16.1	12.2	5.36	3.76
18	2.61	7.63	26.0	19.8	18.4	24.0	33.4	27.3	14.4	10.5	5.32	4.01
19	2.52	7.64	25.1	20.8	18.2	26.3	33.7	25.8	22.0	9.76	5.25	3.90
20	6.88	9.43	24.9	19.0	17.2	25.8	38.0	31.9	24.0	10.6	5.14	3.74
21	8.86	10.1	23.6	* 17.7	15.4	27.7	* 34.8	26.5	20.7	10.4	4.99	3.71
22	9.16	10.1	23.7	16.9	15.3	28.6	35.2	25.9	19.7	9.55	4.96	3.71
23	9.41	11.1	25.4	16.0	15.3	* 27.6	37.3	30.4	* 17.7	8.84	4.91	3.61
24	9.84	9.95	* 28.2	15.9	17.5	25.4	39.6	33.0	16.7	8.38	4.89	3.65
25	9.80	9.42	29.6	16.8	19.3	25.6	50.2	31.5	17.3	7.98	4.75	3.55
26	9.69	8.92	28.5	18.2	17.9	25.8	39.0	32.2	17.8	* 7.68	4.71	3.57
27	9.63	10.3	26.7	19.7	16.3	28.3	32.3	31.5	20.4	12.8	4.63	3.51
28	* 9.62	10.4	23.2	23.2	* 16.1	33.7	31.4	31.3	19.7	11.6	4.57	3.53
29	9.62		19.5	21.3	18.0	38.0	26.4	33.4	19.4	10.9	5.07	3.55
30	9.79		16.8	20.6	19.2	39.0	28.3	34.4	17.1	11.5	4.78	3.50
31	9.82		20.1		23.1		28.1	32.2		8.97		3.51
Sum		240.87	589.1	855.1	977.9	395.97	121.08					
176.33		699.6	559.3	1,079.7	648.5	174.94						

Current Year 1998

Period 1938-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
Jan.	1.145	0.890	24	9.99	19	2.41	5.69	15,235	11,225	150,048	271
Feb.	1.175	1.015	23	11.8	9	5.50	8.60	20,811	13,265	122,304	167
Mar.	1.600	1.160	16	30.6	1	11.7	22.6	60,445	49,086	140,433	2,204
April	1.495	1.240	14	26.1	25	14.9	19.6	50,898	52,642	171,563	8,414
May	1.485	1.210	17	26.1	5	13.9	18.0	48,324	57,161	439,894	644
June	1.810	1.380	11	41.6	14	19.6	28.5	73,881	69,404	375,353	7,421
July	1.910	1.485	3	64.0	29	25.2	34.8	93,286	78,866	244,070	11,904
Aug.	2.015	1.445	14	73.9	9	22.6	31.5	84,491	72,088	194,405	6,007
Sept.	1.620	1.225	1	32.5	18	13.9	21.6	56,030	49,382	211,481	2,995
Oct.	1.400	1.075	4	22.1	26	7.46	12.8	34,212	23,121	163,710	186
Nov.	1.100	.975	2	8.76	28	4.49	5.83	15,115	12,834	124,457	282
Dec.	.990	.935	2	4.96	28	3.39	3.91	10,461	12,822	197,341	254
Yearly	2.015	0.890		73.9		2.41	17.9	563,189	501,896	1,923,317	70,867

* Discharge measurement made on this day

08-3645.00 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 recorder, 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 0.7 kilometer downstream from the headgates of the American Dam which are located at river kilometer 2,018. The zero of the gage is 1,131.45 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 14 current-meter 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 1998.

REMARKS: This canal diverts water from the Rio Grande at the American Dam at El Paso, Texas, 3.4 river kilometers upstream from the International Dam at Cd. Juarez, Chihuahua. Water from this canal discharges into the American Canal Extension and into the Franklin Canal. The transmitter relays gage height data via GOES satellite.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 52.1 CMS on March 27, 1944. Min. frequently no flow.

Average Flow in Cubic Meters per Second

Daily:	Max.	42.6	Aug. 13, 1945	Min.	0	Frequently
Monthly:	Max.	34.3	Aug. 1943	Min.	0	Frequently since 1952
Yearly:	Max.	21.2	1943	Min.	0.24	1990

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.02	0.05	11.6	16.3	17.3	19.9	27.3	23.0	25.2	* 17.3	0	0
2	.02	.05	15.8	* 14.9	18.1	19.9	* 26.6	25.5	25.0	14.5	0	0
3	.02	* .05	17.3	12.9	16.3	19.6	25.6	* 27.3	* 22.3	15.6	0	0
4	.02	.05	16.5	13.6	13.8	* 20.4	24.4	25.1	19.8	18.0	0	0
5	.02	.05	* 15.0	14.8	13.1	20.6	22.0	25.0	20.0	18.4	0	0
6	.02	.05	13.5	13.5	11.9	23.1	26.6	25.4	22.2	19.2	0	0
7	.02	.05	15.0	13.7	11.7	26.8	26.0	22.3	22.4	17.6	0	0
8	.02	.05	17.5	12.2	13.3	27.3	27.2	20.2	22.7	13.3	0	0
9	.02	.05	22.2	13.2	14.6	27.2	26.1	18.3	22.2	9.26	0	0
10	.02	.05	22.9	17.4	14.9	26.9	23.8	22.0	19.7	8.84	0	0
11	.02	.05	20.6	15.0	16.3	26.0	23.2	22.8	17.3	9.21	0	0
12	.02	.05	21.5	15.6	* 17.3	24.4	20.8	22.2	17.5	14.1	0	0
13	.02	.05	21.4	18.5	16.1	18.3	25.4	24.9	17.3	13.0	0	0
14	.02	.05	21.3	18.8	14.6	14.2	26.2	25.2	18.3	4.24	0	0
15	* .02	.05	23.0	17.0	12.9	16.0	24.8	25.5	18.9	* .27	0	0
16	.02	.05	25.7	14.7	15.4	16.4	26.0	23.5	17.1	.27	0	0
17	.02	3.52	24.1	14.6	18.7	16.3	27.4	20.9	15.0	.27	0	0
18	.02	6.81	22.0	14.8	16.2	20.6	27.3	19.5	13.4	.27	0	0
19	.03	6.48	20.7	15.3	15.6	23.1	26.4	18.3	19.6	.27	0	0
20	.03	* 8.15	19.6	13.6	15.0	21.9	28.3	22.3	21.8	.27	0	0
21	.03	8.71	19.0	12.2	13.6	24.5	26.7	19.2	19.2	0	0	0
22	.03	8.80	19.3	11.2	14.1	25.8	26.6	18.6	18.1	0	0	0
23	.03	9.71	20.1	10.5	14.0	23.7	27.4	21.6	16.3	0	0	0
24	.04	8.28	21.6	10.3	15.8	20.5	26.7	24.4	15.5	0	0	0
25	.04	7.81	23.7	10.7	17.0	20.0	26.9	23.6	15.7	0	0	0
26	* .04	7.42	23.2	10.9	15.9	19.2	27.4	23.6	15.9	0	0	0
27	* .04	8.80	21.9	12.3	14.7	23.7	25.4	22.8	18.3	0	0	0
28	.04	8.86	19.5	16.3	14.4	29.0	24.3	22.1	17.9	0	0	0
29	.04	16.0	15.1	16.5	30.1	20.3	23.9	17.6	.03	0	0	0
30	.04	13.7	16.3	17.8	29.4	21.2	25.0	15.9	* .06	0	0	0
31	.05		16.1	18.6		21.8	24.9		.03			
Sum		94.15		426.2		674.8		708.9		194.29		0.00
		0.84		601.3		475.5		786.1		568.1		0.00

Current Year 1998

Period 1939-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Low		Total	Average	Maximum	Minimum	
Jan.			31	0.05	! 1	0.02	0.03	72.6	5,300	51,241	0
Feb.	1.935		23	10.5	1	.05	3.36	8,135	9,194	62,253	0
Mar.	2.815	1.895	16	27.1	1	9.89	19.4	51,952	40,759	69,130	0
April	2.490	1.835	14	20.5	24	9.25	14.2	36,824	36,801	77,408	0
May	2.600	1.965	31	21.5	7	11.0	15.3	41,083	35,451	85,163	0
June	3.190	2.190	29	34.4	14	13.8	22.5	58,303	46,412	80,984	0
July	3.040	2.505	1	30.8	29	19.1	25.4	67,919	54,237	87,171	0
Aug.	2.950	2.380	2	28.4	9	16.7	22.9	61,249	52,408	92,064	0
Sept.	2.850	2.145	1	25.8	18	12.7	18.9	49,084	36,887	77,877	0
Oct.	2.555	1.835	4	20.1	21	0	6.27	16,787	17,792	59,131	0
Nov.			! 1	0	! 1	0	0	0	8,497	37,208	0
Dec.			! 1	0	! 1	0	0	0	7,991	55,112	0
Yearly	3.190			34.4		0	12.4	391,409	351,729	668,068	7,603

* Discharge measurement made on this day

† And other days

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

11

08-3650.00 RIO GRANDE BELOW AMERICAN DAM AT EL PASO, TEXAS
AND CD. JUAREZ, CHIHUAHUA

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the left bank of the river at latitude 31°46'35", longitude 106°31'20", and river kilometer 2,017; 2.4 river kilometers upstream from the International Dam, 5.0 river kilometers upstream from the Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua, and 1.0 river kilometer downstream from the American Dam. The zero of the gage is 1,131.51 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 65 current-meter measurements during the year, and a continuous record of gage heights. Computations by shifting control methods. Records available: June 1938 through 1998.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The operation of the American Dam began June 2, 1938. Part of the flow above the dam is diverted into the American Canal, and the remainder, including excess flood flows, passes below the dam.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 320 CMS on September 14, 1958 with a gage height of 4.42 meters. Min. occasionally no flow.

Average Flow in Cubic Meters per Second

Daily:	Max.	171	May 20, 1942		Min.	0	Occasionally
Monthly:	Max.	138	May 1942		Min.	0	Occasionally
Yearly:	Max.	42.8	1942		Min.	0.39	1956

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.86	10.5	1.02	5.29	*	2.46	*	6.26	*	9.65	6.86	3.55
2	3.88	10.2	*	1.03	5.17	2.35	6.02	11.8	9.26	3.58	.60	*
3	3.86	9.94	.97	*	5.28	2.37	5.84	14.1	9.58	3.35	.60	*
4	3.83	9.87	.96	*	5.25	2.33	5.76	8.34	*	6.72	3.24	.61
5	4.12	*	10.2	.90	5.15	2.34	*	5.92	6.47	6.69	3.26	.61
6	4.08	8.01	.88	*	5.12	2.35	6.23	*	6.68	6.47	3.20	*
7	3.81	6.66	.83	5.27	2.32	7.72	6.43	*	6.58	3.14	.58	7.49
8	3.77	6.18	.84	5.25	*	2.33	*	7.94	7.60	6.64	*	3.14
9	3.67	6.20	.89	5.34	2.39	7.01	6.57	*	6.52	2.37	.55	7.08
10	3.56	7.73	.88	*	5.37	2.39	8.70	*	6.61	6.58	1.64	.54
11	3.47	8.22	.81	5.35	*	2.42	13.6	6.53	6.40	.82	.55	7.48
12	3.46	9.28	.76	5.42	2.39	8.89	6.51	*	6.51	.63	.57	6.37
13	3.41	7.45	*	.77	*	5.39	2.34	6.64	*	8.17	.58	*
14	3.35	7.12	.84	5.17	2.35	6.99	6.90	20.9	*	.63	11.0	6.33
15	3.32	7.09	.88	5.07	*	2.38	*	6.98	6.30	10.3	.66	16.8
16	*	3.48	7.20	1.01	5.05	2.36	6.50	7.70	6.41	*	.63	17.2
17	3.46	4.09	*	2.52	*	5.05	2.28	6.60	*	7.86	6.30	*
18	3.42	1.45	3.44	5.00	2.32	6.69	6.54	6.72	*	.59	12.6	6.12
19	3.52	1.34	*	4.76	4.88	*	2.40	*	6.52	6.64	6.83	*
20	6.86	*	1.20	*	5.41	*	4.88	2.50	6.31	*	9.44	8.08
21	8.49	1.10	5.45	5.34	2.46	6.30	7.34	*	6.90	.66	11.3	5.72
22	8.65	1.03	5.53	*	5.47	*	2.47	*	6.21	7.61	6.50	*
23	8.81	1.01	*	5.50	5.31	2.40	6.20	9.40	6.77	*	9.72	5.61
24	9.14	.97	5.43	5.20	2.43	6.24	12.6	*	6.74	.61	9.05	5.57
25	9.80	.89	5.44	5.17	2.41	6.34	17.2	*	6.54	*	8.73	5.47
26	9.80	*	.85	5.34	5.11	*	2.35	*	6.32	11.4	6.68	.62
27	10.0	.93	*	5.22	*	5.16	2.25	6.60	*	6.78	6.55	.66
28	10.1	.95	5.28	5.18	2.18	8.26	6.60	*	6.59	.64	12.9	5.21
29	10.0	*	5.18	5.15	*	2.19	*	10.5	6.52	6.57	.65	11.6
30	10.2	*	5.23	*	3.04	2.28	10.7	7.18	6.36	.71	12.5	5.37
31	10.5	*	5.32	5.20	*	4.66	*	6.95	*	4.46	9.48	
Sum		147.66		153.88		216.79		227.70		216.51		133.97
	181.68		89.30		75.99		256.42		43.43		193.90	

Current Year 1998

Period 1939-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume Thousand Cubic Meters				
	High	Low	Day	High	Day	Low	Total	Average	Maximum	Minimum	
Jan.	1.990	1.715	31	10.9	18	3.09	5.86	15,697	5,965	98,781	0
Feb.	1.985	1.530	1	10.8	26	.83	5.27	12,758	3,898	60,041	0
Mar.	1.805	1.510	22	5.69	13	.67	2.88	7,716	7,846	79,572	99.8
April	1.845	1.590	29	6.12	30	1.22	5.13	13,295	15,190	91,915	2,752
May	1.850	1.645	31	6.63	18	2.07	2.45	6,566	21,027	369,945	31.1
June	2.130	1.800	11	16.0	5	5.53	7.23	18,731	22,418	308,855	0
July	2.275	1.785	25	23.0	5	6.00	8.27	22,155	24,669	191,605	1,193
Aug.	2.480	1.670	14	34.6	31	3.49	7.35	19,673	19,253	140,115	46.3
Sept.	1.800	1.455	5	6.26	13	.52	1.45	3,752	11,850	152,960	66.4
Oct.	2.425	1.445	27	31.9	10	.53	6.98	18,706	5,105	104,679	22.2
Nov.	1.935	1.790	2	9.85	26	5.00	6.46	16,753	4,266	87,256	0
Dec.	1.820	1.740	2	5.42	27	3.73	4.32	11,575	4,768	142,194	0
Yearly	2.480	1.445		34.6		0.52	5.31	167,377	146,255	1,349,111	12,337

* Discharge measurement made on this day

08-3655.00 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 Cd. Juarez, Chihuahua, (latitude 31°45'40", longitude 106°30'30"), about 80 meters downstream from the canal intake at the International Dam at Cd. Juarez, Chihuahua, which is located at river kilometer 2,015 and 3.4 river kilometers downstream from the American Dam at El Paso, Texas.

RECORDS: Flow records provided by Mexican Section. Records available: 1938 through 1998. These records, showing the water 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 the 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" on the preceding page of this bulletin.

REMARKS: Based on 71 current-meter measurements and a continuous record of stage.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 13.0 CMS on July 21, 1944 with a gage height of 1.83 meters. Min. no flow during several months throughout the year.

Average Flow in Cubic Meters per Second

Daily:	Max.	9.61		May 10, 1942		Min. 0		Several months each year
Monthly:	Max.	7.42		May 1942		Min. 0		Several months each year
Yearly:	Max.	3.28		1942		Min. 0.26		1964

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	* 4.91	2.02	* 5.65	* 5.90	5.85	2.81	0	0	0
2	0	0	0	* 4.89	1.89	5.47	6.06	6.01	* 3.03	0	0	0
3	0	0	0	* 4.86	1.93	* 5.51	* 6.13	* 5.80	2.81	0	0	0
4	0	0	0	* 4.86	* 1.82	5.72	5.99	5.93	* 3.27	0	0	0
5	0	0	0	4.85	1.89	* 5.86	6.06	* 5.96	3.26	0	0	0
6	0	0	0	* 4.86	* 1.98	6.17	* 6.18	5.96	3.24	0	0	0
7	0	0	0	5.07	1.96	6.36	6.21	* 5.59	* 3.52	0	0	0
8	0	0	0	* 4.98	2.05	* 6.32	* 6.23	6.08	3.29	0	0	0
9	0	0	0	5.01	2.07	6.00	6.12	6.01	* 2.13	0	0	0
10	0	0	0	5.04	2.03	* 6.21	* 6.16	* 6.01	.49	0	0	0
11	0	0	0	5.10	* 2.01	6.37	6.11	6.01	0	0	0	0
12	0	0	0	5.06	2.08	6.29	6.03	* 6.03	0	0	0	0
13	0	0	0	* 5.18	* 2.07	6.40	6.46	5.82	0	0	0	0
14	0	0	0	4.94	2.06	6.44	6.27	* 5.83	0	0	0	0
15	0	0	0	* 4.89	* 2.08	* 6.25	5.99	5.38	0	0	0	0
16	0	0	0	4.90	2.07	5.90	6.21	5.76	0	0	0	0
17	0	0	* 2.06	* 4.98	2.10	6.01	6.23	* 5.74	0	0	0	0
18	0	0	* 3.21	5.00	* 2.19	6.04	6.23	5.83	0	0	0	0
19	0	0	* 4.23	5.00	2.28	* 5.87	6.25	* 5.81	0	0	0	0
20	0	0	* 4.92	* 4.90	* 2.27	5.74	* 6.43	5.78	0	0	0	0
21	0	0	4.88	4.96	2.25	5.87	6.07	* 5.51	0	0	0	0
22	0	0	4.97	4.98	* 2.22	* 5.99	* 6.24	6.08	0	0	0	0
23	0	0	* 4.96	* 4.81	2.18	6.18	6.14	6.06	0	0	0	0
24	0	0	4.97	4.80	2.21	* 6.15	* 6.30	* 6.02	0	0	0	0
25	0	0	* 4.98	* 4.82	* 2.22	6.17	6.17	5.92	0	0	0	0
26	0	0	4.94	4.83	2.17	* 6.12	6.11	* 6.20	0	0	0	0
27	0	0	* 4.93	* 4.87	* 2.11	6.14	* 6.33	6.04	0	0	0	0
28	0	0	5.03	4.99	2.11	6.24	6.35	* 5.90	0	0	0	0
29	0	0	4.98	4.92	* 2.14	* 6.42	* 6.40	6.23	0	0	0	0
30	0	0	* 5.01	* 3.26	2.08	6.41	6.26	5.99	0	0	0	0
31	0	0	5.16	4.17			* 6.26	* 4.17	0	0	0	0

Sum 0 146.52 182.27 181.31 0 0 0

0 69.23 66.71 191.88 27.65 0 0

Current Year 1998

Period 1938-1998

Month	Extreme Gage Meters			Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0	0	! 1	0	! 1	0	0	0	41.0	2,504	0
Feb.	0	0	! 1	0	! 1	0	0	0	152	9,264	0
Mar.	1.420	0	31	5.20	! 1	0	2.23	5,981	2,411	9,807	0
April	1.500	.620	13	5.29	30	1.66	4.88	12,659	10,493	15,274	0
May	1.570	.680	31	5.77	4	1.69	2.15	5,764	10,607	19,869	0
June	1.840	1.490	11	6.86	2	5.35	6.08	15,748	11,102	19,360	0
July	1.840	1.530	28	6.76	1	5.14	6.19	16,578	11,461	18,714	0
Aug.	1.850	.710	19	6.37	21	1.47	5.85	15,665	11,069	15,665	0
Sept.	1.340	0	4	3.47	! 10	0	.92	2,389	5,261	15,269	0
Oct.	0	0	! 1	0	! 1	0	0	0	59.8	1,743	0
Nov.	0	0	! 1	0	! 1	0	0	0	0	0	0
Dec.	0	0	! 1	0	! 1	0	0	0	0	0	0
Yearly	1.850	0		6.86		0	2.37	74,784	62,657	103,511	8,207

* Discharge measurement made on this day

! And other days

08-3705.00 RIO GRANDE AT FORT QUITMAN, TEXAS
NEAR COLONIA LUIS LEON, CHIHUAHUA

DESCRIPTION: Cableway, bubbler gage, 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 kilometer 1,888; 2.4 river kilometers downstream from Old Fort Quitman, 14.5 kilometers southeast of Esperanza, Texas, and 28.2 kilometers southeast of McNary, Texas. The zero of the gage is 1,052.35 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 26 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1998.

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

EXTREME FLOWS FROM RECORDS:** Momentary: Max. 300 CMS October 5, 1946 with a gage height of 3.05 meters. Min. frequently no flow.

				Average Flow in Cubic Meters per Second**											
Daily:	Max.	167		May 19, 1942			Min. 0						Frequently		
Monthly:	Max.	142		May 1942			Min. 0						Several months since 1951		
Yearly:	Max.	49.8		1942			Min. 0.07						1965		

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	7.95	8.26	3.86	* 3.14	4.35	3.02	2.11	5.25	* 4.64	7.82	25.7	9.30	
2	7.81	9.55	4.45	2.78	3.88	3.34	2.36	6.78	3.43	* 9.03	19.6	* 9.08	
3	7.86	9.65	4.83	2.61	4.44	* 2.81	2.36	4.83	3.36	10.2	15.6	8.68	
4	7.95	* 10.2	* 4.63	2.61	6.33	2.88	3.17	6.52	3.07	7.90	* 14.3	9.05	
5	7.87	8.59	4.01	3.31	6.69	2.66	4.56	* 6.28	3.40	7.74	13.2	10.4	
6	8.39	9.35	4.12	3.70	4.41	2.38	4.75	4.36	3.19	12.3	14.5	10.6	
7	8.45	10.4	3.63	3.16	3.48	2.85	3.69	3.63	4.03	17.2	14.1	9.97	
8	7.82	8.79	3.09	2.81	3.01	2.94	3.10	3.32	5.46	15.7	13.7	8.94	
9	7.62	8.18	3.69	2.80	2.93	3.46	4.47	4.10	3.51	16.4	11.7	9.25	
10	7.48	7.78	3.61	3.30	3.50	3.31	4.88	3.92	3.66	13.9	8.46	9.00	
11	7.56	8.06	3.37	3.52	3.87	3.66	4.51	3.58	3.45	11.7	8.68	8.65	
12	7.47	9.34	3.26	4.69	4.72	4.60	3.29	3.40	3.67	12.4	8.87	8.76	
13	7.30	9.47	3.25	4.06	4.65	6.15	3.12	3.00	2.90	10.9	9.45	8.49	
14	6.62	8.39	3.44	3.77	4.95	5.47	3.39	5.09	2.90	* 10.7	10.3	8.55	
15	6.52	7.55	3.13	* 3.70	4.03	4.39	* 2.79	3.17	2.62	13.5	11.4	8.38	
16	6.28	6.14	3.41	4.59	3.90	3.45	2.98	6.35	3.06	16.6	10.7	* 8.59	
17	6.30	4.98	3.44	4.82	4.03	* 3.07	2.81	8.60	3.12	22.1	* 12.2	8.94	
18	6.28	* 4.86	* 3.83	4.54	4.12	2.55	3.28	7.62	* 3.23	26.1	9.74	9.38	
19	6.21	3.91	3.94	4.29	5.36	2.46	4.79	4.49	3.05	28.1	10.0	9.49	
20	5.65	3.81	2.94	4.17	* 4.82	2.40	3.65	4.74	4.25	24.3	10.1	9.08	
21	5.82	3.79	2.92	4.93	4.47	2.22	2.81	3.78	7.72	22.2	9.14	9.09	
22	9.14	3.64	3.10	3.92	6.36	2.24	4.01	3.54	8.86	30.7	9.02	9.80	
23	* 10.8	4.20	3.13	3.56	6.45	2.25	4.06	3.51	7.64	34.5	8.55	10.4	
24	10.0	3.83	3.37	3.20	6.16	2.17	4.53	3.66	8.17	27.5	8.00	10.2	
25	10.6	3.68	3.04	3.11	5.23	2.41	4.10	3.54	6.95	22.6	8.75	9.31	
26	11.2	3.45	2.94	3.51	4.49	2.43	4.38	* 3.14	7.89	18.9	10.6	9.48	
27	7.86	3.25	3.12	4.24	* 3.19	2.19	8.71	2.80	6.80	19.3	9.82	9.58	
28	6.78	3.49	3.35	3.84	2.77	2.23	9.72	5.30	6.13	* 28.3	9.32	9.56	
29	8.28	3.44	* 3.49	3.22	2.18	* 6.44	5.35	9.60	15.5	9.84	7.79		
30	9.21	3.50	3.52	3.72	* 2.19	4.40	4.25	7.85	22.7	9.83	7.80		
31	7.58	3.75	3.45				4.09	4.30	33.0			7.36	
Sum		186.39		109.69		90.36		142.20		569.79		282.95	
	242.66		109.59		136.98		127.31		147.61		345.17		

Current Year 1998

Period 1938-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Low		Total	Average	Maximum	Minimum	
Jan.	1.680	1.430	26	12.0	20	5.29	7.83	20,966	11,205	96,674	0
Feb.	1.660	1.350	7	12.3	27	3.02	6.66	16,104	8,730	68,720	0
Mar.	1.525	1.330	3	6.36	21	2.58	3.54	9,469	8,078	72,889	0
April	1.520	1.330	16	6.05	2	2.53	3.66	9,477	10,284	94,942	0
May	1.570	1.310	22	7.48	28	2.50	4.42	11,835	15,867	381,665	0
June	1.575	1.270	13	7.86	6	2.10	3.01	7,807	13,984	295,595	0
July	1.670	1.270	28	10.6	1	1.89	4.11	11,000	19,751	173,266	4.7
Aug.	1.810	1.345	14	14.1	27	2.54	4.59	12,286	18,513	158,563	20.6
Sept.	1.730	1.335	22	11.2	15	2.34	4.92	12,754	21,653	181,266	0
Oct.	2.400	1.565	19	54.6	2	6.92	18.4	49,230	20,903	114,377	0
Nov.	2.050	1.555	1	30.9	10	7.00	11.5	29,823	14,206	106,523	0
Dec.	1.775	1.470	1	14.6	29	6.64	9.13	24,447	14,565	152,593	0
Yearly	2.400	1.270		54.6		1.89	6.82	215,198	177,719	1,569,390	2,050

* Discharge measurement made on this day

08-3712.00 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 Diversión Dam, latitude 30°10'30", longitude 104°41'10" and river kilometer 1,672, 0.5 river kilometer upstream from Capote Creek and about 4.0 kilometers north of Candelaria, Presidio County, Texas and San Antonio, Chihuahua. The zero of the gage is 871.11 meters above mean sea level, U.S.C.&G. S. datum.

RECORDS: Based on 24 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: November 19, 1975 through 1998.

REMARKS: Reservoirs, diversions, and drainage returns modify the flow at this station. Prior to June 1979 the zero of the gage was 871.07 meters above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 561 CMS on September 30, 1978 with a gage height of 3.31 meters. Min. frequently no flow.

Average Flow in Cubic Meters per Second**

Daily:	Max.	222	Dec. 23, 1986	Min.	0	Frequently
Monthly:	Max.	72.2	Dec. 1986	Min.	0	Frequently
Yearly:	Max.	37.7	1987	Min.	0.59	1977

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.08	7.09	4.06	2.75	2.92	1.24	0.39	3.45	8.42	3.34	8.66	8.40
2	9.04	7.25	3.71	* 2.71	2.69	* 1.32	8.98	2.43	3.28	5.48	9.65	* 8.45
3	9.05	* 7.31	* 3.50	2.76	2.54	1.37	.53	1.72	* 2.07	4.96	* 11.2	8.21
4	9.06	7.28	3.58	2.79	2.61	.98	.34	* 5.23	2.18	4.83	12.4	8.28
5	9.05	7.46	3.70	2.78	* 2.57	.86	.47	2.75	1.95	* 4.75	13.3	8.09
6	* 9.03	7.65	3.83	2.73	2.50	1.10	.34	4.30	1.11	5.13	13.6	6.76
7	8.87	7.82	3.87	2.68	2.86	.92	.40	1.23	.99	5.43	13.6	6.33
8	8.71	7.92	3.73	2.76	3.17	.85	* .53	1.80	.91	5.11	13.4	6.75
9	8.56	7.90	3.57	3.01	2.92	.79	.71	1.36	.87	5.27	13.1	8.06
10	8.44	8.06	3.54	3.04	2.45	.74	.80	.96	.92	6.09	12.7	9.63
11	8.28	8.25	3.31	2.88	2.18	6.52	1.46	.93	2.09	6.88	11.8	10.1
12	8.04	8.17	3.26	2.78	1.98	.85	.48	1.28	2.91	7.20	11.2	8.25
13	7.76	8.10	3.35	2.91	1.96	.98	.60	.94	1.56	7.52	11.0	7.75
14	7.57	8.09	3.27	3.02	2.08	.96	.72	4.44	* 1.39	7.47	10.4	* 7.88
15	7.42	8.39	3.27	3.30	2.27	.99	.75	2.68	1.17	6.96	9.62	7.50
16	7.18	8.64	* 3.22	3.45	2.41	* 1.94	2.39	.92	1.29	6.70	* 9.54	7.18
17	7.00	* 8.81	3.21	3.30	2.37	3.15	.76	2.40	.77	6.28	9.04	7.03
18	6.70	8.46	3.14	3.27	* 2.38	2.10	.53	2.40	.72	6.46	9.16	6.46
19	6.45	7.90	3.13	3.36	2.07	1.32	.46	8.47	.98	* 8.86	9.45	5.77
20	* 6.27	7.12	3.15	* 3.70	2.03	.91	.40	9.48	.72	7.87	9.87	5.85
21	6.25	6.62	3.18	3.54	1.98	.81	.38	15.2	.75	14.1	9.97	6.19
22	6.23	6.16	3.36	3.43	2.17	.68	1.40	8.69	.98	16.7	10.0	6.81
23	6.20	5.64	3.11	3.35	2.35	.67	* 4.02	3.29	1.11	14.5	9.31	7.65
24	6.20	5.39	2.95	3.43	2.28	.59	1.81	2.15	1.41	12.8	9.11	7.58
25	6.59	5.08	2.91	3.32	2.35	.52	1.50	1.60	2.96	11.0	8.78	7.30
26	7.00	4.90	2.90	3.05	2.58	.46	.84	* 8.04	3.66	9.43	7.57	7.23
27	7.29	4.62	2.89	2.87	2.58	.52	1.46	32.3	4.06	8.98	7.06	7.22
28	7.44	4.34	2.84	2.71	2.40	.44	.81	14.4	4.18	8.83	6.42	6.99
29	7.54		2.75	2.60	2.21	.35	.84	16.4	4.03	8.93	6.61	6.88
30	7.60		2.70	1.87		.35	1.62	9.66	3.97	8.74	7.70	6.88
31	7.15		2.67		1.50		4.33	18.9		8.61		6.95
Sum		200.42		91.02		35.28		189.80		243.21		230.41
	237.05		101.66		73.21		41.05		63.41		305.22	

Current Year 1998

Month	Extreme Gage Meters			Extreme-Cubic Meters per Second			Total	Period 1975-1998		
	High		Low	Day	Day	Low		Average	Maximum	Minimum
	High	Low	Day	Day	Day	Day				
Jan.	1,930	1,845	1	9.12	24	6.16	7.65	20,481	20,517	183,420
Feb.	1,915	1,815	17	8.86	28	4.21	7.16	17,316	15,058	122,892
Mar.	1,835	1,770	1	4.21	31	2.65	3.28	8,783	12,965	101,919
April	1,800	1,735	20	3.78	29	2.58	3.03	7,864	13,488	91,771
May	1,805	1,690	8	3.20	31	1.36	2.36	6,325	16,361	169,009
June	1,895	1,555	11	16.3	29	.29	1.18	3,048	18,527	186,724
July	2,195	1,565	2	37.3	4	.30	1.32	3,547	24,783	148,433
Aug.	2,460	1,695	26	69.6	11	.81	6.12	16,399	25,571	88,466
Sept.	1,925	1,695	1	14.2	18	.68	2.11	5,479	31,705	166,806
Oct.	2,060	1,855	22	17.7	2	3.04	7.85	21,013	31,293	125,676
Nov.	2,010	1,925	16	13.7	28	6.42	10.2	26,371	22,598	132,602
Dec.	1,955	1,905	11	10.5	20	5.50	7.43	19,907	21,984	187,408
Yearly	2,460	1,555		69.6		0.29	4.96	156,533	254,850	1,191,590
										18,685

* Discharge measurement made on this day

† And other days

08-3715.00 RIO GRANDE ABOVE RIO CONCHOS NEAR PRESIDIO, TEXAS
AND OJINAGA, CHIHUAHUA

DESCRIPTION: Cableway, bubbler gage, and water-stage recorder (graphic and digital) and data collection platform located on the left bank at (latitude 29°36'15", longitude 104°27'05", and river kilometer 1,551; 8.0 river kilometers upstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua and 3.8 river kilometers upstream from the confluence with the Rio Conchos. The zero of the gage is 784.29 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 26 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1998.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The data collection platform is operated in cooperation with the National Weather Service, and relays gage height data upon interrogation by telephone via commercial circuits. Prior to 1978 the zero of the gage was 785.37 meters above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 396 CMS on June 14, 1905. Highest flow recorded since 1924 was 146 CMS, with a gage height of 3.22 meters, on May 26, 1942. Min. frequently no flow.

Average Flow in Cubic Meters per Second**

Daily:	Max.	388	June 13 & 14, 1905	Min.	0	Frequently
Monthly:	Max.	287	June 1905	Min.	0	Frequently
Yearly:	Max.	55.8	1907	Min.	0.04	1964

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.98	6.63	3.86	2.36	2.10	2.13	0.93	1.67	4.56	1.96	8.67	6.80
2	8.86	6.45	3.74	* 2.41	2.19	* 1.20	.87	2.27	5.17	2.10	8.26	* 7.00
3	8.64	* 6.29	* 3.57	2.58	2.64	1.15	1.99	* 2.48	* 3.47	2.01	* 8.30	7.01
4	8.62	6.51	3.43	2.58	2.67	.82	3.67	* 2.54	2.62	2.51	8.97	6.94
5	8.67	6.58	3.41	2.58	* 2.38	.77	1.95	13.9	2.32	* 2.71	9.77	6.82
6	* 8.44	6.33	3.52	2.57	2.25	1.15	1.60	5.40	2.13	2.82	9.35	6.82
7	8.21	6.46	3.74	2.54	2.12	1.07	.88	4.05	1.85	3.12	9.47	6.74
8	8.00	6.71	3.93	2.32	2.01	1.04	* .78	3.75	1.45	3.36	9.46	6.33
9	7.97	7.09	3.89	2.25	2.52	1.01	.46	3.17	1.56	3.52	9.58	6.41
10	8.01	6.89	3.80	2.25	2.83	1.00	.28	3.41	1.82	3.56	* 9.28	6.60
11	7.92	6.61	3.66	2.26	2.71	.85	.24	2.43	1.23	3.67	8.94	7.05
12	7.91	6.75	3.38	2.27	1.97	.44	.80	1.92	1.33	3.92	9.07	7.51
13	7.63	6.88	3.14	2.27	1.62	.94	1.06	1.96	1.69	4.09	8.69	7.87
14	7.36	6.60	3.06	2.27	1.42	1.35	1.04	2.38	* 2.20	3.98	8.78	7.62
15	7.16	6.45	3.21	2.30	1.25	.93	.98	2.70	1.81	4.23	8.98	7.33
16	6.94	6.21	* 3.13	2.34	1.46	* .62	.70	3.06	1.64	4.45	8.73	7.10
17	7.01	* 6.55	3.09	2.62	1.51	.45	.39	2.49	1.15	4.60	8.04	6.93
18	6.86	6.94	3.00	2.80	* 1.80	.40	.57	2.07	1.27	4.50	7.82	6.85
19	6.64	7.20	2.98	2.84	1.78	.75	.58	2.69	1.14	* 4.46	7.87	6.58
20	* 6.05	6.95	* 2.93	* 2.88	1.82	1.17	.53	3.62	1.14	6.38	7.93	6.68
21	5.55	6.35	2.97	2.85	1.72	1.15	.52	4.32	1.09	* 21.9	7.91	* 6.55
22	5.67	5.72	3.12	2.88	1.54	.86	.49	4.64	1.01	12.5	7.74	6.59
23	5.67	5.05	3.17	2.93	1.71	.45	* .32	5.79	.86	9.74	7.75	6.65
24	5.35	4.38	3.34	2.99	1.86	.48	.40	4.33	.62	9.34	7.76	7.06
25	5.16	4.02	3.19	3.00	2.32	.45	1.50	3.03	1.20	9.99	7.91	7.28
26	5.06	4.12	3.05	3.10	2.13	.37	2.73	* 2.47	1.23	9.71	7.88	7.21
27	5.63	4.04	2.91	3.17	1.79	.31	1.89	2.31	3.14	9.26	7.72	7.03
28	6.39	3.97	2.74	3.15	2.08	.19	1.30	4.14	1.94	8.81	7.58	6.75
29	7.03		2.79	2.76	2.58	.14	1.21	5.96	1.81	8.82	7.33	6.77
30	6.97		2.76	2.57	2.23	.45	1.10	9.74	1.89	8.57	6.92	6.90
31	6.80		2.46		2.32		.95	6.71		8.61		6.81
Sum		170.73		78.69		24.09		121.40		189.20		214.59
	221.16		100.97		63.33		32.71		56.34		252.46	

Current Year 1998

Period 1938-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Low		Total	Average	Maximum	Minimum	
Jan.	0.775	0.570	1	9.17	25	4.98	7.13	19,108	11,991	183,346	0
Feb.	.685	.500	18	7.31	27	3.86	6.10	14,751	9,240	119,491	0
Mar.	.515	.395	1	4.06	31	2.31	3.26	8,724	7,255	91,778	0
April	.465	.365	30	3.21	30	1.98	2.62	6,799	6,619	87,920	0
May	.485	.285	10	3.46	15	1.15	2.04	5,472	12,007	295,521	0
June	.420	.105	1	2.42	128	.14	.80	2,081	13,273	267,019	0
July	.570	.125	26	4.66	11	.21	1.06	2,826	17,547	191,983	0
Aug.	1.385	.290	5	26.5	1	1.26	3.92	10,489	18,493	164,116	0
Sept.	.660	.200	27	6.33	124	.57	1.88	4,868	21,558	185,694	0
Oct.	1.430	.365	21	29.1	1	1.88	6.10	16,347	21,726	129,311	0
Nov.	.860	.680	5	11.0	30	6.78	8.42	21,813	12,273	125,343	0
Dec.	.735	.640	13	7.93	8	6.08	6.92	18,541	12,495	167,944	0
Yearly	1.430	0.105		29.1		0.14	4.18	131,819	164,477	1,450,617	1,174

* Discharge measurement made on this day ! And other days

** Period June 1900-March 1914; September 1919-March 1920; and 1924-1998

08-3730.00 RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

DESCRIPTION: Cableway, gravity well, and water-stage recorder located on the right bank at latitude 29°34'55", longitude 104°25'52", 1.0 river kilometer from the confluence with the Rio Grande, 4.0 kilometers northwest of Ojinaga, Chihuahua, and 6.0 kilometers northwest of Presidio, Texas. This stream enters the Rio Grande at river kilometer 1,547, 18.7 river kilometers upstream from the "Rio Grande below Rio Conchos" Gaging Station. The zero of the gage is 780.40 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 285 discharge measurements during the year, 271 by the Mexican Section and 14 by the United States Section. Records available: 1896 through 1998. Prior to April 4, 1954, 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, and Luis L. Leon Reservoir are located 405, 393, and 183 river kilometers, respectively, upstream from this station. Francisco I. Madero Reservoir is located on the Rio San Pedro, a tributary which enters the Rio Conchos 283 river kilometers upstream from this station. Power generation facilities: La Boquilla 14,647 kw., La Colina 3,620 kw., Francisco I. Madero and Luis L. Leon, none. The station was relocated on January 20, 1978 incident to the Rio Grande channel rectification in the Presidio-Ojinaga area.

EXTREME FLOWS FROM RECORDS: Momentary: Max. (period 1968-1997) 2,020 CMS, on September 30, 1978. The greatest recorded flow occurred September 11, 1904 with a peak flow estimated at 4,590 CMS. Min. 0.09 CMS on June 11, 1996.

Daily:	Max.	Average Flow in Cubic Meters per Second**									
		Oct. 1, 1978			Min. 0.09			June 11, 1996			
		Monthly:	Max. 496	Sept. 1991	Min. 0.39	May 1996	Yearly:	Max. 83.6	1991	Min. 2.38	1995

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.65	* 1.25	* 1.31	* 1.22	* 2.21	* 5.37	* 15.8	1.10	4.92	* 1.55	3.18	* 1.15
2	1.66	* 1.14	* 1.31	* 1.29	* 2.19	* 5.23	* 3.49	.82	2.84	* 1.44	3.25	* 1.16
3	1.65	* 1.09	* 1.29	* 1.27	* 2.11	* 4.27	* 13.6	.66	* 2.85	1.52	* 1.29	.96
4	1.54	* 1.10	* 1.33	* 1.31	* 2.89	* 4.61	* 10.0	.31	* 2.49	1.24	* 1.08	* 1.00
5	* 1.48	1.10	* 1.40	* 1.31	* 2.46	* 4.01	* 6.89	28.2	2.18	* 1.22	2.38	1.14
6	* 1.51	* 1.08	* 1.31	* 1.35	* 2.15	* 4.60	* 13.3	* 18.1	2.22	* 1.10	1.54	1.12
7	* 1.47	* 1.08	* 1.01	* 1.32	* 1.87	* 4.14	* 3.72	10.5	* 1.86	* 1.05	1.45	* 1.27
8	* 1.60	* .97	* .94	* 1.47	1.70	* 4.75	* 2.74	5.07	* 1.94	* 1.08	1.47	* 1.07
9	* 1.57	* .97	* .70	* 1.49	* 1.59	* 4.71	* 2.57	3.79	* 1.60	* 1.09	* 1.41	* 1.21
10	* 1.59	* .94	* .68	* 1.49	* 2.35	* 4.37	* 2.02	* 3.04	* 1.39	* 1.09	* 1.42	* 1.25
11	* 1.45	* .90	* .72	* 1.51	* 3.36	* 3.86	* 1.98	* 3.71	* 1.62	1.11	* 1.39	* 1.27
12	* 1.40	* .87	* .65	* 1.50	* 3.71	* 3.58	* 1.80	* 3.77	1.26	* 1.11	1.46	1.41
13	* 1.42	* .95	* .62	* 1.50	* 3.27	* 3.16	* 1.80	* 3.03	.83	* 1.08	* 1.40	1.44
14	* 1.40	* 1.08	* .94	* 1.60	* 3.25	* 3.72	* 1.66	* 2.42	* .36	* 1.15	1.34	* 1.47
15	* 1.36	* 1.36	* 1.01	* 1.58	* 2.97	* 4.65	* 1.70	25.2	* .65	* 1.04	1.44	* 1.86
16	* 1.39	* 1.44	* 1.35	* 1.62	* 2.55	* 4.06	* 1.77	11.9	.88	* 1.09	* 1.38	* 1.84
17	* 1.39	* 1.60	* 1.35	* 1.74	* 2.75	* 3.31	* 1.60	5.64	* 1.61	.95	1.16	* 1.76
18	* 1.39	* 1.27	* 1.47	* 1.74	* 3.03	* 2.70	1.62	7.60	* 1.45	.98	* 1.03	* 1.57
19	* 1.42	* 1.12	* 1.56	* .81	* 3.84	* 2.32	1.62	30.6	1.67	* .86	* 1.01	1.72
20	* 1.38	* 1.14	* 1.70	* 1.86	* 2.47	* 2.17	* 2.31	19.4	1.67	* .90	1.36	* 1.87
21	* 1.50	* 1.14	* 1.47	* 1.98	* 4.63	* 2.17	* 2.75	7.80	* 1.73	* 56.3	1.38	* 1.95
22	* 1.49	* 1.14	* 1.47	* 2.01	* 3.93	* 2.02	* 4.82	15.5	* 1.79	* 7.23	1.31	1.75
23	* 1.40	* 1.01	* 1.43	* 2.01	* 3.75	* 1.97	* 2.81	8.26	* 1.94	* 11.6	* 1.22	1.67
24	* 1.40	* 1.27	* 1.42	* 2.30	* 3.81	* 1.86	* 7.94	6.19	* 1.94	5.07	* 1.30	1.61
25	* 1.19	* 1.29	* 1.37	* 2.44	* 4.67	* 1.84	* 5.32	5.36	1.53	2.82	* 1.25	3.33
26	* 1.19	* 1.42	* 1.35	* 2.82	* 4.74	* 1.72	5.11	4.38	1.44	4.25	* 1.37	3.00
27	* 1.22	* 1.40	* 1.29	* 2.84	* 4.82	* 1.72	* 4.70	5.56	.84	* 3.36	* 1.26	2.81
28	* 1.20	* 1.31	* 1.29	* 2.82	* 4.93	* 1.72	* 3.50	7.28	* 1.96	* 2.81	* .91	2.40
29	* 1.25		* 1.27	* 2.49	* 4.08	* 1.64	* 1.98	10.8	* 1.88	2.71	1.20	1.22
30	* 1.17		* 1.24	* 2.00	* 4.61	* 10.8	* 1.86	10.3	1.82	3.01	* 1.37	1.10
31	* 1.17		* 1.20		* 5.24		* 2.50	* 3.74		2.52		1.02

Sum	32.23	52.69	107.05	270.01	124.33	49.40
43.90	37.45	103.73	135.28	52.96	44.01	

Current Year 1998 Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	Day	Day		Total	Average	Maximum	Minimum
Jan.			2	1.66	130	1.17	1,42	3,793	41,567	263,658
Feb.			16	1.44	12	.87	1.15	2,785	39,316	210,479
Mar.			20	1.70	13	.62	1.21	3,236	50,222	248,201
April			27	2.84	19	.81	1.76	4,552	45,320	110,860
May			31	5.24	9	1.59	3.35	8,962	57,946	211,231
June			30	10.8	29	1.64	3.57	9,249	69,145	361,843
July			1	15.8	17	1.60	4.36	11,688	80,177	297,613
Aug.			19	30.6	4	.31	8.71	23,329	135,190	708,584
Sept.			1	4.92	14	.36	1.77	4,576	189,186	1,285,546
Oct.			21	56.3	19	.86	4.01	10,742	121,536	809,127
Nov.			2	5.25	28	.91	1.47	5,802	44,691	169,500
Dec.			25	3.33	13	.96	1.59	4,268	29,527	81,372
Yearly				56.3		0.31	2.89	90,982	903,823	2,636,721
										75,095

* Discharge measurement made on this day \diamond Mean daily

! And other days

** Period 1968-1998

08-3740.00 ALAMITO CREEK NEAR PRESIDIO, TEXAS

DESCRIPTION: Gravity well and digital water-stage recorder located on the downstream side of the highway bridge on Farm-to-Market Road 170 at latitude 29°31'25", longitude 104°17'15", about 400 meters upstream from its confluence with the Rio Grande, and about 9.7 kilometers southeast of Presidio, Presidio County, Texas. This stream enters the Rio Grande near the lower end of the Presidio Valley at river kilometer 1,529, 13.8 river kilometers 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 771.785 meters above mean sea level U.S.C.&G.S. datum.

RECORDS: Based on 26 current-meter 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 1998.

REMARKS: A small irrigation reservoir (San Esteban) 16.9 kilometers south of Marfa, Presidio County, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. Back water 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 991 CMS.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,600 CMS, determined by slope-area calculations, on September 2, 1962, with a gage height of 4.13 meters. Min. no flow occasionally.

Average Flow in Cubic Meters per Second

Daily:	Max.	351	Sept. 21, 1974	Min.	0	Occasionally
Monthly:	Max.	28.3	Sept. 1974	Min.	0.01	July 1980
Yearly:	Max.	2.75	1974	Min.	0.02	1994

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.07	0.01	0.01	0.02	0.02
2	.04	.04	.04	.04	.04	.03	.03	.06	.01	.01	.02	.02
3	.04	.04	.04	.04	.04	.03	.03	.05	.01	.01	.02	.02
4	.04	.04	* .04	.04	.04	* .03	.03	.04	.01	.01	* .02	.02
5	.04	* .04	.04	.04	.04	.03	.03	4.09	.01	.01	.02	.02
6	.04	.04	.04	.04	* .04	.03	.03	4.67	.01	* .01	.02	.02
7	.04	.04	.04	* .04	.04	* .03	.03	.03	.01	.01	.02	.02
8	* .04	.04	.04	.04	.04	.03	.04	.02	* .01	.01	.02	.02
9	.04	.04	.04	.04	.04	.03	.04	.02	.01	.01	.02	.02
10	.04	.04	.04	.04	.04	.03	.05	* .01	.01	.01	.02	.02
11	.04	.04	.04	.04	.04	.03	.06	.01	.01	.01	.02	.02
12	.04	.04	.04	.04	.04	.03	.08	* .01	.01	.01	.02	.02
13	.04	.04	.04	.05	.04	.03	.09	.01	.01	.01	.02	.02
14	.04	.04	.04	.04	.04	.03	.11	.01	.01	.01	.02	.02
15	.04	.04	.04	.04	.04	.03	.14	.01	.01	.01	.02	.02
16	.04	.04	* .04	.04	.04	.03	.16	.01	.01	.02	.02	.02
17	.04	.04	* .04	.04	.04	* .03	.19	.01	* .01	.02	.02	.02
18	.04	* .04	.04	.04	.04	.03	.23	.01	.01	.02	* .02	.02
19	.04	* .04	.04	.04	.04	.03	.27	.01	.01	.02	* .02	.02
20	.04	.04	.03	.04	* .04	.03	.31	* .04	.01	.02	* .02	.02
21	* .04	.04	.03	.05	.04	.03	.36	.02	.01	.06	.02	* .02
22	.04	.04	.04	.04	.04	.03	* 1.02	.02	.01	.02	.02	.02
23	.04	.04	.04	* .04	.04	.03	.77	.01	.01	.02	.02	.02
24	.04	.04	.04	.04	.04	.03	.24	* .01	.01	.02	.02	.02
25	.04	.04	.04	.04	.04	.03	.53	.01	.01	.02	.02	.02
26	.04	.04	.04	.04	.04	.03	.18	.01	.01	* .02	.02	.02
27	.04	.04	.04	.04	.03	.03	.16	.01	.01	.02	.02	.02
28	.04	.04	.03	.04	.03	.03	.14	.01	.01	.02	.02	.02
29	.04		.04	.04	.03	.03	.12	.01	.01	.02	.02	.02
30	.04		.04	.04	.03	.03	.10	.01	.01	.02	.02	.02
31	.04		.04	.04	.03	.09	.01	.01	.02			
Sum		1.12		1.22		0.90		9.38		0.51		0.62
	1.24		1.21		1.19	5.69		0.30		0.60		

Current Year 1998

Period 1932-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
			High	Low	Day		Total	Average	Maximum	Minimum	
	High	Low	Day	Day	Low						
Jan.	0.530	0.510	! 1	0.04	! 1	0.04	0.04	107	154	370	53.6
Feb.	.550	.530	! 1	.04	! 1	.04	.04	96.8	200	3,853	48.4
Mar.	.570	.525	! 10	.05	! 13	.03	.04	105	169	1,256	46.7
April	.555	.525	! 12	.05	! 1	.04	.04	105	289	4,550	25.9
May	.550	.525	1	.05	! 27	.03	.04	103	905	10,530	26.8
June	.545	.530	30	.04	! 1	.03	.03	77.8	2,014	15,607	25.9
July	.875	.480	22	4.59	! 1	.03	.18	492	3,236	22,813	11.7
Aug.	1.540	.260	5	19.5	! 10	.01	.30	810	3,442	20,167	26.8
Sept.	.870	.855	! 1	.01	! 1	.01	.01	25.9	5,299	73,244	25.9
Oct.	1.185	.860	21	.22	! 1	.01	.02	44.1	1,974	23,731	40.6
Nov.	.895	.870	! 1	.02	! 1	.02	.02	51.8	210	3,150	44.0
Dec.	.910	.875	! 1	.02	! 1	.02	.02	53.6	161	503	48.5
Yearly	1.540	0.260		19.5		0.01	0.07	2,072	18,053	86,682	758

* Discharge measurement made on this day

! And other days

WATER BULLETIN NUMBER 68-- INTERNATIONAL BOUNDARY AND WATER COMMISSION

08-3742.00 RIO GRANDE BELOW RIO CONCHOS NEAR PRESIDIO, TEXAS
AND OJINAGA, CHIHUAHUA

DESCRIPTION: Cableway, bubbler gage, water-stage recorders (graphic and digital) and data collection platform located on the left bank at latitude 29°31'10", longitude 104°17'10", and river kilometer 1,529; 0.6 river kilometer downstream from Alamito Creek and 14.4 river kilometers downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. The zero of the gage is 771.75 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 27 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1955 through 1998. Records are also available from 1896 through June 13, 1932 for a station located about 19.5 river kilometers downstream from the Rio Conchos and 2.1 kilometers upstream from Alamito Creek; and from June 14, 1932 through 1954 for a station about 3.2 river kilometers downstream from the Rio Conchos and 18.3 river kilometers upstream from Alamito Creek.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The data collection platform, operated in cooperation with the National Weather Service, relays gage height data upon interrogation by telephone via commercial circuits. Prior to December 1, 1979 the zero of the gage was 772.97 meters above mean sea level, U. S. C. & G. S. datum. A concrete control weir at this station was removed in December 1991.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,730 CMS on September 30, 1978, with a gage height of 4.70 meters. The greatest recorded flow occurred September 11, 1904, with a peak flow estimated at 4,590 CMS at a station 19.0 kilometers upstream. Min. 0.01 CMS several days in July 1955 and June 30, 1958.

Average Flow in Cubic Meters per Second**

Daily:	Max.	1,510	Oct. 1, 1978	Min.	0.26	June 12, 1996
Monthly:	Max.	544	Sept. 1991	Min.	1.84	May 1996
Yearly:	Max.	98.1	1991	Min.	6.80	1998

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.9	9.87	4.32	2.51	3.44	7.36	16.9	2.31	9.83	3.33	10.7	8.24
2	10.5	8.48	4.27	2.69	3.51	6.28	4.16	2.57	7.99	3.34	12.9	8.94
3	10.3	7.11	3.98	2.53	3.88	5.24	15.7	2.56	6.30	3.35	10.1	* 8.63
4	9.99	* 7.11	* 3.94	5.77	* 4.71	* 5.26	13.7	2.23	5.03	3.52	* 9.98	8.10
5	9.56	7.30	3.52	5.62	3.98	4.59	8.74	50.4	4.36	3.70	12.4	7.87
6	9.21	6.70	3.30	* 4.41	* 3.53	5.58	15.0	* 30.6	4.22	* 3.66	12.3	7.94
7	* 9.19	6.68	4.18	3.06	3.11	5.03	* 4.41	15.7	3.52	3.49	11.9	8.24
8	9.20	7.04	4.11	3.09	2.41	5.63	3.30	9.02	* 3.21	3.30	11.6	8.05
9	9.17	7.75	3.76	2.78	3.11	5.56	2.31	6.93	2.92	3.21	* 11.3	7.81
10	8.75	7.29	3.30	2.88	4.31	5.20	1.60	6.28	2.93	3.07	11.0	7.74
11	8.88	7.25	3.16	4.21	5.23	4.52	.91	6.08	2.62	2.84	11.2	8.26
12	9.54	7.39	3.02	5.16	4.85	3.82	.94	5.65	2.29	2.92	10.5	8.64
13	8.46	7.17	2.91	5.41	4.05	3.02	1.69	4.81	2.15	2.62	10.3	8.75
14	8.51	7.13	2.68	4.62	3.83	4.87	1.16	4.52	2.10	2.27	10.1	8.90
15	8.02	7.12	2.86	3.66	3.37	5.41	1.17	31.6	2.05	2.01	9.82	9.32
16	8.14	7.21	4.40	3.47	2.99	4.50	.72	16.3	2.15	1.84	9.48	* 9.89
17	8.03	7.31	4.76	3.09	3.41	3.55	.35	8.41	* 2.33	1.71	9.17	9.27
18	7.98	* 7.58	* 4.82	3.38	3.98	* 2.36	.40	10.3	2.26	1.41	* 9.04	8.53
19	8.52	* 7.93	4.47	3.86	4.80	1.92	1.16	38.0	2.40	1.43	8.44	8.44
20	7.54	7.81	4.04	5.20	* 5.28	1.87	2.88	25.7	2.40	1.86	8.44	8.44
21	* 6.34	7.45	4.18	* 5.39	5.55	2.22	3.37	12.8	2.41	* 87.7	8.38	8.39
22	6.76	6.72	5.11	* 5.08	4.65	2.18	* 6.14	22.2	2.41	20.5	8.38	7.76
23	6.84	6.22	5.23	4.91	4.64	1.83	3.65	14.8	2.43	22.9	8.38	7.79
24	6.72	5.53	4.65	3.77	4.63	1.42	7.47	* 10.9	2.19	14.8	8.38	7.73
25	6.27	5.61	3.69	4.08	6.19	1.18	7.03	8.63	2.05	12.8	8.56	8.39
26	6.26	4.98	3.31	5.50	6.08	1.11	7.84	6.91	2.21	* 14.2	8.31	9.07
27	6.88	4.42	2.87	10.7	5.81	1.22	6.56	8.14	3.42	12.7	8.31	9.08
28	7.74	4.29	2.91	7.35	6.21	1.41	4.71	12.0	3.53	11.6	8.94	9.07
29	8.46	2.56	3.54	5.84	1.29	* 2.98	18.0	3.31	11.5	9.19	8.43	
30	9.32	3.01	3.50	6.03	11.3	2.45	21.2	3.32	11.6	9.12	8.31	
31	9.29	2.49		6.77			1.96	10.4		11.3		8.36
Sum	194.45	131.22	116.73	425.95	286.48						262.38	
	261.27	115.81	140.18	151.36	100.34						296.62	

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High		Day	High	Low		Total	Average	Maximum	
	High	Low								
Jan.	1.050	0.955	1	11.5	126	6.22	8.43	22,574	57,250	
Feb.	1.015	.900	10.1	4.26	6.94	16,800	50,275	223,569	5,853	
Mar.	.930	.835	122	5.37	128	2.29	3.74	10,006	60,161	
April	1.095	.835	27	20.3	1	2.29	4.37	11,337	55,114	
May	.945	.790	31	7.05	8	2.02	4.52	12,112	68,852	
June	1.565	.750	30	97.4	30	1.03	3.89	10,085	84,692	
July	1.185	.730	1	41.9	117	.26	4.88	13,078	101,740	
Aug.	1.765	.795	5	132	5	2.04	13.7	36,802	166,058	
Sept.	1.070	.885	1	11.2	116	1.96	3.34	8,669	320,186	
Oct.	2.530	.855	21	220	20	1.30	9.24	24,752	157,199	
Nov.	1.145	1.070	2	14.6	126	8.31	9.89	25,628	61,800	
Dec.	1.100	1.055	2	10.5	8	7.53	8.46	22,670	47,352	
Yearly	2.530	0.730		220		0.26	6.80	214,513	1,230,679	
								3,092,559	214,513	

* Discharge measurement made on this day

! And other days

** Period 1968-1998

08-3745.00 TERLINGUA CREEK NEAR TERLINGUA, TEXAS

DESCRIPTION: Cableway, bubbler gage, water-stage recorder (digital) located on the left bank at latitude 29°12'10", longitude 103°37'10", 4.3 creek kilometers upstream from its confluence with the Rio Grande, and about 13.6 kilometers south of Terlingua, Brewster County, Texas. This creek enters the Rio Grande at river kilometer 1,425, the lower end of Santa Helena Canyon. The zero of the gage is 670.83 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 26 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1998.

REMARKS: Irrigation diversions upstream of the station modify the flow of this spring-fed creek. A cableway was reinstalled on July 27, 1995, at the original cableway site, located 137 meters downstream from the new gage.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 988 CMS on May 24, 1935 with a gage height of 5.36 meters on a gage 0.5 kilometer downstream. Min. no flow on several occasions in 1986.

Average Flow in Cubic Meters per Second

Daily:	Max.	487	June 1, 1937	Min. 0	August 14 and 15, 1986
Monthly:	Max.	32.6	Sept. 1974	Min. 0.01	Several months 1995-96
Yearly:	Max.	4.28	1990	Min. 0.10	1994

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.06	.04	.04	* .05	.04	* .03	18.4	.03	* .09	* .05	.08	* .06
2	.06	* .04	* .04	.05	.04	.03	4.06	.01	.08	.05	* .08	.06
3	.06	.04	.04	.05	.04	.03	.45	* .01	.07	.05	.08	.06
4	.06	.04	.04	.05	* .04	.03	.38	.02	.07	.06	.08	.06
5	* .06	.04	.04	.05	.04	.03	.37	.48	.06	.06	.07	.06
6	.06	.04	.04	.05	.04	.03	* 15.1	5.25	.06	.06	.07	.06
7	.06	.04	.04	.05	.04	.03	2.36	.96	.06	.06	.07	.06
8	.06	.04	.04	.05	.04	.03	.44	.36	.06	.06	.07	.06
9	.06	.04	.04	.05	.04	.03	* .08	.10	.06	.05	.07	.06
10	.06	.04	.04	.05	.04	.03	.06	.11	.06	.05	.06	.06
11	.06	.04	.04	.05	.04	.03	.06	.89	.06	.05	.06	.06
12	.06	.04	.05	.05	.04	.03	.06	6.79	.06	.05	* 4.72	.06
13	.06	.04	.05	.04	.04	.02	.06	1.15	.05	.05	7.20	.06
14	.05	.04	.05	.04	.04	.03	.06	.74	.05	.05	.26	.07
15	.05	.04	.05	.04	.04	* .03	.60	.70	* .05	.05	.06	.07
16	.05	.04	.05	.04	.04	.03	.08	.13	.05	.05	.06	.07
17	.05	.04	.05	.04	.04	.03	.07	.14	.05	.05	.06	.07
18	.05	* .04	.05	.04	.04	.63	.06	30.5	.05	.05	.06	.07
19	.05	.04	* .05	.04	.04	.13	.05	7.49	.05	.05	.06	.07
20	.05	.04	.05	.04	.04	.03	* .05	1.17	.05	.05	.06	.07
21	.05	.04	.05	* .04	* .04	.03	.05	.09	.05	10.9	.06	.07
22	* .05	.04	.05	.04	.04	.07	1.44	.06	.05	6.92	.06	* .07
23	.05	.04	.05	.04	.04	.03	4.56	.06	.05	2.38	.06	.07
24	.05	.04	.05	.04	.04	.03	.44	.07	* .05	1.32	.06	.07
25	.05	.04	.05	.04	.04	.03	.72	* .08	.05	.58	.06	.06
26	.05	.04	.05	.04	.04	.03	1.24	.18	.05	.49	.06	.06
27	.05	.04	.05	.04	.04	.03	.07	.09	.05	* .38	.06	.06
28	.04	.04	.05	.04	.04	.03	.03	.06	.05	.28	.06	.06
29	.04	.04	.05	.04	.04	.03	.03	.05	.05	.25	.06	.06
30	.04	.04	.05	.04	.04	.03	.09	.05	.05	.25	.06	.06
31	.04	.04	.05	.04	.04	.03	.04	.15		.44		.06
Sum		1.12	1.32	1.89			58.23		25.24		1.97	
	1.64	1.44	1.20	51.57			1.69		13.93			

Current Year 1998

Period 1932-1998

Month	Extreme Gage Meters		Extreme Cubic Meters per Second			Average	Volume Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
				Day	Day						
Jan.	0.740	0.725	11	0.06	127	0.04	0.05	142	225	1,079	26.8
Feb.	.730	.710	11	.04	11	.04	.04	96.8	283	5,431	25.1
Mar.	.735	.710	11	.05	11	.04	.05	124	285	2,978	26.8
April	.735	.710	11	.05	12	.04	.04	114	1,567	23,016	25.9
May	.745	.720	11	.05	126	.03	.04	104	4,059	32,095	100
June	1.615	.705	18	11.9	11	.03	.06	163	7,738	67,640	73.4
July	2.795	.615	1	253	130	.04	1.66	4,456	9,237	35,429	141
Aug.	2.200	.560	18	125	12	0	1.88	5,031	8,711	79,182	80.4
Sept.	.675	.550	1	.11	112	.05	.06	146	10,548	84,339	124
Oct.	2.115	.555	21	117	11	.05	.81	2,181	4,197	34,414	62.7
Nov.	1.730	.615	12	33.7	112	.06	.46	1,204	557	7,015	80.1
Dec.	.645	.595	13	.07	31	.05	.06	170	349	3,800	92.4
Yearly	2.795	0.550		253		0	0.44	13,932	47,756	135,031	3,032

* Discharge measurement made on this day

! And other days

08-3750.00 RIO GRANDE AT JOHNSON RANCH NEAR CASTOLON, TEXAS
AND SANTA ELENA, CHIHUAHUA

DESCRIPTION: Cableway, gravity well, digital water-stage recorder, and G.O.E.S. Data Collection Platform located on the left bank at latitude 29°02'05", longitude 103°23'25", and river kilometer 1,388; 2.2 river kilometers upstream from the old Johnson Ranch headquarters, 9.7 river kilometers downstream from Smoky Creek, and 14.8 river kilometers upstream from Chizón Crossing and the Chihuahua-Coahuila state line. The zero of the gage is 623.41 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 24 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: April 1936 through 1998.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The Data Collection Platform transmits gage heights by radio via NWS G.O.E.S. satellite to NWS computer bank.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 2,040 CMS, on September 30, 1978 with a gage height of 8.66 meters. A flow estimated at 2,750 CMS with a stage of 7.50 meters occurred at this station site on October 3, 1932. Min. no flow several days in 1933, 1955, 1957, and 1958.

Average Flow in Cubic Meters per Second**

Daily:	Max.	1,850	Oct. 1, 1978	Min.	0.09	June 11, 1996
Monthly:	Max.	470	Sept. 1991	Min.	1.21	May 1996
Yearly:	Max.	97.0	1991	Min.	8.00	1998

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.2	8.37	5.35	* 2.14	4.01	* 4.07	50.8	1.89	* 14.9	* 2.70	11.6	* 9.42
2	10.3	* 8.71	* 4.96	2.25	3.03	4.28	46.0	1.32	12.1	2.68	* 11.2	9.22
3	10.7	8.83	4.77	2.15	2.63	5.01	10.1	* 1.01	11.6	2.13	12.0	8.94
4	10.7	8.11	4.66	2.02	* 2.71	4.44	4.32	1.18	11.1	1.93	11.8	8.93
5	* 10.6	7.52	4.40	1.99	2.64	3.25	9.78	1.77	9.70	1.87	10.4	8.87
6	10.3	7.58	4.17	1.81	2.73	3.11	28.5	37.9	8.25	1.78	11.4	8.87
7	10.1	7.65	4.04	2.97	2.77	2.88	15.1	34.9	7.37	2.03	12.0	8.78
8	9.86	7.57	3.69	3.27	2.44	3.14	8.91	16.4	6.74	2.50	11.3	8.61
9	9.77	7.83	3.64	2.70	2.21	3.48	* 4.42	10.3	6.47	2.96	11.3	8.66
10	9.44	7.84	4.06	2.26	2.18	3.32	2.71	7.10	6.19	3.05	11.3	7.98
11	9.36	7.94	4.33	2.01	2.07	3.79	1.98	5.04	5.90	3.12	11.2	7.93
12	8.91	7.62	4.14	1.78	2.27	4.08	1.64	3.91	5.13	3.30	* 11.1	8.24
13	9.09	7.46	3.88	1.82	2.88	6.89	1.31	3.69	4.28	3.61	61.8	9.20
14	9.16	7.64	3.84	2.09	3.14	4.47	8.25	3.93	2.97	3.90	14.8	10.2
15	8.60	7.67	3.72	2.94	2.81	* 2.93	3.13	3.80	* 1.94	3.74	10.7	10.5
16	8.41	7.60	3.56	2.88	2.55	2.37	5.65	5.14	1.78	3.70	11.0	10.2
17	8.39	7.59	3.52	2.51	2.88	3.07	1.96	15.3	1.87	3.85	10.9	10.3
18	8.19	* 7.58	3.68	2.20	2.93	3.55	1.37	26.6	2.13	3.65	10.4	10.1
19	8.15	7.42	* 4.37	2.01	2.88	7.97	1.12	83.1	2.15	4.09	9.94	9.54
20	8.11	7.52	4.31	2.00	2.97	3.07	* .83	38.5	2.02	4.91	9.07	9.04
21	8.08	7.57	4.20	* 2.02	* 2.91	1.95	.90	28.4	1.85	18.6	8.91	8.85
22	* 7.70	7.42	3.90	2.22	3.45	1.98	1.34	27.4	1.77	215	9.25	* 9.27
23	6.91	7.34	3.88	2.86	3.58	2.69	20.8	14.7	1.66	52.1	9.47	9.13
24	7.04	7.10	4.03	3.11	3.74	1.30	12.1	14.6	1.46	31.7	9.47	8.98
25	7.35	6.68	4.32	3.21	3.58	.82	9.82	* 12.8	1.34	19.9	9.27	9.23
26	7.15	6.21	4.27	3.10	3.52	.73	10.9	11.3	1.26	15.7	9.61	9.57
27	6.90	6.08	3.47	2.67	3.95	.64	6.94	8.19	1.09	* 14.5	10.3	10.9
28	6.86	5.71	2.98	2.68	4.02	.55	6.52	6.18	1.45	13.9	10.1	10.7
29	6.88		2.57	4.88	3.93	.46	5.47	8.02	6.09	12.8	9.87	10.1
30	7.62		2.26	5.35	3.44	7.58	3.43	15.2	3.71	12.1	9.48	9.43
31	8.09		2.23		3.79		2.61	23.8		12.9		8.33
Sum		210.16		77.90		97.87		473.37		480.70		288.02
	268.92		121.20		94.64		288.71		146.27		370.94	

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters						
			High	Day	Low		Total			Average	Maximum	Minimum	
	High	Low		Day	Day		Day	Day	Low				
Jan.	1.300	1.190	1 3	10.7	24	6.61	8.67	23,235	58,420	306,158	17,634		
Feb.	1.265	1.170	1 2	8.91	28	5.53	7.51	18,158	49,905	239,000	9,551		
Mar.	1.170	1.030	1	5.53	31	2.14	3.91	10,472	57,194	261,098	7,484		
April	1.240	.995	29	6.61	12	1.76	2.60	6,731	52,239	185,591	5,930		
May	1.145	.990	1	4.49	110	2.07	3.05	8,177	70,446	228,534	3,230		
June	2.075	.860	30	81.2	30	.40	3.26	8,456	89,466	442,109	7,202		
July	2.940	.885	1	216	20	.62	9.31	24,945	112,207	355,631	15,373		
Aug.	2.885	.910	19	203	4	.84	15.3	40,899	170,655	818,986	28,797		
Sept.	1.430	.930	1	17.8	28	.91	4.88	12,638	118,257	1,217,635	9,407		
Oct.	3.215	1.000	22	273	6	1.64	15.5	41,532	177,242	927,275	21,446		
Nov.	2.450	1.250	13	129	121	8.52	12.4	32,049	64,356	183,566	16,365		
Dec.	1.310	1.230	27	11.3	110	7.54	9.29	24,885	48,826	220,460	14,934		
Yearly	3.215	0.860		273		0.40	8.00	252,177	1,069,213	3,058,852	252,177		

* Discharge measurement made on this day

† And other days

** Period 1968-1998

08-3772.00 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TEXAS
AND RANCHO SANTA ROSA, COAHUILA

DESCRIPTION: Cableway, bubbler gage, concrete control weir, and water-stage recorder (graphic and digital) located on the left bank at latitude 29°46'50", longitude 101°45'30", and river kilometer 1,058; 152 meters downstream from the Terrell-Val Verde County line, 8.8 kilometers downstream from Lozier Canyon, and about 19.8 kilometers west of Langtry, Val Verde County, Texas. The zero of the gage is 352.71 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 46 current-meter measurements during the year, 24 by the United States Section and 22 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations for medium and high flows by shifting control methods. Low flow computations based on a stable control weir rating curve defined by current-meter measurements. Records available: September 1961 through 1998.

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. A computerized radio telemetry system relays gage height data to the Amistad Dam office.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 4,190 CMS on November 5, 1978 with a gage height of 11.63 meters. Min. 4.07 CMS on July 1, 1998.

Average Flow in Cubic Meters per Second**

Daily:	Max.	2,310	Sept. 20, 1974	Min.	4.82	July 2, 1998
Monthly:	Max.	443	Sept. 1991	Min.	8.40	April 1998
Yearly:	Max.	110	1991	Min.	15.9	1998

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.6	13.1	13.6	10.1	9.04	* 8.83	4.87	10.2	15.2	* 5.42	23.5	17.6
2	17.7	13.4	* 13.3	9.60	8.93	9.20	4.82	10.1	23.3	5.44	23.4	17.1
3	17.7	* 14.0	13.2	9.21	9.04	9.31	* 15.2	* 9.59	25.8	5.75	* 19.3	16.8
4	17.7	14.5	13.2	8.75	* 11.3	9.04	55.5	8.28	19.9	8.28	18.0	* 16.5
5	* 17.8	14.9	13.1	8.57	10.7	* 9.20	27.6	177	17.5	8.49	17.2	15.9
6	18.5	15.2	* 13.1	* 8.68	9.93	9.31	* 17.6	55.5	15.3	8.02	17.0	15.4
7	18.0	15.1	12.7	8.73	9.12	9.49	12.6	* 25.9	15.1	7.43	18.4	* 15.0
8	17.6	14.6	11.9	8.44	* 8.24	9.51	40.6	14.0	14.0	7.46	17.0	15.0
9	* 17.3	14.1	12.0	7.95	7.96	9.08	33.5	50.1	12.8	7.28	17.1	15.0
10	17.1	14.1	12.0	7.71	7.80	8.63	21.4	36.9	11.7	7.26	18.3	15.1
11	17.1	14.1	11.6	7.68	7.78	27.3	16.9	23.1	11.1	7.52	17.6	15.2
12	17.0	* 14.1	11.4	8.48	8.04	11.0	13.5	16.8	10.7	7.72	17.6	15.3
13	16.9	* 14.2	11.4	9.14	8.01	16.9	11.3	14.0	12.0	8.26	20.0	15.1
14	16.8	14.2	11.5	8.92	7.92	23.9	10.0	56.2	10.1	8.70	21.4	14.9
15	15.9	14.3	13.6	8.43	7.66	* 13.4	9.75	42.1	9.75	9.00	55.9	15.0
16	* 15.7	14.2	18.8	7.78	7.67	25.8	9.48	12.5	10.8	9.16	* 39.5	15.4
17	15.6	13.8	* 12.3	7.71	8.05	16.3	9.85	* 13.7	9.59	9.53	24.3	16.2
18	15.6	14.0	12.1	7.71	* 8.09	11.6	11.0	11.4	9.62	9.79	23.0	16.9
19	15.6	13.8	12.3	7.71	22.3	9.48	11.4	11.9	8.91	* 9.88	* 22.3	16.8
20	15.5	13.6	12.5	* 8.09	16.8	8.40	* 10.8	55.3	8.61	9.62	21.7	16.7
21	15.4	13.9	13.4	8.35	11.4	8.39	11.1	132	* 8.60	9.79	21.0	* 16.9
22	15.3	13.9	13.7	8.40	9.73	13.8	11.5	51.7	8.39	9.99	20.3	16.4
23	14.6	13.8	13.8	8.27	9.01	11.0	11.8	52.2	8.22	* 10.1	19.6	16.0
24	14.9	13.7	13.9	7.76	9.04	9.51	12.4	48.2	8.05	108	18.9	15.7
25	14.9	14.1	13.7	7.83	9.04	7.78	13.0	42.6	7.88	66.6	18.4	15.8
26	14.1	14.3	12.7	7.87	8.34	7.16	13.5	21.7	7.54	48.0	18.5	16.1
27	13.3	13.8	12.4	7.93	9.04	6.69	13.9	23.8	6.45	33.9	18.2	15.9
28	13.7	13.6	12.2	8.47	9.11	6.14	15.5	20.2	6.22	28.3	17.8	15.9
29	14.1		12.5	8.77	9.04	5.76	13.6	18.4	5.98	24.4	17.6	16.1
30	13.3		12.0	8.96	8.86	4.97	13.3	41.7	5.75	21.8	18.1	16.7
31	13.2		11.0	8.36	10.8	* 16.3				21.0		17.2
Sum	394.4		252.00		336.88			1,123.37		541.89		495.6
	495.5		396.9		295.35			488.07		344.86		640.9

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
Jan.	0.620	0.555	! 4	18.8	31	13.2	16.0	42,811	77,436	259,502	37,722
Feb.	.585	.555	! 6	16.0	1	13.1	14.1	34,076	69,724	289,215	27,673
Mar.	.745	.520	16	35.0	31	10.5	12.8	34,292	78,241	277,246	24,409
April	.520	.475	1	10.5	11	6.73	8.40	21,773	74,556	192,692	21,773
May	.730	.480	19	33.0	115	7.39	9.53	25,518	97,423	289,647	25,518
June	.895	.470	11	62.4	30	4.89	11.2	29,106	119,578	477,792	27,708
July	.970	.460	4	77.3	1	4.07	15.7	42,169	133,965	435,732	29,447
Aug.	2.430	.495	5	417	! 4	7.93	36.2	97,059	196,542	929,405	43,546
Sept.	.720	.480	3	28.8	30	5.71	11.5	29,796	249,026	1,147,133	27,562
Oct.	1.290	.465	24	181	1	4.47	17.5	46,819	225,957	1,112,382	36,616
Nov.	.945	.600	15	72.9	8	16.7	21.4	55,374	98,227	441,434	37,497
Dec.	.605	.570	1	17.9	14	14.7	16.0	42,820	70,155	217,549	39,502
Yearly	2.430	0.460		417		4.07	15.9	501,613	1,490,826	3,465,652	501,613

* Discharge measurement made on this day

! And other days

** Period 1968-1998

08-4474.10 PECOS RIVER NEAR LANGTRY, TEXAS

DESCRIPTION: Cableway, concrete control weir, bubbler gage, and water-stage recorders (graphic and digital) located on the right bank at latitude 29°48'10", longitude 101°26'45", about 12.1 kilometers east of Langtry, Texas, 15.3 river kilometers upstream from the Pecos High Railroad Bridge; 24.1 river kilometers upstream from its confluence with the Rio Grande. This stream enters the Rio Grande at river kilometer 991, 38.0 river kilometers downstream from Langtry, Val Verde County, Texas. The zero of the gage is 345.36 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 44 current-meter measurements during the year, 22 by the United States Section and 22 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 current-meter measurements. Records available: July 1967 through 1998. Records are also available for Pecos River near Comstock, 15.3 river kilometers downstream, from March 17 through December 3, 1898 and May 1900 through October 7, 1954; for Pecos River near Shumla, 5.6 river kilometers 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. A computerized radio telemetry system relays gage height data to the Amistad Dam office.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 16,300 CMS on September 20, 1974, with a gage height of 22.95 meters. The greatest flood of record, which exceeded a gage height of 30.5 meters at this station, occurred on June 28, 1954. The peak discharge was 26,800 CMS at the gaging station located near the railroad bridge 15.3 river kilometers downstream. Min. 1.14 CMS on August 4, 1998 with a gage height of 0.425 meters.

Average Flow in Cubic Meters per Second					
Daily:	Max.	4,330	Sept. 20, 1974	Min.	1.19
Monthly:	Max.	382	Sept. 1974	Min.	1.53
Yearly:	Max.	42.5	1974	Min.	3.29

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.08	4.03	3.48	3.33	2.74	2.19	1.70	1.37	13.8	4.52	5.46	4.19
2	4.11	* 3.83	* 3.50	3.31	2.72	1.98	1.81	1.40	12.0	4.45	6.27	4.21
3	4.17	3.77	3.50	* 3.41	2.64	1.91	* 1.76	* 1.29	10.8	4.33	* 5.38	4.22
4	4.20	3.64	3.47	3.38	* 2.63	1.85	1.66	1.19	* 9.85	4.23	5.41	* 4.35
5	* 4.13	3.87	3.52	3.36	2.64	* 1.81	1.68	1.19	* 9.00	* 4.38	6.64	4.37
6	4.23	3.86	* 3.43	* 3.37	2.61	1.70	* 1.66	2.41	8.41	4.37	5.95	4.31
7	4.10	3.79	3.39	3.43	2.52	1.62	1.64	* 5.55	8.07	4.27	5.48	4.13
8	3.90	3.78	3.18	3.41	* 2.38	1.79	1.53	3.57	7.70	4.13	5.27	3.98
9	* 3.91	3.79	3.23	3.24	2.35	1.79	1.38	3.11	7.36	4.06	5.07	3.95
10	3.92	3.85	3.13	3.16	2.24	1.94	1.32	2.75	7.02	4.10	4.86	4.00
11	4.02	3.73	3.13	3.04	2.16	3.08	1.31	2.53	6.83	4.15	4.63	4.27
12	4.05	* 3.73	3.14	3.06	2.13	3.02	1.34	2.38	6.72	4.24	4.51	4.21
13	4.04	* 3.74	3.23	3.18	2.22	2.80	1.40	2.32	6.57	4.15	5.14	4.17
14	3.98	3.76	3.33	3.25	2.24	2.80	1.57	2.41	6.40	4.08	5.72	* 4.13
15	4.01	3.82	4.85	3.28	2.27	* 2.62	1.98	2.71	6.26	3.99	5.50	4.11
16	* 3.88	3.97	9.01	3.19	2.21	2.43	1.85	2.67	5.98	4.03	* 5.10	4.05
17	3.85	3.76	* 5.60	3.06	2.46	2.37	1.75	* 2.80	6.42	4.31	4.95	4.15
18	3.80	3.70	4.44	3.03	* 2.46	2.29	1.66	3.05	6.78	4.12	4.84	4.17
19	3.76	3.72	3.98	3.05	2.28	2.27	1.54	3.03	6.05	* 4.20	* 4.78	4.22
20	3.75	3.62	3.67	* 2.97	2.16	2.12	1.49	2.92	5.61	4.32	4.60	4.26
21	3.66	3.64	3.56	2.89	2.14	2.01	1.45	3.00	* 5.54	4.25	4.53	4.30
22	3.77	3.73	3.57	2.92	2.13	1.94	1.49	5.48	5.43	4.19	4.48	4.21
23	3.90	3.71	3.60	2.90	2.05	1.90	1.47	5.31	5.22	* 4.21	4.43	4.23
24	3.78	3.70	3.54	2.78	2.06	1.82	1.45	34.6	5.05	4.15	4.41	4.27
25	3.73	3.57	3.51	2.68	2.00	1.77	1.42	7.70	4.83	4.05	4.34	4.25
26	3.76	3.79	3.47	2.73	2.00	1.79	1.38	140	4.73	4.02	4.38	4.25
27	3.73	3.84	3.51	2.69	2.10	1.78	1.35	200 *	4.76	3.98	4.30	4.35
28	3.87	3.51	3.51	2.66	2.07	1.75	1.38	40.9	4.72	4.27	4.24	4.46
29	3.74	3.55	2.63	2.04	1.72	1.38	26.5	4.63	4.45	4.34	4.48	
30	3.76	3.51	2.69	2.34	1.68	1.32	19.7	4.63	4.50	4.31	4.45	
31	4.00	3.37	3.37	2.28		1.32	15.9		4.45			4.47
Sum	105.25	92.08	62.54	549.74	130.95	131.17						
	121.57	116.91	71.27	47.44	207.17	149.32						

Current Year 1998

Period 1967-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second		Average	Volume-Thousand Cubic Meters					
	High	Low	Day	High	Low	Total	Average	Maximum	Minimum		
Jan.	0.570	0.535	6	4.53	21	3.41	3.92	10,504	15,072	36,067	8,824
Feb.	.570	.535	1	4.25	28	3.38	3.76	9,096	14,018	31,348	7,452
Mar.	.790	.525	16	16.5	119	3.06	3.77	10,101	14,006	27,290	8,331
April	.535	.500	3	3.52	126	2.58	3.07	7,956	15,651	64,098	7,956
May	.510	.475	1	2.80	25	1.93	2.30	6,158	19,622	56,812	6,158
June	.530	.455	11	3.41	7	1.57	2.08	5,403	16,703	56,469	5,403
July	.475	.435	15	2.14	111	1.24	1.53	4,099	18,950	54,844	4,099
Aug.	3.560	.425	26	612	14	1.14	17.7	47,498	22,034	199,892	5,153
Sept.	.785	.575	1	14.6	129	4.56	6.91	17,899	52,034	992,293	6,313
Oct.	.580	.550	5	4.72	115	3.89	4.22	11,314	25,587	140,507	7,806
Nov.	.640	.565	5	6.96	28	4.16	4.98	12,901	17,583	73,681	8,127
Dec.	.580	.560	4	4.59	18	3.92	4.23	11,333	15,710	46,697	8,602
Yearly	3,560	0.425	612		1.14	4.89	154,260	246,970	1,341,805	103,647	

* Discharge measurement made on this day

! And other days

08-4474.20 DEAD MANS CANYON NEAR COMSTOCK, TEXAS

To determine storm runoff previously included with flows measured on the Pecos River at a gaging station which was relocated upstream due to completion of Amistad Dam, a gaging station was established at Dead Mans Canyon in 1968.

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", 3.7 kilometers upstream from its confluence with the Pecos River, which is 15.3 kilometers upstream from the Pecos River confluence with the Rio Grande. The zero of the gage is 359.05 meters 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 1998.

REMARKS: This stream is normally dry, its flow being confined to periods of storm runoff from its 228 square kilometers of watershed area. Only the days of flow are shown below.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,070 CMS on September 17, 1974, with a gage height of 3.90 meters. Maximum volumes: Monthly, 35,973 TCM in September 1974; yearly, 37,654 TCM in 1974.

Average Flow in Cubic Meters per Second

Daily:	Max.	166	Sept. 18, 1974	Min.
Monthly:	Max.	13.9	Sept. 1974	Min.
Yearly:	Max.	1.20	1974	see REMARKS Min.

Mean Daily Discharge in CMS 1998

Annual Summary

Month and Day	Month	Maximum Gage and Discharge		Thousand Cubic Meters
		Day	Meters	
No flow during 1998				
	Yearly			

08-4494.00 DEVILS RIVER AT PAFFORD CROSSING NEAR COMSTOCK, TEXAS

DESCRIPTION: Concrete control wall with rectangular notch opening of 25.5 CMS capacity, cableway, bubbler gage, water-stage recorders (graphic & digital), located on the left bank at latitude 29°40'35", longitude 101°00'00", about 18.5 kilometers east of Comstock, Val Verde County, Texas, and 41.0 river kilometers upstream from its confluence with the Rio Grande. The confluence is located at river kilometer 925, 1.1 river kilometer upstream from Amistad Dam. The zero of the gage is 345.00 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 41 current-meter measurements during the year, 23 by the United States Section and 18 by the Mexican Section of the Commission, a stable rating curve based on current-meter measurements, and a continuous record of gage heights. Records available: 1960 through 1998. Records are also available from May 1900 through March 1914 for a station 38.3 river kilometers downstream; from December 1923 through September 1932 for a station 36.7 river kilometers downstream; from September 2, 1932 through August 1957 for a station 33.8 river kilometers downstream; from August 7, 1954 through January 1958 for a station 8.7 river kilometers upstream; and from August 1954 through May 31, 1968 for a station at the mouth 39.8 river kilometers 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. A computerized radio telemetry system relays gage height data to the Amistad Dam office.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 7,080 CMS on September 18, 1974 with a gage height of 6.04 meters. Min. 1.38 CMS on August 20, 1969.

Average Flow in Cubic Meters per Second

Daily:	Max.	3,480	Sept. 18, 1974	Min.	1.52	August 20, 1969
Monthly:	Max.	240	Sept. 1974	Min.	1.82	August 1964
Yearly:	Max.	27.7	1974	Min.	2.83	1968

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.11	5.06	4.33	5.15	4.45	* 3.53	3.82	3.19	18.0	8.91	10.4	7.21
2	5.11	* 4.65	* 4.33	5.13	4.40	3.66	3.52	3.18	17.0	8.99	* 8.50	7.21
3	5.08	4.39	4.11	5.15	4.40	3.67	3.50	* 3.20	15.8	9.01	8.01	7.21
4	5.07	4.32	4.28	5.14	* 4.40	3.67	3.51	3.29	* 14.5	8.79	7.97	7.17
5	* 4.94	4.52	4.40	5.08	4.38	3.59	3.55	3.39	13.8	* 9.20	8.81	7.16
6	4.75	4.49	4.27	* 5.05	4.38	3.44	* 3.56	3.81	13.3	10.2	* 8.33	7.16
7	4.61	4.50	4.24	5.15	4.37	3.36	3.37	4.18	13.0	8.85	8.00	7.04
8	4.50	4.51	4.04	5.05	4.36	3.50	3.27	3.48	12.7	8.39	7.91	* 6.82
9	4.48	4.44	4.04	5.08	4.02	3.64	3.11	3.48	12.4	8.34	7.91	6.90
10	4.50	4.27	4.05	4.87	4.06	5.18	* 3.05	3.47	11.8	8.38	7.75	7.47
11	4.62	4.31	4.03	4.77	3.98	5.78	3.07	3.44	11.5	8.37	7.46	7.41
12	4.49	4.40	4.05	4.81	4.17	* 4.59	3.11	3.39	11.5	8.38	7.60	7.21
13	4.56	* 4.44	* 4.16	4.89	4.24	4.32	3.14	3.27	11.6	8.40	8.42	7.24
14	4.50	4.69	4.37	4.83	* 4.25	4.29	3.22	* 3.74	11.2	8.25	8.30	7.26
15	4.50	4.73	4.58	4.85	4.25	* 4.19	3.26	3.63	11.1	7.93	7.81	7.12
16	* 4.51	4.88	* 10.9	* 4.77	4.26	4.17	3.27	3.50	10.8	7.95	7.75	6.93
17	4.52	4.72	11.2	4.77	4.27	3.90	3.16	* 3.39	12.5	8.21	7.75	6.91
18	4.55	4.63	7.25	4.77	* 4.24	4.32	3.19	3.43	11.7	8.05	7.75	7.03
19	4.51	4.60	6.58	4.77	4.18	4.10	3.19	3.43	11.7	* 7.91	7.75	7.31
20	4.55	* 4.48	6.38	* 4.66	4.15	3.97	* 3.22	6.54	10.7	7.95	7.39	7.35
21	4.59	4.54	6.37	4.70	4.11	3.84	3.22	6.05	* 10.7	8.11	7.29	* 7.33
22	4.57	4.53	6.38	4.69	4.06	3.75	3.21	5.72	10.7	7.83	7.23	6.90
23	4.58	4.57	6.15	4.68	4.02	3.69	3.19	178	10.4	7.81	7.27	6.92
24	4.45	4.46	5.95	4.41	3.98	3.64	3.22	2,360	9.93	7.72	7.26	6.95
25	4.52	4.49	5.96	4.46	3.94	3.61	3.22	339	9.82	7.67	7.29	7.13
26	4.47	4.37	5.82	4.51	3.90	3.58	3.21	91.1	9.46	7.62	7.21	7.04
27	4.29	4.39	5.83	4.40	4.24	3.58	3.19	101	9.47	7.59	7.18	7.23
28	4.33	4.35	5.55	4.40	3.83	3.54	3.18	43.9	9.45	7.61	7.16	7.12
29	4.34		5.53	4.41	3.78	3.64	3.16	30.8	9.25	7.57	7.16	7.11
30	4.44		5.46	4.40	3.66	3.83	3.13	26.7	8.99	7.29	7.16	7.14
31	5.37		5.12		3.56		3.20	20.3		7.25		7.16
Sum		126.71		143.80		117.35		3,280.36		254.53		221.15
	143.41		169.71		128.29		101.22		354.27		233.78	

Current Year 1998

Period 1960-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
Jan.	0.575	0.510	31	6.55	19	4.09	4.63	12,391	19,850	35,576	5,732
Feb.	.555	.510	1	5.72	10	4.09	4.53	10,948	18,495	52,636	4,933
Mar.	.825	.510	16	23.0	13	4.03	5.47	14,663	17,791	41,204	5,163
April	.540	.515	1	5.15	123	4.37	4.79	12,424	17,858	47,831	5,575
May	.525	.490	1	4.77	31	3.36	4.14	11,084	19,701	49,101	5,572
June	.605	.490	110	7.96	25	3.30	3.91	10,139	22,155	67,011	5,253
July	.515	.470	1	4.13	10	2.80	3.27	8,745	27,014	230,071	4,976
Aug.	4.080	.475	24	3,460	11	2.91	106	283,423	49,084	504,380	4,878
Sept.	.815	.630	1	20.6	29	8.71	11.8	30,609	51,967	621,065	6,167
Oct.	.695	.600	1	13.3	130	7.06	8.21	21,991	36,166	272,093	6,172
Nov.	.690	.600	1	12.3	127	7.16	7.79	20,199	21,127	40,721	5,590
Dec.	.620	.590	10	8.22	17	6.69	7.13	19,107	20,536	38,316	5,794
Yearly	4.080	0.470		3,460		2.80	14.5	455,723	321,744	872,184	89,420

* Discharge measurement made on this day

! And other days

08-4494.40 BIG SATAN CREEK NEAR COMSTOCK, TEXAS

To determine storm runoff previously included with flows measured on the Devils River at a gaging station which was re-located upstream due to completion of Amistad Dam, a gaging station was established at Big Satan Creek in 1968.

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", 1.8 kilometers upstream from its confluence with the Devils River, which is 34.1 kilometers upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 345.64 meters 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 1998.

REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 109 square kilometers of watershed area. Only the days of flow are shown below.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 2,280 CMS on August 23, 1998, with a gage height of 4.420 meters. Maximum volumes: Monthly, 30,502 TCM in August 1998; yearly, 30,502 TCM in 1998.

Average Flow in Cubic Meters per Second

Daily:	Max.	249	Aug. 23, 1998			Min.
Monthly:	Max.	11.4	Aug. 1998			Min.
Yearly:	Max.	0.97	1998			Min.

Mean Daily Discharge in CMS 1998

Month and Day			
Aug. 23	249		
24	104		
25	0.03		

Annual Summary

Month	Maximum Gage and Discharge			Thousand Cubic Meters
	Day	Meters	CMS	
Aug.	23	4.420	2,280	30,502
Yearly		4.420	2,280	30,502

08-4494.80 ROUGH CANYON NEAR DEL RIO, TEXAS

To determine storm runoff previously included with flows measured on the Devils River at a gaging station which was re-located upstream due to completion of Amistad Dam, a gaging station was established at Rough Canyon in 1968.

DESCRIPTION: Cableway, control weir, bubbler gage, and digital recorder located on the right bank at latitude 29°34'40", longitude 100°56'00", 6.3 kilometers upstream from its confluence with the Devils River, which is 17.9 kilometers upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 314.12 meters 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 1998.

REMARKS: This stream is normally dry, its flow being confined to periods of storm runoff from its 62.2 square kilometers of watershed area. Only the days of flow are shown below.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 438 CMS on August 24, 1998, with a gage height of 2.870 meters. Maximum volumes: Monthly, 11,697 TCM in August 1998; yearly, 11,697 TCM in 1998.

Average Flow in Cubic Meters per Second

Daily:	81.9	Aug. 24, 1998			Min.
Monthly:	4.37	Aug. 1998			Min.
Yearly:	0.37	1998			Min.

Mean Daily Discharge in CMS 1998

Month and Day			
Aug. 18	0.17		
19	5.67		
20	4.21		
21	.08		
23	43.0		
24	81.9		
25	.35		

Annual Summary

Month	Maximum Gage and Discharge			Thousand Cubic Meters
	Day	Meters	CMS	
Aug.	24	2.870	438	11,697
Yearly		2.870	438	11,697

08-4494.85 NORTH FORK SAN PEDRO CREEK NEAR DEL RIO, TEXAS

To determine storm runoff previously included with flows measured on the Devils River at a gaging station which was re-located upstream due to completion of Amistad Dam, a gaging station was established at the north fork of San Pedro Creek in 1968.

DESCRIPTION: Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29°31'20", longitude 100°53'00", 4.8 kilometers upstream from its confluence with the Middle Fork Branch, which is 10.1 kilometers upstream from its confluence with Devils River which itself is 7.2 river kilometers above Devils River confluence with the Rio Grande. The zero of the gage is 343.49 meters 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 1998.

REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 44 square kilometers of watershed area. Only the days of flow are shown below.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 253 CMS on August 23 & 24, 1998, with a gage height of 3.750 meters. Maximum volumes: Monthly, 10,670 TCM in August 1998; yearly, 10,670 TCM in 1998.

Average Flow in Cubic Meters per Second

Daily:	Max.	67.1	Aug. 23, 1998	Min.	
Monthly:	Max.	3.98	Aug. 1998	Min.	see REMARKS
Yearly:	Max.	0.34	1998	Min.	

Mean Daily Discharge in CMS 1998

Month and Day			
Aug. 23	67.1		
Aug. 24	56.4		

Annual Summary

Month	Maximum Gage and Discharge		
	Day	Meters	CMS
Aug.	23	3.750	253
Yearly		3.750	253

! And other days

08-4494.90 MIDDLE FORK SAN PEDRO CREEK NEAR DEL RIO, TEXAS

To determine storm runoff previously included with flows measured on the Devils River at a gaging station which was re-located upstream due to completion of Amistad Dam, a gaging station was established at the middle fork of San Pedro Creek in 1968.

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", 5.1 kilometers upstream from its confluence with the North Fork Branch, which is 10.1 kilometers above the confluence with Devils River, which itself is 7.2 river kilometers above the Devils River confluence with the Rio Grande. The zero of the gage is 346.56 meters 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 1998.

REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 31 square kilometers of watershed area. Only the days of flow are shown below.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,560 CMS on August 23, 1998, with a gage height of 3.425 meters. Maximum volumes: Monthly, 18,121 TCM in August 1998; yearly, 18,121 TCM in 1998.

Average Flow in Cubic Meters per Second

Daily:	Max.	96.8	Aug. 23, 1998	Min.	
Monthly:	Max.	6.77	Aug. 1998	Min.	see REMARKS
Yearly:	Max.	0.57	1998	Min.	

Mean Daily Discharge in CMS 1998

Month and Day			
Aug. 23	94.0		
24	96.8		
25	2.51		
26	15.1		
27	0.67		
28	0.33		
29	0.17		
30	0.08		
31	0.07		

Annual Summary

Month	Maximum Gage and Discharge		
	Day	Meters	CMS
Aug.	23	3.425	1,560
Yearly		3.425	1,560

08-4495.90 EVANS CREEK NEAR COMSTOCK, TEXAS

To determine storm runoff previously included with flows measured on the Devils River at a gaging station which was re-located upstream due to completion of Amistad Dam, a gaging station was established at Evans Creek in 1968.

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", 17.7 kilometers upstream from its confluence with the Devils River, which is 5.1 kilometers upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 354.34 meters 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 1998.

REMARKS: This creek is normally dry, its flow being confined to periods of storm runoff from its 192 square kilometers of watershed area. Only the days of flow are shown below.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 714 CMS on August 23, 1998, with a gage height of 2.180 meters. Maximum volumes: Monthly, 23,342 TCM in August 1998; yearly, 23,342 TCM in 1998.

Average Flow in Cubic Meters per Second

Daily:	212	Aug. 23, 1998	Min.	see REMARKS
Monthly:	8.71	Aug. 1998	Min.	
Yearly:	0.74	1998	Min.	

Mean Daily Discharge in CMS 1998

Month and Day		
Aug. 23	212	
24	56.5	
25	1.66	

Annual Summary

Month	Maximum Gage and Discharge			Thousand Cubic Meters
	Day	Meters	CMS	
Aug.	23	2.180	714	23,342
Yearly		2.180	714	23,342

08-4508.05 CARMINA SPRINGS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 2.00 CMS capacity and staff gage located on a creek about 40 meters upstream from its confluence with the Rio Grande, at latitude 29°26'50", longitude 101°03'35", and about 17.7 kilometers northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from Mexico at river kilometer 923, 0.4 river kilometer downstream from Amistad Dam and 20.3 river kilometers 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 6 current-meter measurements during the year. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1998.

REMARKS: At least 104 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 CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.94	0.97	0.94	0.97	0.85	0.64	0.54	0.48	0.80	0.80	0.85	0.87
2	.94	.97	.94	.97	.84	.64	.53	.48	.80	.80	.85	.87
3	.94	.97	.94	.96	.82	.62	.52	.48	.80	.80	.85	.87
4	.94	.97	.97	.96	.82	.62	.52	.48	.80	.80	.85	.87
5	.94	.97	.97	.94	.82	.61	.52	.48	.80	.80	.84	.87
6	.94	.94	.97	.96	.82	.60	.52	.48	.80	.80	.82	.87
7	.94	.94	.97	.94	.81	.60	.51	.48	.80	.80	.82	.87
8	.99	.94	.97	.94	.80	.59	.52	.48	.80	.80	.82	.87
9	.98	.94	.97	.94	.80	.58	.52	.48	* .80	.80	.82	.87
10	.97	.94	.96	.94	.80	.70	.52	.46	.80	.80	.82	.87
11	.97	.94	* .97	.94	.80	.68	.52	.46	.80	.80	* .82	.87
12	.97	.94	.97	.94	.80	.58	.50	.46	.80	.80	.82	.87
13	.97	.97	.97	.94	.80	.57	.50	.44	.80	.80	.82	.87
14	.97	.97	.97	.94	.79	.57	.50	.44	.80	.80	.82	.87
15	.97	.97	1.02	.94	.78	.56	.50	.44	.80	.82	.82	.87
16	.97	.97	.98	.94	.76	.54	.50	.44	.80	.82	.82	* .87
17	.97	.97	.97	.94	.74	.56	.50	.46	.80	.82	.82	.87
18	.97	.97	.97	.94	.73	.54	.50	.46	.80	.82	.85	.87
19	.97	.97	.97	.94	.71	.54	.50	.46	.80	.85	.85	.87
20	.97	.97	.97	.94	.71	.56	.50	.45	.80	.85	.85	.87
21	.97	.97	.97	.94	.71	.56	.50	.44	.80	* .85	.85	.87
22	.97	.97	.96	.94	.69	.56	.50	.44	.80	.85	.85	.87
23	.97	.97	.96	.94	.69	.56	.50	1.16	.80	.85	.85	.87
24	.97	.97	.96	.92	.69	.56	.48	1.06	.80	.85	.85	.87
25	.97	.97	.97	.90	.66	.56	.48	.66	.80	.85	.85	.87
26	.97	.94	.97	.88	.66	.56	.48	.69	.80	.85	.85	.87
27	.97	.94	.97	.87	.66	.56	.48	.69	.80	.85	.85	.88
28	.97	.94	.97	.87	.66	.56	.48	.71	.80	.85	.85	.90
29	.97	.97	.97	.87	.66	.54	.48	.73	.80	.85	.85	.90
30	.97	.97	.97	.85	.64	.54	.48	.75	* .80	.85	.85	.92
31	.97	.97	.97	.64				.48	.76	.80	.85	.92
Sum		26.86		27.90		17.46		17.38		25.53		27.14
	29.89		30.00		23.16		15.58		24.00		25.13	

Current Year 1998

Period 1969-1998

Month	Extreme Gage Meters			Extreme-Cubic Meters per Second		Average	Volume-Thousand Cubic Meters				
	High	Low	Day	Φ High	Day		Total	Average	Maximum	Minimum	
Jan.	0.290	0.280	1.8	0.99	1.1	0.94	0.96	2,582	3,543	5,155	449
Feb.	.285	.280	1.1	.97	1.6	.94	.96	2,321	3,209	4,603	460
Mar.	.370	.280	15	1.41	1.1	.94	.97	2,592	3,498	5,406	618
April	.285	.260	1.1	.97	30	.85	.93	2,411	3,306	4,512	776
May	.260	.215	1	.85	130	.64	.75	2,001	3,317	4,604	874
June	.575	.190	10	2.67	116	.54	.58	1,509	3,174	4,411	738
July	.190	.175	1	.54	124	.48	.50	1,346	3,248	4,553	658
Aug.	.850	.165	24	4.67	113	.44	.56	1,502	3,321	4,460	666
Sept.	.250	.250	1!	.80	1	.80	.80	2,074	3,784	4,199	731
Oct.	.260	.250	19	.85	1	.80	.82	2,206	3,580	4,750	1,024
Nov.	.260	.255	1	.85	5	.82	.84	2,171	3,492	4,546	1,189
Dec.	.275	.265	130	.92	1	.87	.88	2,345	3,633	5,019	1,329
Yearly	0.850	0.165		4.67		0.44	0.79	25,060	41,105	53,373	11,701

* Discharge measurement made on this day

Φ Mean daily

! And other days

LOURDES AND HILDA SPRINGS NEAR CD. ACUNA, COAHUILA

08-4508.20 LOURDES SPRING

DESCRIPTION: Rectangular sharp-crested weir of 0.82 CMS 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 17.9 kilometers northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from Mexico at river kilometer 922, 19.6 river kilometers upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 282.33 meters 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 1998.

REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted.

Month	Current Year 1998						Period 1969-1998			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters		
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum
Jan.	0.090	0.090	! 1	0.05	! 1	0.05	0.05	134	148	199
Feb.	.090	.090	! 1	.05	! 1	.05	.05	121	135	228
Mar.	.090	.090	! 1	.05	! 1	.05	.05	134	148	258
April	.090	.090	! 1	.05	! 1	.05	.05	130	143	171
May	.090	.085	! 1	.05	! 21	.04	.05	124	145	176
June	.085	.080	! 1	.04	! 19	.04	.04	104	140	181
July	.080	.075	! 1	.04	! 19	.03	.04	96.0	143	187
Aug.	.085	.075	! 19	.04	! 1	.03	.03	92.0	145	187
Sept.	.085	.085	! 1	.04	! 1	.04	.04	104	140	181
Oct.	.090	.085	! 21	.05	! 1	.04	.04	117	144	187
Nov.	.090	.085	! 1	.05	! 19	.04	.05	119	139	181
Dec.	.085	.085	! 17	.05	! 1	.04	.04	120	141	187
Yearly	0.090	0.075		0.05		0.03	0.04	1,395	1,711	2,085
										793

φ Mean daily ! And other days

08-4508.30 HILDA SPRING

DESCRIPTION: Rectangular sharp-crested weir of 1.50 CMS capacity and staff gage located on a creek about 100 meters upstream from its confluence with the Rio Grande, at latitude 29°26'20", longitude 101°03'35", and about 17.7 kilometers upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 276.80 meters 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 1998.

REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted.

Month	Current Year 1998						Period 1969-1998			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters		
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum
Jan.	0.035	0.035	! 1	0.02	! 1	0.02	0.02	53.6	186	321
Feb.	.035	.035	! 1	.02	! 1	.02	.02	48.4	166	290
Mar.	.035	.035	! 1	.02	! 1	.02	.02	53.6	176	297
April	.035	.035	! 1	.02	! 1	.02	.02	51.8	166	278
May	.035	.025	! 1	.02	! 21	.01	.02	44.1	167	268
June	.025	.025	! 1	.01	! 1	.01	.01	25.9	158	259
July	.025	.025	! 1	.01	! 1	.01	.01	26.8	158	285
Aug.	.035	.025	! 19	.02	! 1	.01	.01	38.0	156	295
Sept.	.035	.030	! 1	.02	! 20	.01	.02	42.3	156	289
Oct.	.030	.030	! 21	.02	! 1	.01	.01	36.3	172	299
Nov.	.035	.030	! 1	.02	! 1	.02	.02	51.8	172	311
Dec.	.035	.035	! 1	.02	! 1	.02	.02	53.6	180	321
Yearly	0.035	0.025		0.02		0.01	0.02	526	2,013	3,345
										526

φ Mean daily ! And other days

08-4509.00 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), located on the left bank at latitude 29°25'30", longitude 101°02'25", and river kilometer 920, 3.4 river kilometers downstream from Amistad Dam and 17.4 river kilometers upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 274.00 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 30 current-meter measurements during the year, 18 by the Mexican Section and 12 by the U.S. Section, 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 current-meter measurements. Records available: September 1954 through 1998. Records are also available from May 1900 through April 1915 for a station 3.1 kilometers upstream; from December 1919 through March 1920 for a station 2.7 kilometers 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 1998 for a station approximately 17.1 kilometers 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, 3.4 river kilometers upstream. A computerized radio telemetry system relays gage height data to the Amistad Dam office.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 32,790 CMS on June 28, 1954, determined by slope-area computation, with a gage height of 16.98 meters at the old station site 152 meters downstream. This is the greatest rate of discharge recorded at any point on the Rio Grande. Max. since Amistad Dam, 1,760 CMS on Sept. 21, 1974. Min. 0.63 CMS on February 14, 1969, with a gage height of 0.33 meters.

Average flow in Cubic Meters per Second**

Daily:	Max.	1,730	Sept. 22, 1974	Min.	1.19	August 26, 1998
Monthly:	Max.	609	Sept. 1974	Min.	1.72	October 1971
Yearly:	Max.	139	1974	Min.	16.3	1972

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30.9	33.0	33.0	32.9	193	118	65.8	45.1	2.52	9.00	9.76	7.60
2	28.8	32.5	31.9	32.5	190	122	73.3	46.7	2.52	9.00	8.53	8.14
3	29.3	33.7	32.7	33.3	190	122	69.8	47.4	2.52	9.00	8.53	8.14
4	29.7	31.9	33.2	32.7	193	119	75.7	40.9	2.52	9.00	8.66	8.14
5	29.1	32.8	33.4	32.3	197	119	69.0	42.6	2.75	8.53	8.50	8.14
6	29.0	32.6	32.6	31.5	190	108	72.4	44.3	2.75	8.92	8.44	8.14
7	31.0	30.8	31.9	33.2	37.0	95.0	40.3	42.4	2.75	9.00	8.33	8.14
8	31.7	31.0	35.1	* 32.6	29.1	90.4	* 41.4	43.3	3.08	9.00	8.33	8.25
9	31.6	32.4	33.3	32.8	166	89.8	43.8	42.2	* 3.08	9.00	8.51	8.90
10	30.9	31.8	33.9	32.6	182	* 84.6	45.9	41.9	3.08	9.00	8.32	9.01
11	31.1	* 31.3	* 33.5	32.5	253	86.5	42.8	40.8	3.08	9.00	* 8.32	9.01
12	31.7	32.6	33.2	32.8	265	85.9	43.5	41.1	3.08	9.00	8.54	9.01
13	32.8	31.8	33.4	34.0	235 *	88.8	42.5	41.6	3.08	9.00	8.85	9.01
14	* 31.4	32.5	34.4	34.3	250	88.3	49.4	41.2	3.08	* 9.00	8.90	9.01
15	* 33.0	31.9	34.1	33.4	253	88.9	42.9	42.3	3.08	* 9.00	8.74	9.01
16	33.9	32.7	33.6	* 33.5	254	86.9	42.2	43.5	3.34	8.76	8.83	9.01
17	31.1	32.0	34.2	33.6	253	* 82.8	42.6	43.2	9.70	8.53	8.81	* 9.01
18	31.6	31.6	33.9	206	256	* 86.8	* 43.1	44.2	9.44	8.53	8.92	9.01
19	32.9	33.7	46.7	235	135	88.1	46.4	43.9	10.0	8.53	8.59	9.01
20	32.0	* 33.7	32.2	235	115	88.5	47.0	43.0	10.0	8.53	* 8.63	9.14
21	33.3	33.0	33.3	236	115 *	74.9	42.1	43.9	10.0	8.96	8.65	9.46
22	34.0	32.7	32.8	227 *	112	74.5	* 44.4	43.8	8.67	8.53	8.79	* 9.3
23	32.7	32.7	32.6	225	112	72.2	45.7	49.1	* 5.90	8.53	8.93	9.66
24	31.7	32.7	33.8	237	113	72.6	* 45.6	30.8	6.80	8.53	9.00	9.82
25	32.1	33.3	* 34.8	256	116	74.5	45.7	1.38	8.53	8.53	9.12	9.82
26	32.6	33.0	34.1	252	118	73.0	45.4	1.19	8.53	8.53	9.12	9.82
27	31.5	33.4	* 34.4	248	116	73.6	44.1	3.73	8.53	8.53	9.15	9.82
28	* 34.0	32.8	35.4	252 *	101	70.4	47.6	5.42	8.53	* 8.53	8.60	9.82
29	31.3	33.7	250 *	111	78.1	42.5	3.26	8.65	8.53	7.41	9.82	
30	32.7	33.0	248	110	75.4	43.1	3.23	8.99	9.04	7.13	* 9.01	
31	33.5	32.8	111			44.2	3.32		9.00			8.86
Sum	909.9	3,667.5		2,678.5		1,048.73		272.57		258.94		278.17
982.7	1,048.9		5,071.1		1,530.0		168.58					

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second		Average	Volume Thousand Cubic Meters			
	High	Low	Day	High	Low	Total	Average	Maximum	Minimum
Jan.	0.560	0.135	11	71.3	11	4.42	31.7	84,905	115,396
Feb.	.515	.140	28	60.8	20	4.77	32.5	78,615	151,801
Mar.	.690	.140	19	107	19	4.77	33.8	90,625	183,107
April	1.100	.140	29	260	110	4.77	122	316,872	199,173
May	1.165	.140	11	290	8	4.77	164	438,143	277,914
June	.830	.135	28	153	27	4.42	89.3	231,422	208,371
July	.685	.100	4	106	7	2.19	49.4	132,192	171,294
Aug.	.700	.070	23	109	26	1.13	33.8	90,610	182,841
Sept.	.235	.105	17	13.8	11	2.52	5.62	225,918	1,578,960
Oct.	.205	.185	20	10.5	1.5	8.53	8.79	23,550	1,002,326
Nov.	.205	.165	128	10.5	30	6.74	8.63	22,372	119,143
Dec.	.200	.170	21	10.0	1	7.18	8.97	24,034	103,814
Yearly	1.165	0.070		290		1.13	49.1	1,547,905	4,398,694
									514,104

* Discharge measurement made on this day

o Mean daily

! And other days

** Period 1968-1998

08-4509.04 SPRING M-15 NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Rectangular sharp-crested weir of 0.23 CMS capacity and staff gage located at latitude 29°25'20", longitude 101°02'40", about 0.4 kilometer upstream from its confluence with the Rio Grande and about 15.1 kilometers northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from Mexico at river kilometer 919, 16.5 river kilometers upstream from the international highway bridge between Del Rio, Texas, and Cd. Acuna, Coahuila. The zero of the gage is 281.98 meters 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 1998.

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.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
2	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
3	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
4	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
5	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
6	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
7	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
8	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
9	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
10	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
11	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
12	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
13	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
14	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
15	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
16	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
17	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
18	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
19	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
20	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
21	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
22	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
23	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
24	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
25	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
26	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
27	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
28	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
29	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
30	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
31	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01	.01
Sum		0.28		0.30		0			0.13		0.31	
	0.31		0.31		0.20			0		0.30		0.31

Current Year 1998

Period 1969-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day		Night			Total	Average	Maximum	Minimum	
			High	Low	Day	Night						
Jan.	0.040	0.040	11	1	0.01	11	0.01	0.01	26.8	81.6	162	26.0
Feb.	0.040	0.035	11	1	0.01	11	0.01	0.01	24.2	74.2	152	24.0
Mar.	0.035	0.035	11	1	0.01	11	0.01	0.01	26.8	72.9	150	26.8
April	0.030	0.030	11	1	0.01	11	0.01	0.01	25.9	68.9	130	25.9
May	0.030	0.025	11	1	0.01	121	0	0.01	17.3	72.2	139	17.3
June	0.025	0.020	11	0	11	0	0	0	0	62.5	149	0
July	0.020	0.020	11	0	11	0	0	0	0	63.0	131	0
Aug.	0.030	0.020	119	1	0.01	11	0	0	11.2	64.0	150	0
Sept.	0.030	0.030	11	1	0.01	11	0.01	0.01	25.9	69.2	204	0
Oct.	0.035	0.030	11	1	0.01	11	0.01	0.01	26.8	81.4	402	0
Nov.	0.035	0.035	11	1	0.01	11	0.01	0.01	25.9	76.7	249	25.9
Dec.	0.040	0.035	11	1	0.01	11	0.01	0.01	26.8	75.9	162	26.8
Yearly	0.040	0.020		0.01		0	0.01	238	863	1,680	238	

♦ Mean daily ! And other days

08-4509.05 ARROYO DE LOS JABONCILLOS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 2.00 CMS capacity and staff gage located at latitude 29°24'25", longitude 101°02'20", about 200 meters upstream from its confluence with the Rio Grande, and about 13.8 kilometers northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from Mexico at river kilometer 918, 15.3 river kilometers 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 12 current-meter measurements during the year. Mean daily discharge determined by prorating between readings. Records available: 1969 through 1998.

REMARKS: At least 70 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 CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.75	0.71	0.74	0.67	0.58	0.37	0.28	0.25	0.48	0.51	0.57	0.64
2	.75	.71	.72	.67	.57	.37	.28	.24	.43	.52	.57	.64
3	.75	.72	.71	.68	.57	.36	.28	.24	.44	.52	.57	.64
4	.74	.72	.69	.68	.56	.37	.28	.24	.44	.52	.57	.65
5	.74	.72	.69	.68	.56	.37	.27	.24	.45	.54	.57	.65
6	.74	.72	.68	.68	.55	.38	.27	.24	.47	.62	.57	.65
7	.74	.72	.68	.69	.54	.39	.27	.24	.46	.52	.57	.65
8	.73	.72	.67	.69	.53	.40	.27	.24	.46	.52	.58	.66
9	.72	.72	.67	.69	.52	.40	.27	.24	.46	.53	.58	.66
10	.71	.72	.66	.68	.52	.40	.27	.24	.46	.53	.58	.66
11	.70	.72	.66	.68	.51	.40	.27	.24	.47	.54	.58	.67
12	.69	.72	.68	.67	.50	.39	.26	.24	.47	.54	.58	.67
13	.68	.73	.69	.67	.49	.38	.26	.24	.48	.55	.60	.68
14	.67	.73	.71	.66	.48	.36	.26	.24	.48	* .55	.61	.68
15	.68	.73	.72	* .66	.48	.35	* .26	.24	.49	.56	.63	.69
16	.69	.73	.74	.65	.47	.34	.26	.24	.49	.57	.61	* .69
17	.70	.74	.75	.65	.46	.33	.26	.24	* .53	.58	.61	.69
18	.71	* .74	* .77	.64	.45	.33	.26	.24	.53	.58	* .61	.69
19	.72	.74	.76	.64	.45	.32	.25	* .25	.56	.59	.61	.69
20	.73	.75	.76	.63	.44	.32	.25	.25	.55	.60	.61	.69
21	.74	.75	.75	.63	.43	.32	.25	.25	.54	.61	.61	.69
22	.73	.75	.74	.62	.43	.32	.25	.25	.54	.60	.61	.70
23	.73	.76	.73	.62	.42	* .31	.25	.32	.53	.59	.61	.70
24	.72	.76	.73	.61	.42	.31	.25	.40	.53	.58	.61	.71
25	.72	.77	.72	.61	.41	.31	.25	.48	.52	.58	.61	.71
26	.71	.77	.71	.60	.41	.30	.25	.55	.52	.58	.61	.72
27	.71	.77	.71	.60	* .40	.30	.25	.54	.52	.56	.62	.72
28	.70	.75	.70	.59	.39	.29	.25	.54	.52	* .55	.62	.73
29	.70	.69	.59	.59	.39	.29	.25	.53	.51	.57	.63	.73
30	.71	.68	.58	.58	.38	.28	.25	.53	.51	.57	.63	.74
31	.71	.68			.38		.25	.52		.57		.74
Sum	20.59	19.41	10.36		9.74		17.35			21.23		
	22.22	21.99	14.69		8.08		14.84			17.94		

Current Year 1998

Period 1969-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	Φ High	Φ Low		Total	Average	Maximum	Minimum	
				Day	Day						
Jan.	0.345	0.320	! 1	0.75	14	0.67	0.72	1,920	3,887	5,822	431
Feb.	.350	.330	125	.77	! 1	.71	.74	1,779	3,532	5,189	470
Mar.	.350	.315	18	.77	110	.66	.71	1,900	3,825	5,642	649
April	.325	.290	! 7	.69	30	.58	.65	1,677	3,585	5,359	785
May	.290	.210	1	.58	130	.38	.47	1,269	3,580	5,600	889
June	.230	.180	! 8	.40	30	.28	.35	895	3,325	5,021	836
July	.180	.165	! 1	.28	119	.25	.26	698	3,326	5,387	698
Aug.	.280	.160	26	.55	! 2	.24	.31	842	3,293	5,330	818
Sept.	.285	.235	19	.56	2	.43	.49	1,282	3,404	5,448	965
Oct.	.265	.210	6	.62	1	.51	.56	1,499	3,756	6,428	1,249
Nov.	.310	.285	115	.63	! 1	.57	.60	1,550	3,764	5,979	1,335
Dec.	.340	.310	130	.74	! 1	.64	.68	1,834	3,911	5,808	1,398
Yearly	0.350	0.160		0.77		0.24	0.54	17,145	43,188	63,943	12,157

* Discharge measurement made on this day

Φ Mean daily

! And other days

08-4509.06 SPRING M-5 NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Rectangular sharp-crested weir of 0.50 CMS 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 14.8 kilometers northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from Mexico at river kilometer 919, 16.2 river kilometers upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 284.19 meters 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 1998.

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.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.05	0.05	0.05	0.05	0.04	0.03	0.03	0.02	0.03	0.04	0.04	0.04
2	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
3	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
4	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
5	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
6	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
7	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
8	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
9	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
10	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
11	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
12	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
13	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
14	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
15	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
16	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
17	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
18	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
19	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
20	.05	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04
21	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
22	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
23	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
24	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
25	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
26	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
27	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
28	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
29	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
30	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
31	.05	.05	.05	.04	.03	.03	.02	.03	.04	.04	.04	.05
Sum		1.40	1.38	0.90		0.75		1.24		1.35		
	1.55	1.55	1.13	0.80		1.01		1.20				

Current Year 1998

Period 1969-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Φ High		Φ Low			Total	Average	Maximum	Minimum	
			Day	Day	Day	Day						
Jan.	0.090	0.090	! 1	0.05	! 1	0.05	0.05	134	178	241	83.8	
Feb.	.090	.090	! 1	.05	! 1	.05	.05	121	161	213	84.7	
Mar.	.090	.090	! 1	.05	! 1	.05	.05	134	174	227	80.1	
April	.090	.080	! 1	.05	! 19	.04	.05	119	168	220	78.0	
May	.080	.070	! 1	.04	! 21	.03	.04	97.6	173	229	80.1	
June	.070	.060	! 1	.03	! 1	.03	.03	77.8	164	223	77.8	
July	.060	.055	! 1	.03	! 19	.02	.03	69.1	165	213	54.0	
Aug.	.070	.055	! 16	.03	! 1	.02	.02	64.8	168	241	54.0	
Sept.	.075	.070	! 20	.04	! 1	.03	.03	87.3	166	233	52.1	
Oct.	.080	.075	! 1	.04	! 1	.04	.04	107	175	241	54.0	
Nov.	.080	.080	! 1	.04	! 1	.04	.04	104	170	233	78.0	
Dec.	.085	.080	! 21	.05	! 1	.04	.04	117	176	241	80.1	
Yearly	0.090	0.055		0.05		0.02	0.04	1,233	2,038	2,650	892	

Φ Mean daily ! And other days

08-4509.10 ARROYO DEL BUEY NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 1.00 CMS capacity, located at latitude 29°24'20", longitude 101°02'25", 0.3 kilometer upstream from its confluence with the Rio Grande, and about 13.7 kilometers northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from Mexico at river Kilometer 918, 5.6 river kilometers downstream from Amistad Dam and 15.1 kilometers 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 1998.

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 0.5 creek kilometer 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 566 CMS.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.18	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17	0.18	0.18	0.18
2	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
3	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
4	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
5	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
6	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
7	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
8	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
9	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
10	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
11	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
12	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
13	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
14	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
15	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
16	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.18
17	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.17
18	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.17
19	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.17
20	.18	.18	.18	.18	.18	.17	.17	.17	.17	.18	.18	.17
21	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
22	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
23	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
24	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
25	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
26	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
27	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
28	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
29	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
30	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
31	.18	.18	.18	.18	.17	.17	.17	.17	.17	.18	.18	.17
Sum	5.04	5.40	5.10	5.27	5.58	5.43						
	5.58	5.58	5.47	5.27	5.21	5.40						

Current Year 1998

Period 1961-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Φ High		Φ Low			Total	Average	Maximum	Minimum	
			Day	Day	Day	Day						
Jan.	0.215	0.215	1 1	0.18	1 1	0.18	0.18	482	436	651	8.4	
Feb.	.215	.215	1 1	.18	1 1	.18	.18	435	399	624	6.7	
Mar.	.215	.215	1 1	.18	1 1	.18	.18	482	435	725	11.5	
April	.215	.210	1 1	.18	1 1	.18	.18	467	451	937	7.8	
May	.210	.205	1 1	.18	1 1	.17	.18	473	482	1,092	13.4	
June	.205	.200	1 1	.17	1 1	.17	.17	441	452	664	7.8	
July	.205	.200	1 1	.17	1 1	.17	.17	455	418	657	8.0	
Aug.	.205	.205	1 1	.17	1 1	.17	.17	455	437	653	8.3	
Sept.	.210	.205	1 20	.18	1 1	.17	.17	450	450	648	8.1	
Oct.	.210	.210	1 1	.18	1 1	.18	.18	482	473	671	8.0	
Nov.	.215	.210	1 1	.18	1 1	.18	.18	467	436	638	7.8	
Dec.	.215	.210	1 1	.18	1 1	.17	.18	469	442	664	8.0	
Yearly	0.215	0.200		0.18		0.17	0.18	5,558	5,311	7,674	268	

Φ Mean daily

! And other days

08-4511.20 MARIS SPRING NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 3.00 CMS capacity and staff gage located at the spring about 30 meters from the right bank of the Rio Grande at latitude 29°24'00", longitude 101°01'40", and about 12.9 kilometers northwest of Cd. Acuna, Coahuila. This spring enters the Rio Grande from Mexico at river kilometer 917, 14.3 river kilometers upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 6.4 river kilometers 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 February 1984 and September 1985 through 1998.

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 may 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 a 0.32 CMS capacity. Beginning March 1, 1984, discharge computations were temporarily discontinued due to leakage under the weir. Discharge computations were resumed on August 14, 1985.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.25	.25	.25	.25	.25	.25	.25	.24	.55	.26	.25	.25
2	.25	.25	.25	.25	.25	.25	.25	.24	.55	.26	.25	.25
3	.25	.25	.25	.25	.25	.25	.25	.24	.51	.26	.25	.25
4	.25	.25	.25	.25	.25	.25	.25	.24	.47	.26	.25	.25
5	.25	.25	.25	.25	.25	.25	.25	.24	.43	.26	.25	.25
6	.25	.25	.25	.25	.25	.25	.24	.24	.40	.26	.25	.25
7	.25	.25	.25	.25	.25	.25	.25	.24	.36	.26	.25	.25
8	.25	.25	.25	.25	.25	.25	.25	.24	.32	.26	.25	.25
9	.25	.25	.25	.25	.25	.25	.25	.24	.28	.26	.25	.25
10	.25	.25	.25	.25	.24	.25	.24	.24	.28	.26	.25	.25
11	.25	.25	.25	.25	.24	.25	.24	.24	.27	.26	.25	.25
12	.25	.25	.25	.25	.24	.25	.23	.24	.27	.26	.25	.25
13	.25	.25	.25	.25	.24	.25	.23	.24	.27	.26	.25	.25
14	.25	.25	.25	.25	.24	.25	.23	.24	.27	.26	.25	.25
15	.25	.25	.25	.25	.24	.25	.23	.24	.26	.26	.25	.25
16	.25	.25	.25	.25	.24	.25	.23	.24	.26	.26	.25	.25
17	.25	.25	.25	.25	.25	.25	.23	.24	.26	.26	.25	.25
18	.25	.25	.25	.25	.25	.25	.23	.25	.27	.29	.25	.25
19	.25	.25	.25	.25	.25	.25	.23	.25	.27	.26	.25	.25
20	.25	.25	.25	.25	.24	.25	.23	.24	.28	.26	.25	.25
21	.25	.25	.25	.25	.25	.25	.23	.24	.28	.26	.25	.25
22	.25	.25	.25	.25	.25	.25	.23	.24	.28	.26	.25	.25
23	.25	.25	.25	.25	.25	.25	.23	.32	.27	.26	.25	.25
24	.25	.25	.25	.25	.25	.25	.23	.40	.27	.26	.25	.25
25	.25	.25	.25	.25	.25	.25	.23	.47	.27	.26	.25	.25
26	.25	.25	.25	.25	.25	.25	.24	.55	.27	.25	.25	.25
27	.25	.25	.25	.25	.25	.25	.24	.55	.26	.25	.25	.24
28	.25	.25	.25	.25	.25	.25	.24	.55	.26	.25	.25	.24
29	.25	.25	.25	.25	.25	.25	.24	.55	.26	.25	.25	.24
30	.25	.25	.25	.25	.25	.25	.24	.55	.26	.25	.25	.24
31	.25	.25	.25	.25	.25	.25	.24	.55	.25	.25	.25	.24
Sum		7.00		7.50		7.50		9.79		7.99		7.70
		7.75		7.75		7.68		7.34		9.51		7.50

Current Year 1998

Period 1961-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Φ High		Φ Low			Total	Average	Maximum	Minimum	
			Day	Day	Day	Day						
Jan.	0.080	0.080	! 1	0.25	! 1	0.25	0.25	670	695	1,152	5.4	
Feb.	.075	.070	! 1	.25	! 1	.25	.25	605	622	1,136	5.0	
Mar.	.075	.075	! 1	.25	! 1	.25	.25	670	683	1,179	7.0	
April	.235	.230	! 1	.25	! 1	.25	.25	648	687	1,217	10.4	
May	.075	.060	! 1	.25	! 1	.24	.25	664	748	1,624	10.7	
June	.080	.070	! 1	.25	! 1	.25	.25	648	725	1,719	7.4	
July	.070	.040	! 1	.25	! 1	.23	.24	634	743	1,693	9.8	
Aug.	.640	.050	26	.55	15	.24	.32	816	759	1,524	7.6	
Sept.	.275	.100	! 1	.55	15	.26	.32	822	775	1,434	13.3	
Oct.	.090	.070	! 1	.26	125	.25	.26	690	837	1,752	13.4	
Nov.	.075	.070	! 1	.25	! 1	.25	.25	648	771	1,650	12.7	
Dec.	.070	.065	! 1	.25	127	.24	.25	665	721	1,464	10.7	
Yearly	0.640	0.040		0.55		0.23	0.26	8,210	8,766	16,058	74.3	

φ Mean daily ! And other days

08-4511.30 EIGHT MILE CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Concrete wall with 90° V-notch weir of 0.20 CMS capacity at latitude 29°24'00", longitude 101°00'55", 1.3 creek kilometers upstream from its confluence with the Rio Grande, and about 12.9 kilometers northwest of Del Rio, Val Verde County, Texas. This stream enters the Rio Grande from the United States at river kilometer 916, 7.4 river kilometers downstream from Amistad Dam and 13.4 kilometers upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage is 278.58 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 12 current-meter measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: March 1961 through 1998.

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. Bubbler gage and water-stage recorder were removed April 1, 1985.

EXTREME FLOWS FROM RECORDS:

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	* 0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	* 0	0	0
3	0	0	0	0	0	* 0	0	0	0	0	0	*
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	* 0	0	0	0	0	* 0	0	0	0	0
6	0	* 0	0	0	* 0	0	0	0	0	0	0	0
7	* 0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	* 0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	*
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum		0.00										
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Current Year 1998**Period 1961-1998**

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	Φ High	Day	Φ Low		Total	Average	Maximum	Minimum
				Day	Day	Day					
Jan.			! 1	0	! 1	0	0	0	134	363	0
Feb.			! 1	0	! 1	0	0	0	125	396	0
Mar.			! 1	0	! 1	0	0	0	130	386	0
April			! 1	0	! 1	0	0	0	120	313	0
May			! 1	0	! 1	0	0	0	121	412	0
June			! 1	0	! 1	0	0	0	104	264	0
July			! 1	0	! 1	0	0	0	104	481	0
Aug.			! 1	0	! 1	0	0	0	102	369	0
Sept.			! 1	0	! 1	0	0	0	101	296	0
Oct.			! 1	0	! 1	0	0	0	114	412	0
Nov.			! 1	0	! 1	0	0	0	115	396	0
Dec.			! 1	0	! 1	0	0	0	121	349	0
Yearly			0		0		0	0	1,391	3,567	0

* Discharge measurement made on this day

Φ Mean daily

! And other days

08-4511.40 MCKEE SPRING NEAR DEL RIO, TEXAS

DESCRIPTION: This spring is located on the left floodplain of the Rio Grande at latitude 29°23'35", longitude 101°01'15", about 46 meters from the edge of the low-flow channel and about 12.9 kilometers northwest of Del Rio, Texas. Water from this spring enters the Rio Grande from the United States at river kilometer 916, 7.7 river kilometers downstream from Amistad Dam.

RECORDS: Based on 12 current-meter measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: November 1961 through 1998.

REMARKS: The flow of this spring is uniform during periods of dry weather and is modified by periodic residential pumping. It is estimated that backwater from the Rio Grande will reach the emergence of this spring when the river flow is approximately 396 CMS. 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 Cubic Meters per Second											
Daily	Max.	0.31	Feb. 16, 1983							Min.	0	Occasionally			
Monthly	Max.	0.26	Feb. 1983							Min.	0	Occasionally			
Yearly	Max.	0.22	1979							Min.	0	1963			

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.07	0.08	0.07	0.06	0.06	0.06	* 0.07	0.03	0.10	0.07	0.07	0.07
2	.07	.08	.07	.06	.06	.06	.07	.03	.10	* .07	.07	.07
3	.07	.08	.07	.06	.06	* .06	.07	.03	.11	.07	.07	* .07
4	.07	.08	.07	.06	.06	.06	.07	.03	* .11	.07	.07	.07
5	.07	.08	* .07	.06	.06	.06	.07	* .03	.11	.07	.07	.07
6	.07	* .08	.07	.06	* .06	.06	.06	.03	.11	.07	.07	.07
7	* .07	.08	.07	.06	.06	.06	.06	.04	.10	.07	.07	.07
8	.07	.08	.07	* .06	.06	.06	.06	.04	.10	.07	.07	.07
9	.07	.08	.07	.06	.06	.06	.06	.04	.10	.07	* .07	.08
10	.07	.08	.07	.06	.06	.06	.06	.04	.10	.07	.07	.08
11	.07	.08	.07	.06	.06	.06	.06	.05	.10	.07	.07	.08
12	.07	.08	.07	.06	.06	.06	.06	.05	.10	.07	.07	.08
13	.07	.08	.07	.06	.06	.06	.06	.05	.10	.07	.07	.08
14	.07	.08	.07	.06	.06	.06	.06	.05	.09	.07	.07	.08
15	.07	.08	.07	.06	.06	.06	.06	.06	.09	.07	.07	.08
16	.07	.08	.07	.06	.06	.06	.05	.06	.09	.07	.07	.08
17	.07	.08	.07	.06	.06	.06	.05	.06	.09	.07	.07	.08
18	.07	.08	.07	.06	.06	.06	.05	.06	.09	.07	.07	.08
19	.07	.08	.07	.06	.06	.06	.07	.05	.07	.09	.07	.08
20	.07	.08	.07	.06	.06	.06	.05	.06	.09	.07	.07	.08
21	.07	.08	.07	.06	.06	.06	.07	.05	.08	.07	.07	.09
22	.07	.08	.06	.06	.06	.07	.05	.08	.08	.07	.07	.09
23	.08	.07	.06	.06	.06	.06	.04	.08	.08	.07	.07	.09
24	.08	.07	.06	.06	.06	.07	.04	.08	.08	.07	.07	.09
25	.08	.07	.06	.06	.06	.07	.04	.08	.08	.07	.07	.09
26	.08	.07	.06	.06	.06	.07	.04	.09	.08	.07	.07	.09
27	.08	.07	.06	.06	.06	.07	.04	.09	.08	.07	.07	.09
28	.08	.07	.06	.06	.06	.07	.04	.09	.07	.07	.07	.09
29	.08	.06	.06	.06	.06	.07	.04	.09	.07	.07	.07	.09
30	.08	.06	.06	.06	.06	.07	.04	.10	.07	.07	.07	.09
31	.08	.06	.06	.06	.06	.07	.04	.10	.07	.07	.07	.10
Sum		2.15	1.80	1.93	1.87	1.87	2.17	2.52				
		2.26	2.07	1.86	1.65	1.87	2.74	2.10				

Current Year 1998**Period 1961-1998**

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
Jan.			! 23	0.08	! 1	0.07	0.07	195	326	649	0
Feb.			! 1	0.08	! 20	.07	.08	186	307	628	0
Mar.			! 1	.07	! 22	.06	.07	179	330	650	0
April			! 1	.06	! 1	.06	.06	156	322	604	0
May			! 1	.06	! 1	.06	.06	161	348	633	.7
June			! 18	.07	! 1	.06	.06	167	320	580	0
July			! 1	.07	! 23	.04	.05	143	329	692	0
Aug.			! 30	.10	! 1	.03	.06	162	331	622	0
Sept.			! 3	.11	! 28	.07	.09	237	319	591	0
Oct.			! 1	.07	! 1	.07	.07	187	331	640	0
Nov.			31	.10	! 1	.07	.08	218	320	596	0
Dec.											
Yearly				0.11		0.03	0.07	2,172	3,896	6,978	0.7

* Discharge measurement made on this day

φ Mean daily

! And other days

08-4511.50 ARROYO DE LA TREINTA Y UNA NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 1.00 CMS capacity, located at latitude 29°22'35", longitude 101°01'15", 966 creek meters upstream from its confluence with the Rio Grande, and about 10.5 kilometers northwest of Cd. Acuna, Coahuila. This stream enters the Rio Grande from Mexico at river kilometer 913, 10.1 river kilometers downstream from Amistad Dam and 10.6 river kilometers 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 1998.

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 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. It is estimated that backwater from the Rio Grande will affect the flow at this station only during times of extremely high release.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.06	0.07	0.07	0.07	0.05	0.06	0.06	0.06	0.11	0.08	0.07	0.06
2	.06	.07	.07	.07	.05	.06	.06	.06	.11	.08	.07	.06
3	.06	.07	.07	.07	.05	.06	.06	.06	.11	.07	.07	.06
4	.07	.07	.07	.07	.05	.06	.06	.06	.11	.07	.07	.06
5	.07	.07	.07	.07	.05	.06	.06	.06	.11	.07	.07	.06
6												
7	.07	.07	.07	.07	.05	.06	.06	.06	.10	.07	.07	.06
8	.07	.07	.07	.07	.05	.06	.06	.06	.10	.07	.07	.06
9	.07	.07	.07	.07	.05	.06	.06	.06	.10	.07	.07	.06
10	.07	.07	.07	.07	.05	.06	.06	.06	.10	.07	.07	.06
11	.07	.07	.07	.06	.05	.06	.06	.07	.10	.07	.07	.06
12	.07	.07	.07	.06	.05	.06	.06	.06	.10	.07	.07	.06
13	.07	.07	.07	.06	.05	.06	.06	.06	.10	.07	.07	.06
14	.07	.07	.07	.06	.05	.06	.06	.06	.08	.10	.07	.06
15	.07	.07	.07	.06	.05	.06	.06	.06	.08	.10	.07	.06
16	.07	.07	.07	.06	.05	.06	.06	.06	.08	.09	.07	.06
17	.07	.07	.07	.06	.05	.06	.06	.06	.09	.09	.07	.07
18	.07	.07	.07	.06	.05	.06	.06	.06	.08	.09	.07	.07
19	.07	.07	.07	.06	.05	.06	.06	.06	.09	.09	.07	.06
20	.07	.07	.07	.06	.05	.06	.06	.06	.09	.09	.07	.07
21	.07	.07	.07	.06	.06	.06	.06	.06	.09	.09	.07	.06
22	.07	.07	.07	.06	.06	.06	.06	.06	.09	.09	.07	.06
23	.07	.07	.07	.06	.06	.06	.06	.06	.09	.09	.07	.06
24	.07	.07	.07	.06	.06	.06	.06	.06	.09	.08	.07	.06
25	.07	.07	.07	.06	.06	.06	.06	.06	.10	.08	.07	.06
26	.07	.07	.07	.06	.06	.06	.06	.06	.10	.08	.07	.06
27	.07	.07	.07	.06	.06	.06	.06	.06	.10	.08	.07	.06
28	.07	.07	.07	.05	.06	.06	.06	.06	.10	.08	.07	.06
29	.07	.07	.07	.05	.06	.06	.06	.06	.10	.08	.07	.06
30	.07	.07	.07	.05	.06	.06	.06	.06	.10	.08	.07	.06
31	.07	.07	.07	.06	.06	.06	.06	.06	.11	.07	.07	.06
Sum		1.96	1.86	1.80	2.49	2.19	2.01					
2.14		2.17	1.67	1.86	2.84	2.19	1.98					

Current Year 1998

Period 1961-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters						
	High	Low	Day		Day		Total	Average	Maximum				
			High	Low									
Jan.	0.110	0.105	1	4	0.07	1	1	0.06	0.07	185	203	348	18.7
Feb.	.110	.110	1	1	.07	1	1	.07	.07	169	186	317	17.1
Mar.	.110	.110	1	1	.07	1	1	.07	.07	187	203	403	17.5
April	.110	.100	1	1	.07	1	10	.06	.06	161	213	373	13.0
May	.095	.095	1	20	.06	1	1	.05	.05	144	209	323	7.3
June	.100	.095	1	1	.06	1	1	.06	.06	156	197	313	5.2
July	.100	.100	1	1	.06	1	1	.06	.06	161	191	312	0
Aug.	.145	.100	31	1	.11	1	1	.06	.08	215	198	398	0
Sept.	.150	.120	1	1	.11	1	1	.08	.09	245	207	337	16.2
Oct.	.120	.110	1	1	.08	1	3	.07	.07	189	220	348	14.9
Nov.	.110	.105	1	1	.07	1	19	.06	.07	171	204	382	17.5
Dec.	.105	.105	1	17	.07	1	1	.06	.06	174	208	382	18.7
Yearly	0.150	0.095			0.11			0.05	0.07	2,157	2,439	4,026	308

φ Mean daily

I And other days

08-4513.00 CANTU SPRING NEAR DEL RIO, TEXAS

DESCRIPTION: Concrete enclosure 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 4.0 kilometers northwest of Del Rio, Texas and 5.6 creek kilometers upstream from the confluence of Cienegas Creek with the Rio Grande. Cienegas Creek enters the Rio Grande at river kilometer 906, 3.0 river kilometers upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila.

RECORDS: Based on 12 current-meter measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: March 1961 through 1998.

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 Cubic Meters per Second											
Daily	Max.	0.37	March 2, 1989						Min. 0	Occasionally	
Monthly	Max.	0.34	March 1989						Min. 0	Occasionally	
Yearly	Max.	0.24		1989					Min. 0	1963	

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.16	0.16	0.15	0.15	0.15	0.12	* 0.10	0.10	0.17	0.18	0.19	0.18
2	.16	.16	.15	.15	.15	.12	.10	.10	.18	* .18	.19	.18
3	.16	.16	.15	.15	.15	* .12	.10	.10	.18	.18	.19	* .18
4	.16	.16	.15	.15	.15	.12	.10	* .10	.18	.18	.19	.18
5	.16	.16	* .15	.15	.15	.12	.10	* .10	.18	.18	.19	.18
6	* .16	.16	.15	.15	* .15	.12	.10	.11	.18	.18	* .19	.18
7	* .16	.16	.15	.15	.15	.12	.10	.11	.18	.18	.19	.18
8	.16	.16	.15	* .15	.15	.12	.10	.11	.18	.18	.19	.18
9	.16	.16	.15	.15	.15	.12	.10	.11	.18	.18	.19	.18
10	.16	.16	.15	.15	.15	.11	.10	.12	.18	.18	.19	.18
11	.16	.16	.15	.15	.14	.11	.10	.12	.18	.18	.19	.18
12	.16	.16	.15	.15	.14	.11	.10	.12	.18	.18	.19	.19
13	.16	.16	.15	.15	.14	.11	.10	.12	.18	.18	.19	.19
14	.16	.16	.15	.15	.14	.11	.10	.13	.18	.18	.19	.19
15	.16	.16	.15	.15	.14	.11	.10	.13	.18	.18	.19	.19
16	.16	.16	.15	.15	.14	.11	.10	.13	.18	.18	.19	.19
17	.16	.16	.15	.15	.14	.11	.10	.13	.18	.18	.19	.19
18	.16	.16	.15	.15	.14	.11	.10	.14	.18	.18	.19	.19
19	.16	.16	.15	.15	.14	.11	.10	.14	.18	.19	.19	.19
20	.16	.15	.15	.15	.13	.11	.10	.14	.18	.19	.18	.19
21	.16	.15	.15	.15	.13	.11	.10	.15	.18	.19	.18	.19
22	.16	.15	.15	.15	.13	.11	.10	.15	.18	.19	.18	.19
23	.16	.15	.15	.15	.13	.11	.10	.15	.18	.19	.18	.19
24	.16	.15	.15	.15	.13	.10	.10	.15	.18	.19	.18	.19
25	.16	.15	.15	.15	.13	.10	.10	.16	.18	.19	.18	.19
26	.16	.15	.15	.15	.13	.10	.10	.16	.18	.19	.18	.19
27	.16	.15	.15	.15	.13	.10	.10	.16	.18	.19	.18	.19
28	.16	.15	.15	.15	.13	.10	.10	.16	.18	.19	.18	.19
29	.16	.15	.15	.15	.13	.10	.10	.17	.18	.19	.18	.20
30	.16	.15	.15	.15	.12	.10	.10	.17	.18	.19	.18	.20
31	.16	.15	.15	.15	.12	.10	.10	.17	.18	.19	.18	.20
Sum		4.39		4.50		3.32		4.11		5.71		5.81
	4.96		4.65		4.30		3.10		5.39		5.59	

Current Year 1998

Period 1961-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			! 1	0.16	! 1	0.16	0.16	429	421	697	0
Feb.			! 1	.16	! 20	.15	.16	379	378	749	0
Mar.			! 1	.15	! 1	.15	.15	402	414	907	0
April			! 1	.15	! 1	.15	.15	389	390	780	0
May			! 1	.15	! 30	.12	.14	372	398	750	0
June			! 1	.12	! 24	.10	.11	287	371	675	0
July			! 1	.10	! 1	.10	.10	268	379	671	0
Aug.			! 29	.17	! 1	.10	.13	355	383	668	0
Sept.			! 2	.18	! 1	.17	.18	466	389	661	0
Oct.			! 19	.19	! 1	.18	.18	493	429	777	0
Nov.			! 1	.19	! 20	.18	.19	483	407	768	0
Dec.			! 29	.20	! 1	.18	.19	502	417	734	0
Yearly				0.20		0.10	0.15	4,825	4,776	8,063	0

* Discharge measurement made on this day

φ Mean daily

! And other days

08-4515.00 CIENEGAS CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Measurement sections, one each, located on Cienegas Creek at latitude 29°21'10", longitude 100°56'35", 0.8 creek kilometer upstream from its confluence with the Rio Grande; and for the Briggs Farm ditch, latitude 29°21'40", longitude 100°56'30", .884 meters downstream from the ditch intake which branches off the right bank of Cienegas Creek immediately upstream of a small diversion dam across the creek, and about 4.0 kilometers west of Del Rio, Val Verde County Texas. The point of diversion is 2.9 creek kilometers upstream from the confluence of Cienegas Creek with the Rio Grande. Cienegas Creek enters the Rio Grande at river kilometer 906, 3.0 river kilometers upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila.

RECORDS: Based on 12 current-meter measurements at Cienegas Creek and 12 current-meter measurements at Briggs Farm ditch, respectively, during the year. Mean daily discharge computations determined by combining the two records for the total yield of the springs. Records available: March 1965 through 1998. Discharge measurement data available since November 1962. Records are also available from September 1931 through June 1935 for a station 0.5 creek kilometer downstream. The station was moved 0.3 creek kilometer upstream in June 1983.

REMARKS: Low flow of this stream is from springs, one of which is Cantu Spring, whose discharge is shown on the previous page. The flow of this stream is modified by irrigation diversions through the Briggs Farm ditch. 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 Cubic Meters per Second											
Daily:	Max.	1.21		August 12, 1972					Min.	0.01	April 21, 1966
Monthly:	Max.	0.70		July 1976					Min.	0.02	August 1967
Yearly:	Max.	0.51		1977					Min.	0.03	1968

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.35	0.39	0.29	0.30	0.29	0.22	* 0.24	0.21	0.36	0.23	0.34	0.27
2	.35	.39	.28	.31	.29	.22	.24	.21	.36	* .23	.34	.27
3	.35	.39	.28	.31	.29	* .22	.24	.20	.37	.24	* .34	* .27
4	.34	.39	.27	.31	.28	.22	.23	.20	* .37	.24	.35	.27
5	.35	.39	* .27	.31	.28	.22	.23	* .21	.36	.24	.35	.27
6	.35	* .39	.27	.32	* .28	.22	.23	.21	.36	.24	.35	.27
7	* .35	.39	.27	.31	.28	.22	.23	.22	.35	.25	.35	.27
8	.35	.38	.28	* .31	.28	.23	.23	.23	.35	.25	.34	.28
9	.35	.38	.28	.31	.27	.23	.23	.23	.34	.25	.34	.28
10	.35	.37	.27	.31	.27	.23	.23	.24	.34	.27	.34	.28
11	.35	.37	.27	.31	.27	.23	.23	.24	.33	.27	.33	.28
12	.36	.36	.28	.31	.27	.23	.23	.25	.33	.27	.33	.28
13	.36	.36	.28	.31	.27	.23	.23	.25	.32	.27	.33	.28
14	.36	.35	.28	.31	.27	.23	.23	.25	.32	.28	.32	.28
15	.36	.35	.28	.30	.26	.23	.23	.26	.31	.28	.32	.28
16	.36	.34	.29	.30	.26	.23	.22	.27	.31	.28	.32	.29
17	.36	.34	.29	.30	.26	.24	.22	.27	.30	.29	.32	.29
18	.36	.33	.29	.30	.26	.23	.22	.28	.30	.29	.32	.29
19	.36	.33	.28	.30	.26	.23	.22	.28	.29	.29	.31	.29
20	.36	.33	.29	.29	.26	.23	.22	.29	.29	.29	.30	.30
21	.37	.33	.29	.30	.26	.23	.22	.30	.28	.30	.30	.30
22	.37	.32	.29	.30	.26	.24	.21	.30	.28	.30	.30	.30
23	.38	.32	.29	.30	.26	.23	.21	.31	.27	.30	.30	.30
24	.38	.31	.29	.30	.26	.23	.21	.32	.27	.31	.29	.30
25	.38	.31	.30	.29	.26	.23	.21	.32	.26	.31	.29	.31
26	.38	.30	.30	.29	.23	.23	.21	.33	.26	.31	.29	.31
27	.38	.30	.30	.29	.23	.24	.21	.34	.25	.31	.29	.31
28	.38	.29	.29	.29	.23	.24	.21	.33	.25	.33	.29	.31
29	.38	.30	.28	.28	.23	.24	.21	.34	.24	.33	.28	.31
30	.38	.30	.28	.28	.23	.24	.21	.34	.24	.33	.27	.31
31	.38	.30	.30	.29	.24	.23	.21	.35	.26	.34	.29	.31
Sum		9.80		9.05		6.88		8.38		8.72		8.96
	11.24		8.84		8.03		6.90		9.26		9.54	

Current Year 1998

Period 1965-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	Φ	High	Day		Total	Average	Maximum	Minimum
				High	Low	Day	Φ				
Jan.			123	0.38	4	0.34	0.36	971	979	1,532	163
Feb.			11	.39	28	.29	.35	847	902	1,512	121
Mar.			125	.30	14	.27	.29	764	937	1,563	85.6
April			6	.32	129	.28	.30	782	867	1,388	59.2
May			11	.29	126	.23	.26	694	870	1,430	81.7
June			117	.24	122	.21	.22	594	814	1,322	18.1
July			11	.24	122	.21	.22	596	790	1,884	9.3
Aug.			31	.35	13	.20	.27	724	797	1,531	8.0
Sept.			14	.37	129	.24	.31	800	800	1,287	16.2
Oct.			31	.34	11	.23	.28	753	912	1,400	19.1
Nov.			14	.35	30	.27	.32	824	892	1,378	31.1
Dec.			125	.31	11	.27	.29	774	938	1,441	78.6
Yearly				0.39		0.20	0.29	9,123	10,498	15,992	856

* Discharge measurement made on this day

Φ Mean daily

! And other days

08-4518.00 RIO GRANDE AT DEL RIO, TEXAS AND Cd. ACUNA, COAHUILA

DESCRIPTION: Cableway, bubbler gage, concrete control weir, water-stage recorders (graphic and digital) and data collection platform located on the left bank at latitude 29°20'07", longitude 100°55'41", and river kilometer 903, 360 meters upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 20.4 river kilometers downstream from Amistad Dam. The zero of the gage is 264.93 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 31 current-meter measurements during the year, 13 by the United States Section and 18 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 current-meter measurements. Records available: December 1923 through July 2, 1941 and January 1968 through 1998. Records are available from May 1900 through April 1915 for a station 19.6 kilometers upstream; from December 1919 through March 1920 for a station 14.0 kilometers upstream near McKee's Switch; from July 2, 1941 through 1954 and October 1960 through 1967 for a station 366 meters downstream at the international highway bridge; and from September 1954 through the current year for a station, Rio Grande below Amistad Dam, 17.0 kilometers 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 data collection platform, 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 32,300 CMS occurred on June 28, 1954, with a gage height of 11.66 meters at a station 360 meters downstream. The lowest recorded flow was 3.51 CMS which occurred March 5 and 6, 1969, with a gage height of 0.38 meters.

				Average Flow in Cubic Meters per Second**							
Daily:	Max.	1,810	Sept. 22, 1974					Min.	4.64		Aug. 13, 1971
Monthly:	Max.	632	Sept. 1974					Min.	5.32		October 1971
Yearly:	Max.	146	1974					Min.	19.9		1972

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	36.1	33.9	33.3	33.2	220	132	73.8	48.3	6.15	11.4	12.0	9.88
2	35.2	33.2	32.0	32.9	210	137	76.3	51.9	6.23	11.1	11.6	10.7
3	35.1	33.8	32.3	34.2	210	138	75.6	53.5	6.19	10.9	11.7	10.9
4	35.2	33.6	34.3	33.8	213	134	77.5	46.9	5.96	10.9	11.8	10.9
5	35.1	33.4	32.7	34.3	217	133	74.3	48.8	5.73	10.8	11.8	11.0
6	34.4	34.0	33.1	32.1	213	116	77.6	48.7	5.83	11.4	* 11.6	11.1
7	35.8	32.3	31.6	35.6	52.8	104	47.1	47.2	5.78	10.9	11.6	11.1
8	34.9	31.1	33.1	35.6	32.8	97.3	47.6	47.1	5.71	10.8	11.6	11.1
9	34.4	33.8	33.5	36.6	171	98.6	47.2	46.8	5.76	10.9	11.5	11.7
10	34.3	31.5	33.0	35.9	197	94.6	* 48.1	46.0	5.63	11.0	11.4	11.9
11	34.3	32.6	33.7	35.9	271	96.6	48.5	44.3	5.65	11.0	11.4	12.3
12	35.5	32.8	33.0	36.3	289	* 93.6	49.0	44.5	5.63	11.1	11.4	12.3
13	37.0	33.5	* 33.1	37.3	256	97.3	48.4	44.5	5.62	11.1	11.8	12.3
14	35.1	33.2	33.8	37.1	269 *	98.3	54.0	* 45.2	5.43	11.3	11.9	12.3
15	34.7	34.6	34.7	37.3	275	97.0	48.8	47.1	5.52	* 11.3	11.9	12.4
16	* 35.3	33.7	34.6	* 36.9	276	96.7	46.9	48.0	5.65	11.2	11.9	12.4
17	34.6	34.2	35.0	* 34.4	276	94.7	* 48.1	49.6	12.5	11.2	11.9	* 12.4
18	33.6	34.5	34.2	204	280	94.6	47.4	50.6	12.9	11.1	11.8	12.4
19	35.0	* 34.9	49.0	244	156	* 94.4	49.0	51.2	12.6	11.1	11.8	12.3
20	33.7	* 37.0	* 32.9	248	131	93.4	51.1	49.4	13.1	11.3	* 11.2	12.2
21	34.5	34.2	30.1	250	127	80.5	42.6	* 47.8	13.2	11.5	10.9	12.2
22	* 36.2	34.0	32.7	243	129 *	79.1	47.4	46.8	* 12.7	11.3	10.9	11.8
23	33.9	33.6	33.4	243 *	128	77.0	50.1	107	9.42	11.2	11.1	11.8
24	33.9	33.2	34.3	255	128	78.5	50.8	704	9.41	11.1	11.1	12.0
25	33.8	33.6	34.5	280	132	79.7	50.6	14.0	11.3	11.1	11.0	11.9
26	33.4	33.2	34.2	278	134	77.3	51.0	8.74	11.3	11.2	11.0	11.9
27	33.0	33.5	34.6	274	133	78.4	50.0	8.30	11.3	11.1	11.2	11.9
28	34.5	33.1	35.4	278	131	72.2	52.8	9.20	11.4	11.1	11.2	11.9
29	33.0	33.3	33.3	279	129	86.2	48.0	7.84	11.5	11.2	9.98	12.0
30	33.5	33.0	275	127	80.5	50.4	7.21	11.6	11.6	9.81	12.1	
31	33.6	32.3		127			49.0	* 6.40		11.7		12.1

Sum	940.0	3,950.4	2,928.5	1,926.89	345.9	365.18
	1,072.6	1,050.7	5,640.6	1,679.0	256.70	341.79

Month	Current Year 1998						Period 1968-1998					
	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters					
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum		
Jan.	0.735	0.490	1	64.9	22	14.7	34.6	92,673	121,277	272,866	17,882	
Feb.	.690	.490	14	52.8	26	14.4	33.6	81,216	155,788	552,852	22,983	
Mar.	.850	.475	19	103	21	12.7	33.9	90,780	187,237	489,370	21,337	
April	1.190	.495	29	287	16	15.2	132	341,315	205,815	566,611	41,748	
May	1.240	.505	11	313	8	16.7	182	487,348	284,609	669,284	38,149	
June	.935	.505	28	141	27	17.8	97.6	253,022	212,961	512,957	28,546	
July	.850	.400	6	107	20	5.44	54.2	145,066	175,488	452,566	38,823	
Aug.	4.770	.415	24	2,170	31	6.07	62.2	166,483	190,808	827,137	35,556	
Sept.	.510	.400	17	18.2	14	5.26	8.56	22,179	234,268	1,637,441	22,179	
Oct.	.470	.450	30	12.2	1	10.7	11.2	29,886	213,458	1,005,540	14,281	
Nov.	.470	.450	17	12.5	1	9.73	11.4	29,531	127,035	650,690	16,830	
Dec.	.470	.450					31,552	109,818	282,187	17,168		
Yearly	4.770	0.400		2,170			5.26	56.2	1,771,051	2,218,562	4,617,893	627,328

* Discharge measurement made on this day ! And other days ** Period 1968-1998

Values for January 1968 are Rio Grande near Del Rio less Arroyo de las Vacas flow

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

08-4520.00 ARROYO DE LAS VACAS AT CD. ACUNA, COAHUILA

DESCRIPTION: Cableway, concrete wall with a V-shape concrete control weir of 10 CMS 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 2.9 creek kilometers upstream from its confluence with the Rio Grande. This stream enters the Rio Grande at river kilometer 903 on the upstream side of the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 20.7 river kilometers downstream from Amistad Dam. The zero of the gage is 270.00 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 24 current-meter measurements during the year, 20 by the Mexican Section and 4 by the United States Section, and a continuous record of gage heights. Computations by shifting control methods for flows exceeding the capacity of the weir. Records available: Occasional estimates from June 1935 to March 19, 1938 and a continuous record from March 20, 1938 through 1998.

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 10 CMS, constructed at this station, started operating December 14, 1961. On June 28, 1954, backwater from the Rio Grande reached an elevation of 275.08 meters 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. 1,800 CMS with a gage height of 7.70 meters on June 17, 1961. Min. no flow on several occasions.

		Average Flow in Cubic Meters per Second**					
Daily:	Max.	678	June 17, 1961	Min.	0	Occasionally	
Monthly:	Max.	29.8	June 1961	Min.	0.01	Occasionally	
Yearly:	Max.	2.74	1961	Min.	0.08	1952	

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.10	0.20	0.14	0.14	0.07	0.03	0.02	0.01	0.57	0.11	0.30	0.16
2	.16	.14	.13	.14	.07	.02	.02	.01	.48	.10	.19	.15
3	.12	.18	.15	.12	.07	.03	.02	.01	.38	.11	.15	.15
4	.14	.13	.20	.13	.07	.02	.02	.01	.34	.11	.26	.16
5	.12	.15	.20	.16	.06	.02	.02	.02	.31	.11	.22	.17
6	.16	.16	.19	.16	.06	.02	.01	.03	.29	.22	.17	.17
7	.16	.14	.15	.14	.05	.02	.01	.04	.28	.11	.17	.16
8	* .16	.15	.14	.12	.06	.02	.01	.04	.27	* .11	.18	.16
9	.16	.18	.16	.11	.06	.02	.01	.04	.26	.11	.18	.16
10	.16	.12	.16	.11	.05	.07	.01	.04	.26	.11	.17	.17
11	.19	* .12	* .16	.10	.05	.06	.01	.04	.24	.11	.17	* .18
12	.17	* .12	* .16	.10	.06	.03	.01	.05	.26	.11	* .17	.18
13	.14	.12	.19	.10	* .05	.02	.01	* .05	.26	.11	.20	.16
14	.12	.13	.17	.10	.06	.02	.01	.05	.23	.10	.23	.17
15	.10	.16	.24	.10	.05	* .02	.01	.06	.21	.10	.19	.17
16	.08	.18	1.03	.10	.06	.02	* .01	.05	.20	.11	.17	.17
17	.08	.16	.34	.11	.05	.02	.01	.05	4.56	.12	.17	.16
18	.08	.15	.27	.11	.06	.02	.01	.24	.97	.21	.15	.17
19	.09	.13	.20	.11	.06	.02	.01	5.07	.32	.14	.16	.20
20	.16	.14	.19	.11	.05	.02	.01	.40	.22	.13	.15	.21
21	.16	.16	.18	.10	* .05	.02	.01	.39	* .18	.15	.15	.19
22	.14	.21	.19	.10	.05	.02	.01	.18	.16	.14	.14	.18
23	.18	.14	.20	.11	.05	.02	.01	43.8	.15	.14	.17	.22
24	.19	.13	.19	.10	.05	.02	.01	303	.14	.13	.17	.23
25	.21	.12	.19	.10	.05	.01	.01	6.51	.14	.13	.16	.25
26	.18	* .12	.19	.11	.05	.02	.01	3.32	.13	.14	.16	.25
27	.13	* .13	.18	.10	.05	.01	.01	1.97	.13	.14	.16	.25
28	.12	.14	.16	.10	.08	.01	.01	1.43	.12	.14	.16	.23
29	.18		.16	.08	.04	.01	.01	1.17	.11	.14	.16	.19
30	.17		.16	* .08	.03	.01	.01	1.04	.11	.14	.16	.17
31	.20		.14		.03		.01	.07		.15		.16
Sum		4.11		3.35		0.67		369.99		3.98		5.70
	4.51		6.51		1.70		0.36		12.28		5.43	

Current Year 1998

Period 1938-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
Jan.	0.150	0.100	31	0.25	115	0.08	0.15	390	503	1,420	38.9
Feb.	.145	.110	26	.23	126	.11	.15	355	612	7,339	40.6
Mar.	.430	.110	16	3.44	1	.11	.21	562	733	3,214	72.6
April	.135	.085	6	.19	30	.06	.11	289	1,552	20,483	93.3
May	.190	.060	28	.45	31	.06	.05	147	1,589	11,194	111
June	.160	.050	10	.30	125	.01	.02	57.9	2,630	77,118	53.6
July	.075	.035	12	.04	14	.01	.01	31.1	1,566	20,240	31.0
Aug.	6.390	.045	23	1,190	1	.01	11.9	31,967	1,983	31,967	51.8
Sept.	.890	.105	17	10.8	30	.10	.41	1,061	3,054	61,139	45.8
Oct.	.225	.105	6	.69	114	.10	.13	344	1,789	25,218	27.6
Nov.	.265	.120	1	1.04	22	.14	.18	469	498	3,321	25.9
Dec.	.150	.120	25	.25	3	.14	.18	492	460	1,372	26.8
Yearly	6.390	0.035		1,190		0.01	1.15	36,165	16,969	86,384	2,554

* Discharge measurement made on this day

† And other days

08-4528.00 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, gravity well and graphic water-stage recorder located on the left side of the canal under the US Highway 277 Bridge across San Felipe Creek at latitude 29°21'55" and longitude 100°53'10". The bridge is located about 1.0 creek kilometer downstream from the source of the springs and 6.3 creek kilometers upstream 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 graphic water-stage recorder located on the left bank about 91 meters downstream from the US Highway 277 Bridge at latitude 29°21'50" and longitude 100°53'10". This stream enters the Rio Grande at river kilometer 902, 0.8 river kilometer 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, 287.30 meters and 283.70 meters 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 26 and 26 current-meter measurements at each station respectively, during the year, and continuous records of gage heights. Computations are by shifting control methods. Records for the Del Rio Pumping Plant are furnished by the City of Del Rio Water Department. Records available: Total yield of the springs, February 1961 through 1998.

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 Cubic Meters per Second									
Daily:	Max.	4.84	July 23, 1976	Min.	0.83								July 29, 1964
Monthly:	Max.	4.33	December 1976	Min.	0.97								August 1964
Yearly:	Max.	4.22	1977	Min.	1.43								1963

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	3.22	3.32	3.33	3.56	3.31	3.23	3.09	2.23	*	2.97	3.52	3.72	* 3.74
2	3.23	3.33	3.34	3.52	3.31	3.20	3.04	2.23	2.96	3.39	3.72	3.68	
3	3.24	*	3.32	3.40	3.55	3.29	3.23	3.04	2.20	2.95	3.46	* 3.74	3.64
4	3.30	3.30	3.46	3.59	3.33	3.19	3.14	*	2.18	2.94	3.49	3.67	3.64
5	3.30	3.28	3.55	3.57	*	3.28	3.21	3.15	2.37	2.94	3.42	3.61	3.58
6	*	3.32	3.28	*	3.55	3.60	3.29	3.23	* 3.10	2.39	2.93	*	3.48
7	3.36	3.29	3.54	*	3.59	3.30	3.20	*	3.03	2.34	2.92	3.37	3.49
8	3.35	3.32	3.49	3.58	3.31	3.18	2.94	2.27	2.91	3.41	3.56		3.60
9	3.37	3.36	3.53	3.48	3.29	3.26	2.92	2.24	2.90	3.47	3.52	3.65	
10	3.37	3.31	3.49	3.42	3.29	3.29	3.09	2.91	2.10	2.89	3.42	3.62	3.66
11	3.38	3.35	3.47	3.43	3.28	3.05	2.91	2.06	2.88	3.43	3.59	3.59	
12	3.41	3.35	3.47	3.43	3.31	3.10	2.90	2.02	2.88	3.41	3.58	3.64	
13	3.40	3.36	3.47	3.37	3.34	3.12	2.89	2.04	2.87	3.37	3.56	3.61	
14	3.41	3.32	3.48	3.35	3.32	3.17	2.89	2.23	2.86	*	3.53	3.58	3.52
15	3.42	3.33	3.51	3.37	3.32	3.25	2.88	2.17	2.85	3.63	3.59	*	3.55
16	3.43	3.36	3.39	3.33	3.32	*	3.40	2.86	2.30	2.84	3.62	3.59	3.64
17	3.36	*	3.35	*	3.29	3.28	3.31	3.44	2.89	2.48	2.83	3.66	* 3.55
18	3.39	3.36	3.30	3.21	3.38	3.58	3.58	2.88	*	2.59	2.82	3.64	3.59
19	3.40	3.34	3.27	3.22	*	3.40	3.49	2.88	2.38	2.82	3.63	3.58	3.78
20	*	3.40	3.34	3.29	3.28	3.37	3.38	2.88	2.25	2.81	*	3.59	3.57
21	3.40	3.27	3.28	*	3.24	3.31	3.34	*	2.79	*	2.28	3.62	3.58
22	3.36	3.33	3.31	3.27	3.30	3.33	2.84	2.26	2.79	3.67	3.59	3.36	
23	3.36	3.33	3.38	3.27	3.23	3.22	2.73	2.33	2.78	3.60	3.60	3.40	
24	3.30	3.34	3.40	3.23	3.17	3.26	2.75	2.40	2.77	3.58	3.59	3.40	
25	3.36	3.34	3.42	3.24	3.17	3.27	2.74	2.47	2.76	3.68	3.57	3.43	
26	3.35	3.29	3.43	3.19	3.16	3.17	2.78	2.54	2.76	3.73	3.64	3.46	
27	3.34	3.34	3.47	3.21	3.15	3.13	2.71	2.62	2.75	*	3.74	3.56	3.50
28	3.32	3.30	3.48	3.30	3.17	3.11	2.75	2.69	2.74	3.76	3.61	3.51	
29	3.31			3.49	3.32	3.24	3.15	2.81	2.76	2.97	3.78	3.63	3.56
30	3.29			3.48	3.31	3.21	2.82	2.83	2.97	3.79	3.71	*	3.57
31	3.33			3.52		3.20		2.85	2.90		3.80		3.64
Sum		93.11		101.31		97.14		73.15		110.69		111.28	
	103.76		106.28		101.66		89.79		85.86		108.08		

Current Year 1998

Period 1961-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	Day	Day		Total	Average	Maximum	Minimum	
Jan.			16	3.43	1	3.22	3.35	8,965	8,626	11,558	2,805
Feb.		1	9	3.36	21	3.27	3.33	8,045	7,647	10,129	2,614
Mar.		1	5	3.55	19	3.27	3.43	9,183	8,372	11,137	2,917
April			6	3.60	26	3.19	3.38	8,753	8,091	10,610	2,826
May			19	3.40	27	3.15	3.28	8,783	8,457	11,471	3,506
June			5	3.15	27	2.71	2.90	7,758	8,373	11,523	2,731
July			31	2.90	12	2.02	2.36	6,320	8,282	11,751	2,608
Aug.		1	1	2.97	28	2.74	2.86	7,418	8,141	11,038	3,152
Sept.			31	3.80	17	3.37	3.57	9,564	8,664	11,408	3,094
Oct.			3	3.74	7	3.49	3.60	9,338	8,361	11,058	2,941
Nov.			20	3.79	22	3.36	3.59	9,615	8,675	11,633	2,948
Dec.											
Yearly				3.80		2.02	3.24	102,135	99,888	133,083	45,119

* Discharge measurement made on this day ϕ Mean daily

! And other days

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

08-4530.00 SAN FELIPE CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Bubbler gage, and water-stage recorders (graphic and digital) located on the left bank at latitude 29°19'50", longitude 100°53'20", immediately upstream from the Silos Farm road bridge, 1.8 creek kilometers upstream from its confluence with the Rio Grande, and about 3.2 kilometers south-southeast of Del Rio, Val Verde County, Texas. This stream enters the Rio Grande at river kilometer 902, 0.8 river kilometer downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 267.44 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 44 current-meter measurements during the year, 26 by the United States Section and 18 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: September 1931 through 1998.

REMARKS: The flow of this spring-fed creek is greatly modified by municipal and irrigation diversions upstream from the station. Backwater from the Rio Grande reaches this station when the Rio Grande at Del Rio reaches a stage of 4.6 meters, or a flow of about 1,700 CMS. On June 28, 1954 combined creek flow and backwater from the Rio Grande reached a stage of 7.47 meters at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 3,340 CMS on August 24, 1998, with a gage height of 7.705 meters. Min. 0.01 CMS on July 20, 1953.

Average Flow in Cubic Meters per Second

Daily:	Max.	464	August 24, 1998	Min.	0.04	July 21, 1953
Monthly:	Max.	22.8	June 1935	Min.	0.13	July 1953
Yearly:	Max.	3.97	1998	Min.	0.71	1953

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
1	3.09	3.11	2.66	2.64	1.99	1.73	1.45	1.53	*	3.18	2.32	3.44 *	3.11	
2	3.14	3.07	2.63	2.77	2.01	*	1.71	1.48	1.54	3.23	2.28	3.31	3.08	
3	3.15	*	3.14	2.52	2.68	1.97	1.90	1.49	1.52	3.27	2.31	*	3.18	
4	3.12	3.18	2.44	2.60	1.90	2.01	1.63	*	1.50	3.30	2.34	3.47	3.29	
5	3.10	3.18	2.31	2.58	*	2.02	1.91	1.61	1.49	3.35	2.49	3.41	3.38	
6	*	3.14	3.22	*	2.41	2.61	2.03	2.01	1.56	1.48	3.39	*	3.22	
7	3.19	3.20	2.41	*	2.62	2.08	2.10	*	1.60	1.46	3.44	3.31	3.11 *	3.22
8	3.17	3.12	2.49	2.53	2.03	*	2.13	1.60	1.45	3.49	3.28	2.91	3.10	
9	3.15	*	2.99	*	2.37	2.61	2.07	2.03	1.57	1.47	3.53	3.28	*	2.74
10	3.18	3.08	2.43	2.72	2.06	2.38	1.54	*	1.53	3.58	3.22	2.58	3.06	
11	3.18	3.12	2.59	2.59	2.00	2.99	1.52	1.33	3.36	3.23	2.55	3.09		
12	3.15	3.17	2.65	2.63	1.95	2.43	1.52	1.31	3.07	3.17	2.92	2.98		
13	3.19	3.14	2.66	*	2.63	1.88	2.58	*	1.46	1.32	3.15	3.24	3.17	2.93
14	3.18	3.26	2.67	2.68	1.96	2.59	1.56	*	1.37	3.24	3.18	3.29	2.95	
15	3.17	3.27	2.82	2.59	1.95	2.45	1.64	1.29	2.95	3.11	3.51	*	2.85	
16	3.19	3.29	3.18	2.71	1.99	*	2.14	1.65	1.43	2.79	2.94	*	3.56	2.68
17	3.14	*	3.07	*	2.68	2.11	1.93	1.76	1.75	4.63	3.09	3.50	2.57	
18	3.19	3.16	3.03	2.78	1.94	1.79	1.83	*	1.90	4.40	2.94	3.72	2.46	
19	3.16	3.08	3.10	2.70	*	2.10	1.75	1.85	3.22	4.26	2.87	3.50	2.42	
20	*	3.23	3.08	3.14	2.45	2.18	1.86	1.85	2.27	4.08	*	2.86	3.32	2.33
21	3.21	3.12	3.17	*	2.29	2.15	1.85	*	1.68	3.00	3.87	2.73	3.23	2.55
22	3.21	3.01	3.17	2.20	2.08	1.78	1.42	2.47	*	3.61	2.77	3.13	2.54	
23	3.19	2.92	2.76	2.25	2.03	1.87	1.35	2.57	3.25	2.83	3.10	2.66		
24	3.21	2.86	2.80	2.25	2.12	1.87	1.35	4.66	3.02	2.87	3.12	2.92		
25	3.14	2.85	2.72	2.35	2.09	1.72	1.38	4.20	3.07	2.81	3.51	3.04		
26	3.11	2.91	2.69	2.27	2.10	1.70	1.40	5.40	3.07	*	2.77	3.71	3.37	
27	3.11	2.73	2.64	2.24	2.13	1.76	1.40	5.17	2.96	2.72	3.70	3.59		
28	3.08	2.66	2.68	2.07	1.99	1.75	1.45	*	3.18	2.99	2.73	3.68	3.71	
29	3.05		2.74	2.06	1.88	1.69	1.44	3.23	2.87	2.75	3.57	3.85		
30	3.10		2.70	2.03	1.86	1.64	1.43	3.15	2.59	2.75	3.32	3.95		
31	3.10		2.75		1.73		1.48	3.16	2.80				3.99	
Sum	86.11		74.81		60.05			552.82		89.21		95.37		
	97.72		84.40		62.38			47.95		100.99		98.67		

Current Year 1998

Period 1932-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second		Average	Total	Volume-Thousand Cubic Meters		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	1.410	1.355	20	3.60	5	2.86	3.15	8,443	6,748
Feb.	1.410	1.325	16	3.73	28	2.46	3.08	7,440	5,689
Mar.	1.585	1.290	15	5.32	5	2.04	2.72	7,292	5,469
April	1.355	1.265	5	3.18	30	1.96	2.49	6,464	5,706
May	1.315	1.225	17	2.65	130	1.62	2.01	5,390	6,482
June	1.890	1.200	11	9.78	30	1.37	2.00	5,188	6,578
July	1.295	1.180	14	2.09	2	1.23	1.55	4,143	5,612
Aug.	7.705	1.175	24	3,340	111	1.19	17.8	47,764	57,768
Sept.	2.475	1.340	17	19.6	30	2.35	3.37	8,726	6,602
Oct.	1.485	1.330	5	4.17	1	2.23	2.88	7,708	6,755
Nov.	1.680	1.385	1	5.37	11	2.38	3.29	8,525	9,958
Dec.	1.450	1.325	31	4.01	20	2.26	3.08	8,240	6,187
Yearly	7.705	1.175		3,340		1.19	3.97	125,323	73,554
								125,323	22,441

* Discharge measurement made on this day

! And other days

08-4539.00 DIVERSIONS FROM THE RIO GRANDE
MAVERICK CANAL AT MILE 13 NEAR QUEMADO, TEXAS

DESCRIPTION: Foot bridge for making current-meter measurements, and water-stage recorder (graphic), located on the left bank of a gunnite-lined section of the canal at latitude 29°03'00", longitude 100°39'40", 0.8 canal kilometer downstream from the Tequesquite Creek Siphon, 5.6 canal kilometers upstream from the Las Moras Creek Siphon, about 12.1 kilometers north-northwest of Quemado, Maverick County, Texas and 20.6 kilometers downstream from the canal intake. The canal intake is at river kilometer 875, 28.0 river kilometers 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 222 current-meter measurements during the year and a continuous record of gage heights, 27 measurements were made by the U.S. Section, and 195 measurements were made by the Maverick County Water Control and Improvement District No. 1. Computations by shifting control methods. Gage heights at this station are affected by gate operation at Las Moras Siphon. Records available: June 21, 1969 through 1998.

REMARKS: At canal kilometer 51.2 a portion of the diverted water returns to the river through the Maverick Power Plant, and the remainder enters the Maverick Canal Extension. In 1998, 5,215 hectares of land were irrigated between this station and the power plant, and 10,575 hectares were irrigated from the extension, making a total of 15,790 hectares. A total of 835,796 TCM returned to the Rio Grande at the power plant and through irrigation system returns published in the following pages of this bulletin.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 52.4 CMS on February 15, 1989. Min. no flow several days in June, July, and November 1954; and October 1978.

Average Flow in Cubic Meters per Second**											
Daily	Max.	50.4	Aug. 19, 1990				Min.	0	Oct. 2 & 3, 1978		
Monthly	Max.	47.5	April 1990				Min.	8.35	Feb. 1977		
Yearly	Max.	42.2	1980				Min.	17.9	1972		

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34.8	36.8	* 37.4	34.4	43.0	36.2	30.4	34.8	* 15.5	14.4	* 15.8	0.46
2	35.1	* 36.7	37.4	34.1	43.7	* 37.2	* 30.1	* 35.1	14.6	* 14.7	16.3	.45
3	35.0	* 36.2	* 35.9	* 34.3	* 43.8	39.2	29.7	35.8	* 13.4	14.6	* 15.5	.20
4	* 35.2	* 36.5	36.6	34.2	44.1	* 39.7	30.2	* 31.8	13.0	* 14.1	17.1	.14
5	35.4	36.8	36.9	34.6	* 43.6	39.9	* 30.5	* 27.9	12.5	13.8	* 19.1	.10
6	* 35.5	36.7	* 36.3	* 34.5	43.7	* 39.8	* 29.9	25.4	* 12.1	* 16.0	* 16.1	.08
7	35.5	* 37.2	36.1	* 33.6	* 40.9	39.2	* 29.8	* 34.7	12.0	16.0	15.6	.05
8	* 35.1	36.4	35.7	* 34.2	* 35.2	* 38.1	* 30.9	35.2	* 11.9	* 15.6	* 15.8	.02
9	35.2	35.8	* 35.7	* 34.0	* 36.6	38.5	28.7	* 35.2	11.5	15.2	* 15.7	* 9.03
10	35.0	* 37.1	35.4	33.9	42.8	* 38.1	* 29.8	35.5	* 11.6	15.0	* 16.2	14.8
11	35.3	36.2	35.4	32.7	43.1	37.7	33.5	35.3	11.7	* 14.9	15.6	* 15.2
12	* 35.4	* 36.2	* 35.1	* 33.1	* 43.1	* 37.6	* 33.2	* 35.4	* 11.3	15.1	15.6	* 15.0
13	35.7	36.3	35.6	33.7	42.5	37.5	33.0	* 34.6	11.0	* 15.1	16.0	* 15.1
14	* 34.8	36.0	35.9	* 33.7	* 42.2	37.4	* 31.9	34.8	* 10.8	14.8	17.3	* 15.2
15	32.8	* 36.1	* 35.9	32.6	* 42.4	* 37.2	31.8	* 35.1	10.8	14.3	* 16.1	* 15.0
16	32.6	36.0	37.3	* 33.1	* 43.1	35.1	* 33.5	35.3	10.8	* 14.6	* 15.6	* 15.0
17	* 35.8	* 35.7	36.7	* 33.1	* 43.1	35.3	33.1	35.2	* 11.2	15.4	* 15.9	15.2
18	35.6	35.5	* 36.3	35.7	* 42.4	* 29.0	33.2	31.6	* 21.3	15.8	* 15.9	* 15.3
19	35.2	* 35.5	* 35.6	36.0	* 41.1	42.8	* 29.1	* 33.4	* 29.8	* 18.9	15.9	* 16.1
20	* 35.5	* 36.5	35.8	42.5	* 43.3	* 30.0	33.8	* 28.9	* 17.5	* 15.4	* 15.9	* 15.3
21	35.8	* 35.8	34.3	* 42.2	42.7	30.6	* 33.3	* 30.2	17.3	15.6	* 15.7	15.5
22	* 36.7	35.6	* 35.1	* 43.5	* 42.0	34.0	* 34.3	31.0	* 17.0	* 15.4	* 15.7	15.7
23	36.5	* 35.3	* 35.4	43.7	40.7	29.8	* 34.3	31.6	16.1	14.9	15.9	* 15.6
24	36.6	34.6	35.0	44.3	* 42.1	* 29.5	* 34.9	35.2	* 12.4	15.1	* 16.0	15.8
25	* 36.8	34.3	* 34.8	43.7	42.8	30.2	* 34.1	7.02	* 11.7	* 15.2	16.0	15.7
26	37.0	34.6	33.9	* 44.1	43.2	* 30.4	34.2	* 14.2	14.2	* 15.3	15.9	* 15.8
27	* 36.7	34.0	35.0	44.9	* 43.6	30.1	* 34.8	* 13.5	* 14.9	15.3	* 15.7	* 15.7
28	36.7	33.9	35.5	45.5	* 43.6	* 30.1	34.8	22.2	* 14.7	* 15.4	15.5	15.9
29	* 37.3		* 35.7	* 45.3	* 44.2	31.1	* 34.8	* 20.8	* 14.5	15.3	* 11.5	* 16.1
30	36.7		34.9	44.8	45.0	* 30.6	34.9	17.8	14.1	15.0	.48	15.8
31	* 37.0		34.9	* 44.9		* 35.0	* 16.2			14.9		15.7
Sum		1,004.3		1,135.1		1,028.8		907.12		468.1		350.33
		1,104.3		1,107.7		1,320.2		1,009.8		410.3		461.58

Month	Current Year 1998						Period 1968-1998				
	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
Jan.	3,030	2,470	31	41.9	15	28.5	35.6	95,412	88,551	120,225	25,730
Feb.	3,050	2,500	10	41.3	28	28.3	35.9	86,772	86,657	113,996	20,233
Mar.	2,905	2,365	2	41.9	21	29.0	35.7	95,705	97,151	122,230	34,141
April	3,085	2,235	28	46.7	113	26.2	37.8	98,073	97,960	123,587	50,229
May	3,095	2,375	12	45.7	8	29.3	42.6	114,065	103,107	126,490	49,910
June	3,240	2,460	6	40.1	16	27.9	34.3	88,888	99,200	116,310	38,497
July	2,745	2,315	130	36.5	9	27.4	32.6	87,247	99,256	120,518	44,129
Aug.	3,055	.855	24	45.6	25	2.90	29.3	78,375	99,542	119,784	45,279
Sept.	2,195	1,380	18	24.2	115	10.6	13.7	35,450	94,377	117,876	35,450
Oct.	1,865	1,655	6	17.3	5	13.6	15.1	40,444	94,283	121,971	27,426
Nov.	1,850	.165	5	20.1	30	.18	15.4	39,881	86,530	115,209	27,737
Dec.	1,650	.015	29	16.1	8	.01	11.3	30,269	86,049	120,494	29,007
Yearly	3,240	0.015		46.7		0.01	28.2	890,581	1,132,663	1,337,047	565,712

* Discharge measurement made on this day

** Period 1968-1998

08-4550.00 PINTO CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: 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", 2.6 creek kilometers upstream from its confluence with the Rio Grande, and about 30.6 kilometers southeast of Del Rio, Val Verde County, Texas. This stream enters the Rio Grande at river kilometer 864, 9.1 river kilometers downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam. The zero of the gage is 248.01 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 26 current-meter measurements during the year, 12 by the United States Section and 14 by the Mexican Section of the Commission, and a continuous record of gage heights. Records available: September 1955 through 1998 at this station, and November 22, 1928 through August 1955 at a site 6.3 kilometers upstream.

REMARKS: Flow of this spring-fed creek is modified by small irrigation diversions upstream from the station. When flow in the Rio Grande exceeds about 2,270 CMS at the mouth of this creek, backwater may reach the station. At this station during the Rio Grande flood of June 1954, backwater reached a gage height of 8.78 meters, or an elevation of 256.79 meters above mean sea level.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 5,270 CMS on June 24, 1948 with a gage height of 9.75 meters. Min. frequently no flow.

				Average Flow in Cubic Meters per Second											
Daily:	Max.	799	June 24, 1948	Min.	0							Frequently			
Monthly:	Max.	27.0	June 1948	Min.	0							Frequently			
Yearly:	Max.	2.97	1932	Min.	0.04							1980			

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	.46	.38	.21	.12	.03	0	0	0	.50	.57	1.35	* 0.75	
2	.46	.38	.19	.11	.03	*	0	0	.46	.61	1.29	.77	
3	.46	* .35	* .18	.11	.03	0	0	0	.43	.64	1.23	.81	
4	.45	.34	.18	.11	.01	0	0	*	0	.40	.65	1.18	
5	.45	.34	.19	.11	* .01	0	0	0	.38	.65	* 1.15	.79	
6	* .45	.34	.18	.12	.01	0	0	0	.36	* 1.05	1.13	.80	
7	.44	.34	.18	* .14	.01	0	*	0	.36	2.09	1.06	* .79	
8	.43	.34	.18	.12	.01	0	0	0	.35	1.07	1.10	.76	
9	.41	* .34	* .15	.11	.01	0	0	0	.35	.87	* 1.10	.80	
10	.41	.34	.15	.09	.01	.01	0	0	.35	.82	1.05	.87	
11									.38	.82	1.01	.95	
12	*	.41	.31	.17	.08	.01	0	0	.40	.85	1.00	.90	
13	.41	.31	.18	* .08	.01	0	0	0	.41	.88	1.12	.88	
14	.41	.32	.21	.07	.01	0	0	0	.40	.86	1.21	.88	
15	.40	.34	.22	.07	0	0	0	0	.40	.84	1.10	.87	
16	.39	.36	.36	.06	0	0	0	0	.39	.86	1.07	.87	
17	.38	.34	.33	.05	0	0	0	0	.48	.94	1.37	.86	
18	.37	.34	.30	.05	0	0	0	0	.54	.98	1.33	.86	
19	.37	.31	.24	.05	0	0	0	0	.50	.94	1.27	.85	
20	.37	.30	.19	.04	0	0	0	0	.48	.94	1.23	.85	
21	.38	.30	.17	.04	0	0	0	0	.47	1.00	1.18	.84	
22	.38	.30	.17	.04	0	0	0	0	.58	.97	1.13	.84	
23	.38	.30	.17	.04	0	0	0	32.8	.40	.94	1.09	.84	
24	.38	.28	.17	.03	0	0	0	477	.49	.94	1.04	.83	
25	.38	.27	.17	.03	0	0	0	16.5	.58	.97	1.00	.83	
26	.38	.25	.17	.02	0	0	0	0	3.50	.53	* 1.55	.95	
27	.37	.23	.16	.02	0	0	0	0	1.81	.54	1.71	.91	
28	.37	.22	.15	.02	0	0	0	0	1.08	.55	1.62	.87	
29	.36	.14	.02	0	0	0	0	0	.81	.56	1.54	.83	
30	.37	.14	.02	0	0	0	0	0	.66	.56	1.48	.76	
31	.48	.13	.02	0	0	0	0	0	.56	1.42		.75	
Sum		8.88		2.05		0.01			534.72		32.07		25.53
	12.57		5.91		0.20		0.00		13.58		33.14		

Current Year 1998 Period 1929-1998

Month	Extreme Gage Meters			Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.375	0.285	31	0.77	18	0.33	0.41	1,086	698	2,784	0
Feb.	.305	.255	16	.42	28	.21	.32	767	735	7,106	0
Mar.	.315	.225	16	.45	130	.11	.19	511	673	3,085	0
April	.235	.195	1	.14	126	.02	.07	177	1,440	33,464	0
May	.220	.160	1	.04	115	0	.01	17.3	2,078	36,248	0
June	.230	.050	10	.04	11	0	0	0	4,373	69,981	0
July	.080	.025	1	0	1	0	0	0	195	37,030	0
Aug.	4.870	.040	24	854	11	0	17.2	46,200	2,299	60,070	0
Sept.	.395	.315	22	.69	110	.31	.15	1,173	2,313	60,397	0
Oct.	.665	.345	6	3.46	1	.57	1.03	2,771	1,381	12,133	0
Nov.	.480	.400	16	1.42	30	.79	1.10	2,863	636	3,196	0
Dec.	.435	.395	111	.96	71	.74	.82	2,206	727	3,041	0
Yearly	4.870	0.025		854		0	1.83	57,772	17,548	94,053	1,178

* Discharge measurement made on this day ! And other days

08-4556.00 RIO SAN DIEGO NEAR JIMENEZ, COAHUILA

DESCRIPTION: Cableway, masonry and concrete Cipolletti Weir of 22 CMS 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 $29^{\circ}04'20''$, longitude $100^{\circ}47'35''$, about 6.0 kilometers west of Jimenez, Coahuila, and 7.0 river kilometers upstream from its 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 kilometer 856, 16.8 river kilometers downstream from Maverick County Water Control and Improvement District No. 1 diversion dam and 46.4 river kilometers downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 253.51 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 61 current meter measurements, 57 measurements by the Mexican Section, and 4 by the U. S. Section, the weir discharge table and a continuous record of gage heights. Records available: October 1932 through 1998.

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 0.80 meters; in November 1961 an additional 0.06 meters, and the capacity of the weir was increased from 20 CMS to 22 CMS.

EXTREME FLOWS FROM RECORDS:** Momentary: Max. 2,320 CMS on June 17, 1961 with a gage height of 6.31 meters. Min. no flow occurred on several occasions.

		Average Flow in Cubic Meters per Second**				
Daily:	Max.	1,040	July 18, 1975	Min.	0	Occasionally
Monthly:	Max.	67.5	Oct. 1932	Min.	0.07	July 1996
Yearly:	Max.	17.6	1976	Min.	0.68	1956

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	6.58	2.93	2.01	0.64	0.22	0.14	0.15	0.67	13.5	7.06	3.13	2.33	
2	6.74	2.56	1.75	.64	.22	* .14	.16	.67	12.0	7.06	3.02	2.66	
3	6.89	*	2.20	1.48	.64	.21	.14	.17	.67	11.6	6.82	2.90	
4	7.04	2.07	1.40	.64	.21	.14	.18	* .80	11.0	6.82	2.79	3.60	
5	7.20	1.94	1.32	.64	.20	.14	.19	2.00	10.4	6.57	2.90	3.60	
6	* 7.35	1.81	1.24	.64	.19	.14	.20	1.28	10.1	* 6.30	2.68	3.48	
7	7.04	1.69	1.17	* .64	.19	.14	* .21	1.45	9.78	6.16	2.68	3.16	
8	6.74	1.56	1.09	.64	.18	.14	.21	1.45	* 9.78	6.02	2.68	*	
9	6.43	1.43	1.01	.64	.18	* .14	.20	1.64	9.51	5.90	2.68	2.90	
10	6.12	*	1.30	* .93	.64	.17	.14	.20	1.28	9.24	5.77	* 2.68	2.90
11	5.81	1.86	.94	.64	.17	.14	.19	* 1.10	9.24	5.77	2.68	2.68	
12	5.51	*	2.41	.96	.64	* .16	.14	1.10	10.7	5.52	* 2.68	2.46	
13	*	5.20	2.97	.97	.64	* .16	.14	* 1.28	11.0	* 5.40	2.68	2.46	
14	5.14	3.53	.99	*	.64	.15	.14	* .18	.95	5.16	2.68	*	
15	5.07	4.09	1.00	.61	.15	.14	.17	.95	9.24	5.03	2.68	*	
16	5.01	4.64	1.02	.59	.15	*	.14	.15	1.10	7.86	5.03	* 2.57	2.24
17	4.94	*	5.20	* 1.03	.56	.15	.14	.14	1.28	7.86	5.03	2.46	2.24
18	4.88	4.93	.99	.54	.14	.14	.13	* 3.55	* 11.5	5.46	2.35	2.24	
19	4.81	4.67	.94	.51	*	.14	.14	.12	2.68	11.3	4.80	2.35	2.24
20	*	4.75	4.40	.90	.49	.14	.14	.10	2.03	11.0	* 4.68	2.46	2.24
21	4.75	4.14	.86	*	.46	.14	.14	* .09	2.03	9.24	4.57	2.35	2.24
22	4.75	3.87	.82	.43	.14	.14	.09	1.82	9.24	4.46	2.24		
23	4.75	3.61	*	.77	.40	.14	*	.08	2.24	9.24	4.34	2.24	
24	4.75	3.34	.73	.37	.14	.14	.08	483	8.12	4.10	*	2.24	
25	4.75	3.07	.72	.33	.14	.14	.08	128 *	8.12	4.10	2.24		
26	4.75	2.81	.70	.30	*	.14	.14	.08	24.0	7.86	4.10	2.24	
27	*	4.75	.69	.27	.14	.14	.08	19.0	7.60	* 3.85	2.24		
28	4.39	2.28	.68	*	.24	.14	.14	.08	16.5	7.60	3.48	2.24	
29	4.02		.67	.22	.14	.14	.07	15.2	* 7.33	3.24	2.24	*	
30	3.66		.65	.21	.14	*	.14	.07	14.5	7.06	3.13	2.24	
31	3.29		*	.64	.14	.14	.07	14.2	371	2.90			
Sum		83.85	167.86	31.07	15.49	5.02	4.20	4.29	748.42	288.72	158.63	76.24	79.25

Current Year 1998 Period 1932-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
				Day	Day						
Jan.	0.165	0.120	6	8.12	31	3.29	5,41	14,503	10,374	44,937	2,300
Feb.	.340	.290	17	6.02	10	1.30	2.99	7,245	8,171	31,769	1,279
Mar.	.305	.230	1	2.01	31	.64	1.00	2,684	7,379	33,352	797
April	.230	.175	11	.64	30	.21	.52	1,338	8,140	49,678	698
May	.155	.160	11	.22	118	.14	.16	434	13,786	148,269	395
June	.140	.140	11	.60	118	.14	.14	363	14,118	133,550	282
July	.175	.140	7	.21	129	.07	.14	371	16,614	167,938	179
Aug.	4.380	.140	24	1,330	11	.06	24.1	64,663	14,654	112,553	392
Sept.	.275	.190	18	13.8	30	7.06	9.62	24,945	20,764	116,770	843
Oct.	.375	.300	1	13.5	31	1.16	5.12	13,706	25,357	88,603	1,011
Nov.	.290	.280	8	5.03	121	2.24	2.54	6,587	17,356	79,021	990
Dec.	.290	.280	5	4.10	115	2.24	2.56	6,847	12,574	55,901	1,389
Yearly	4.380	0.120		1,330		0.06	4.56	143,686	169,287	557,477	21,508

* Discharge measurement made on this day ! And other days

08-4557.00 RIO GRANDE NEAR JIMENEZ, COAHUILA AND QUEMADO, TEXAS

DESCRIPTION: Cableway, control weir of 36 CMS capacity, gravity well, and water-stage recorder located on the right bank at latitude 29°03'00", longitude 100°39'50", and river kilometer 853; 2.4 kilometers south-southeast of Jimenez, Coahuila, 3.0 river kilometers downstream from Rio San Diego, about 12.1 kilometers north-northwest of Quemado, Maverick County, Texas, 19.8 river kilometers downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam, and 49.6 river kilometers downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 234.39 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 37 current-meter measurements during the year, 25 by the Mexican Section and 12 by the United States Section of the Commission, 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 current-meter measurements. Records available 1968 through 1998. Records, excluding some high flow periods, are also available from 1956 through May 1965 for a station 14.0 river kilometers upstream. Records prior to 1976 were published under 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 21.5 river kilometers upstream largely control the flow at this station. The weir was placed in operation June 1, 1967, at which time the zero of the gage was set 1.00 meter higher.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 3,220 CMS on August 25, 1998, with a gage height of 7.68 meters. Min. 0.05 CMS on September 21, 1995, with a gage height of 0.055 meters.

				Average Flow in Cubic Meters per Second											
Daily:	Max.	3,220	August 25, 1998					Min.	0.08	April 25 and 26, 1983					
Monthly:	Max.	602	Sept. 1974					Min.	0.80	June 1969					
Yearly:	Max.	124	1974					Min.	8.11	1968					

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			
1	8.89	6.24	4.57	3.85	190	79.1	47.2	16.7	12.0	8.60	5.02	19.6			
2	9.76	5.84	4.53	3.76	155	83.6	46.1	16.7	11.7	8.60	4.73	20.2			
3	8.20	5.39	3.78	3.68	155	87.1	47.3	17.2	11.4	8.40	4.60	21.5			
4	8.88	5.29	4.14	3.60	158	85.4	46.6	20.4	11.1	8.10	4.50	21.8			
5	8.54	4.92	4.36	3.51	164	82.9	47.5	22.8	10.8	7.40	4.70	21.8			
6	8.52	4.86	3.81	3.42	160	71.3	45.6	26.8	10.5	7.50	4.30	21.8			
7	8.13	4.87	3.91	3.34	80.6	68.5	46.3	22.5	10.2	8.90	4.30	21.4			
8	8.36	3.98	3.78	4.16	6.05	* 56.6	16.6	18.4	9.89	7.90	4.30	20.9			
9	7.87	* 4.99	* 3.13	2.46	48.4	58.4	19.0	17.0	9.59	7.30	* 4.20	11.9			
10	7.61	5.11	3.94	3.06	147	56.5	17.8	* 17.2	* 9.29	7.10	4.10	* 5.99			
11	6.34	5.62	3.49	4.29	204 *	56.8	14.5	16.5	9.43	7.10	4.10	5.26			
12	* 5.74	5.55	3.63	4.44	261	53.2	13.3	15.5	9.57	7.00	4.20	4.55			
13	7.32	* 5.62	3.45	4.79	222	53.1	* 13.3	14.7	9.72	* 6.90	4.20	4.30			
14	8.90	5.96	3.18	5.66	236	55.0	16.2	14.3	9.86	6.80	4.10	4.16			
15	9.42	6.30	3.96	6.92	240 *	53.5	23.2	15.2	* 10.0	6.50	4.10	* 4.16			
16	9.79	6.76	7.55	5.97	240	56.7	14.3	18.6	9.93	* 6.40	4.20	4.16			
17	6.53	6.76	5.02	5.29	240	61.1	14.7	18.7	9.86	6.40	* 4.10	4.16			
18	5.83	5.73	4.90	80.5	242	60.0	16.2	33.4	9.79	6.80	4.20	4.16			
19	5.93	5.26	4.08	226	167	60.6	15.6	89.5	9.72	6.70	4.50	4.16			
20	6.34	6.00	17.6	225	80.0	60.4	28.2	36.2	9.64	* 6.30	* 4.70	4.16			
21	5.40	5.16	5.12	224	73.8	54.8	11.1	* 28.0	9.57	6.20	4.60	4.16			
22	* 5.56	5.42	4.46	205	81.1	* 47.1	11.6	27.4	9.50	6.10	4.50	3.82			
23	5.08	4.89	* 3.77	201	77.5	47.3	14.6	26.6	9.43	5.80	4.50	3.89			
24	5.00	* 4.44	3.39	200	76.6	46.3	15.2	836	9.36	5.80	* 4.60	3.89			
25	5.48	4.21	4.32	240	78.1	48.0	15.8	3,220	9.29	5.60	4.40	3.89			
26	5.46	4.26	6.08	234	84.0	44.5	17.0	447	9.29	* 5.60	4.40	3.89			
27	5.48	3.56	4.68	220	83.3	46.4	* 15.3	145	9.29	5.50	4.40	3.89			
28	5.28	4.10	4.51	227	77.9	46.5	14.2	93.2	9.12	5.40	4.50	3.89			
29	6.60		4.16	233	75.5	50.4	16.9	74.8	8.94	5.30	6.80	3.76			
30	5.22		4.02	220	73.1	50.9	13.4	67.7	8.76	5.00	20.0	3.62			
31	7.37		3.92		75.7		14.4	63.6		4.80		3.62			
Sum		147.09		2,807.70		1,782.0		5,497.6		207.80		272.44			
218.83		145.24		4,256.65		709.0		296.54		149.85					

Current Year 1998 Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Low		Total	Average	Maximum	Minimum
Jan.	0.285	0.100	16	16.9	123	3.62	7,06	18,907	61,699	216,588
Feb.	.210	.080	20	10.8	27	2.61	5.25	12,709	97,810	495,046
Mar.	.580	.075	20	48.1	! 8	2.37	4.69	12,549	117,074	486,605
April	1.340	.055	25	243	5	1.50	93.6	242,585	139,535	502,502
May	1.480	.070	9	275	12	2.14	137	367,429	216,067	608,342
June	.785	.185	2	91.6	29	8.93	59.4	153,965	147,519	489,197
July	.715	.100	1	76.2	22	3.62	22.9	61,258	122,907	384,578
Aug.			25	* 3,220	14	* 14.3	177	474,993	146,284	2,864
Sept.	.225	.180	1	12.0	30	8.76	9.88	25,621	185,075	1,559,261
Oct.	.200	.120	7	10.0	30	4.73	6.70	17,954	179,082	1,025,395
Nov.	.320	.105	30	20.0	14	3.94	5.00	12,947	79,985	615,686
Dec.	.340	.100	3	21.8	129	3.62	8.79	23,539	57,515	223,396
Yearly		0.055		3,220		1.50	45.2	1,424,456	1,550,552	3,909,913
										256,561

* Discharge measurement made on this day

! And other days

φ Mean daily

08-4571.00 RIO SAN RODRIGO AT EL MORAL, COAHUILA

DESCRIPTION: Bubbler gage and water-stage recorder located on the left bank at El Moral, Coahuila, latitude 28°53'20", longitude 100°37'55", 1.6 river kilometers from the confluence with the Rio Grande, and about 25 kilometers northwest of Piedras Negras, Coahuila. This stream enters the Rio Grande at river kilometer 834, 39.3 river kilometers downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam and 35.2 river kilometers upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 228.89 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 23 current-meter measurement during the year, 2 by the United States Section, and 21 by the Mexican Section, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1962 through 1998.

REMARKS: Prior to 1976 this station was published under the heading "Rio San Rodrigo near Mouth at El Moral, Coahuila." The flow of this spring-fed stream is modified by diversions above this station. La Fragua Dam, located about 19 river kilometers upstream from this station, began operation in 1991. The concrete control weir, placed in operation on November 25, 1969, was destroyed by the flood of July 12, 1976, and the station was relocated on October 15, 1976.

EXTREME FLOWS FROM RECORDS:** Momentary: Max. 3,970 CMS on July 18, 1975, with a gage height of 5.62 meters. Min. frequently no flow.

				Average Flow in Cubic Meters per Second									
Daily:	Max.	1,260	July 18, 1975						Min.	0	Frequently		
Monthly:	Max.	209	July 1976						Min.	0	Frequently		
Yearly:	Max.	23.7	1976						Min.	0.07			1996

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.17	0.10	0	0	0	0	0	0.26	0.69	0.04	0	0.54
2	.01	.10	0	0	0	0	.85	.22	.56	.04	0	.51
3	0	.10	0	0	0	0	1.71	* .22	.47	.04	0	.48
4	0	.08	0	0	0	0	0	2.31	.22	.40	.04	0
5	0	.07	0	0	0	0	0	2.67	.21	.35	* .04	.46
6	0	.06	0	0	0	0	2.96	.20	.30	.05	0	.44
7	0	.04	0	0	0	0	* 3.07	.20	.25	0	0	.41
8	.09	.04	0	0	0	0	2.39	.20	* .21	0	.25	* .39
9	.08	.04	0	0	0	0	* 1.99	.20	.19	0	.80	.39
10	.07	.02	0	0	0	0	1.93	.19	.16	0	* 1.06	.39
11	.06	0	0	0	0	0	1.97	* .18	.15	0		
12	.05	0	0	0	0	0	1.81	.18	.17	0	1.43	.38
13	.05	* 0	0	0	0	0	1.08	.17	.14	0	1.56	.36
14	.05	0	0	0	0	0	.64	.17	* .12	0	2.01	.33
15	.05	0	0	0	0	0	.61	.17	.10	0	2.58	* .31
16	.05	0	0	0	0	0	* .43	.17	.08	.04	4.37	.31
17	.04	0	0	0	0	0	.43	.18	2.72	0	4.98	.30
18	.04	0	0	0	0	0	.43	* 12.5	.30	0	5.00	.28
19	.04	0	0	0	0	0	.42	8.93	.19	0	5.01	.28
20	* .04	0	0	0	0	0	.40	1.35	.14	0	5.04	.28
21	.04	0	0	0	0	0	* .38	.52	.12	0	5.07	.29
22	.04	0	0	0	0	0	.38	.33	.10	0	5.15	.27
23	.04	0	0	0	0	0	.36	.30	.10	0	* 5.17	.27
24	.07	0	0	0	0	0	.36	275	.10	0	4.73	.27
25	.09	0	0	0	0	0	.34	126	.09	0	2.26	.26
26	.09	0	0	0	0	0	.32	13.0	.08	0	1.40	.25
27	.10	0	0	0	0	0	.32	6.77	.06	0	* 1.12	.25
28	.10	0	0	0	0	0	.30	* 3.33	.06	0	.98	.24
29	* .10	0	0	0	0	0	.28	1.95	.05	0	.90	* .22
30	.10	0	0	0	0	0	.28	1.35	.04	0	.81	.21
31	.10	0	0	0	0	0	.28	1.02	0			.20
Sum		0.65	0	0	0	0		455.67		0.29		10.37
		1.76	0	0	0	0		31.70		8.49		63.39

Current Year 1998

Period 1962-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
			High	Day	Low		Total	Average	Maximum	Minimum	
	High	Low									
Jan.	0.265	0	1	0.24	1 2	0	0.06	152	4,602	20,066	
Feb.	.205	0	1 1	.10	1 10	0	.02	56.2	3,151	12,251	
Mar.	0	0	1 1	0	1 1	0	0	0	2,425	9,653	
April	0	0	1 1	0	1 1	0	0	0	5,052	46,663	
May	0	0	1 1	0	1 1	0	0	0	4,678	36,113	
June	0	0	1 1	0	1 1	0	0	0	7,445	127,224	
July	.560	0	7	3.14	1 1	0	1.02	2,739	31,791	560,796	
Aug.	5.000	.245	24	602	11	.13	14.7	39,370	12,637	109,801	
Sept.	.815	.155	17	10.6	30	.04	.28	754	18,565	65,176	
Oct.	.290	0	16	.32	1 1	0	.01	25.1	15,604	80,464	
Nov.	.650	0	24	5.25	1 1	0	2.11	5,477	10,364	103,632	
Dec.	.340	.255	1	.54	31	0	.33	896	6,400	25,993	
Yearly	5.000	0		602		0	1.57	49,449	122,714	748,140	
										2,288	

* Discharge measurement made on this day

! And other days

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

08-4575.00 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 14.5 kilometers north-northwest of Eagle Pass, Maverick County, Texas, and about 51.8 canal kilometers downstream from the point of diversion. The return enters the Rio Grande at river kilometer 816.

RECORDS: Based on records furnished by the Maverick County Water Control and Improvement District No. 1 (MCWCID 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 discharge 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 and MCWCID No. 1. There were 168 current-meter measurements made during the year. 23 measurements were made by U.S. Section of the Commission and 145 measurements were made by MCWCID No. 1. Records available: 1949 through 1998.

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 Cubic Meters per Second**									
Daily:	Max.	48.1	April	28, 1990		Min.	0	Occasionally	
Monthly:	Max.	44.4	April	1990		Min.	1.20	Dec. 1971	
Yearly:	Max.	36.7	1990			Min.	6.57	1972	

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34.6	34.2	* 34.2	31.7	38.3	35.4	26.1	* 29.1	15.0	* 12.8	* 14.0	0
2	34.2	* 34.2	34.6	* 31.4	40.1	* 34.6	* 26.5	29.7	* 12.9	* 12.6	14.8	0
3	34.1	34.1	* 33.1	* 32.5	* 41.0	34.1	26.2	30.0	* 11.4	12.9	15.7	0
4	* 34.0	* 33.9	31.7	33.1	40.9	* 34.2	* 27.2	* 28.4	11.5	* 12.9	* 13.5	0
5	33.8	* 34.2	* 32.3	33.2	* 40.0	33.7	* 27.8	24.2	11.1	11.6	14.1	0
6	33.3	32.7	* 32.3	* 33.6	39.1	* 34.1	* 28.3	* 21.8	* 10.5	* 12.3	* 15.3	0
7	34.0	* 32.5	33.2	30.8	* 38.4	35.1	28.4	28.3	10.1	14.5	14.7	0
8	* 33.7	33.0	32.7	30.9	33.8	* 34.2	* 27.7	* 31.4	* 9.90	* 14.5	* 15.0	9.30
9	34.1	32.3	33.6	* 30.0	* 30.5	32.8	* 24.5	32.3	9.00	14.1	15.0	0
10	34.1	* 33.5	* 32.8	30.3	37.1	* 33.2	* 24.6	* 32.5	6.40	13.9	14.9	8.70
11	34.5	33.3	32.9	29.9	38.4	34.5	* 27.8	* 31.7	8.10	* 13.8	* 15.1	* 13.0
12	* 33.9	* 33.2	* 32.7	30.7	* 38.5	* 34.6	* 28.2	* 32.3	* 9.70	13.6	15.0	12.6
13	33.8	33.0	33.4	* 30.2	37.3	35.0	* 28.2	* 31.6	* 9.10	* 13.3	15.4	* 12.8
14	* 33.9	33.2	34.1	29.8	* 37.5	35.0	* 26.8	31.0	8.20	* 13.3	* 15.8	* 13.6
15	* 31.9	* 33.8	* 32.8	28.7	37.5	35.4	26.9	* 32.6	8.00	13.5	15.9	14.1
16	31.0	34.6	35.8	* 29.7	* 39.1	35.1	* 27.3	33.0	7.80	* 13.5	* 15.8	* 14.0
17	* 33.5	* 33.8	35.5	28.6	40.8	* 28.8	26.9	* 33.7	* 8.60	13.7	15.6	* 14.0
18	34.5	33.4	34.6	29.8	* 40.0	26.1	27.8	32.0	* 14.2	14.4	15.3	13.7
19	33.4	* 32.8	* 34.3	* 35.0	39.8	* 26.3	* 29.5	* 29.6	* 20.6	14.4	* 15.4	14.2
20	* 33.2	33.2	* 34.8	37.3	* 40.6	26.5	28.7	* 27.8	15.9	* 14.1	* 15.4	* 14.0
21	33.8	34.5	33.4	38.2	* 39.7	* 27.0	* 28.3	28.4	16.8	13.8	* 15.0	13.7
22	34.0	* 34.1	* 33.3	* 39.1	* 38.0	26.9	28.4	29.1	* 16.9	* 14.3	14.8	13.9
23	34.2	33.7	33.7	39.8	* 35.8	* 25.6	* 28.3	* 31.6	16.6	13.9	* 13.7	* 14.3
24	33.9	33.7	32.4	39.4	* 36.8	* 24.4	* 29.6	28.9	* 14.1	13.8	14.4	14.8
25	33.4	* 34.8	* 31.5	* 39.4	37.1	24.9	* 31.4	10.0	12.0	* 14.0	14.9	14.8
26	* 32.1	35.3	30.3	40.5	37.4	* 25.2	32.2	* 10.1	12.9	* 14.0	14.9	* 14.8
27	* 32.4	34.8	30.5	40.8	* 37.4	24.2	* 32.4	12.9	* 13.9	13.5	* 14.8	* 14.9
28	32.7	35.2	31.4	40.7	36.3	* 24.2	30.4	* 16.5	13.3	* 13.5	14.6	14.6
29	* 33.6	32.7	* 32.7	* 40.7	* 35.9	25.6	* 30.1	21.3	12.4	14.0	* 14.3	* 14.4
30	33.2	31.4	31.2	39.7	* 25.2	28.5	18.2	* 12.9	14.0	14.0	3.60	14.2
31	* 33.6	31.2	31.2	* 36.9	* 36.9	28.2	* 15.9	14.0	14.0	14.0	14.5	
Sum		945.0		1,025.5	911.9		825.9		422.5		312.90	
	1,040.4		1,025.2	1,177.1	873.2		359.80		434.70			

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Volume-Thousand Cubic Meters				
	High	Low	Day	Day	High	Low	Total	Average	Maximum	Minimum	
Jan.			1	34.6	16	31.0	33.6	89,891	73,248	116,090	6,108
Feb.			26	35.3	9	32.3	33.8	81,648	72,477	108,078	6,008
Mar.			16	35.8	26	30.3	33.1	88,577	74,236	109,909	7,047
April			27	40.8	17	28.6	34.2	88,603	73,049	115,145	5,305
May			3	41.0	9	30.5	38.0	101,701	80,995	113,668	17,131
June			1	35.4	127	24.2	30.4	78,788	72,869	102,070	8,162
July			27	32.4	9	24.5	28.2	75,444	70,332	96,639	6,830
Aug.			17	33.7	25	10.0	26.6	71,358	71,283	97,044	22,766
Sept.			19	20.6	10	6.40	12.0	31,087	75,572	111,197	16,949
Oct.			1	7	14.5	5	11.6	36,504	77,332	109,382	13,750
Nov.			15	15.9	30	3.60	14.5	37,558	70,850	106,644	3,951
Dec.			27	14.9	1	0	10.1	27,035	70,652	112,566	3,217
Yearly				41.0		0	25.6	808,194	882,895	1,158,234	207,661

* Discharge measurement made on this day

† Mean daily

‡ And other days

** Period 1968-1998

08-4577.00 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, Maverick County 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 Hughes Ranch, Lateral 1, Lateral 2 Spill, Canon Grande, Quenado Creek, Lateral 15 Spill, Houchin Spill, and Elm Creek; and a Parshall flume at the Lateral 2 Sand Trap Spill into Las Moras Creek immediately below the canal siphon. Gate leakage at Las Moras Creek which is measured periodically and mean daily discharges are determined by prorating between current-meter measurements.

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 1998. Records computed by the U.S. Section of the Commission prior to 1996. Beginning in 1996, the Maverick County Irrigation District computes and provides the discharge data through the Texas Natural Resource Conservation Commission. 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 shown on a prior page of this bulletin.

EXTREME FLOWS FROM RECORDS:

				Average Flow in Cubic Meters per Second**								
Daily:	Max.	26.3		Sept. 29, 1975					Min.	0.07		Aug. 4 & 8, 1985
Monthly:	Max.	4.36		June 1968					Min.	0.14		Sept. 1985
Yearly:	Max.	3.57		1968					Min.	0.41		1985

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.021	0.53	0.54	0.65	0.85	0.75	0.78	1.08	0.92	0.71	0.65	0.19
2	.56	.59	.59	.70	.89	.75	.80	1.11	.91	.71	.65	.18
3	.55	.58	.63	.66	.81	.76	.80	1.02	.81	.79	.67	.18
4	.56	.57	.61	.68	.81	.78	.90	1.03	.84	.65	.65	.18
5	.53	.58	.68	.72	.81	.82	.96	1.05	.51	.74	.61	.16
6	.53	.61	.72	.70	.80	.89	.96	.91	.50	.72	.64	.16
7	.51	.59	.78	.81	.84	.85	.92	.81	.49	.84	.65	.17
8	.54	.57	.81	.82	.78	.84	.92	.96	.51	.92	.63	.15
9	.54	.56	.68	.77	.76	.75	.93	1.13	.51	.87	.60	.15
10	.60	.57	.73	.78	.74	.77	.89	1.12	.54	.81	.58	.24
11	.65	.56	.73	.78	.84	.81	.99	1.11	.61	.74	.56	.34
12	.59	.66	.73	.72	.89	.84	1.03	1.16	.64	.74	.55	.37
13	.59	.56	.75	.73	.87	.84	1.05	1.19	.59	.73	.54	.35
14	.70	.58	.76	.78	.83	.87	1.03	1.14	.57	.74	.55	.35
15	.61	.59	.78	.80	.83	.87	.99	1.14	.54	.74	.58	.35
16	.63	.58	.79	.80	.89	.82	.96	1.14	.55	.74	.58	.35
17	.63	.62	.78	.79	.92	.78	.98	1.12	.56	.75	.58	.35
18	.59	.66	.77	.77	.92	.70	1.00	1.19	.68	.77	.59	.36
19	.63	.71	.76	.76	.99	.76	1.01	1.16	.89	.77	.60	.38
20	.60	.65	.76	.78	1.11	.76	1.00	1.07	.89	.80	.62	.40
21	.57	.66	.75	.85	1.26	.72	.98	1.05	.88	.82	.64	.40
22	.62	.63	.75	.87	1.02	.69	.98	1.05	.87	.84	.62	.41
23	.65	.65	.77	.86	.91	.64	1.00	1.08	.82	.85	.50	.39
24	.62	.64	.78	.86	.88	.69	1.02	18.7	.70	.86	.49	.38
25	.63	.64	.80	.90	.87	.73	1.08	8.30	.69	.86	.50	.41
26	.66	.61	.76	.79	.91	.76	1.10	.92	.75	.88	.49	.42
27	.67	.60	.79	.86	.87	.79	1.08	.90	.77	.88	.50	.43
28	.69	.60	.81	.91	.83	.84	1.02	.88	.75	.86	.51	.44
29	.69		.80	.98	.90	.81	1.05	.89	.74	.85	.49	.45
30	.68		.89	.91	.82	.75	1.06	.91	.75	.83	.23	.42
31	.67		.76		.73		1.06	.91		.80		.44
Sum		16.93		23.79		23.43		57.23		24.80		9.95
18.50			23.04		27.18		30.33		20.53		17.05	

Current Year 1998						Period 1968-1998					
Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day		φ Low	Total	Average	Maximum	Minimum
Jan.		14	0.70	1	0.21	0.60	1,598	3,506	9,424	1,252	
Feb.		19	.71	1	.53	.60	1,463	3,304	7,556	1,158	
Mar.		30	.89	1	.54	.74	1,991	4,388	7,940	1,383	
April		29	.98	1	.65	.79	2,055	4,490	9,615	1,016	
May		21	1.26	31	.73	.88	2,348	4,300	10,087	1,048	
June		6	.89	23	.64	.78	2,024	4,309	11,334	640	
July		26	1.10	1	.78	.98	2,621	4,460	10,060	405	
Aug.		24	18.7	7	.81	1.85	4,945	4,551	11,423	486	
Sept.		1	.92	7	.49	.68	1,774	3,889	9,472	356	
Oct.		8	.92	1	.71	.80	2,143	3,949	8,097	1,337	
Nov.		3	.67	30	.23	.57	1,473	3,758	10,726	1,019	
Dec.		29	.45	18	.15	.32	860	3,340	7,122	860	
Yearly				18.7		0.15	0.80	25,295	48,244	112,857	12,834

φ Mean daily

! And other days

** Period 1968-1998

08-4580.00 RIO GRANDE AT PIEDRAS NEGRAS, COAHUILA
AND EAGLE PASS, TEXAS

DESCRIPTION: Cableway, gravity well, water-stage recorder, and data collection platform located on the left bank at latitude 28°42'50", longitude 100°30'25", and river kilometer 800, 1.0 river kilometer upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila and 124 river kilometers downstream from Amistad Dam. The zero of the gage is 208.15 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 35 discharge measurements during the year, 22 by the Mexican Section, and 13 by the United States Section, 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 1998. 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 data collection platform is coupled to leased telephone circuits. This system is operated in cooperation with the National Weather Service. **EXTREME FLOWS FROM RECORDS:** Momentary: Max. 27,300 CMS, determined by slope-area calculations, on June 29, 1954, with a gage height of 16.31 meters. Well-authenticated information indicates the occurrence of a flood in June 1865 with an estimated discharge of 35,000 CMS and a gage height of 17.07 meters on the present gage, and also that these were the only floods since 1745 with flows greater than 23,400 CMS. Min. 0.69 CMS on June 22, 1953, with a gage height of 0.02 meters.

Average Flow in Cubic Meters per Second**

Daily:	Max.	3,810	Aug. 25, 1998	Min.	4.90	April 25, 1984
Monthly:	Max.	622	Sept. 1974	Min.	9.16	June 1969
Yearly:	Max.	147		Min.	27.5	1972

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	42.9	38.9	33.7	31.2	238	123	75.6	45.0	38.8	* 20.9	19.5	* 17.0
2	42.4	* 37.4	* 34.7	* 30.9	193	131	* 70.4	45.6	34.8	20.3	20.8	20.4
3	42.4	36.6	33.6	31.9	192	136	* 73.1	* 46.4	* 30.4	20.6	* 19.1	* 21.7
4	40.6	36.0	31.5	32.8	194 *	138 *	* 72.6	48.0	28.8	20.5	18.0	21.8
5	* 40.9	* 35.9	* 32.0	33.2	197	137	75.6	46.2	26.6	* 19.3	18.4	22.0
6	40.4	35.3	32.4	* 33.8	196	137	72.7	* 47.8	24.7	22.9	* 20.9	22.2
7	40.7	35.4	32.8	31.1	178 *	80.9	76.0	50.0	23.6	29.5	19.9	22.5
8	* 39.8	35.6	32.1	31.2	60.1	87.4	47.4	49.0	22.7	26.1	19.9	18.0
9	40.5	33.4	32.9	31.4	36.7	96.2	41.2	48.5	21.5	24.3	21.1	15.4
10	40.1	35.2	31.9	30.1	151	93.1	40.2	48.9	18.4	22.9	21.3	13.5
11	40.1	34.4	32.2	30.3	193	121	42.1	47.3	16.5	22.5	21.6	19.1
12	38.6	34.6	31.8	32.0	266	112	42.0	46.9	21.8	22.2	21.7	17.1
13	38.9	34.1	32.7	31.8	260	104	41.7	45.4	21.8	21.6	22.5	15.8
14	39.2	34.8	33.3	31.6	238	107	39.7	44.4	* 19.8	20.7	24.4	* 16.4
15	38.4	35.2	34.3	30.9	254	108	43.5	46.9	18.7	20.9	24.4	17.0
16	37.8	* 36.0	* 38.6	32.2	256	108	43.8	50.7	16.7	20.3	* 24.8	16.8
17	39.7	35.1	39.2	31.5	258	110	38.7	* 51.5	22.5	20.8	24.9	16.8
18	38.7	35.1	36.4	31.4	258 *	103 *	40.0	76.9	24.2	24.2	24.8	* 16.7
19	* 36.8	33.5	35.8	187	245	103	42.0	126	34.7	* 40.7	25.0	17.2
20	36.7	33.2	38.1	224 *	133	102	43.8	64.3	29.8	31.1	25.4	17.9
21	37.4	35.5	43.9	228	124	102	55.9	55.9	29.3	23.9	25.2	17.5
22	36.9	34.4	35.4	227	117	86.2	36.0	55.8	27.5	22.4	25.0	17.8
23	37.3	34.2	35.1	222	118	80.4	38.6	57.5	26.9	21.1	24.2	17.8
24	37.1	33.6	33.3	220	117	75.9	42.3	1,340	24.8	20.0	23.9	18.8
25	36.4	34.2	32.2	238	117	75.9	44.5	3,810	21.7	19.6	24.3	19.1
26	36.4	34.6	32.0	253	122	76.6	46.2	474	22.1	19.6	23.4	19.2
27	35.4	33.9	32.9	250	124	71.7	46.9	163	23.5	19.3	23.0	19.1
28	35.6	34.2	33.2	245 *	120	74.0	44.0	112	22.7	18.5	21.9	18.9
29	36.4	34.8	250	116	64.9	43.9	97.0	20.9	19.2	22.1	18.0	
30	37.3	33.0	245	117	82.7	43.1	86.2	20.7	19.0	14.1	17.7	
31	36.6	32.3	119		42.5	79.5			19.0			18.9

Sum	980.3	3,358.3	3,027.5	7,407.3	693.9	568.1
1,198.4	1,057.9	5,307.8	1,546.0	736.9	665.5	

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum	
Jan.	0.895	0.805	1	44.6	127	32.6	38.7	103,542	147,963	352,875	32,306
Feb.	.865	.785	1	40.3	20	30.0	35.0	84,698	174,256	552,787	43,917
Mar.	1.010	.770	20	61.9	12	28.2	34.1	91,403	196,045	563,328	25,779
April	2.070	.760	30	256	10	27.0	112	290,157	212,850	570,326	29,641
May	2.165	.825	12	277	9	35.0	171	458,594	296,851	726,365	44,643
June	1.470	.865	13	143	29	40.3	101	261,576	237,666	594,778	23,750
July	1.250	.805	1	103	10	32.6	49.9	133,574	231,056	961,969	32,194
Aug.	10.670	.830	25	6,600	5	37.0	239	639,991	231,227	916,834	70,131
Sept.	1.110	.885	1	41.0	11	12.7	24.6	63,668	278,124	1,611,965	63,668
Oct.	1.150	.915	19	46.6	5	16.4	22.4	59,953	273,171	1,099,958	59,953
Nov.	.990	.845	20	25.8	30	8.10	22.2	57,499	167,950	704,160	56,497
Dec.	1.000	.840	7	26.8	10	7.40	18.3	49,084	145,298	356,400	32,314
Yearly	10.670	0.760		6,600		7.40	72.7	2,293,739	2,592,457	4,629,385	870,435

* Discharge measurement made on this day

! And other days

** Period 1968-1998

08-4581.50 RIO ESCONDIDO AT VILLA DE FUENTE, COAHUILA

DESCRIPTION: Cableway, gravity well, concrete control weir of 50 CMS capacity and water-stage recorder located on the right bank of the Rio Escondido on the outskirts of Villa de Fuente, Coahuila, at latitude 28°40'05", longitude 100°31'00", about 5.0 kilometers southwest of Piedras Negras, Coahuila, 8.0 river kilometers from the confluence with the Rio Grande, and 10.9 river kilometers downstream from the confluence of Rio San Antonio with Rio Escondido. Rio Escondido enters the Rio Grande at river kilometer 794, 5.0 river kilometers downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 218.96 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 24 discharge measurements during the year, 22 by the Mexican Section, and 2 by the United States Section and a continuous record of gage heights. Records available: October 1932 through 1998.

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 222.48 meters 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. 680 CMS on June 29, 1936 with a stage of 224.61 meters above mean sea level. Min. frequently no flow.

			Average Flow in Cubic Meters per Second									
Daily:	Max.	371	Sept. 24, 1964						Min. 0			
Monthly:	Max.	23.4	Sept. 1964						Min. 0.01			
Yearly:	Max.	7.29	1987						Min. 0.07		Sept. 1965	1956

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.22	0.27	0.36	0.18	0.14	0.06	0.08	0	0.12	0.09	0.14	* 0.14
2	* .22	* .27	* .36	.18	.14	.06	.07	0	.12	.09	.14	.14
3	.22	.27	.36	.18	.13	.06	.06	0	.12	.09	* .16	.14
4	.21	.27	.36	.18	* .13	* .06	.06	0	.12	.09	.16	.14
5	* .23	.27	.36	.17	.12	.06	.06	0	.12	* .09	.17	.14
6	.23	.28	.36	.16	.12	.04	* .07	0	.12	.09	.16	* .14
7	.22	.28	.37	.16	.11	.04	.07	0	.12	.09	.15	.14
8	.22	.27	.36	.16	.11	.03	.06	0	.12	.10	.15	.14
9	.22	.27	.35	.16	.10	0	.06	0	.12	.10	.14	.14
10	.22	.26	.36	.16	.09	.52	.06	0	.12	.10	.13	.16
11	.22	.26	.34	.16	.09	3.53	.06	0	.12	.10	.09	.16
12	.22	.30	.18	.16	.12	* .36	.05	0	.12	.10	.09	.16
13	.21	.45	.18	.16	.11	.19	.05	0	.12	.11	.10	.16
14	.21	.46	.19	.16	.10	.14	.05	0	* .12	.11	.12	.16
15	.20	.46	.23	.16	.10	.12	.04	0	.12	.11	.11	.17
16	.32	* .55	* .67	.16	.09	.14	0	0	.12	.11	* .11	.19
17	.34	.51	.41	.16	.10	.12	0	0	2.17	.12	.11	.25
18	.28	.44	.36	.16	* .10	* .12	0	0	1.27	.12	.16	.20
19	*	.28	.40	.30	.15	.09	.12	0	.40	* .12	.17	.20
20	.28	.39	.29	.14	.08	.12	0	0	.25	.08	.16	.19
21	.28	.40	.29	.15	.08	.11	0	0	.20	.09	.16	.19
22	.28	.40	.29	.14	.08	.10	0	0	.17	.09	.14	.19
23	.28	.39	.29	.14	.08	.10	0	0	.14	.09	.15	.19
24	.27	.38	.25	.14	.08	.09	0	0	.12	.10	.14	.19
25	.27	.38	.22	.14	.08	.08	0	0	.10	.10	.14	.20
26	.26	.37	.21	.14	.08	.08	0	0	.10	.10	.14	.20
27	.26	.37	.20	.14	.08	.08	0	0	.10	.11	* .15	.20
28	.28	.36	.20	.14	.07	.08	0	0	.10	.11	.16	.20
29	.27	.19	.14	.06	.08	.08	0	0	.10	.10	.16	.20
30	.27	.18	.14	.07	.08	0	0	0	.10	.10	.16	.20
31	.27		.18	.07			0	0		.13		
Sum		9.98		4.67		6.77		0.00		3.13		5.43
	7.76		9.25		3.00		0.90		7.24		4.22	

Current Year 1998

Period 1932-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum
Jan.	0.210	0.125	16	0.41	115	0.20	0.25	670	4,049	23,350
Feb.	.245	.155	16	.60	110	.26	.36	862	3,150	17,803
Mar.	.320	.115	16	1.16	112	.18	.30	799	2,665	14,070
April	.115	.085	1	.18	129	.14	.16	403	2,874	27,069
May	.085	.030	2	.14	29	.06	.10	259	4,503	31,418
June	.725	0	11	9.84	1 8	0	.23	585	3,488	31,888
July	.045	0	15	.08	16	0	.03	77.8	3,165	32,694
Aug.	0	0	! 1	0	! 1	0	0	0	4,273	37,135
Sept.	.735	.065	17	10.2	125	.10	.24	626	6,011	60,665
Oct.	.115	.050	31	.18	120	.08	.10	270	6,200	49,084
Nov.	.175	.060	18	.30	111	.09	.14	365	4,824	31,743
Dec.	.150	.090	17	.25	! 1	.14	.18	469	4,259	27,140
Yearly	0.735	0		10.2		0	0.17	5,386	49,461	229,999
										2,163

* Discharge measurement made on this day ! And other days

08-4586.00 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 Canon Diablo, Lateral 50 Spill, Rosita Creek, Lateral 60-K Spill, Sauz Creek, Indio Creek, 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 1998. Records computed by the U.S. Section of the Commission prior to 1996. Beginning in 1996, the Maverick County Irrigation District computes and provides the discharge data through the Texas Natural Resource Conservation Commission. Records prior to 1976 were published under the "Return Flow to the Rio Grande from Maverick Canal, Eagle Pass to San Antonio Crossing".

EXTREME FLOWS FROM RECORDS:

				Average Flow in Cubic Meters per Second**												
Daily:	Max.	9.91	July 5, 1968	Min.	0.01	Sept. 27, 1997										
Monthly:	Max.	7.00	July 1968	Min.	0.04	April 1997										
Yearly:	Max.	5.10	1971	Min.	0.07	1998										

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.				
1	0.02	0.13	0.05	0.05	0.09	0.03	0.05	0.01	0.05	0.01	0.03	0.03				
2	.07	.13	.05	.05	.07	.10	.05	.02	.05	.02	.03	.04				
3	.07	.10	.04	.09	.03	.06	.05	.05	.04	.03	.03	.04				
4	.07	.09	.05	.09	.04	.03	.05	.07	.04	.02	.02	.07				
5	.07	.08	.05	.05	.03	.06	.05	.09	.04	.03	.02	.05				
6	.07	.08	.05	.04	.03	.12	.04	.10	.05	.03	.02	.05				
7	.22	.11	.05	.05	.03	.07	.03	.23	.05	.05	.05	.05				
8	.36	.09	.06	.05	.04	.17	.04	.16	.05	.05	.05	.07				
9	.31	.09	.05	.05	.05	.14	.04	.10	.06	.04	.06	.08				
10	.16	.10	.06	.04	.07	.10	.06	.12	.05	.05	.07	.07				
11	.10	.11	.06	.06	.05	.20	.07	.12	.05	.05	.08	.08				
12	.08	.12	.07	.04	.03	.20	.05	.07	.05	.04	.09	.10				
13	.08	.12	.07	.05	.03	.46	.05	.05	.05	.05	.10	.09				
14	.10	.14	.05	.08	.04	.46	.03	.05	.05	.04	.10	.09				
15	.11	.10	.06	.05	.05	.25	.02	.05	.05	.03	.11	.08				
16	.11	.08	.07	.07	.12	.19	.03	.05	.05	.03	.12	.10				
17	.09	.09	.06	.05	.04	.18	.04	.06	.05	.04	.10	.10				
18	.08	.10	.08	.10	.08	.15	.05	.05	.06	.05	.05	.10				
19	.08	.12	.06	.14	.10	.15	.07	.05	.06	.06	.12	.03				
20	.08	.14	.06	.20	.10	.07	.07	.05	.07	.04	.14	.04				
21	.08	.16	.06	.06	.07	.05	.05	.04	.10	.14	.06	.11				
22	.08	.09	.05	.08	.08	.06	.05	.04	.09	.15	.05	.12				
23	.08	.07	.05	.11	.05	.07	.05	.03	.06	.14	.04	.12				
24	.08	.06	.05	.18	.04	.07	.06	.03	.06	.14	.04	.14				
25	.08	.07	.05	.06	.02	.06	.05	.04	.04	.11	.04	.12				
26	.09	.07	.05	.03	.03	.05	.02	.05	.04	.10	.04	.11				
27	.09	.07	.05	.03	.04	.05	.02	.05	.03	.08	.04	.10				
28	.11	.07	.05	.04	.07	.06	.02	.05	.02	.03	.05	.09				
29	.14	.05	.04	.11	.06	.02	.06	.02	.06	.02	.03	.05				
30	.17	.05	.03	.03	.03	.05	.02	.07	.02	.02	.03	.04				
31	.20	.06	.03	.03								.10				
Sum		2.78		2.06		3.77		2.07		1.93		2.69				
3.53		1.72		1.69		1.32		1.48		1.65						

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum
Jan.			8	0.36	1	0.02	0.11	305	5,453	15,700
Feb.			20	.14	24	.06	.10	240	4,540	13,204
Mar.			18	.08	3	.04	.06	149	5,948	14,401
April			20	.20	126	.03	.07	178	6,450	18,066
May			16	.12	25	.02	.05	146	6,028	17,672
June			13	.46	1	.03	.13	326	6,256	17,742
July			11	.07	115	.02	.04	114	6,125	18,723
Aug.			7	.23	1	.01	.07	179	5,739	14,290
Sept.			21	.10	128	.02	.05	128	4,834	11,301
Oct.			22	.15	1	.01	.06	167	4,519	10,138
Nov.			16	.12	14	.02	.06	143	4,646	13,309
Dec.			24	.14	1	.03	.09	232	4,868	15,785
Yearly				0.46		0.01	0.07	2,307	65,406	161,048
										2,307

φ Mean daily

! And other days

** Period 1968-1998

08-4587.00 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 kilometer 741, 0.9 river kilometer downstream from Cuervo Creek, which marks the lower end of the Maverick County Water Control and Improvement District No. 1, 3.1 river kilometers upstream from Tovar Creek, 8.0 kilometers northeast of Villa Guerrero, Coahuila, about 18.5 kilometers south of El Indio, Maverick County, Texas, and 57.8 river kilometers downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 176.78 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 24 current-meter 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 current-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 1998 with several days missing prior to September 1955. Records prior to 1976 were published under the title "Rio Grande C. & G. S. datum.

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

EXTREME FLOWS FROM RECORDS: Momentary: Max. 25,800 CMS in June 1954, was determined by slope-area computation, with an elevation of 190.29 meters. Min. 1.54 CMS occurred on June 24, 1953 with an elevation of 177.38 meters at a station 518 meters upstream from the present site.

		Average Flow in Cubic Meters per Second**					
Daily:	Max.	4,310	August 25, 1998	Min.	9.26	June 29 & 30, 1972	
Monthly:	Max.	617	Sept. 1974	Min.	14.2	June 1969	
Yearly:	Max.	150	1974	Min.	35.0	1972	

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	40.8	38.4	37.8	* 33.4	227	103	66.4	39.7	* 40.2	18.6	18.0	17.4
2	40.4	40.6	37.2	32.1	186	103	64.7	40.7	* 35.1	19.3	19.0	* 19.1
3	40.0	39.6	37.7	32.2	177	106 *	64.7	40.3	31.4	18.6	19.9	18.9
4	39.2	* 38.2	* 36.4	33.9	178	110	67.5	41.2	29.1	18.1	* 19.3	20.2
5	38.9	37.3	34.1	33.7	181	110	68.0	* 43.3	27.5	18.2	21.4	20.5
6	40.8	37.8	35.8	35.1	168 *	109	69.8	42.2	25.4	27.4	21.0	20.0
7	41.2	37.5	35.7	35.0	155	98.6	67.9	45.8	24.4	* 25.4	21.4	20.6
8	42.3	37.0	36.4	32.3	89.8	96.5	66.1	44.3	23.9	25.2	19.8	21.3
9	41.0	36.3	36.5	32.8	37.1	83.5	38.6	43.6	23.4	22.6	19.4	19.4
10	41.4	34.4	36.7	32.2	84.6	87.3	37.5	44.1	21.8	21.0	19.4	17.3
11	40.7	36.7	35.8	31.3	165	112	37.4	43.4	19.1	20.1	19.6	17.6
12	41.0	35.7	36.6	31.8	225	93.3	38.5	41.6	19.8	19.3	19.2	18.9
13	39.6	37.2	37.3	33.5	248	85.1	39.3	40.6	21.0	18.4	20.5	17.4
14	39.5	37.4	37.0	33.0	225	84.1	38.7	40.0	20.3	17.8	25.8	16.3
15	40.9	38.5	37.0	* 32.2	238	83.7	* 38.9	41.4	19.6	16.9	23.9	16.8
16	39.3	40.4	42.0	30.6	242	81.5	46.2	47.8	* 18.8	16.7	22.2	* 16.0
17	39.8	40.2	41.7	31.4	243	* 85.7	38.8	68.1	107	16.6	22.3	15.3
18	41.3	* 38.5	* 40.4	30.9	243	83.2	37.8	65.2	44.9	37.7	* 22.5	14.7
19	40.0	37.4	38.6	106	243	81.3	39.1	137 *	28.7	31.3	22.1	15.1
20	38.2	36.2	38.6	200	157 *	81.1	40.4	79.4	32.0	35.1	21.2	15.7
21	* 37.7	36.3	47.0	207	124	81.2	48.3	60.2	27.0	* 25.2	21.2	15.5
22	38.4	38.6	40.8	212	115	76.6	42.9	55.6	27.2	21.7	21.4	16.0
23	38.2	37.0	36.9	206 *	118	70.1	33.9	55.7	25.3	20.1	21.4	16.2
24	38.4	36.3	36.2	204	113	68.3	36.1	238	24.5	18.8	21.0	16.3
25	37.4	35.9	34.5	213	112	66.0	39.7	4,310	22.3	17.5	21.3	16.3
26	36.6	38.0	33.5	229	114	68.1	42.0	1,270	19.4	17.6	21.1	16.4
27	36.4	37.3	35.2	230	118	65.4	44.5	162	20.1	17.0	21.0	16.3
28	35.6	37.0	34.1	229	115	64.1	43.1	95.6	20.2	16.8	20.8	16.3
29	36.6	33.9	231	108	66.4	40.1	71.3	19.3	17.1	20.5	15.8	
30	37.6	35.1	232	105	* 67.2	41.2	55.4	18.1	17.5	20.7	15.3	
31	37.2	33.8	210	102	38.5	46.8			17.8			15.7
Sum		1,051.7		3,086.4		2,571.3		7,450.3		651.4		534.6
	1,216.4		1,148.3		4,956.5		1,456.6		836.8		628.3	

Current Year 1998 | Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Low		Total	Average	Maximum	Minimum
Jan.	1.975	1,890	6	46.8	127	33.4	39.2	105,097	157,825	344,184
Feb.	1.955	1,880	17	44.0	24	32.4	37.6	90,867	183,930	548,741
Mar.	2.030	1,860	21	58.1	51	30.9	37.0	99,213	204,355	567,475
April	2.580	1,850	30	243	118	28.2	103	266,665	223,471	584,928
May	2.605	1,840	13	261	10	24.7	160	428,242	314,230	740,332
June	2.370	2,000	11	129	30	44.4	85.7	222,160	255,825	681,150
July	2.200	1,880	6	86.9	11	32.7	47.0	125,850	244,628	972,830
Aug.	8.375	1,905	25	6,150	6	37.3	240	643,706	244,763	1,016,428
Sept.	2.370	1,750	17	143	16	16.8	27.9	72,300	292,107	77,147
Oct.	2.020	1,740	18	55.4	16	15.5	21.0	56,281	285,452	1,598,663
Nov.	1.830	1,765	14	26.7	1	17.9	20.9	54,285	180,904	681,981
Dec.	1.805	1,730	8	22.9	18	13.7	17.2	46,189	152,964	54,285
Yearly	8.375	1,730		6,150		13.7	70.1	2,210,855	2,740,454	341,125
									4,731,321	1,105,710

* Discharge measurement made on this day

† And other days

** Period 1968-1998

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

08-4590.00 RIO GRANDE AT LAREDO, TEXAS
AND NUEVO LAREDO, TAMAULIPAS

DESCRIPTION: Bubbler gage and water-stage recorder (graphic and digital) and data collection platform located at the Lincoln Juarez International Bridge on the left bank at (latitude 27°30'05", longitude 99°30'13" and river kilometer 580. The zero of the gage is 107.12 meters above mean sea level U. S. C. & G. S. datum.

RECORDS: Based on 28 current-meter measurements during the year made from the bridge and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through 1913; (gage height records only) January through March 1914; May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June, November, and December 1922; 1923 through March 2, 1989 at a station 1.3 kilometers downstream of present site; March 3, 1989 through May 1990 at a station 0.5 kilometer upstream of present site; and June 1990 through 1998 at the present site.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The data collection platform, 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. 20,300 CMS on June 30, 1954 was determined by slope-area calculations, with a gage height of 18.44 meters at a site 0.5 kilometer upstream. Well authenticated information established the occurrence of a greater flood in 1865 with a gage height of 19.05 meters on a gage 1.3 kilometers downstream with a discharge of approximately 27,000 CMS. These were only floods since 1745 with flows greater than 17,000 CMS. Min. No flow several days in June and July 1953, and July 24, 1956.

Average Flow in Cubic Meters per Second**									
Daily:	Max.	3,270	June 30, 1971			Min.	7.00	July 2, 1972	
Monthly:	Max.	579	Sept.	1974		Min.	14.1	June	1969
Yearly:	Max.	152		1974		Min.	38.2		1972

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	40.7	39.8	34.5	* 30.2	255	108 *	63.8	35.2	* 53.3	19.7	18.8	* 19.3
2	41.1	* 37.8	33.7	28.5	249	109	72.9	33.2	46.4	18.7	* 18.0	19.0
3	41.2	40.2	* 33.9	28.9	200	111	67.5	* 35.2	43.8	18.8	17.2	14.2
4	41.1	38.8	33.7	27.4	188 *	116	61.6	36.0	39.5	19.8	17.5	15.9
5	* 41.4	38.1	33.4	27.1	188	122	65.2	35.7	34.6	* 17.5	20.5	18.5
6	41.3	37.0	31.3	29.7	189	122	* 63.4	37.3	31.7	32.6	17.7	18.4
7	54.1	35.9	29.1	31.1	189 *	118	65.7	37.6	29.5	53.6	18.6	19.4
8	44.0	34.9	29.9	33.5	185	108	62.2	38.1	27.5	33.9	17.9	19.0
9	41.4	34.1	29.5	30.4	103	104	63.1	40.4	25.9	26.0	20.0	18.6
10	41.1	35.5	28.4	26.6	39.3	87.0	40.9	38.5	25.0	24.5	18.8	19.0
11	41.1	32.0	30.1	27.2	51.0	84.3	32.4	37.9	24.6	23.1	18.3	18.6
12	41.2	31.3	31.7	27.6	163	121	31.4	38.3	23.3	21.8	18.3	16.9
13	41.1	33.1	33.8	27.8	237	100	34.7	37.1	20.7	21.8	18.7	14.1
14	40.6	35.8	33.4	* 28.7	259	89.1	36.4	38.6	20.4	21.0	21.6	* 18.6
15	40.0	36.7	34.6	29.7	229	* 83.2	36.5	41.3	22.1	20.5	22.8	18.0
16	39.6	34.7	* 38.7	27.8	245	83.8	35.0	35.9	22.8	19.9	25.6	17.3
17	39.3	* 37.8	41.2	26.7	248	81.3	37.1	* 51.3	* 31.8	19.4	* 22.9	17.8
18	38.0	38.7	41.6	26.4	250 *	81.1	40.2	85.1	237	22.1	21.9	18.5
19	39.2	37.2	41.4	26.5	252	82.5	34.1	60.0	94.2	* 46.0	22.1	18.7
20	* 39.4	35.6	39.2	78.4	252	80.5	* 33.9	130	37.9	59.3	22.2	18.4
21	37.6	32.6	38.8	217	154	79.3	35.7	91.1	34.7	41.4	22.3	19.5
22	36.9	31.1	38.9	224	107	79.0	36.1	56.1	33.0	38.7	21.8	20.0
23	37.5	35.6	42.8	228	99.5	79.5	44.2	48.8	30.2	28.8	21.4	19.8
24	36.4	35.7	37.9	221	104	66.3	31.0	47.3	28.2	25.1	23.3	17.5
25	36.5	34.8	36.5	220	101	63.2	29.2	250	28.2	23.5	22.6	17.2
26	36.4	33.6	33.2	230	104	61.5	34.0	1,780 *	25.6	21.5	21.7	17.2
27	34.8	34.2	29.8	256	107	65.2	36.6	2,470 *	22.6	20.2	21.0	17.4
28	33.8	35.6	29.2	254	114	67.7	38.4	212 *	20.1	19.6	21.4	17.8
29	33.5	29.0	249	113	65.3	39.2	104	20.5	19.9	20.6	17.4	
30	33.8	30.2	253	108	65.8	36.4	73.5	20.8	19.6	19.7	17.6	
31	35.7	31.4	106			33.7	59.9		18.4			16.7
Sum		998.2		2,972.2		2,682.6		6,115.4		816.7		556.3
	1,219.8		1,060.8		5,188.8		1,372.5		1,155.9		615.2	

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second		Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Total	Average	Maximum	Minimum
Jan.	1.090	0.765	7	66.6	29	30.2	39.3	105,391	163,049
Feb.	.895	.750	1	42.6	21	27.1	35.7	86,244	191,429
Mar.	.910	.710	23	45.5	10	25.1	34.2	91,653	210,521
April	2.090	.650	28	259	19	24.0	99.1	256,798	230,580
May	2.160	.705	14	267	11	22.2	167	448,312	339,053
June	1.395	.905	12	133	26	50.2	89.4	118,584	817,599
July	1.120	.640	2	84.7	!24	26.6	44.3	231,777	252,770
Aug.	10.570	.670	27	3,590	1	30.0	197	528,371	251,071
Sept.	2.185	.570	18	292	113	18.2	38.5	99,870	305,011
Oct.	1.060	.535	20	78.4	5	16.1	26.3	70,563	322,829
Nov.	.645	.540	16	26.4	3	16.6	20.5	53,153	185,226
Dec.	.565	.475	22	20.9	13	11.3	17.9	48,064	157,151
Yearly	10.570	0.475		3,590		11.3	67.8	2,138,780	2,900,471
								4,799,562	1,209,723

* Discharge measurement made on this day

! And other days

** Period 1968-1998

08-4597.00 RIO SALADO NEAR LAS TORTILLAS, TAMAULIPAS

DESCRIPTION: Cableway, control weir with notch opening of 72 CMS capacity, gravity well, and water-stage recorder located on the right bank at latitude 26°50'10", longitude 99°33'50", 3 river kilometers downstream from the confluence of Rio Sabinas with Rio Salado, 10 kilometers southeast of the town of Las Tortillas, Tamaulipas, and 39.9 river kilometers from the confluence with the Rio Grande. This stream enters the Rio Grande at river kilometer 482, 39.8 river kilometers upstream from Falcon Dam. The zero of the gage is 99.28 meters above mean sea level, U. S. C. & G. S. datum. Since July 1996, the actual measurements and record of gage heights have been obtained at the Nuevo Laredo to Reynosa Highway Bridge approximately 39.8 kilometers downstream from the gaging station near Las Tortillas. The zero of the gage at the Bridge is 89.00 meters above mean sea level, U.S.C. and G.S. datum.

RECORDS: Based on 7 discharge measurement during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: September 9, 1953 through 1998. Records are also available for a station at old Cd. Guerrero, 30 kilometers downstream, from 1900 through 1913 and 1923 through September 8, 1953.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,840 CMS on September 16, 1971, with a gage height of 12.31 meters. Min. frequently no flow. The maximum discharge was measured at the highway bridge 20.9 river kilometers 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 Cubic Meters per Second**

Daily:	Max.	1,780	Sept. 16, 1971	Min.	0	Frequently
Monthly:	Max.	384	Sept. 1971	Min.	0	
Yearly:	Max.	93.9	1971	Min.	1.08	1994

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	1.18	1.57	0.41	0
2	0	0	0	0	0	0	0	0	2.53	1.10	.33	0
3	0	0	0	0	0	0	0	0	2.74	.71	.28	0
4	0	0	0	0	0	0	0	0	2.16	.48	.24	0
5	0	0	0	0	0	0	0	0	1.93	.41	.24	0
6	0	0	0	0	0	0	0	0	1.86	.59	.20	0
7	0	0	0	0	0	0	0	0	1.74	.46	.17	0
8	0	0	0	0	0	0	0	0	.75	.28	.15	0
9	0	0	0	0	0	0	0	0	1.71	.55	.15	0
10	0	0	0	0	0	0	0	0	1.54	.46	.14	0
11	0	0	0	0	0	0	0	0	1.15	.30	.11	0
12	0	0	0	0	0	0	0	0	.90	.21	.10	0
13	0	0	0	0	0	0	0	0	1.01	.21	.10	0
14	0	0	0	0	0	0	0	0	1.80	.20	.34	0
15	0	0	0	0	0	0	0	0	1.60	.31	.46	0
16	0	0	0	0	0	0	0	0	2.10	.89	.26	0
17	0	0	0	0	0	0	0	0	59.6	.35	.14	0
18	0	0	0	0	0	0	0	0	27.4	.27	.07	0
19	0	0	0	0	0	0	0	0	27.7	.68	.02	0
20	0	0	0	0	0	0	0	0	20.9	.43	0	0
21	0	0	0	0	0	0	0	0	12.4	50.7	10.6	0
22	0	0	0	0	0	0	0	0	2.10	50.6	26.9	0
23	0	0	0	0	0	0	0	0	1.49	43.4	14.8	0
24	0	0	0	0	0	0	0	0	.49	38.4	5.91	0
25	0	0	0	0	0	0	0	0	.26	27.1	2.35	0
26	0	0	0	0	0	0	0	0	.10	21.0	1.74	0
27	0	0	0	0	0	0	0	0	14.3	1.19	0	0
28	0	0	0	0	0	0	0	0	9.35	.76	0	0
29	0	0	0	0	0	0	0	0	3.67	.53	0	0
30	0	0	0	0	0	0	0	0	1.86	.50	0	0
31	0	0	0	0	0	0	0	0	.33	.45	0	0
Sum	0	0	0	0	0	0	0	0	99.45	75.56	3.91	0
	0	0.00	0.00	0.00	0	0	0	0	670.38			

Current Year 1998

Period 1953-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
				Day	Day	Day					
Jan.	89,000	89,000	! 1	0	! 1	0	0	0	0	9,925	73,777
Feb.	89,000	89,000	! 1	0	! 1	0	0	0	0	82,285	0
Mar.	89,000	89,000	! 1	0	! 1	0	0	0	0	5,421	36,628
April	89,000	89,000	! 1	0	! 7	0	0	0	0	250,373	0
May	89,000	89,000	! 1	0	! 5	0	0	0	0	29,124	447,500
June	89,000	89,000	! 1	0	! 2	.05	0	0	0	32,231	304,451
July	89,000	89,000	! 1	0	! 1	0	0	0	0	29,803	544,635
Aug.	90,200	89,000	18	35.5	! 1	0	3.21	8,592	22,652	259,070	0
Sept.	90,960	89,120	17	85.6	! 13	.75	22.3	57,921	90,558	996,183	2,651
Oct.	90,070	89,030	22	29.0	15	.15	2.44	6,528	55,191	679,329	136
Nov.	89,150	89,000	14	1.12	20	0	.13	338	27,643	416,863	0
Dec.	89,000	89,000	! 1	0	! 1	0	0	0	0	16,790	217,244
Yearly	90,960	89,000		85.6		0	2.33	73,379	340,124	2,961,050	34,122

* Discharge measurement made on this day

! And other days

** Period September 1953-1998

08-4613.00 RIO GRANDE BELOW FALCON DAM NEAR FALCON, TEXAS
AND NUEVA CO. 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 kilometer 442; about 11.3 kilometers southwest of Falcon, Starr County, Texas and 139 river kilometers downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. A gravity well and graphic water-stage recorder located 4.1 river kilometers downstream and a cableway located 1.6 kilometers 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 cableway during spillway gate operations. During 1998 there were 4 current-meter measurements made at the cableway by the United States Section during spillway operations. Records available: 1958 through 1998. Records are also available from December 17, 1952 through 1957 for a station at Chapeno, 4.1 kilometers downstream, where discharges included arroyo inflow below Falcon Dam. This 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. 2,340 CMS on September 18, 1971. Min. 0.04 CMS on March 24 and 25, 1957 (at Chapeno gaging station).

Average Flow in Cubic Meters per Second**

Daily	Max.	2,160	Sept. 18, 1971	Min.	0.04	March 24 & 25, 1957
Monthly	Max.	920	Oct. 1958	Min.	0.67	Nov. 1973
Yearly	Max.	196	1958	Min.	39.6	1997

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.3	58.3	16.5	66.6	220	93.9	58.2	46.4	41.7	13.0	17.8	16.0
2	25.9	40.3	18.9	109	213	94.2	57.8	48.5	28.9	13.0	18.0	16.0
3	26.1	20.5	21.7	113	220	95.5	57.9	49.1	26.1	13.0	17.7	16.0
4	26.2	18.2	26.3	140	220 *	98.4	58.1	46.3	29.1	18.1	9.20	18.0
5	26.2	15.5	26.4	141	215	90.7	47.7	41.6	29.1	17.9	4.40	19.9
6	26.3	18.1	21.8	144	220	83.9	47.7	38.6	29.0	12.7	2.90	19.9
7	28.8	20.4	16.5	145	221	83.0	48.0	19.0	18.3	11.0	1.50	19.9
8	43.6	22.7	16.5	169	225	83.3	45.8	38.9	12.0	11.0	1.50	20.3
9	63.7	25.2	21.6	192	218	90.7	53.3	36.7	10.0	11.0	5.00	16.0
10	66.6	30.4	26.4	219	228	93.3	44.7	34.1	5.80	11.0	9.00	17.8
11	54.4	33.0	38.8	190	224	83.8	50.1	* 36.5	5.80	12.0	9.00	18.2
12	54.2	36.4	44.0	182	180	73.7	52.9	39.1	10.0	12.3	5.80	18.2
13	43.7	34.3	15.5	185	159 *	78.4	50.1	40.3	10.0	11.0	2.50	20.2
14	47.8	24.3	11.8	193	149	84.5	48.2	39.7	10.0	11.0	2.50	22.6
15	50.2	15.4	10.5	208	150	79.1	35.9	39.8	8.10	11.0	4.30	23.1
16	53.0	13.5	13.0	230	124	80.7	30.6	39.8	2.50	11.0	6.50	23.2
17	55.4	13.5	18.0	258	128	91.8	34.1	37.4	1.60	11.0	10.0	23.0
18	55.4	13.5	20.4	263	140	91.3	62.8	23.9	.50	11.0	13.5	23.0
19	55.5	12.5	42.2	271	149	83.4	67.5	20.5	.50	7.20	14.8	23.0
20	55.6	9.50	23.0	300	130	83.7	49.1	25.4	.50	3.50	16.0	23.0
21	50.5	16.5	27.9	326	110	81.9	49.1	12.0	.50	2.50	16.0	23.0
22	45.5	13.0	30.5	326	116	76.6	44.4	11.0	1.30	2.50	16.0	19.8
23	55.5	13.0	30.6	327	106	72.1	36.6	13.5	.50	2.50	14.5	16.0
24	70.5	16.5	37.8	327	106	66.7	34.2	21.1	.50	2.50	12.0	14.0
25	70.4	16.5	47.8	328	101	59.0	31.4	3.40	3.30	13.5	12.0	
26	65.2	11.5	57.4	323	95.9	55.7	43.8	33.5	4.50	8.80	16.0	12.0
27	57.5	11.5	67.8	329	78.5	58.7	44.3	34.0	10.6	11.3	15.1	13.0
28	53.3	16.5	70.2	304	81.0	59.4	54.1	48.6	12.0	13.0	15.0	14.0
29	52.9	70.2	276 *	87.8	54.6	54.4	63.9	8.50	12.0	16.0	16.6	
30	55.4	68.4	250	94.3	55.4	48.9	59.5	10.8	12.0	16.0	18.8	
31	60.2	67.1	94.0				44.1	51.8	15.0		23.7	
Sum	590.50	1,025.5	6,834.6	4,803.5	2,377.4	1,488.5	1,121.9	318.10	332.10	322.00	580.2	

Current Year 1998

Period 1954-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second		Average	Volume-Thousand Cubic Meters				
	High	Low	Day	Day		Total	Average	Maximum	Minimum	
Jan.			24	70.5	.2	25.9	49.1	131,484	256,307	
Feb.	1	58.3	20	9.50	21.1	51,019	176,933	453,153	13,796	
Mar.	128	70.2	15	10.5	33.1	88,603	164,138	487,987	27,900	
April	27	329	1	66.6	228	590,509	405,232	861,235	14,541	
May	10	228	27	78.5	155	415,022	461,975	882,527	26,611	
June	4	98.4	29	54.6	79.2	205,407	314,704	830,101	24,322	
July	19	67.5	16	30.6	48.0	128,606	198,175	482,117	15,837	
Aug.	29	63.9	22	11.0	36.2	96,932	258,979	1,823,919	74,233	
Sept.	1	41.7	118	.50	11.1	28,693	186,776	1,333,232	1,761	
Oct.	4	18.1	121	2.50	10.3	27,484	248,871	2,463,696	2,383	
Nov.	2	18.0	1	1.50	10.7	27,821	129,054	1,391,291	1,727	
Dec.	31	23.7	125	12.0	18.7	50,129	116,157	573,923	10,807	
Yearly			329		0.50	58.4	1,841,709	2,917,301	6,188,898	1,247,998

* Discharge measurement made on this day

φ Mean daily

! And other days

** Period 1954-1998

08-4620.00 RIO ALAMO AT CD. MIER, TAMAULIPAS

DESCRIPTION: Cableway, reinforced concrete weir of 5 CMS 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 1.0 kilometer north of Cd. Mier, Tamaulipas, and 8.0 river kilometers from the confluence with the Rio Grande. This stream enters the Rio Grande at river kilometer 422, 20.0 river kilometers downstream from Falcon Dam. The weir is located about 91 meters downstream from the recorder. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on the weir discharge table at low flows and a continuous record of gage heights. High flow computations by shifting control methods. During 1998 there were 2 current meter measurements made at the cableway jointly by the Mexican Section and the U.S. Section. Records available: July 1923 through 1998.

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 .40 meters to make it coincide with the weir crest elevation. Prior to January 1, 1969, the zero of the gage was 57.41 meters above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 4,100 CMS on September 11, 1948, with a stage of 67.64 meters above mean sea level. Min. periods of no flow have occurred at times during all years of record except 1934, 1935, 1968, 1972, 1974, 1976, 1977, 1979, and 1981.

Average Flow in Cubic Meters per Second

Daily:	Max. 2,470	Sept. 11, 1948	Min. 0	Frequently
Monthly:	Max. 207	Sept. 1967	Min. 0	Frequently
Yearly:	Max. 23.7	1967	Min. 0.35	1993

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0.28	0.30	0	0
2	0	0	0	0	0	0	0	0	.22	.20	.17	0
3	0	0	0	0	0	0	0	0	.20	.48	.18	0
4	0	0	0	0	0	0	0	0	.20	1.36	3.02	0
5	0	0	0	0	0	0	0	0	.20	.52	12.3	0
6	0	0	0	0	0	0	0	1.23	1.52	.35	3.45	0
7	0	0	0	0	0	0	0	1.47	4.91	.20	1.72	0
8	0	0	0	0	0	0	0	0	.16	3.25	.17	0
9	0	0	0	0	0	0	0	0	5.63	.10	1.00	0
10	0	0	0	0	0	0	0	0	8.77	.60	.48	0
11	0	0	0	0	0	0	0	0	3.21	0	.22	0
12	0	0	0	0	0	0	0	0	1.25	0	.20	0
13	0	0	0	0	0	0	0	0	.88	6.51	.20	0
14	0	0	0	0	0	0	0	0	.74	2.51	.34	0
15	0	0	0	0	0	0	4.03	0	5.23	1.42	.22	0
16	0	0	0	0	0	0	0	.80	0	10.5	.93	.20
17	0	0	0	0	0	0	0	.49	27.8	33.6	.36	.10
18	0	0	0	0	0	0	0	.29	167 *	* 74.9	.20	.10
19	0	0	0	0	0	0	0	.18	19.1	43.5	.20	.10
20	0	0	0	0	0	0	0	0	3.43	13.7	.20	0
21	0	0	0	0	0	0	0	0	1.53	6.43	.17	0
22	0	0	0	0	0	0	0	0	1.52	3.32	.10	0
23	0	0	0	0	0	0	0	0	1.69	4.94	.06	0
24	0	0	0	0	0	0	0	0	.91	6.90	0	0
25	0	0	0	0	0	0	0	0	1.37	11.0	0	0
26	0	0	0	0	0	0	0	0	.84	5.68	0	0
27	0	0	0	0	0	0	0	0	.60	2.52	0	0
28	0	0	0	0	0	0	0	0	.42	1.56	0	0
29	0	0	0	0	0	0	0	0	.38	1.20	0	0
30	0	0	0	0	0	0	0	0	.30	.59	0	0
31	0	0	0	0	0	0	0	0	.30	0	0	0
Sum		0	0	0	0	0	0	5.79	230.05	256.83	16.94	25.22

Current Year 1998

Period 1924-1998

Month	Extreme Gage Meters		Extreme Cubic Meters per Second				Average	Total	Volume Thousand Cubic Meters		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	57.400	57.400	1 1	0	1 1	0	0	0	2,076	43,079	0
Feb.	57.400	57.400	1 1	0	1 1	0	0	0	2,629	65,959	0
Mar.	57.400	57.400	1 1	0	1 1	0	0	0	2,079	24,456	0
April	57.400	57.400	1 1	0	1 1	0	0	0	5,649	44,665	0
May	57.400	57.400	1 1	0	1 1	0	0	0	9,742	168,990	0
June	57.400	57.400	1 1	0	1 1	0	0	0	11,118	102,675	0
July	58.250	57.400	15	25.5	14	0	.19	500	6,755	76,780	0
Aug.	61.140	57.400	18	240	5	0	7.42	19,876	18,395	253,778	0
Sept.	59.300	57.420	18	80.5	2	.20	8.56	22,199	40,670	535,810	167
Oct.	58.115	57.400	13	17.5	11	0	.55	1,464	17,788	238,962	0
Nov.	58.360	57.400	4	27.0	1 1	0	.84	2,179	3,687	31,041	0
Dec.	57.400	57.400	1 1	0	1 1	0	0	0	2,579	19,714	0
Yearly	61.140	57.400		240		0	1.47	46,209	123,167	747,096	11,053

* Discharge measurement made on this day

† And other days

08-4642.00 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", 5.0 river kilometers from the confluence with the Rio Grande, and 15.0 river kilometers downstream from Marte R. Gomez Dam. This stream enters the Rio Grande at river kilometer 384; 6.0 river kilometers upstream from the Rio Grande gaging station at Rio Grande City, 58.1 river kilometers downstream from Falcon Dam. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 1 discharge measurement during the year by the Mexican Section and a continuous record of gage heights. Computations by shifting control methods. Discharge prorated between measurements during times of extremely low flow. Records available: 1954 through 1998.

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 39.76 meters above mean sea level, U. S. C. & G. S. datum.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 3,270 CMS on September 25, 1967 with a stage of 52.57 meters above mean sea level. Min. no flow occurs frequently.

Average Flow in Cubic Meters per Second

Daily:	Max.	3,250	Sept. 25, 1967	Min.	0	Frequently
Monthly:	Max.	894	Sept. 1967	Min.	0	Frequently
Yearly:	Max.	113	1967	Min.	0.02	1992

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	.42	9.32	0	0	0
16	0	0	0	0	0	0	0	0	.08	0	0	0
17	0	0	0	0	0	0	0	0	12.8	0	0	0
18	0	0	0	0	0	0	0	0	33.9	26.8	0	0
19	0	0	0	0	0	0	0	0	24.9	8.65	126	0
20	0	0	0	0	0	0	0	0	0	31.8	0	0
21	0	0	0	0	*	0	0	0	0	.38	0	0
22	0	0	0	0	*	0	0	0	0	0	0	0
23	0	0	0	0	*	0	0	0	.75	0	0	0
24	0	0	0	0	*	0	0	0	0	0	0	0
25	0	0	0	0	*	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum				0	0	0	0	0	63.52	184.98	0	0

Current Year 1998

Period 1954-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
			High	Low	Day		Total	Average	Maximum	Minimum	
	High	Low	Day	Day	Low						
Jan.	39.400	39.400	! 1	0	! 1	0	0	9,217	118,256	0	
Feb.	39.400	39.400	! 1	0	! 1	0	0	5,445	79,341	0	
Mar.	39.400	39.400	! 1	0	! 1	0	0	2,790	30,236	0	
April	39.400	39.400	! 1	0	! 1	0	0	2,491	44,253	0	
May	39.400	39.400	! 1	0	! 1	0	0	3,565	35,412	0	
June	39.400	39.400	! 1	0	! 1	0	0	15,863	412,934	0	
July	39.400	39.400	! 1	0	! 1	0	0	25,580	421,148	0	
Aug.	40.735	39.400	18	76.8	14	0	2.05	5,488	19,047	337,857	
Sept.	40.535	39.400	18	60.5	13	0	2.18	5,659	115,537	2,316,989	
Oct.	41.660	39.400	19	157	17	0	5.97	15,982	98,663	1,111,977	
Nov.	39.400	39.400	! 1	0	! 1	0	0	27,232	283,859	0	
Dec.	39.400	39.400	! 1	0	! 1	0	0	16,258	190,901	0	
Yearly	41.660	39.400		157		0	0.86	27,129	341,688	3,566,125	648

* Discharge measurement made on this day

! And other days

08-4645.00 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 20.0 river kilometers upstream from the confluence with the Rio Grande. The Rio San Juan enters the Rio Grande at river kilometer 384. 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 the Rio Grande City 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.

RECORDS: Based on 6 discharge measurements during the year by the Mexican Section. 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, 5.0 river kilometers upstream from the confluence with the Rio Grande. All storm water measured at these two drains was deducted and is not included in the tabulation below. Records available: 1953 through 1998. Records prior to 1976 include Rio San Juan flow.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0.10	0.05	0.25	0.69	0	0	0	0	0	0
2	0	0	.10	.05	.26	.72	0	0	0	0	0	0
3	0	0	* .10	* .05	.28	.70	0	0	0	0	0	0
4	0	0	* .10	.05	.29	.67	0	0	.56	0	0	0
5	0	0	.10	.05	.31	.65	0	0	.70	0	0	0
6	0	0	.10	.05	* .32	.63	0	0	.95	0	0	0
7	0	0	.09	.05	.28	.60	0	0	1.20	1.10	0	0
8	0	0	.09	.05	.24	.58	0	0	.70	1.10	0	0
9	0	0	.09	.05	.20	.56	0	0	.70	0	0	0
10	0	0	.09	.05	.16	.53	0	0	.40	0	0	0
11	0	0	.09	.04	.12	.51	0	0	.30	0	0	0
12	0	0	.09	.04	* .08	.49	0	0	.30	0	0	0
13	0	0	.09	.04	.11	.46	0	0	.30	1.20	0	0
14	0	0	.08	.04	.14	.44	0	0	.80	1.20	0	0
15	0	0	.08	.04	.17	.42	0	0	0	0	0	0
16	0	0	.08	* .04	.20	.40	0	0	1.10	0	0	0
17	0	0	.08	.05	.23	.37	0	0	1.50	0	0	0
18	0	* .10	.08	.07	.26	.35	0	0	1.90	0	0	0
19	0	.10	.08	.08	.29	.33	0	0	2.10	0	0	0
20	0	.10	.07	.10	.32	.30	0	0	2.05	0	0	0
21	0	.10	.07	.11	.35	.28	0	0	.90	0	0	0
22	0	.10	.07	.12	.38	.26	0	0	.50	0	0	0
23	0	.10	.07	.14	.41	.23	0	0	1.50	0	0	0
24	0	.10	.07	.15	.44	.21	0	0	1.30	0	0	0
25	0	.10	.07	.17	.48	.19	0	0	2.30	0	0	0
26	0	.10	.06	.18	.51	.16	0	0	2.00	0	0	0
27	0	.10	.06	.19	.54	.14	0	0	1.20	0	0	0
28	0	.10	.06	.21	.57	.12	0	0	1.00	0	0	0
29	0	.06	.22	.60	.09	.09	0	0	.90	0	0	0
30	0	.06	.24	.63	.07	0	0	0	.80	0	0	0
31	0	.06	.66			0	0	0	0			
Sum		1.10		2.77		12.15		0		4.60		0
	0	2.49		10.08					27.96			

Current Year 1998

Period 1954-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	Day	φ High	φ Low		Total	Average	Maximum	Minimum
Jan.			! 1	0	! 1	0	0	0	335	1,470	0
Feb.			! 18	.10	! 1	0	.04	95.0	433	1,157	0
Mar.			! 1	.10	26	.06	.08	215	528	952	32.0
April			30	.24	! 11	.04	.09	239	421	1,338	24.2
May			31	.66	12	.08	.33	871	796	1,807	14.7
June			2	.72	30	.07	.41	1,050	682	1,551	6.0
July			! 1	0	! 1	0	0	0	400	3,573	0
Aug.			! 1	0	! 1	0	0	0	339	3,902	0
Sept.			25	2.30	! 1	0	.93	2,416	317	2,416	.9
Oct.			! 13	1.20	! 1	0	.15	397	232	985	0
Nov.			! 1	0	! 1	0	0	0	189	794	0
Dec.			! 1	0	! 1	0	0	0	177	610	0
Yearly				2.30		0	0.17	5,283	4,649	13,656	606

* Discharge measurement made on this day

φ Mean daily

! And other days

OB-4646.00 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 Natural Resource Conservation Commission, 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 Watermaster.

During 1998, 1,704 irrigable hectares 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 0.6% of the total irrigable area below Falcon Dam allotted Rio Grande water.

The total diversion during 1998 in this river reach was 11,703 TCM, or 1.1% of the total water diverted from the Rio Grande below Falcon Dam. Records of diversions in this river reach were determined by means of flow meters. 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 Cubic Meters per Second									
Daily:	Max.	4.59						Min. 0	Occasionally
Monthly:	Max.	1.58	May 1, 1998	April 1984				Min. 0.06	March 1957
Yearly:	Max.	0.65			1989			Min. 0.20	1968

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.55	0.20	0.33	1.46	4.59	0.60	1.44	1.59	1.16	0.45	0.17	0.27
2	.58	.38	.52	1.11	.92	.42	.46	.28	.51	.62	.37	.26
3	.62	.43	.55	.88	.36	.36	.40	.28	.57	.70	.36	.29
4	.51	.35	.52	.64	.57	.37	.34	.28	.33	.48	.38	.30
5	.53	.56	.63	.44	.57	.37	.27	.41	.34	.48	.24	.24
6	.59	.58	.59	.47	.56	.34	.28	.41	.25	.47	.14	.20
7	.47	.46	.54	.44	.63	.30	.31	.45	.19	.43	.14	.27
8	.54	.29	.26	.61	.54	.33	.31	.33	.18	.44	.14	.27
9	.59	.44	.23	.61	.63	.31	.39	.28	.18	.45	.16	.33
10	.40	.54	.37	.52	.42	.32	.39	.33	.18	.37	.14	.28
11	.28	.54	.50	.40	.46	.29	.31	.33	.18	.32	.14	.31
12	.36	.59	.40	.24	.47	.31	.28	.40	.18	.35	.14	.25
13	.41	.47	.27	.57	.43	.29	.29	.40	.18	.26	.12	.31
14	.55	.38	.19	.56	.48	.28	.34	.41	.19	.31	.12	.37
15	.47	.19	.19	.57	.49	.29	.32	.29	.32	.39	.12	.45
16	.38	.28	.19	.57	.50	.29	.26	.27	.31	.64	.12	.60
17	.32	.29	.20	.77	.47	.28	.26	.28	.18	.59	.12	.51
18	.32	.31	.23	.61	.46	.39	.26	.33	.24	.34	.12	.51
19	.55	.35	.29	.56	.39	.39	.26	.46	.28	.21	.14	.50
20	.39	.35	.34	.60	.38	.33	.30	.40	.18	.19	.14	.43
21	.33	.38	.39	.61	.53	.25	.29	.41	.18	.19	.12	.58
22	.36	.20	.29	.75	.43	.47	.29	.38	.18	.19	.12	.32
23	.50	.35	.44	.57	.35	.48	.29	.28	.18	.32	.38	.33
24	.48	.41	.63	.58	.38	.47	.29	.30	.18	.36	.40	.25
25	.32	.43	.55	.61	.35	.33	.29	.38	.18	.42	.29	.20
26	.39	.51	.54	0	.43	.33	0	.40	.18	.56	.23	.20
27	.43	.55	.57	0	.48	.25	0	.48	0	.45	.23	0
28	.46	.59	.59	0	.37	0	0	.58	0	.48	.13	0
29	.56	0	0	0	.41	0	0	.54	0	.45	0	0
30	.46	0	0	0	.36	0	0	0	0	.49	0	0
31	.47	0	0	0	0	0	0	0	0	.48	0	0
Sum		11.36		15.75		9.44		11.96		12.88		8.83
	13.97		11.34		18.41		8.92		7.15		5.42	

Current Year 1998

Period 1960-1998

Month	Average Rainfall**		Extreme-Cubic Meters per Second			Total	Volume--Thousand Cubic Meters				
	Millimeters	1998	1960-1998	Day	High	Low	Average	Total	Average	Maximum	
Jan.	25	3	0.62	11	0.28	0.45	1,207	932	1,828	196	
Feb.	55	28	112	.59	15	.19	.41	982	1,143	2,198	275
Mar.	43	15	15	.65	129	0	.37	980	1,524	2,558	549
April	0	37	1	1.46	126	0	.53	1,361	1,647	4,088	440
May	0	65	1	4.59	31	0	.59	1,591	1,295	3,237	260
June	28	66	1	.60	128	0	.31	816	1,148	3,217	258
July	18	36	1	1.44	126	0	.29	771	965	1,897	343
Aug.	10	55	1	1.59	130	0	.39	1,033	922	1,798	343
Sept.	303	112	1	1.10	127	0	.24	618	747	1,745	220
Oct.	110	49	3	.70	120	.19	.42	1,113	1,080	2,109	448
Nov.	45	27	24	.40	129	0	.18	468	776	1,793	260
Dec.	6	23	16	.60	127	0	.28	763	728	1,490	179
Yearly	619	538		4.59		0	0.37	11,703	12,907	20,497	6,154

♦ Mean daily

! And other days

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

08-4647.00 RIO GRANDE AT RIO GRANDE CITY, TEXAS
NEAR CAMARGO, TAMAULIPAS

DESCRIPTION: Cableway, bubbler gage, 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 kilometer 378; about 1.6 kilometer downstream from Rio Grande City, Texas, and 6.0 river kilometers downstream from Rio San Juan. The zero of the gage is 30.48 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 30 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: January 1955 through 1998. 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" 4.8 kilometers 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, 64.1 river kilometers upstream. The transmitter relays gage height data via radio to the Mercedes Office of the Commission, and to the Anzalduas Dam control room, where it is recorded automatically.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,230 CMS on September 22 and 23, 1967, with a gage height of 18.71 meters.

	Average Flow in Cubic Meters per Second**												
Daily:	Max.	5,860	Sept.	23, 1967							Min.	0.36	March 5, 1985
Monthly:	Max.	1,400	Oct.	1958							Min.	6.66	March 1957
Yearly:	Max.	259		1958							Min.	43.3	1997

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	25.9	54.1	13.3	66.9	212 *	98.5	58.5	44.9	54.3	10.1	11.8	9.82
2	28.9	51.3	14.8	* 78.0	202	* 98.1	* 59.9	47.7	* 45.4	* 12.0	15.0	* 9.30
3	28.5	* 34.7	* 17.1	107	214	98.1	59.9	50.1	31.4	12.5	* 15.8	9.47
4	28.1	20.1	22.8	120	216	102	60.2	* 50.4	27.1	12.6	16.5	9.75
5	27.3	15.4	25.6	142	216 *	103	58.7	49.7	29.7	15.8	22.6	12.7
6	* 26.2	12.1	26.0	143 *	217	91.5	50.6	45.1	32.8	23.2	19.8	14.9
7	26.5	13.9	21.8	147	218	89.2	49.9	47.0	40.2	29.8	11.5	15.2
8	26.4	18.0	13.3	159 *	220	90.0	50.9	29.4	28.2	14.4	8.34	14.9
9	44.5	20.8	14.6	173	217	91.1	50.1	36.8	19.4	9.74	7.10	15.5
10	58.9	23.4	18.4	202	222	97.7	53.5	42.7	16.3	9.40	5.00	13.6
11	58.9	28.8	24.7	214	222	98.3	47.5	39.0	15.4	9.44	4.03	12.9
12	53.1	33.2	41.1	199	205	84.8	51.0	40.8	11.2	9.90	7.27	14.7
13	50.8	36.0	43.4	185	173	79.8	52.9	43.4	7.51	22.5	9.99	15.5
14	46.2	42.8	19.7	191	154	86.6	50.1	47.9	8.75	16.1	9.48	17.0
15	47.5	34.8	13.0	207 *	152	89.3	54.9	52.0	* 71.8	12.9	7.29	* 19.9
16	* 49.7	19.5	10.8	227	143	85.4	41.6	49.3	48.7	12.1	5.55	20.0
17	51.4	16.1	11.2	241	131	* 90.1	30.0	49.3	61.6	11.2	4.70	19.0
18	52.3	* 15.9	14.9	252	133	98.1	34.1	154	138 *	48.8	* 5.45	19.5
19	52.3	14.3	18.3	256	149	94.1	60.9	119 *	89.7	198	9.76	19.3
20	52.4	14.6	37.7	262	151 *	88.3	64.3	33.5	36.1	* 56.7	12.9	19.1
21	52.6	12.6	21.5	298	122	87.6	* 51.4	30.5	12.2	13.6	14.1	19.2
22	48.5	15.8	25.2	316 *	114	84.9	49.6	24.9	10.3	7.94	14.0	18.6
23	46.4	16.2	27.2	318	118	80.4	44.6	17.1	20.4	5.93	13.2	18.2
24	53.4	12.9	* 27.7	322	111	75.0	38.1	16.2	36.9	4.46	12.5	14.3
25	60.0	16.3	38.6	322	110	68.1	32.7	17.3	21.6	3.37	12.7	13.4
26	59.9	15.2	49.1	319	104	61.9	33.5	30.6	10.9	2.47	9.62	11.5
27	57.3	12.3	55.5	310	96.0	59.4	43.2	34.9	7.09	2.06	10.5	10.7
28	53.7	10.3	61.8	299 *	85.2	61.9	46.7	35.3	6.81	3.24	11.2	10.7
29	50.4		64.0	269	88.5	61.4	54.9	49.0	10.4	10.1	10.2	11.4
30	51.3		64.9	243	95.7	59.0	55.0	64.5	11.7	12.6	9.80	12.2
31	52.3		65.0	98.7			50.2	60.4			12.1	15.7
Sum		631.4		6,587.9		2,553.6		1,452.7		625.05		457.94
1,421.6			923.0		4,910.1		1,539.4		961.86		327.68	

Current Year 1998

Period 1954-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters		
	High	Low	Day	Day	Low		Total	Average	Maximum
Jan.	8,350	7,910	25	61.0	1	23.7	45.9	122,826	267,135
Feb.	8,270	7,650	1	55.2	28	9.28	22.6	54,553	464,530
Mar.	8,305	7,680	31	65.9	17	9.93	29.8	79,747	177,787
April	9,630	8,270	24	329	1	65.9	220	569,195	382,055
May	9,200	8,350	10	227	28	84.8	158	424,233	465,135
June	8,490	8,175	14	105	30	55.5	85.1	350,488	850,281
July	8,310	7,950	20	67.2	18	25.9	49.7	135,004	811,943
Aug.	9,200	7,740	18	231	24	15.0	46.9	125,513	97,028
Sept.	9,060	7,620	18	173	22	5.04	32.1	83,105	342,436
Oct.	9,440	7,460	19	272	27	1.88	20.2	54,006	355,524
Nov.	7,910	7,510	5	26.5	11	3.78	10.9	28,312	162,583
Dec.	7,865	7,725	115	20.4	12	8.73	14.8	39,566	140,931
Yearly	9,630	7,460		329		1.88	61.3	1,934,689	3,338,674
								8,165,042	1,364,475

* Discharge measurement made on this day

! And other days

** Period 1954-1998

08-4683.00 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. Miguel Aleman and Rio Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gomez Dam situated on the Rio San Juan 20.0 river kilometers upstream from the confluence with the Rio Grande. The Rio San Juan enters the Rio Grande at river kilometer 384. 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 the Rio Grande City 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.

RECORDS: Drain water reaching the Rio Grande through Morillo Drain was determined by hourly staff gage readings and the weir discharge table, and through Puertecitos and Los Indios Drains by prorating between frequent current meter measurements. All storm water measured at these drains was deducted and is not included in the tabulation below. Records available: 1953 through 1998.

REMARKS: 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.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0		0.11	0.01	0.20	0	0	0	0	0
2	0	0	0		.11	.01	* .21	0	0	0	0	0
3	0	0	0		* .12	.01	.20	0	0	0	0	0
4	0	0	0		.11	.01	.20	0	0	.75	0	0
5	0	0	0		.10	.01	.19	0	0	.90	0	0
6	0	0	0		.10	* .01	.18	0	0	1.34	0	0
7	0	0	0		.09	.03	.18	0	0	1.15	.80	0
8	0	0	0		.08	.04	.17	0	0	.80	.70	0
9	0	0	0		.07	.11	.16	0	0	.80	0	0
10	0	0	0		.07	.12	.16	0	0	.51	0	0
11	0	0	0		.15	.11	.15	0	0	.20	0	0
12	0	0	0		.23	* .13	.14	0	0	.20	0	0
13	0	0	0		.12	.12	.14	0	0	.20	.90	0
14	.46	0	0		.06	.12	.13	0	0	.60	.50	0
15	.67	0	0		.03	.28	.13	0	0	0	0	0
16	.09	0	0		* .02	.69	.12	0	0	1.20	0	0
17	0	.05	.01		.34	.11	0	0	0	1.60	0	0
18	0	.06	.01		.14	.11	0	0	0	1.80	0	0
19	0	.06	.01		.14	.10	0	0	0	2.00	0	0
20	0	.06	.01		.15	.09	0	0	0	2.05	0	0
21	.18	0	.07		.01	.15	.09	0	0	1.00	0	0
22	.40	0	.07		.01	.16	.08	0	0	.50	0	0
23	0	.08	.01		.16	.16	.07	0	0	1.70	0	0
24	0	.08	.01		.85	.17	.07	0	0	1.60	0	0
25	0	.08	.01		1.71	.17	.06	0	0	1.20	0	0
26	0	0	.09	1.35	.18	.05	0	0	0	.50	0	0
27	0	0	.09	.71	.18	0	0	0	0	.40	0	0
28	0	0	.10	.45	.19	0	0	0	0	.20	0	0
29	0	0	.10	.01	.19	0	0	0	0	.20	0	0
30	0	0	.10	.01	.19	0	0	0	0	.20	0	0
31	0	0	.11	.20	0	0	0	0	0	0	0	0
Sum		0	6.86	3.49	0	0				23.60	2.90	0
	1.80	1.20	4.52		0							

Current Year 1998

Period 1954-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Φ High		Φ Low			Total	Average	Maximum	Minimum	
			Day	Day	Day	Day						
Jan.			15	0.67	! 1	0	0.06	156	2,952	9,405	73.4	
Feb.	1	0	1	0	0	0	0	0	3,397	8,707	0	
Mar.			31	.11	! 1	0	.04	104	2,314	6,526	104	
April			25	1.71	117	.01	.23	593	4,130	12,815	468	
May			16	.69	! 1	.01	.15	391	9,348	37,225	151	
June			2	.21	! 1	0	.12	302	9,007	106,021	302	
July	1	0	0	! 1	0	0	0	0	4,696	60,172	0	
Aug.	1	0	0	! 1	0	0	0	0	2,477	16,395	0	
Sept.			20	2.05	! 1	0	.79	2,039	2,504	13,905	1.7	
Oct.			13	.90	! 1	0	.09	251	2,883	12,127	67.4	
Nov.	! 1	0	0	! 1	0	0	0	0	1,996	12,904	0	
Dec.	! 1	0	0	! 1	0	0	0	0	2,490	41,991	0	
Yearly				2.05		0	0.12	3,836	48,194	221,389	2,905	

* Discharge measurement made on this day

Φ Mean daily

! And other days

08-4684.00 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 Natural Resource Conservation Commission, 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 Watermaster.

During 1998, 68,072 irrigable hectares and several towns and rural homes were allotted Rio Grande water in the river between the gaging station at Rio Grande City and Anzalduas Dam. Such irrigable area was 24.8% of the total irrigable area below Falcon Dam allotted Rio Grande water.

The total diversion during 1998 in this river reach was 194,185 TCM, or 18.3% of the total water diverted from the Rio Grande below Falcon Dam. Records of diversions in this river reach were determined by means of flowmeters and by a deflection meter developed by the International Boundary and Water Commission. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

		Average Flow in Cubic Meters per Second									
Daily:	Max.	34.6	June 21, 1960					Min.	0	Occasionally	
Monthly:	Max.	28.6	June 1960					Min.	0.29	March 1957	
Yearly:	Max.	13.5	1989					Min.	5.32	March 1966	

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.06	6.17	1.96	10.8	12.5	9.04	10.7	6.47	8.46	2.78	3.89	4.43
2	4.49	7.82	5.92	10.1	5.32	10.4	7.72	6.42	5.23	2.76	7.28	4.22
3	3.20	7.51	5.75	9.16	6.72	10.0	4.88	11.4	4.39	2.54	7.73	4.03
4	3.40	3.23	4.43	6.36	10.6	11.6	3.02	10.4	4.98	2.76	5.11	3.73
5	5.51	2.55	4.39	5.76	12.2	9.18	4.61	11.3	2.68	6.39	2.70	3.16
6	5.01	3.26	4.69	10.1	13.2	7.15	7.26	10.7	3.21	5.35	3.60	2.04
7	5.85	.91	3.19	11.8	13.4	7.23	9.05	7.98	2.19	4.44	1.08	5.69
8	7.80	1.12	2.95	11.3	11.9	10.5	9.01	5.07	3.68	2.84	2.07	6.60
9	6.59	4.11	6.67	12.1	8.34	11.0	9.56	6.85	1.40	2.47	1.28	5.07
10	4.40	4.73	7.24	10.6	9.41	11.1	8.47	10.1	.08	.69	1.33	4.15
11	3.84	4.36	5.81	7.03	13.4	10.9	4.01	10.3	.50	1.67	2.21	4.52
12	6.77	5.46	7.14	6.61	13.0	9.08	4.86	9.71	.07	2.96	1.08	2.84
13	6.39	5.05	6.64	12.0	13.3	6.52	9.70	11.3	.07	2.83	1.53	2.28
14	7.16	2.47	5.21	11.8	14.4	6.90	10.4	8.88	.55	2.62	1.32	4.89
15	9.62	1.61	3.24	11.8	12.3	9.67	9.64	4.22	.87	1.62	1.24	6.06
16	5.78	3.02	.73	12.9	7.89	11.8	9.96	6.35	4.99	2.63	3.55	5.28
17	3.00	3.54	1.19	11.6	9.05	10.9	9.33	8.86	3.93	1.82	3.98	5.12
18	5.59	1.15	1.89	7.62	12.4	11.3	4.79	9.88	2.09	1.90	2.46	5.30
19	9.86	1.47	6.99	9.62	12.8	10.9	5.37	9.80	1.35	3.68	2.80	2.85
20	9.59	2.68	7.18	12.9	12.9	6.80	8.52	8.28	1.20	8.87	2.82	2.92
21	8.85	1.24	5.83	12.9	12.4	8.06	10.7	4.66	3.63	6.53	1.69	4.77
22	10.0	1.20	5.19	11.5	10.1	11.1	10.6	1.60	1.11	5.50	1.67	4.41
23	8.56	3.39	8.19	12.2	6.85	10.9	9.23	.95	2.07	.19	2.73	5.90
24	5.87	2.22	7.39	11.7	6.77	10.8	9.40	2.48	2.05	.80	2.84	.58
25	6.23	.56	8.65	9.58	8.75	10.0	5.50	2.72	1.81	1.60	4.03	.04
26	9.08	.83	10.0	8.65	12.1	8.88	5.64	5.79	1.27	3.96	.12	.61
27	10.7	2.56	7.57	11.4	12.1	4.87	9.77	8.37	.28	4.06	1.25	2.03
28	11.5	1.06	5.65	12.3	12.1	5.70	10.8	7.52	2.21	3.93	3.93	5.26
29	10.9		4.88	11.1	9.62	10.8	10.6	4.59	1.92	2.93	2.76	3.73
30	8.95		8.17	9.21	3.72	9.95	12.6	4.52	2.12	4.31	4.19	3.38
31	5.57		9.21		4.78		8.84	8.56		3.90		3.07
Sum		85.08		312.50		283.03		226.03		101.33		118.96
213.12		173.94		324.32		254.54		70.39		84.27		

Current Year 1998

Period 1960-1998

Month	Average Rainfall** Millimeters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	1998	1960-1998	Day	Φ High	Day	Φ Low		Total	Average	Maximum	Minimum
Jan.	2	29	28	11.5	17	3.00	6.87	18,414	16,158	35,458	2,479
Feb.	71	27	2	7.82	25	.36	3.04	7,351	17,610	47,610	4,040
Mar.	43	18	26	10.0	16	.73	5.61	15,028	27,635	51,495	8,288
April	15	34	116	12.9	5	5.76	10.4	27,000	32,138	53,085	4,216
May	0	66	14	14.4	30	3.72	10.5	28,021	27,615	55,732	3,919
June	4	69	16	11.8	27	4.87	9.43	24,454	27,436	73,847	6,181
July	6	34	30	12.6	4	3.02	8.21	21,992	27,458	57,262	8,330
Aug.	35	51	3	11.4	23	.95	7.29	19,529	27,874	44,751	8,469
Sept.	217	95	1	8.46	112	.07	2.35	6,082	18,037	42,873	5,102
Oct.	126	57	20	8.87	23	.19	3.27	8,755	21,723	46,570	4,358
Nov.	32	23	3	7.73	26	.12	2.81	7,281	18,685	45,171	3,614
Dec.	11	26	8	6.60	25	.04	3.84	10,278	15,274	30,837	3,091
Yearly	562	529		14.4		0.04	6.16	194,185	277,643	424,806	168,318

Φ Mean daily

! And other days

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

08-4686.00 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", 0.8 canal kilometer from the canal intake, and about 8.0 kilometers northwest of Reynosa, Tamaulipas. The canal intake is immediately upstream from Anzalduas Dam at river kilometer 274, 165 river kilometers downstream from Falcon Dam. The zero of the gage is 26.31 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 117 discharge measurements during the year, 104 by the Mexican Section and 13 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1998.

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 37.0 canal kilometers downstream from this station. For area irrigated during the year see the tabulation under the heading of "Drainage Basin and Irrigated Areas" in this Bulletin. Flow at this canal station is affected by backwater from the operation of canal gates 19 kilometers and 37 kilometers below this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 310 CMS on June 2, 1957, with a gage height of 4.88 meters. Min. no flow occurs frequently.

Average Flow in Cubic Meters per Second

Daily:	Max.	279	May 17, 1994	Min.	0	Frequently
Monthly:	Max.	215	April 1993	Min.	0	Several months
Yearly:	Max.	60.3	1989	Min.	4.26	1952

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	155 *	0	0	0	0	0	0	0
2	0	* 14.3	0	0	141 *	0	0	0	0	0	0	0
3	0	7.20	0	* 12.6	117 *	0	0	0	0	0	0	* 7.20
4	0	0	0	* 41.3	125 *	0	0	* 10.9	0	0	0	* 13.8
5	0	6.52	0	* 49.0	126 *	0	0	3.20	0	0	6.96	0
6	0	* 10.3	0	* 59.4	121 *	0	0	0	0	0	* 18.3	0
7	0	0	0	* 73.2	114 *	0	0	0	0	.50	16.6	0
8	8.00	0	6.13	* 54.8	113 *	* 9.80	0	0	* 11.7	18.4	0	* 7.50
9	* 6.75	0	* 9.67	* 72.2	121 *	0	0	0	* 10.3	10.4	0	* 12.6
10	0	5.10	0	112 *	118 *	0	* 7.40	0	* 12.8	0	4.22	4.70
11	0	* 12.5	0	117 *	107 *	0	5.20	0	* 12.4	0	0	0
12	0	0	0	121 *	112 *	0	0	0	6.09	0	0	0
13	0	0	0	126 *	* 85.9	0	0	0	0	* 4.80	0	0
14	0	0	0	121 *	* 57.9	0	0	0	0	14.0	0	* 6.60
15	0	5.92	0	113 *	* 37.3	* 8.20	0	0	0	19.5	0	* 10.4
16	11.3	* 26.3	* 8.60	136 *	34.5	2.10	0	0	17.5	4.10	* 7.64	3.50
17	0	0	0	136 *	34.8	0	* 5.30	0	* 16.4	0	* 5.20	0
18	0	0	0	151 *	* 29.4	0	6.50	18.2	* 32.5	.60	0	0
19	0	* 6.40	0	159 *	* 22.3	* 9.40	6.50	119 *	40.2	* 13.5	0	0
20	0	* 11.1	* 8.69	159 *	* 21.4	9.40	* 19.4	* 51.9	27.9	* 15.2	0	0
21	0	3.20	17.6	170 *	* 19.8	2.30	* 11.0	* 18.9	10.4	* 13.8	0	* 7.40
22	0	0	0	191 *	* 18.8	0	0	0	* 8.40	* 13.0	0	* 17.3
23	* 14.4	0	0	205 *	* 18.6	0	0	0	10.2	* 11.6	0	* 13.8
24	4.80	0	0	205 *	* 18.4	0	0	0	10.3	14.8	0	0
25	0	0	0	217 *	* 4.30	0	0	0	* 10.5	0	0	0
26	0	0	0	215 *	0	0	0	0	10.5	0	* 7.90	8.70
27	0	* 11.5	0	215 *	0	0	0	0	10.5	0	* 11.1	0
28	0	5.75	0	211 *	0	0	0	0	10.4	0	7.40	0
29	0	0	0	201 *	0	* 9.80	0	0	0	0	0	0
30	4.89	0	0	181 *	0	0	0	0	0	0	0	0
31	16.8	0	0	0	0	0	0	0	0	0	0	0
Sum	126.09		3,824.5		51.00		222.10		154.20		113.50	
	66.94		50.69		1,873.40		61.30		268.99		85.32	

Current Year 1998

Period 1952-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				1952-1998	
	High	Low	Day	Φ	High		Total	Average	Maximum	Minimum		
				High	Low							
Jan.			31	16.8	! 1	0	2.16	5,784	131,441	439,093	0	
Feb.			16	26.3	! 1	0	4.50	10,894	102,875	310,245	0	
Mar.			21	17.6	! 1	0	1.64	4,380	44,439	182,376	1,182	
April			25	217	! 1	0	127	330,437	190,890	557,401	2,950	
May	1	155	126	0	0	60.4	161,862	260,377	531,533	467		
June	8	9.80	1	0	0	1.70	4,406	117,953	333,959	0		
July	20	19.4	! 1	0	0	1.98	5,296	51,924	200,370	392		
Aug.	19	119	! 1	0	0	7.16	19,189	95,430	333,642	698		
Sept.	19	40.2	! 1	0	0	8.97	23,241	62,042	204,486	131		
Oct.	15	19.5	! 1	0	0	4.97	13,323	59,544	258,526	0		
Nov.	6	18.3	! 1	0	0	2.84	7,372	17,247	103,226	0		
Dec.	22	17.3	! 1	0	0	3.66	9,806	28,433	205,654	0		
Yearly			217		0	18.9	595,990	1,162,595	1,903,119	134,796		

* Discharge measurement made on this day

Φ Mean daily

! And other days

08-4692.00 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°07'54", longitude 98°19'47", and river kilometer 273; 0.8 river kilometer downstream from Anzalduas Dam, about 7.0 kilometers northwest of Reynosa, Tamaulipas, and 16.6 river kilometers 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 154 discharge measurements during the year, 107 by the Mexican Section and 47 by the United States Section of the Commission, and a continuous record of gage heights. Records available: 1952 through 1998.

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 25.18 meters 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. 3,700 CMS on September 24, 1967, with a stage of 34.48 meters above mean sea level. Min. periods of no flow have occurred on several occasions in 1953, 1954, 1956, and 1957.

Average Flow in Cubic Meters per Second

Daily:	Max.	3,440	Sept. 25, 1967	Min.	0	Occasionally
Monthly:	Max.	1,070	Oct. 1958	Min.	0.16	March 1957
Yearly:	Max.	182	1958	Min.	4.49	1957

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17.0	40.7	6.04	56.2	61.6	72.8	34.5	25.6	39.1	5.90	5.20	* 9.07
2	17.0	41.1	8.53	57.8	55.3	72.1	36.2	28.8	36.9	4.49	5.26	9.06
3	14.9	34.8	9.38	53.5	60.1	68.1	44.4	30.5	37.1	2.63	7.92	* 8.87
4	15.0	21.6	15.1	53.9	62.6	68.0	34.5	30.4	25.6	3.60	5.37	* 6.81
5	18.1	18.0	17.1	64.6	64.0	73.7	35.1	27.7	21.6	6.41	4.40	3.98
6	20.0	9.62	13.5	65.8	64.6	72.0	36.2	22.1	22.7	6.40	2.92	5.87
7	21.6	7.69	10.9	65.8	66.0	66.7	35.4	18.2	32.2	6.30	0	* 13.0
8	23.0	11.0	10.9	68.5	72.7	63.9	34.4	18.9	24.8	7.43	0	* 14.1
9	22.9	15.5	16.9	62.0	84.1	64.2	29.4	17.3	11.1	2.43	3.55	11.9
10	21.5	14.4	21.6	51.7	83.0	63.3	27.0	18.9	7.59	3.59	4.27	* 8.85
11	45.9	19.2	19.0	66.5	87.8	62.2	28.0	19.2	7.54	3.62	4.31	8.09
12	43.4	22.7	19.0	62.5	87.3	55.5	29.3	19.2	6.76	3.67	4.18	8.22
13	42.4	21.8	17.1	54.8	87.3	50.6	30.6	21.1	6.08	3.72	4.19	9.08
14	38.5	15.5	14.0	53.1	87.7	55.4	27.4	18.5	5.34	3.72	3.92	10.8
15	37.0	15.3	13.4	50.4	82.8	59.4	25.4	16.0	4.75	2.90	3.80	* 9.60
16	37.0	11.2	12.9	50.0	84.2	56.0	25.5	20.4	50.5	1.98	* 6.05	12.6
17	37.0	8.57	12.6	57.3	83.3	53.7	21.8	22.8	32.7	1.99	* 6.50	15.2
18	37.0	7.12	12.5	57.0	84.9	67.4	19.8	22.8	71.1	1.99	8.03	* 12.9
19	37.0	5.74	13.5	64.9	84.9	65.1	25.2	19.0	114	86.9	7.88	11.0
20	37.0	6.71	14.9	65.2	81.2	56.2	28.3	16.2	76.7	224	6.37	16.4
21	37.5	6.04	11.3	65.1	78.3	60.7	26.7	18.4	31.6	104	6.15	* 17.3
22	36.7	6.60	13.5	68.9	75.9	60.4	23.4	15.9	7.00	29.0	7.40	* 14.4
23	35.1	11.7	17.9	71.9	62.7	51.5	20.7	13.8	10.1	4.91	* 6.83	10.6
24	34.0	11.8	24.1	72.1	64.1	51.2	17.8	13.4	22.2	2.88	* 7.81	8.60
25	50.2	11.9	30.1	63.3	61.5	48.5	17.6	13.3	34.0	2.88	5.99	6.34
26	49.1	9.93	34.4	72.4	62.9	46.1	19.4	12.9	16.8	2.90	3.73	7.38
27	48.9	6.54	38.2	71.9	75.5	33.0	23.2	16.1	4.28	2.92	* 3.63	9.31
28	48.7	5.33	42.8	74.3	76.2	41.1	24.7	21.2	3.74	3.64	3.61	10.3
29	45.7		47.8	68.7	76.1	42.2	26.5	18.5	4.09	4.40	6.87	* 10.3
30	36.5		52.0	62.2	76.2	38.2	27.9	30.1	4.07	4.68	8.99	13.6
31	38.4		56.4	73.8			28.0	39.8	5.29			15.4
Sum		418.09	1,872.3	1,739.2	647.0	647.0	647.0	647.0	549.17	328.93		
1,044.0		647.35	2,308.6	864.3	772.04	772.04	772.04	772.04	155.13			

Current Year 1998 Period 1954-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters		
	High	Low	Day	High	Day		Total	Average	Maximum
Jan.	24,780	23,940	25	52.8	3	14.7	33.7	90,202	109,819
Feb.	24,620	23,610	2	42.5	28	5.00	14.9	36,123	87,644
Mar.	24,940	23,620	30	56.4	1	5.20	20.9	55,931	96,450
April	25,430	24,800	28	75.5	3	48.0	62.4	161,767	141,972
May	25,340	25,060	8	88.7	2	54.9	74.5	199,463	185,545
June	25,090	24,430	2	75.5	27	32.3	58.0	150,267	218,122
July	24,610	23,960	3	46.5	24	13.3	27.9	74,676	158,090
Aug.	24,285	23,890	30	40.8	26	10.6	20.9	55,901	153,953
Sept.	25,600	23,500	19	119	27	3.16	25.7	66,704	241,998
Oct.	26,960	23,350	20	254	8	1.21	17.7	47,448	271,002
Nov.	23,690	23,100	24	9.94	7	0	5.17	13,403	131,560
Dec.	23,970	23,400	21	20.3	5	2.45	10.6	28,420	98,718
Yearly	26,960	23,100		254		0	31.1	980,305	1,894,873
								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 Bunker Floodway Station at Anzalduas Dam near Mission and again 40.6 kilometers downstream at the Main Floodway Station on Farm Road No. 88 bridge south of Weslaco. At a point 4.8 kilometers 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 1998, 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 59.7 kilometers downstream from Anzalduas Dam.

Floodwater entering the system through the Retamal Inlet flows into Culebron and Villa Cardenas Reservoirs through the Retamal Floodway, while floodwater entering the canal at Anzalduas Dam reaches these lakes via the Culebron and Retamal Canals. From that point it flows in a southeastward 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 1998, no flood flow was diverted through Retamal Floodway or Anzalduas Canal.

08-4732.00 DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE, ANZALDUAS DAM TO PROGRESO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Natural Resource Conservation Commission, 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 Watermaster.

During 1998, 47,547 hectares 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 17.4% of the total irrigable area below Falcon Dam allotted Rio Grande water.

The total diversion during 1998 in this river reach was 210,141 TCM, or 19.8% of the total water diverted from the Rio Grande below Falcon Dam. Records of diversions in this river reach were determined by means of flowmeters and by deflection meters which were developed by the International Boundary and Water Commission. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

				Average Flow in Cubic Meters per Second									
Daily:	Max.	33.4	June 1, 1990	Min.	0	Occasionally							
Monthly:	Max.	23.1	June 1990	Min.	0.38	May 1972							
Yearly:	Max.	12.6	1989	Min.	4.73	1970							

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.03	4.49	0.43	11.5	9.57	13.5	14.4	3.75	7.97	1.82	1.43	3.72
2	7.65	7.78	3.75	11.0	5.44	14.3	13.9	8.03	7.68	2.23	2.43	7.07
3	1.49	6.78	4.40	7.75	11.0	12.8	8.92	8.28	7.46	.74	7.25	5.65
4	1.87	.95	3.74	8.07	14.6	14.3	4.26	8.65	2.94	.10	6.70	2.90
5	8.11	1.69	8.16	10.7	16.6	11.1	12.1	7.89	2.03	11.0	5.99	.31
6	8.82	1.24	3.09	13.0	17.4	15.4	9.76	3.54	1.61	8.41	2.10	.09
7	8.63	.68	2.45	11.9	17.4	10.1	9.99	3.48	8.62	5.34	.68	4.77
8	9.22	.40	1.01	11.9	12.3	12.4	9.61	2.38	6.21	3.31	0	6.79
9	9.16	5.54	6.12	12.5	16.6	13.1	7.96	2.87	2.96	1.72	.52	6.77
10	3.10	6.00	7.76	8.66	12.9	13.5	5.22	11.8	1.01	.28	1.44	3.47
11	5.69	5.88	7.17	10.2	15.8	13.5	3.79	8.45	1.00	0	1.48	.87
12	9.16	7.97	5.01	11.2	16.9	8.76	4.16	8.35	.22	.95	1.47	.42
13	8.68	.17	4.28	11.5	15.8	6.89	12.6	8.88	0	2.12	1.37	1.33
14	8.30	1.13	1.44	13.8	14.8	7.49	9.80	4.18	.54	5.36	.40	1.18
15	8.80	6.37	1.33	10.9	9.31	17.0	9.18	4.27	.66	.75	0	3.12
16	9.34	.62	1.90	11.0	13.5	12.9	10.6	2.53	6.35	.76	.99	3.97
17	3.23	.46	2.24	9.48	10.4	13.3	4.87	9.22	.73	.22	2.31	7.61
18	2.73	.10	2.88	16.0	12.7	13.2	4.17	7.23	.78	0	8.51	6.88
19	9.16	.66	5.21	12.5	16.2	12.0	11.6	6.41	.25	9.21	4.92	1.97
20	10.1	.85	6.83	13.5	15.2	7.95	11.5	6.46	0	6.06	.66	4.87
21	9.73	.35	2.38	13.9	15.8	16.7	12.0	4.45	1.08	3.85	.18	7.27
22	10.4	.15	1.96	13.3	12.5	13.6	9.70	3.33	5.11	3.40	0	7.53
23	10.6	5.50	7.73	10.3	18.5	14.1	8.22	3.59	.86	4.72	1.00	6.54
24	4.40	6.54	8.55	7.58	14.2	12.7	5.21	8.34	5.92	.72	1.85	.21
25	8.47	7.85	8.79	3.79	15.9	12.5	3.11	6.90	1.40	.01	4.37	0
26	10.2	2.01	9.36	14.6	16.5	11.1	4.03	7.94	.23	.56	0	0
27	10.4	3.05	10.7	12.4	16.0	4.53	10.7	9.63	0	.93	.05	0
28	9.76	1.80	11.0	13.2	16.7	10.5	10.5	4.84	.41	5.70	.01	2.00
29	12.4		9.80	11.8	16.2	12.9	9.45	3.65	1.20	4.32	0	2.71
30	5.94		11.0	10.2	14.0	13.0	9.55	8.10	.91	.85	2.01	1.83
31	4.23		11.1		11.3			6.32	9.17	1.29		.95
Sum		95.01		338.13		365.12		196.59		86.73		102.80
	230.80		171.57		442.02		267.18		76.14		60.12	

Current Year 1998

Period 1960-1998

Month	Average Rainfall** Millimeters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	1998	1960-1998	Day	Φ High	Day		Total	Average	Maximum	Minimum
Jan.	12	33	29	12.4	1	1.03	7,45	19,941	16,709	43,121
Feb.	84	32	13	8.17	18	.10	3.39	8,209	14,368	35,196
Mar.	20	20	31	11.1	1	.43	5.53	14,824	22,553	44,562
April	30	37	26	14.6	25	3.79	11.3	29,214	26,900	48,447
May	0	74	23	18.5	2	5.44	14.3	38,191	27,557	53,225
June	1	67	15	17.0	27	4.53	12.2	31,566	32,681	59,901
July	5	38	1	14.4	25	3.11	8.62	23,084	29,252	49,928
Aug.	39	60	10	11.8	8	2.38	6.34	16,985	22,242	35,973
Sept.	233	107	7	8.62	113	0	2.34	6,578	14,656	34,885
Oct.	109	61	5	11.0	111	0	2.80	7,493	18,072	34,964
Nov.	60	29	18	8.51	18	0	2.00	5,194	14,898	41,712
Dec.	18	30	17	7.61	125	0	3.32	8,882	12,609	24,623
Yearly	611	588		18.5		0	6.66	210,141	252,497	398,520
										149,260

Φ Mean daily

! And other days

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

08-4736.00 DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE, PROGRESO TO SAN BENITO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Natural Resource Conservation Commission, 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 Watermaster.

During 1998, 126,463 hectares and several towns and rural homes were allotted Rio Grande water in the river reach between Progreso and the gaging station at San Benito. Such irrigable area was 46.2% of the total irrigable area below Falcon Dam allotted Rio Grande water.

The total diversion during 1998 in this river reach was 504,493 TCM, or 47.6% of the total water diverted from the Rio Grande below Falcon Dam. Records of diversions in this river reach were determined by means of flowmeters, by open channel rating stations, and by deflection meters which were developed by the International Boundary and Water Commission. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

			Average Flow in Cubic Meters per Second									
Daily:	Max.	82.4	June 5, 1990			Min. 0			Occasionally			
Monthly:	Max.	63.0	May 1995			Min. 1.52			March 1957			
Yearly:	Max.	27.6	1989			Min. 10.4			March 1968			

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.26	10.1	0	21.1	43.7	45.2	29.9	18.0	20.0	7.91	0.05	3.18
2	4.78	11.8	.85	18.5	38.5	44.3	21.8	16.6	22.8	8.84	.05	4.05
3	5.35	17.3	1.44	20.4	44.9	44.9	20.6	18.4	21.5	10.4	.02	4.07
4	5.33	15.9	1.52	22.3	38.6	42.9	20.4	19.5	20.8	4.47	2.28	3.88
5	8.44	12.7	1.54	20.0	36.7	41.5	18.1	19.7	13.1	3.26	2.83	3.09
6	9.84	8.29	5.65	21.8	34.5	41.3	19.7	19.7	11.6	3.49	0	1.98
7	9.78	4.02	6.90	20.7	36.1	43.4	17.6	16.6	14.4	2.34	0	2.01
8	9.82	0	7.93	28.0	40.8	43.5	17.6	12.6	14.4	2.06	0	1.93
9	11.9	.23	7.99	28.1	39.6	36.9	16.6	11.7	10.1	.81	0	2.93
10	9.44	3.24	2.87	29.8	40.5	37.4	15.1	14.0	6.11	1.56	1.80	3.29
11	10.8	4.68	3.02	23.6	31.1	36.3	13.0	10.4	2.10	0	3.08	2.98
12	14.5	4.55	2.97	29.3	39.4	37.1	12.1	10.1	2.12	0	2.84	1.90
13	28.9	5.56	8.28	28.4	45.2	36.9	17.0	10.0	2.12	4.04	0	1.84
14	27.0	7.06	9.39	31.7	43.6	34.3	17.2	8.49	10.4	8.92	0	1.90
15	25.8	7.25	6.73	26.0	47.2	35.7	17.2	7.85	1.53	5.99	0	1.84
16	22.5	5.42	3.61	23.2	48.7	41.2	17.3	6.86	9.22	0	0	2.06
17	22.9	3.63	5.06	24.6	47.4	41.7	15.5	6.22	23.0	0	2.38	1.96
18	24.1	1.44	5.84	23.6	44.6	43.2	10.7	9.25	45.1	0	4.08	3.26
19	24.9	3.58	5.82	27.9	46.4	43.9	11.0	10.6	25.8	2.69	5.85	4.18
20	22.2	.61	4.48	30.2	47.9	40.5	12.4	11.3	34.2	22.4	3.69	4.04
21	20.7	.76	2.79	32.8	47.1	34.7	16.8	4.78	29.5	33.6	1.87	4.15
22	20.5	3.15	4.19	33.9	44.3	35.1	17.0	3.36	37.7	27.2	1.84	3.97
23	22.3	1.00	7.18	35.6	44.4	35.1	15.3	3.33	8.41	15.8	3.70	3.89
24	13.9	2.27	7.13	34.8	43.6	34.7	13.7	3.63	14.8	8.03	6.24	2.58
25	14.8	1.45	14.2	36.6	42.6	29.2	11.5	4.66	16.1	4.60	4.80	1.90
26	17.8	3.53	13.5	39.3	45.4	34.2	9.98	6.20	11.8	6.10	0	0
27	23.0	3.05	14.1	37.2	45.4	25.3	12.2	5.97	25.8	5.38	0	1.77
28	22.1	2.29	15.8	40.4	43.7	13.0	16.9	5.68	3.17	4.08	0	1.84
29	22.2	16.4	39.6	42.2	25.3	16.4	9.34	3.80	3.40	0	2.75	
30	22.5	28.8	37.1	42.5	32.4	19.9	10.3	3.79	3.09	1.81	3.38	
31	12.7	23.7	43.6	43.6	20.7	13.5			1.78		2.54	
Sum	144.86	239.68	866.5	1,320.2	1,111.1	511.18	328.62	465.27	202.24	49.21	85.14	
	515.04											

Current Year 1998

Period 1960-1998

Month	Average Rainfall** Millimeters		Extreme-Cubic Meters per Second		Average	Volume-Thousand Cubic Meters		
	1998	1960-1998	Day	High		Total	Average	Maximum
Jan.	1	38	13	28.9	1	4,499	48,463	119,807
Feb.	69	39	3	17.3	8	5,17	28,359	75,228
Mar.	4	26	30	28.8	1	7.73	20,708	84,858
April	1	45	28	40.4	2	18.5	74,866	62,015
May	0	76	16	48.7	11	31.1	114,065	97,188
June	0	74	1	45.2	28	13.0	37.0	95,999
July	5	48	1	29.9	26	9.98	44,252	162,181
Aug.	19	71	15	19.7	23	3.33	16,166	13,350
Sept.	263	132	18	45.1	15	1.53	28,393	44,577
Oct.	187	76	21	33.6	111	0	6,52	40,199
Nov.	98	39	24	6.24	16	0	1.64	28,393
Dec.	10	36	19	4.18	26	0	2.75	7,356
Yearly	657	700		48.7	0	16.0	504,493	569,735
							868,544	328,940

* Mean daily

† And other days

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

08-4737.00 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°01'51", longitude 97°43'37", and river kilometer 156, 6.3 river kilometers downstream from San Benito pumping plant and about 15.3 kilometers southwest of San Benito, Texas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 33 current-meter 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 current-meter measurements. Records available: November 26, 1952 through August 25, 1953, and December 1953 through 1998.

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, 286 river kilometers 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 Mercedes office of the Commission, and to the Anzalduas Dam Control Room, where it is recorded automatically. 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. 708 CMS on September 29, 1967 with a gage height of 18.61 meters. Min. no flow occurs occasionally.

Average flow in Cubic Meters per Second**

Daily:	Max. 702	Sept. 29, 1967	Min. 0	Occasionally
Monthly:	Max. 405	Oct. 1971	Min. 1.12	Dec. 1956
Yearly:	Max. 107	1976	Min. 5.66	

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.57	10.3	4.59	* 7.07	* 18.3	13.5	5.26	0.50	* 2.16	5.02	3.76	* 2.93
2	8.05	* 17.7	5.12	9.38	19.3	13.8	4.06	.63	1.33	5.04	* 3.79	1.99
3	7.48	12.1	* 5.31	12.0	19.9	* 14.1	3.98	1.64	.90	3.62	4.20	1.59
4	7.95	9.55	5.75	12.3	22.3	13.7	4.59	3.26	1.00	4.03	4.87	1.36
5	* 7.30	9.25	6.07	10.8	22.1	13.3	5.09	3.57	1.87	4.46	4.14	1.29
6	5.37	10.1	5.51	17.0	16.8	13.6	6.28	* 2.47	3.20	4.58	3.81	1.18
7	3.99	10.5	4.64	15.6	17.2	12.6	6.34	1.91	3.53	3.87	3.92	1.27
8	2.75	10.7	3.70	11.5	16.9	12.7	5.59	3.86	4.36	* 3.12	3.71	* 1.40
9	2.01	9.53	3.03	22.0	18.2	14.4	4.83	7.24	4.48	2.95	3.61	1.49
10	1.65	8.10	2.58	37.7	17.4	15.4	4.32	7.25	5.07	3.58	3.35	1.23
11	1.63	6.64	* 4.85	33.4	25.5	14.2	4.15	5.90	* 8.88	6.16	3.36	1.16
12	1.70	5.48	7.33	21.3	24.6	12.7	5.20	4.20	10.6	7.21	3.45	1.20
13	1.65	6.18	7.64	39.8	17.3	10.8	5.48	3.21	10.9	8.82	3.56	1.20
14	1.74	8.42	6.21	34.2	* 18.3	10.4	5.29	2.85	11.1	4.46	3.65	1.71
15	* 1.99	9.37	5.36	19.6	14.9	10.4	4.00	3.25	11.6	2.51	3.75	2.41
16	1.81	10.5	5.88	* 15.0	13.9	9.20	3.06	5.32	9.97	5.30	3.86	2.45
17	1.74	12.0	6.21	17.1	15.2	6.33	2.85	8.59	8.33	9.21	* 3.79	2.26
18	1.61	9.71	6.00	18.6	16.2	* 3.75	3.39	* 6.34	2.90	4.94	5.42	1.96
19	1.49	9.42	* 5.35	18.9	* 16.1	2.94	3.83	3.79	1.40	5.61	3.33	1.65
20	2.49	8.78	5.28	* 21.0	15.5	2.84	3.87	3.94	42.1	12.5	3.07	1.40
21	4.27	9.15	5.69	23.8	15.4	3.63	3.30	7.20	59.2	* 78.0	3.02	* 1.37
22	* 3.78	8.30	4.27	18.4	16.5	4.60	2.67	10.1	35.5	* 73.1	2.80	1.55
23	3.63	7.84	3.73	19.1	16.4	4.89	* 2.52	10.8	11.9	29.2	2.13	1.63
24	3.62	* 8.02	2.87	26.7	15.7	4.22	2.77	11.0	5.20	16.5	* 1.34	1.74
25	5.54	6.83	* 2.20	33.5	13.7	* 4.24	3.12	* 10.6	1.35	8.46	1.29	1.90
26	5.65	5.80	2.04	31.3	13.3	5.52	3.60	7.39	3.18	4.59	2.62	2.27
27	5.94	4.63	1.74	32.9	12.7	6.07	3.79	5.64	3.42	2.45	2.84	4.11
28	6.36	4.56	2.38	31.4	12.2	6.55	3.34	4.62	4.58	2.95	3.07	4.45
29	6.46		6.82	24.4	11.7	6.42	2.87	2.27	4.82	3.09	3.33	4.50
30	6.70		6.82	18.0	12.3	6.56	2.30	1.53	4.68	3.71	3.08	4.09
31	8.13		5.52		13.2	1.87	2.38		3.49			4.13
Sum		249.46		653.75		273.36		153.25		328.53		64.87
134.05		150.49		519.0		123.41		279.51		99.92		

Current Year 1998

Period 1954-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day		Total	Average	Maximum	Minimum
Jan.	11.965	10.490	1	10.3	19	1.47	4.32	11,582	52,198	393,481
Feb.	12.540	10.980	2	19.7	27	4.43	8.91	21,553	53,038	447,576
Mar.	11.540	10.530	112	7.92	28	1.48	4.85	15,002	45,885	444,640
April	13.410	10.965	13	48.0	1	5.31	21.8	56,484	56,909	430,013
May	13.210	11.530	11	31.1	29	11.5	16.7	44,842	85,072	472,420
June	12.050	10.505	10	16.2	20	2.52	9.11	23,618	94,436	647,984
July	11.195	10.385	16	6.93	31	1.76	3.98	10,663	78,578	552,457
Aug.	10.730	10.385	25	11.3	1	.45	4.94	13,241	81,432	1,020,220
Sept.	12.340	10.425	21	65.1	19	.65	9.32	24,150	138,485	787,894
Oct.	13.520	10.490	21	91.0	15	1.78	10.6	28,385	170,251	1,086,522
Nov.	10.605	10.450	14	5.06	25	1.14	3.33	8,633	82,327	816,665
Dec.	10.585	10.450	29	4.76	16	1.10	2.09	5,605	67,904	591,018
Yearly	13.520	10.385		91.0		0.45	8.30	261,758	1,006,515	3,383,956
										179,397

* Discharge measurement made on this day

! And other days

** Period 1954-1998

08-4749.00 DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE, SAN BENITO TO BROWNSVILLE

Beginning June 1971, the Texas Water Rights Commission, now the Texas Natural Resource Conservation Commission, 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 Watermaster.

During 1998, 28,538 hectares and several towns and rural homes were allotted Rio Grande water in the river reach between gaging stations near San Benito and Brownsville. Such irrigable area was 10.4% of the total irrigable area below Falcon Dam allotted Rio Grande water.

The total diversion during 1998 in this river reach was 134,760 TCM, or 12.8% of the total water diverted from the Rio Grande below Falcon Dam. Records of diversion in this river reach were determined by means of flowmeters, and by deflection meters which were developed by the International Boundary and Water Commission. More than one crop per year is often grown on parts of this land.

EXTREME FLOWS FROM RECORDS:

Average Flow in Cubic Meters per Second			
Daily:	Max.	22.1	June 14, 1963
Monthly:	Max.	15.3	June 1965
Yearly:	Max.	6.32	1965
			Min. 0 Occasionally
			Min. 0.52 Feb. 1966
			Min. 2.78 1981

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.86	5.20	1.23	5.12	17.2	11.1	5.70	8.99	3.72	2.72	1.30	1.92
2	1.76	5.95	1.39	1.97	12.5	8.81	5.50	2.66	6.71	.77	1.03	1.71
3	1.67	6.52	2.32	4.90	10.7	8.47	4.02	2.05	6.90	.79	.70	1.42
4	1.49	8.04	2.66	5.95	12.0	9.76	4.17	2.82	7.57	1.57	1.54	1.00
5	1.37	3.89	2.16	6.27	12.2	10.4	4.59	3.12	5.20	2.03	.59	.96
6	1.13	4.60	1.08	4.29	11.3	8.47	4.13	3.15	3.24	1.20	.78	.93
7	1.14	4.50	1.18	2.21	11.2	4.11	5.59	3.82	1.38	2.82	.75	.87
8	1.59	4.40	1.57	3.04	11.3	6.37	5.64	4.32	1.16	4.31	1.41	.97
9	1.67	6.10	2.17	3.97	9.62	11.6	6.45	4.12	1.16	3.67	1.51	.90
10	1.70	6.20	2.03	8.76	8.59	9.98	7.10	4.27	1.25	1.10	.70	.82
11	1.61	5.07	1.86	11.4	8.63	9.89	6.78	4.04	1.25	.93	.86	.88
12	1.60	3.82	1.92	11.4	9.44	10.8	3.90	3.77	1.55	.96	1.36	.88
13	1.19	3.19	1.99	12.5	9.47	9.96	2.17	2.26	.58	2.17	.91	.81
14	1.33	3.10	1.74	8.12	9.20	7.38	4.36	5.14	4.26	2.43	.86	.88
15	1.65	2.95	2.10	7.87	11.6	7.14	4.65	3.63	3.83	2.39	1.36	1.18
16	1.64	2.09	2.09	9.58	10.6	8.63	8.76	3.30	2.62	1.06	.90	1.43
17	2.10	1.65	1.39	4.98	10.3	9.21	8.11	3.60	2.77	1.00	1.69	1.24
18	2.18	2.80	2.75	3.89	10.8	9.02	3.99	3.68	5.71	1.08	.89	1.49
19	2.39	2.82	2.47	3.83	12.1	9.64	4.09	3.07	7.68	2.43	1.42	2.18
20	2.05	3.68	3.01	8.18	10.3	8.03	4.91	2.67	6.93	.64	1.27	2.08
21	2.23	2.57	2.54	9.62	11.9	6.67	5.72	3.05	2.90	1.15	1.52	2.12
22	2.48	2.58	2.56	10.5	12.1	6.49	5.62	2.59	2.56	3.53	1.26	2.06
23	2.04	3.82	2.35	11.5	11.7	7.17	5.59	2.44	3.22	2.82	1.20	2.01
24	1.82	2.68	2.23	11.2	10.8	7.07	4.08	4.16	3.06	2.94	1.25	2.09
25	1.83	1.62	2.32	10.8	12.2	7.26	3.04	7.40	2.84	3.04	1.33	.96
26	2.25	1.52	2.38	10.1	12.2	6.74	3.23	5.42	3.12	1.68	1.35	.93
27	2.54	1.58	3.20	10.3	12.0	5.92	3.37	3.35	2.58	2.49	1.49	1.35
28	4.32	1.41	2.11	10.4	11.2	5.61	3.59	4.59	1.91	1.85	1.61	1.41
29	5.19	1.23	10.2	10.1	5.16	3.42	5.97	1.19	2.56	1.44	1.99	
30	5.49	1.22	10.3	10.8	4.83	3.74	.42	2.13	1.45	2.27		
31	5.69	1.15			8.78	2.77	1.50		2.02			
Sum	104.35	69.00	233.15	62.40	241.69	148.78	116.28	99.27	62.28	35.73	43.95	

Current Year 1998

Month	Average Rainfall** Millimeters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	1998	1960-1998	Day	φ High	Day		Total	Average	Maximum	Minimum
Jan.	2	42	31	5.69	6	1.13	2.23	5,962	12,546	30,303
Feb.	94	36	4	8.04	28	1.41	3.73	9,016	9,014	25,442
Mar.	23	24	27	3.20	6	1.08	2.01	5,391	9,028	18,745
April	0	48	13	12.5	2	1.97	7.77	20,144	14,431	34,233
May	0	76	1	17.2	10	8.59	11.1	29,621	19,259	59,789
June	0	72	9	11.6	7	4.11	8.06	20,882	20,394	39,816
July	9	44	16	8.76	13	2.17	4.80	12,855	15,781	29,633
Aug.	26	76	1	8.99	31	1.50	3.75	10,047	11,715	21,680
Sept.	250	142	19	7.68	30	.42	3.31	8,577	7,693	14,796
Oct.	136	80	8	4.31	20	.64	2.01	5,381	7,095	14,503
Nov.	89	41	17	1.69	5	.59	1.19	3,087	5,627	11,127
Dec.	3	38	30	2.27	13	.81	1.42	3,797	6,120	11,785
Yearly	632	719		17.2		0.42	4.27	134,760	138,703	199,208
										87,788

φ Mean daily

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

08-4750.00 RIO GRANDE NEAR BROWNSVILLE, TEXAS
AND MATAMOROS, TAMAULIPAS

DESCRIPTION: Cableway, bubbler gage, water-stage recorders (graphic and digital), and digital transmitter located on the left bank at latitude 25°52'33", longitude 97°27'18", and river kilometer 78.3. 0.3 river kilometer downstream from El Jardin pumping plant, and 11.2 river kilometers 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 35 current-meter measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1934 through 1998.

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, 364 river kilometers upstream. Excessive upstream flood flows are partly diverted into the United States and Mexican floodway systems before reaching this station. The transmitter relays gage height data via radio to the Mercedes office of the Commission, and to the Anzalduas Dam Control Room, where it is recorded automatically.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 898 CMS on October 8, 1945 with a gage height of 9.60 meters. Min. no flow occurs frequently.

		Average Flow in Cubic Meters per Second**				
Daily:	Max.	459	Oct. 19 & 20, 1971		Min. 0	Frequently
Monthly:	Max.	408	Oct. 1971		Min. 0.10	Aug. 1957
Yearly:	Max.	103	1976		Min. 1.19	1956

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.73	0.46	1.99	* 0.06	* 4.10	1.97	2.19	1.03	* 1.80	6.71	2.99	* 1.72
2	5.65	* 2.81	1.51	.06	2.87	2.35	3.10	1.11	1.73	* 5.71	* 2.77	2.27
3	6.97	5.37	* .82	.06	2.74	* 2.41	3.17	.95	1.39	4.98	2.48	1.77
4	5.87	5.52	.72	.06	3.20	2.25	3.00	.67	.77	3.98	6.00	1.22
5	* 5.22	5.78	1.02	.08	3.47	2.12	2.96	* .33	.76	3.28	6.24	.75
6	4.96	6.27	1.73	.18	5.10	2.02	2.97	.43	.77	3.95	5.00	.73
7	4.50	6.10	2.25	.35	4.80	4.83	2.90	.62	.72	5.27	4.04	.91
8	3.55	6.42	2.40	1.52	4.00	5.72	3.28	.85	1.66	3.09	3.39	* .80
9	2.40	7.55	1.99	1.88	4.77	* 1.84	3.05	.99	4.47	1.86	2.98	.53
10	1.52	5.85	1.10	1.15	4.82	2.14	* 2.90	1.17	* 9.87	1.91	2.43	.41
11	1.01	3.17	* .67	.27	5.04	3.09	2.43	1.38	5.41	2.80	2.62	.45
12	.65	3.08	.60	.39	5.76	4.01	4.04	2.01	3.69	2.54	2.66	.46
13	.45	3.10	.75	.68	8.45	4.30	5.78	2.92	3.31	3.65	2.42	.37
14	.40	2.88	.63	.83	* 6.85	4.77	6.00	2.65	4.01	4.91	2.07	.29
15	* .44	3.85	1.37	* 2.67	5.55	5.18	5.07	1.99	3.65	5.25	1.41	.28
16	.27	5.20	2.28	2.57	3.82	5.97	2.16	1.53	5.08	4.53	* 1.25	.53
17	.16	5.69	1.77	2.12	2.64	4.51	1.26	1.32	6.17	4.34	1.72	1.52
18	.13	5.70	.93	3.10	2.20	* 3.65	2.25	* 1.70	5.47	4.43	2.12	1.91
19	.11	5.32	* 1.03	2.91	* 2.38	2.86	3.20	2.39	3.08	4.72	2.19	1.92
20	.11	4.60	1.00	* 2.69	2.06	2.04	3.13	2.74	2.06	4.00	1.94	1.51
21	.11	3.63	.84	1.51	2.47	1.07	2.54	3.17	12.1	* 9.51	1.69	* .90
22	.16	4.06	.65	1.42	2.83	.38	2.38	3.47	31.5	60.1	1.47	.48
23	* .17	4.37	.48	1.84	2.75	.24	* 2.11	3.03	24.3	* 66.1	1.36	.40
24	.12	* 3.77	.35	1.33	4.18	* .39	1.70	2.81	14.7	40.2	1.04	.49
25	.12	2.83	* .25	1.33	4.32	.75	1.90	* 1.74	8.72	23.4	* .87	.33
26	.15	3.17	.17	3.07	2.65	.93	1.90	1.63	4.98	14.4	.68	.30
27	.26	3.09	.11	5.43	2.97	1.13	1.96	2.91	3.49	10.2	.63	.31
28	.48	2.37	.08	5.64	3.28	1.47	1.84	2.78	3.61	6.36	1.18	1.45
29	.63		.06	5.85	2.70	1.88	1.94	1.80	4.92	4.15	2.23	2.34
30	.34		.04	6.33	2.03	2.09	1.65	1.26	6.83	3.85	1.66	2.22
31	.33		.02		1.70		1.23	1.67		3.36		2.13
Sum		122.01		57.38		78.36		55.05		323.54		31.70
	48.97		29.61		116.50		85.99		181.02		71.53	

Current Year 1998 | Period 1954-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Low		Total	Average	Maximum	Minimum
Jan.	1.010	0.275	3	7.24	23	0.09	1.58	4,231	41,378	407,379
Feb.	1.115	.305	9	8.21	1	.30	4.36	10,542	66,069	446,279
Mar.	.710	.325	17	2.71	31	.01	.96	2,558	39,030	445,080
April	1.045	.250	30	6.87	2	0	1.91	4,958	40,323	397,086
May	1.200	.485	13	9.47	31	1.59	3.76	10,066	65,222	438,873
June	1.080	.300	7	7.00	23	.20	2.61	6,770	73,772	600,151
July	.940	.420	14	6.19	31	1.06	2.77	7,430	66,409	539,704
Aug.	.815	.375	22	4.03	5	.29	1.78	4,756	68,620	1,001,626
Sept.	2.720	.400	22	32.8	5	.13	6.03	15,640	123,692	784,150
Oct.	4.310	.475	23	74.0	9	1.27	10.4	27,954	158,469	1,094,351
Nov.	1.285	.405	4	8.48	27	.58	2.38	6,180	77,103	650,763
Dec.	.710	.315	2	2.76	124	.22	1.02	2,739	64,619	591,508
Yearly	4.310	0.250		74.0		0	3.29	103,824	864,706	3,263,087
										37,722

* Discharge measurement made on this day

! And other days

** Period 1954-1998

08-4753.00 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 Natural Resource Conservation Commission, 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 1998, 1,653 hectares 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 area below Falcon Dam allotted Rio Grande water.

The total diversion during 1998 in this river reach was 3,752 TCM, or 0.4% of the total water diverted from the Rio Grande below Falcon Dam. Records of diversions in this river reach were determined 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 Cubic Meters per Second								
Daily:	Max.	2.78	June 1, 1996				Min.	0	Frequently
Monthly:	Max.	0.66	June 1965				Min.	0	Occasionally
Yearly:	Max.	0.20	1965				Min.	0.02	1976

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.07	0	0	0.16	1.56	0.74	0.65	0.45	0	0	0	0
2	0	0	.01	0	.46	.68	0	0	0	0	0	.04
3	0	0	.01	.17	.43	.55	0	.06	0	0	0	.07
4	0	0	.01	.13	.39	.48	0	.13	0	0	0	.03
5	0	.27	.09	.13	.33	.63	.10	.12	0	0	0	0
6	0	.35	.18	.13	.40	.38	.04	.13	0	0	0	0
7	0	.45	.24	.22	.36	.15	.04	.09	0	0	0	0
8	0	.35	.24	.14	.30	.25	0	.09	0	0	0	0
9	0	.51	.27	.23	.24	.33	0	0	0	0	0	.03
10	0	.56	.36	.22	.19	.28	0	.06	0	0	0	.03
11	0	.66	.25	.13	.25	.44	0	.06	0	0	0	.03
12	0	.53	.25	.05	.35	.39	0	0	0	0	0	0
13	0	.46	.20	.13	.39	.29	0	.04	0	0	0	0
14	0	.29	.04	.13	.49	.23	0	0	0	0	0	0
15	0	.01	.18	.44	.24	0	0	0	0	0	0	.04
16	0	.20	.01	.23	.57	.26	0	0	0	0	0	.04
17	.06	.18	.06	.20	.36	.68	0	0	0	0	0	.04
18	0	.18	.12	0	.39	.36	0	0	0	0	0	0
19	.12	.22	.08	.12	.39	.36	0	0	0	0	0	0
20	.12	.08	.02	.20	.41	.42	0	0	0	0	0	0
21	.12	.16	.08	.35	.63	.32	0	0	0	0	0	0
22	0	.08	.01	.52	.93	.32	.05	0	0	0	0	0
23	0	.08	.07	.44	.75	.32	.12	0	0	0	.05	0
24	0	.03	.11	.57	.66	.40	0	0	0	0	.05	0
25	0	.03	.13	.45	.62	.27	0	0	0	0	.09	0
26	0	.11	.13	0	.54	.27	0	0	0	0	.04	0
27	0	.18	0	.66	.37	0	0	0	0	.04	0	0
28	0	.19	0	.73	0	0	0	0	0	0	0	0
29	0	0	0	.61	0	0	0	0	0	0	0	0
30	0	0	0	.51	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum		5.78		5.23		10.41		1.23		0		0.35
	0.49		3.35		15.34		1.00					0.27

Current Year 1998

Period 1960-1998

Month	Average Rainfall** Millimeters		Extreme-Cubic Meters per Second			Average	Total	Volume-Thousand Cubic Meters			
	1998	1960-1998	Day	Φ High	Day			Average	Maximum	Minimum	
Jan.	7	44	112	0.12	! 2	0	0.02	42.3	396	1,573	
Feb.	39	34	11	.66	! 1	0	.21	499	280	1,113	
Mar.	17	21	10	.36	! 1	0	.11	289	182	782	
April	2	49	24	.57	! 2	0	.17	452	348	1,187	
May	0	68	1	1.56	31	0	.49	1,325	485	1,673	
June	3	67	1	.74	128	0	.35	899	600	1,718	
July	0	43	1	.65	! 2	0	.03	86.4	248	960	
Aug.	33	74	1	.45	! 2	0	.04	106	116	391	
Sept.	216	145	! 1	0	! 1	0	0	0	46.2	199	
Oct.	89	86	1 1	0	! 1	0	0	0	57.9	224	
Nov.	96	45	25	.09	! 1	0	.01	23.3	70.7	311	
Dec.	9	38	3	.07	! 1	0	.01	30.2	114	613	
Yearly	511	714		1.56		0	0.12	3,752	2,944	6,212	670

Φ Mean daily

! And other days

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

08-4754.00 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 Natural Resource Conservation Commission, 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 Watermaster.

In 1998, 273,977 hectares, 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 1,056,800 TCM. Records of diversion from the Rio Grande were determined by means of flowmeters, by open channel rating stations and by deflection meters developed by the International Boundary and Water Commission. 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 area irrigated on the United States side below Falcon Dam.

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

EXTREME FLOWS FROM RECORDS:

				Average Flow in Cubic Meters per Second												
Daily:	Max.	159	June 1, 1960	Min.						0.08	Aug. 10, 1980					
Monthly:	Max.	123	June 1980	Min.						2.89	Mar. 1957					
Yearly:	Max.	59.8	1989	Min.						24.9	1970					

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.8	26.2	3.95	50.1	89.1	80.2	62.8	39.3	41.3	15.2	6.67	13.3
2	19.3	33.7	12.6	42.7	65.1	78.9	49.4	34.0	42.9	14.6	10.8	17.1
3	12.3	38.5	14.5	43.3	74.1	77.1	38.8	40.5	40.8	14.5	15.7	15.2
4	12.6	28.5	12.9	43.5	76.8	79.4	32.2	41.8	36.6	8.90	15.6	11.5
5	24.0	21.7	17.0	43.3	78.6	73.2	39.8	42.5	23.4	22.7	12.1	7.52
6	25.4	18.3	15.3	49.8	77.4	73.0	41.2	37.6	19.9	18.5	6.48	5.04
7	25.9	11.0	14.5	47.3	79.1	65.3	42.6	32.4	26.8	14.9	2.51	13.3
8	29.0	6.56	14.0	55.0	77.1	73.4	42.2	24.8	25.6	12.5	3.48	16.3
9	29.9	16.9	23.5	57.5	75.0	73.2	41.0	25.8	15.8	8.67	3.31	15.7
10	19.0	21.3	20.6	58.6	72.0	72.6	36.3	40.6	8.63	3.63	5.27	11.8
11	22.2	21.2	18.6	52.8	69.6	71.3	27.9	33.6	5.03	2.60	7.63	9.28
12	32.4	22.9	17.7	58.8	79.6	66.4	25.3	32.3	4.14	4.87	6.75	6.04
13	45.6	22.9	21.7	65.1	84.6	60.9	41.8	32.9	2.95	11.2	3.81	6.26
14	44.3	14.4	18.0	66.1	83.0	56.6	42.1	25.1	15.9	19.3	2.58	8.85
15	46.3	18.4	13.6	57.3	81.3	70.0	41.0	20.3	7.21	10.8	2.60	12.2
16	39.6	11.6	8.53	57.5	81.8	75.1	46.9	19.3	23.5	4.45	5.44	12.8
17	31.6	9.75	10.1	51.6	78.0	76.1	38.1	28.2	30.6	3.04	10.4	16.0
18	34.9	5.98	13.7	51.7	81.4	77.5	23.9	30.4	53.9	2.98	15.9	16.9
19	46.8	9.08	20.9	54.5	88.3	77.2	32.3	30.3	35.4	18.0	15.0	11.2
20	44.5	8.23	21.9	65.6	87.1	64.0	37.6	29.1	42.5	38.0	8.44	13.9
21	42.0	5.46	14.0	70.2	88.4	66.7	45.5	17.4	37.3	45.1	5.26	18.3
22	43.7	7.36	14.2	70.5	80.4	67.1	43.3	11.3	46.7	39.7	4.77	18.0
23	44.0	14.1	26.0	70.6	82.6	68.1	38.8	10.6	14.7	23.5	8.68	18.3
24	26.5	14.2	26.0	66.4	76.4	66.1	32.7	18.9	26.0	12.5	12.2	5.46
25	31.7	11.7	34.6	61.8	80.4	59.6	23.4	22.1	22.3	9.25	14.6	2.90
26	39.7	8.51	35.9	72.7	87.2	61.5	22.9	25.8	16.6	12.3	1.51	1.54
27	47.1	10.8	36.3	71.3	86.6	41.2	36.0	27.8	28.7	12.9	2.83	5.15
28	48.1	7.15	35.3	76.3	84.8	34.8	41.8	23.2	7.70	15.6	5.55	10.5
29	51.3		32.3	72.7	79.1	54.2	39.9	24.1	8.11	13.2	4.20	11.2
30	43.3		49.2	66.8	71.9	60.2	45.8	26.3	7.24	10.4	9.46	10.9
31	28.7		45.2	68.5			38.6	32.7		8.99		8.77
Sum		446.38		1,771.4		2,020.9		881.0		452.78		351.21
	1,042.5		662.38		2,463.3		1,191.9		718.21		229.53	

Current Year 1998 Period 1958-1998

Month	Average Rainfall** Millimeters		Extreme-Cubic Meters per Second			Volume-Thousand Cubic Meters					
	1998	1958-1997	Day	Φ High	Day	Φ Low	Average	Total	Average	Maximum	Minimum
Jan.	4	36	29	51.3	1	10.8	33.6	90,072	91,907	224,987	11,984
Feb.	69	35	3	38.5	21	5.46	15.9	38,567	68,743	155,700	14,537
Mar.	25	20	30	49.2	1	3.95	21.4	57,230	93,513	193,098	19,538
April	8	38	28	76.3	2	42.7	59.0	153,049	136,713	258,994	15,713
May	0	67	1	89.1	2	63.1	79.5	212,829	150,072	306,530	19,823
June	6	68	1	80.2	28	34.8	67.4	174,606	168,761	319,179	32,671
July	7	39	1	62.8	26	22.9	38.4	102,980	135,230	242,015	38,857
Aug.	27	60	5	42.5	23	10.6	28.4	76,118	108,030	182,408	44,662
Sept.	247	112	18	53.9	13	2.95	23.9	62,053	73,441	168,349	15,676
Oct.	126	72	21	45.1	11	2.60	14.6	39,120	78,455	162,305	16,023
Nov.	70	32	18	15.9	26	1.51	7.65	19,831	64,015	163,201	15,633
Dec.	10	30	121	18.3	26	1.54	11.3	30,345	60,185	113,823	17,311
Yearly	599	609		89.1		1.51	33.5	1,056,800	1,229,065	1,879,991	785,513

Φ Mean daily

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

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

OUTFALLS FROM SEWERS INTO THE RIO GRANDE

In Thousand Cubic Meters

EL PASO SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande through the outfall of the Haskell Street Wastewater Treatment Plant located 11.4 river kilometers downstream from the American Dam and the Northwest Wastewater Treatment Plant which enters the Rio Grande 0.5 miles upstream from the American Dam. Outfalls from both Plants are measured by means of ultrasonic flow meters with a Parshall flume at the Northwest Plant. The records are furnished by the City of El Paso, Texas.

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1998	3,140	2,927	3,344	3,237	3,395	3,526	3,829	3,742	3,431	3,361	3,140	3,082	40,154
Average	2,635	2,473	2,695	2,613	2,804	2,696	3,011	3,104	2,894	2,801	2,644	2,628	32,998

Period average 1989-1998

EAGLE PASS SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande at approximately river kilometer 782. The outfall from this plant is measured by means of a flowmeter. The records are furnished by the Eagle Pass Water Treatment Department.

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1998	257	244	251	217	231	199	205	269	298	315	289	302	3,077
Average	238	219	244	235	249	235	223	236	248	257	247	254	2,885

Period average 1989-1998

LAREDO SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande from two sewage treatment plants, Zacate Creek Sewage Treatment Plant and Southside Sewage Treatment Plant. These sewage outfalls enter the Rio Grande at river kilometers 579 and 573, 1.4 and 7.9 river kilometers respectively downstream from the old international highway bridge Laredo, Texas and Nuevo Laredo, Tamaulipas. The records are furnished by the Laredo Water Treatment Plant in Laredo, Texas.

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1998	1,336	1,249	1,460	1,524	1,662	1,603	1,682	1,697	1,652	1,688	1,557	1,533	18,643
Average	1,288	1,207	1,358	1,367	1,485	1,462	1,518	1,527	1,376	1,463	1,275	1,318	16,644

Period average 1989-1998

BROWNSVILLE SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande at river kilometer 75.3, 14.3 river kilometers downstream from the Gateway Bridge between Brownsville, Texas and Matamoros, Tamaulipas and 3.1 river kilometers downstream from the Brownsville Gaging station. Records are furnished by the City of Brownsville.

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1998	585	560	631	600	599	582	600	626	651	646	628	620	7,328
Average	659	610	671	679	699	670	670	692	684	738	652	656	8,080

Period average 1989-1998

MUNICIPAL AND INDUSTRIAL WATER USES

In Thousand Cubic Meters

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 main supply is derived from San Felipe Springs; and the city of El Paso, whose supply is partially derived from deep wells. The amount shown below for the city of El Paso is Rio Grande water pumped from the Franklin Canal at the Robertson-Umbenhauer Water Treatment Plant and from the Riverside Canal at the Jonathan W. Rogers Water Treatment Plant for municipal use. 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 prior pages of this bulletin. Population data was provided by the Chamber of Commerce for each city in the United States, except El Paso, which was provided by the City Planning Office; Falcon Village, estimated by the International Boundary and Water Commission; Del Rio, by the Middle Rio Grande Development Council; Laughlin Air Force Base, by the U.S. Air Force; Laredo, by the Laredo Development Foundation; and Rio Bravo and San Ygnacio, which are based on utilities connections.

In the United States

Month	EL PASO (Pop. 540,203)			DEL RIO (Pop. 32,045)		
	1998	Period 1989 - 1998		1998	Period 1989 - 1998	
		Average	Maximum		Average	Maximum
Jan.	0	123	741	0	985	844
Feb.	380	769	1,907	0	959	810
Mar.	4,400	4,523	6,678	981	1,201	1,072
April	8,210	6,525	8,583	3,422	1,540	1,223
May	9,707	7,457	10,169	5,086	1,844	1,365
June	9,633	7,321	9,702	5,313	1,716	1,541
July	9,730	7,366	10,005	5,076	1,843	1,741
Aug.	9,965	7,496	10,300	4,809	1,463	1,671
Sept.	9,457	6,747	9,469	4,838	#	1,326
Oct.	2,030	2,727	7,930	0	#	1,185
Nov.	0	8.4	83.6	0	#	898
Dec.	0	0	0	0	#	838
Yearly	63,512	51,062	70,268	31,668		14,514
						17,027
						11,551

Month	EAGLE PASS (Pop. 27,000)			LAREDO (Pop. 140,000)		
	1998	Period 1989 - 1998		1998	Period 1989 - 1998	
		Average	Maximum		Average	Maximum
Jan.	467	404	467	312	2,749	2,389
Feb.	475	376	475	266	2,387	2,398
Mar.	550	452	550	353	2,937	2,855
April	702	501	702	359	3,816	3,112
May	823	551	823	423	4,461	3,544
June	744	610	744	480	5,109	4,461
July	901	678	901	513	5,580	4,128
Aug.	654	684	845	515	5,002	5,942
Sept.	574	546	712	392	3,748	3,175
Oct.	521	509	588	411	3,296	3,141
Nov.	428	426	496	350	2,985	3,561
Dec.	422	416	462	365	2,942	2,745
Yearly	7,261	6,153	7,261	5,036	45,012	2,589
						2,942
						33,172

Month	LAREDO POWER STATION			RIO BRAVO (Pop. 5,000)		
	1998	Period 1989 - 1998		1998	Period 1989 - 1998	
		Average	Maximum		Average	Maximum
Jan.	83.5	81.6	123	44.2	81.5	53.9
Feb.	75.0	93.3	115	68.7	84.1	87.9
Mar.	110	118	175	71.8	84.1	55.1
April	124	132	162	87.3	96.4	84.1
May	195	159	212	124	125	63.3
June	184	193	260	156	144	92.0
July	286	225	286	169	149	105
Aug.	194	211	260	146	135	98.6
Sept.	239	188	239	135	105	74.8
Oct.	140	147	189	114	96.6	76.2
Nov.	107	88.0	145	43.0	73.4	62.8
Dec.	146	99.9	146	45.1	84.6	53.6
Yearly	1,884	1,736	1,892	1,518	1,259	892
						1,259
						530

Missing Data

MUNICIPAL AND INDUSTRIAL WATER USES

In Thousand Cubic Meters

In the United States

Month	SAN YGNACIO (Pop. 788)			ZAPATA (Pop. 9,500)				
	1998	Period 1989 - 1998			1998	Period 1989 - 1998		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	16.2	12.7	16.2	8.3	194	138	199	93.4
Feb.	15.3	13.0	15.3	10.5	145	136	169	95.3
Mar.	18.9	15.6	18.9	12.7	158	162	194	132
April	24.8	17.0	24.8	11.2	193	166	225	113
May	27.0	19.6	27.0	12.6	258	181	258	126
June	25.2	20.4	25.2	16.3	219	191	231	163
July	27.5	22.0	27.5	14.9	224	211	305	146
Aug.	23.9	20.8	28.2	16.6	218	212	269	144
Sept.	13.9	16.3	21.8	10.4	142	168	207	115
Oct.	16.2	17.3	20.2	14.3	167	167	231	116
Nov.	13.4	14.5	16.8	10.2	113	150	196	105
Dec.	14.6	14.1	16.5	9.4	115	148	227	114
Yearly	237	203	237	165	2,146	2,030	2,505	1,715

Month	FALCON VILLAGE (Pop. 80)			ROMA (Pop. 8,059)				
	1998	Period 1989 - 1998			1998	Period 1989 - 1998		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	7.7	7.5	9.6	4.2	200	177	217	131
Feb.	6.9	7.1	8.9	3.8	187	176	229	131
Mar.	8.3	8.3	11.6	4.9	194	202	246	175
April	10.8	8.7	11.2	4.5	245	219	278	171
May	12.4	9.7	13.9	5.7	292	249	331	181
June	12.1	10.3	16.4	7.6	285	251	309	200
July	12.8	12.0	17.4	9.7	270	269	325	222
Aug.	12.8	11.3	15.0	7.4	274	266	316	217
Sept.	10.6	9.8	14.3	7.8	222	221	247	195
Oct.	10.1	9.3	12.6	6.3	214	199	251	64.4
Nov.	8.5	7.8	11.5	5.5	183	187	251	137
Dec.	8.6	7.5	9.3	5.0	193	178	207	141
Yearly	122	109	150	83.4	2,759	2,594	2,954	2,169

Month	RIO GRANDE CITY (Pop. 40,000)			BROWNSVILLE (Pop. 115,000)				
	1998	Period 1989 - 1998			1998	Period 1989 - 1998		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	291	215	291	158	1,781	1,859	1,965	1,744
Feb.	174	181	257	137	1,605	1,720	2,084	1,480
Mar.	112	208	292	112	1,920	2,009	2,279	1,865
April	276	242	440	160	2,102	2,007	2,405	1,630
May	323	252	378	168	2,454	2,073	2,580	987
June	252	248	336	201	2,378	2,254	2,515	1,918
July	259	287	360	173	2,497	2,486	3,008	1,513
Aug.	265	267	333	233	2,304	2,537	3,470	2,127
Sept.	174	251	356	174	1,846	2,057	2,437	1,828
Oct.	125	229	271	125	1,733	2,005	2,287	1,733
Nov.	171	209	263	153	1,678	1,831	1,997	1,661
Dec.	250	210	250	170	1,774	1,883	2,128	1,727
Yearly	2,670	2,799	3,459	2,348	24,072	24,721	26,934	23,387

MUNICIPAL AND INDUSTRIAL WATER USES

In Thousand Cubic Meters

In Mexico

Month	CD. ACUNA, COAHUILA (Pop. 81,577)			RIO ESCONDIDO POWER PLANT		
	Period 1989 - 1998			1998	Period 1989 - 1998	
	Average	Maximum	Minimum		Average	Maximum
Jan.	397	317	397	305	1,810	1,063
Feb.	349	288	349	276	1,720	1,531
Mar.	414	320	414	305	1,886	2,014
April	412	313	412	295	2,151	1,832
May	428	322	428	298	2,583	1,291
June	416	313	416	291	2,178	1,883
July	430	325	430	301	2,881	2,323
Aug.	395	320	395	296	1,759	2,365
Sept.	400	313	400	296	2,127	1,946
Oct.	418	321	418	294	2,504	2,142
Nov.	371	307	371	294	2,373	1,564
Dec.	365	313	365	290	1,736	1,041
Yearly	4,795	3,773	4,795	3,588	25,708	20,996
					25,708	15,615

Month	PIEDRAS NEGRAS, COAHUILA (Pop. 116,097)			NUEVO LAREDO, TAMAULIPAS (Pop. 274,913)		
	Period 1989 - 1998			1998	Period 1989 - 1998	
	Average	Maximum	Minimum		Average	Maximum
Jan.	1,336	888	1,336	740	4,150	2,944
Feb.	1,253	856	1,253	702	3,413	2,686
Mar.	1,433	920	1,433	591	3,775	2,701
April	1,477	914	1,477	564	3,916	3,108
May	1,682	1,034	1,682	664	4,231	3,123
June	1,713	1,080	1,713	774	4,259	3,154
July	1,838	1,187	1,838	845	4,527	3,503
Aug.	1,698	1,155	1,698	848	3,913	3,394
Sept.	1,692	1,082	1,692	820	4,239	3,448
Oct.	1,588	1,063	1,588	835	4,215	3,260
Nov.	1,398	946	1,398	744	3,859	3,204
Dec.	1,465	943	1,465	702	3,711	3,402
Yearly	18,573	12,069	18,573	9,024	48,208	37,928
					56,762	25,422

Month	NUEVA CD. GUERRERO, TAMAULIPAS (Pop. 4,007)			CD. MIER, TAMAULIPAS (Pop. 6,270)		
	Period 1989 - 1998			1998	Period 1989 - 1998	
	Average	Maximum	Minimum		Average	Maximum
Jan.	54.8	53.6	73.1	36.6	53.6	52.7
Feb.	48.0	49.1	64.9	31.9	48.4	45.9
Mar.	51.8	54.1	69.9	43.0	53.6	52.3
April	30.1	51.5	71.9	30.1	51.8	52.7
May	60.3	62.2	72.6	54.0	75.2	58.2
June	58.9	62.8	71.5	54.8	77.0	67.2
July	62.2	65.7	74.4	55.3	80.4	73.4
Aug.	64.2	65.2	74.9	54.2	70.0	65.5
Sept.	61.2	62.0	72.2	48.9	77.8	63.8
Oct.	57.0	64.6	74.4	52.8	67.4	59.3
Nov.	54.4	60.1	72.4	50.7	61.3	56.8
Dec.	63.6	57.6	74.1	39.0	71.7	57.6
Yearly	667	708	825	637	788	705
					853	543

MUNICIPAL AND INDUSTRIAL WATER USES

In Thousand Cubic Meters

In Mexico

Month	CD. MIGUEL ALEMÁN, TAMAULIPAS (Pop. 22,363)				CD. DÍAZ ORDAZ, TAMAULIPAS (Pop. 15,685)			
	1998	Period 1989 - 1998			1998	Period 1996 - 1998		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	245	210	245	160	130	132	136	130
Feb.	223	190	238	103	111	117	131	110
Mar.	257	222	257	158	130	132	146	121
April	252	224	259	169	143	125	143	108
May	260	234	268	188	163	140	163	124
June	259	230	259	170	135	141	148	135
July	268	237	268	182	120	140	161	120
Aug.	268	238	268	188	146	143	149	135
Sept.	235	227	259	168	136	132	136	129
Oct.	241	227	252	182	137	133	137	131
Nov.	232	231	338	166	129	127	129	124
Dec.	244	214	244	153	134	131	134	128
Yearly	2,984	2,682	3,028	2,054	1,614	1,595	1,652	1,519

Month	REYNOSA, TAMAULIPAS (Pop. 336,732)				CONTROL — VALLE HERMOSO, TAMAULIPAS (Pop. 55,274)			
	1998	Period 1996 - 1998			1998	Period 1998		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	3,370	3,462	3,594	3,370				
Feb.	2,998	3,159	3,326	2,998				
Mar.	3,413	3,545	3,784	3,413	69.1	69.1	69.1	69.1
April	3,836	3,617	3,853	3,162	401	401	401	401
May	4,787	4,107	4,787	3,110	334	334	334	334
June	5,348	4,418	5,348	3,266	340	340	340	340
July	6,143	4,919	6,143	3,845	338	338	338	338
Aug.	5,944	4,997	5,944	4,501	264	264	264	264
Sept.	5,098	4,608	5,098	4,069	334	334	334	334
Oct.	4,355	4,188	4,355	4,018	371	371	371	371
Nov.	3,741	3,779	3,828	3,741	378	378	378	378
Dec.	3,828	3,867	3,828	3,491	327	327	327	327
Yearly	52,861	48,448	52,861	43,936	3,156	3,156	3,156	3,156

Month	MATAMOROS, TAMAULIPAS (Pop. 363,236)							
	1998	Period 1996 - 1998						
		Average	Maximum	Minimum				
Jan.	4,505	3,754	4,505	3,002				
Feb.	4,368	3,687	4,368	3,006				
Mar.	4,815	3,908	4,815	3,000				
April	4,009	3,456	4,009	2,903				
May	4,302	4,148	4,302	3,993				
June	4,654	3,664	4,654	1,940				
July	4,889	4,358	5,333	2,853				
Aug.	4,396	4,304	5,321	3,194				
Sept.	3,359	3,723	4,763	3,046				
Oct.	3,889	3,729	4,318	2,980				
Nov.	4,538	3,953	4,749	2,573				
Dec.	4,793	4,176	5,145	2,589				
Yearly	52,517	40,541	52,517	19,175				

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN
In Million Cubic Meters

Data are presented below for all storage reservoirs in the Rio Grande basin in the United States and Mexico that exceed 18.5 million cubic meters in capacity. The monthly figures represent the water in storage on the last day of each month, in millions of cubic meters. 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, Sanchez and Platoro from the State of Colorado, Division of Water Resources; Heron, El Vado, Elephant Butte, Caballo, Sumner, and Brantley from the United States Bureau of Reclamation; Costilla from the New Mexico Interstate Stream Commission; Abiquiu, Cochiti, Jemez Canyon and Santa Rosa from United States Corps of Engineers; Bluewater from the United States Geological Survey; Storrie from the State Engineer Office of New Mexico; Red Bluff from the Red Bluff Water Power Control District; Delta Lake from the Delta Lake Irrigation District. The data for all reservoirs in the Mexican portion of the watershed were provided by the National Water Commission. The data for Amistad Reservoir (International) and Falcon Reservoir (International) were provided by the International Boundary and Water Commission.

In the United States

Month	RIO GRANDE (Capacity 63.0)		CONTINENTAL (Capacity 28.0)		SANTA MARIA (Capacity 55.6)		TERRACE (Capacity 21.2)		MOUNTAIN HOME (Capacity 22.9)	
	1998	Average 1927-1998	1998	Average 1928-1998	1998	Average 1928-1998	1998	Average 1925-1998	1998	Average 1924-1998
Jan.	6.3	17.8	5.0	6.0	9.1	9.7	12.7	5.6	6.0	4.6
Feb.	8.0	19.1	5.9	6.5	9.5	10.2	13.4	6.1	6.3	4.9
Mar.	12.1	21.0	6.9	7.1	10.1	10.7	14.7	6.9	6.4	5.3
April	15.8	22.5	8.6	8.0	8.6	11.6	16.1	7.4	7.2	6.0
May	18.0	25.6	9.8	9.6	7.7	14.6	15.5	8.4	12.7	8.1
June	12.3	28.8	5.4	9.9	7.7	17.2	11.3	10.0	12.9	8.7
July	11.9	19.3	3.7	7.3	8.0	14.1	7.1	7.9	9.0	6.3
Aug.	11.9	12.1	1.3	4.8	9.7	9.7	4.7	5.4	6.6	4.0
Sept.	12.0	10.7	1.5	4.3	9.7	8.2	3.6	4.3	5.2	3.5
Oct.	11.9	11.3	1.6	4.4	9.7	8.2	3.6	4.3	5.4	3.5
Nov.	17.9	13.6	2.9	4.7	10.1	8.8	5.7	4.7	5.9	3.9
Dec.	23.1	16.4	4.0	5.7	10.6	9.4	7.2	5.2	6.0	4.3
Avg.	13.4	18.2	4.7	6.5	9.2	11.0	9.6	6.3	7.5	5.3
Max.	23.1	67.6	9.8	32.9	10.6	51.9	16.1	21.8	12.9	20.2
Min.	6.3	0	1.3	0	7.7	0	3.6	0	5.2	0

Month	SANCHEZ (Capacity 127.3)		PLATORO (Capacity 73.5)		COSTILLA (Capacity 19.4)		HERON (Capacity 495.0)		EL VADO (Capacity 229.8)	
	1998	Average 1927-1998	1998	Average 1952-1998	1998	Average 1922-1998	1998	Average 1971-1998	1998	Average 1935-1998
Jan.	41.9	19.7	34.8	20.1	8.4	5.8	426.2	338.9	130.9	73.1
Feb.	42.1	19.6	35.0	19.8	9.0	6.3	422.4	334.9	126.6	70.9
Mar.	43.7	20.4	35.7	20.2	9.9	6.9	403.6	323.5	149.0	77.0
April	45.6	21.8	36.1	20.1	11.1	8.2	383.0	318.0	185.7	115.1
May	49.3	24.8	40.1	23.1	13.4	10.5	426.2	357.8	220.5	155.7
June	43.7	26.7	45.6	31.5	10.8	10.0	458.3	390.0	215.1	148.3
July	42.4	22.3	38.1	28.8	8.2	6.8	460.5	392.3	193.8	128.2
Aug.	41.7	18.6	30.9	25.6	6.0	4.5	455.9	390.3	152.4	105.0
Sept.	39.7	18.2	26.9	25.2	3.9	3.8	437.2	385.3	97.8	91.0
Oct.	40.6	19.0	25.0	24.4	5.0	4.3	422.4	383.7	94.2	85.1
Nov.	43.0	19.5	26.0	21.0	5.9	4.8	403.4	380.1	115.3	76.4
Dec.	44.1	19.9	26.6	21.1	6.6	5.3	380.5	356.7	130.9	75.4
Avg.	43.2	20.9	33.4	23.4	8.2	6.4	423.3	362.6	151.0	100.1
Max.	49.3	78.6	45.6	68.2	13.4	20.2	460.5	495.0	220.5	251.0
Min.	39.7	0	25.0	0	3.9	0	380.5	0	94.2	0

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN
In Million Cubic Meters

In the United States

Month	ABIQUIU (Capacity 1,481.4)		COCHITI (Capacity 619.6)		JEMEZ CANYON (Capacity 123.9)		BLUEWATER (Capacity 47.5)		ELEPHANT BUTTE (Capacity 2,547.1)	
	1998	Average 1965-1998	1998	Average 1973-1998	1998	Average 1965-1998	1998	Average 1927-1998	1998	Average 1915-1998
Jan.	218.7	112.0	73.0	72.7	28.0	12.2	7.2	10.5	2,435.5	1,171.6
Feb.	221.4	110.3	74.7	68.5	27.3	12.5	7.4	11.3	2,437.7	1,177.4
Mar.	222.6	108.3	74.8	68.5	32.3	13.4	20.1	16.2	2,375.6	1,139.5
April	222.3	120.4	74.6	76.5	33.8	17.6	35.8	20.3	2,327.3	1,131.1
May	222.3	167.8	75.1	104.0	33.6	18.6	32.6	18.3	2,384.7	1,227.9
June	192.9	158.2	72.2	107.5	32.3	15.5	26.9	15.4	2,278.2	1,257.1
July	190.9	144.3	72.0	82.7	32.7	14.2	23.2	13.5	2,151.3	1,190.3
Aug.	189.5	141.0	71.2	74.6	31.0	13.6	20.4	12.2	2,036.1	1,126.1
Sept.	190.0	135.1	72.5	74.0	29.5	13.1	18.8	11.5	1,972.1	1,098.8
Oct.	191.8	129.9	73.4	77.1	29.5	12.5	18.4	11.0	1,973.2	1,101.3
Nov.	200.7	121.4	71.4	77.1	29.3	12.5	18.7	10.8	2,046.1	1,128.0
Dec.	210.1	119.5	73.8	76.5	28.6	12.7	18.5	10.6	2,094.4	1,160.0
Avg.	206.1	130.7	73.2	80.0	30.7	14.0	20.5	13.5	2,209.4	1,159.1
Max.	222.6	493.8	75.1	471.2	33.8	88.8	33.8	58.1	2,437.7	2,840.5
Min.	189.5	0	71.2	4.4	27.3	0	7.2	0	1,972.1	4.1

Month	CABALLO (Capacity 408.9)		STORRIE (Capacity 28.7)		SANTA ROSA (Capacity 542.6)		LAKE SUMNER (Capacity 116.8)		BRANTLEY (Capacity 69.4)	
	1998	Average 1938-1998	1998	Average 1939-1998	1998	Average 1980-1998	1998	Average 1937-1998	1998	Average 1988-1998
Jan.	53.4	121.8	27.0	10.8	116.1	74.1	36.1	69.6	31.4	28.4
Feb.	73.6	152.0	27.0	10.8	108.7	72.7	51.9	74.3	34.5	30.8
Mar.	74.4	126.9	27.0	11.6	99.9	72.6	39.4	63.5	57.4	37.4
April	83.0	128.5	28.2	12.2	107.0	74.5	38.5	55.7	39.1	30.0
May	87.1	138.0	NR	12.8	115.0	78.2	49.4	55.7	24.4	30.7
June	79.0	125.5	28.2	11.8	77.8	76.8	29.9	50.1	38.9	36.6
July	90.4	103.5	25.9	11.5	43.3	72.1	22.3	48.2	39.8	27.5
Aug.	79.6	72.8	NR	11.9	60.4	74.6	27.7	51.2	29.7	27.9
Sept.	46.1	56.5	25.4	11.8	33.3	72.4	11.0	52.8	35.1	30.0
Oct.	45.8	66.8	NR	11.2	42.2	74.1	12.4	54.5	36.9	24.5
Nov.	48.7	80.6	NR	11.2	57.7	76.1	18.7	58.4	38.2	25.0
Dec.	51.3	99.6	26.6	10.9	60.9	77.2	24.0	64.0	42.9	26.0
Avg.	67.7	106.0		11.5	76.9	74.6	30.1	58.2	37.4	29.6
Max.	90.4	427.5		32.3	116.1	143.5	51.9	192.8	57.4	57.4
Min.	45.8	0		0	33.3	0	11.0	0.5	24.4	1.1

Month	RED BLUFF (Capacity 357.3)		DELTA LAKE (Capacity 30.8)						TOTAL IN U.S. RESERVOIRS (Capacity 7,509.7)	
	1998	Average 1936-1998	1998	Average 1939-1998					1998	Average Estimated
Jan.	118.5	122.0	18.7	19.3					3,844.9	2,326.4
Feb.	121.5	124.5	19.9	18.7					3,883.8	2,362.2
Mar.	121.8	121.4	16.3	18.0					3,853.7	2,296.2
April	101.5	107.8	20.7	18.1					3,827.4	2,331.4
May	91.9	107.7	17.9	18.5					3,947.2	2,616.2
June	84.1	108.6	17.8	18.7					3,781.3	2,662.9
July	70.2	98.7	22.9	18.7					3,567.6	2,458.6
Aug.	61.4	93.9	16.5	17.7					3,344.6	2,297.2
Sept.	60.1	98.0	22.3	19.1					3,153.7	2,227.6
Oct.	65.0	107.2	22.3	18.9					3,130.3	2,237.0
Nov.	81.4	111.8	19.7	19.0					3,266.7	2,269.4
Dec.	84.5	117.3	18.4	18.6					3,373.6	2,312.1
Avg.	88.5	109.9	19.5	18.6					3,581.2	2,366.4
Max.	121.8	404.0	22.9	27.9					3,947.2	
Min.	60.1	12.3	16.3	0					3,130.3	

NR - Not Reported

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN
In Million Cubic Meters

In Mexico

Month	SAN GABRIEL (Capacity 255.4)		PICO DEL AGUILA (Capacity 50.0)		LA BOQUILLA (Capacity 2,903.4)		LA COLINA (Capacity 24.1)		FRANCISCO I. MADERO (Capacity 348.0)	
	1998	Average 1990-1998	1998	Average 1993-1998	1998	Average 1914-1998	1998	Average 1940-1998	1998	Average 1948-1998
Jan.	132.7	139.5	6.7	17.4	1,444.8	1,815.4	24.2	22.8	191.0	259.4
Feb.	126.2	135.6	6.9	15.3	1,439.8	1,765.5	24.2	23.3	191.0	254.3
Mar.	115.5	129.1	7.8	12.5	1,341.6	1,686.9	24.3	23.4	181.5	236.7
April	103.0	118.3	8.1	9.4	1,218.0	1,588.6	24.3	23.8	173.3	199.1
May	79.5	102.9	7.2	7.3	1,069.0	1,491.6	24.4	23.5	158.9	165.7
June	66.7	90.2	7.1	7.2	919.8	1,406.0	24.4	23.6	127.0	142.9
July	50.8	92.6	7.5	7.3	807.1	1,446.4	24.4	23.6	106.5	162.5
Aug.	64.0	112.6	31.8	13.5	861.2	1,675.2	24.3	23.3	134.4	208.3
Sept.	73.8	135.5	20.5	14.2	851.3	1,885.8	24.8	23.1	149.4	249.9
Oct.	77.0	146.5	20.8	18.6	835.3	1,893.5	24.2	22.9	154.7	256.9
Nov.	77.7	145.9	21.6	18.8	841.1	1,859.0	24.2	21.3	157.9	258.0
Dec.	78.0	145.3	21.6	19.0	837.3	1,847.3	24.6	22.9	160.5	257.5
Avg.	87.1	124.3	14.0	13.4	1,038.9	1,696.8	24.3	23.1	157.2	220.9
Max.	132.7	475.5	31.8	42.6	1,444.8	3,402.1	24.8	27.8	191.0	452.2
Min.	50.8	19.8	6.7	6.3	807.1	20.8	24.2	14.3	106.5	1.7

Month	CHIHUAHUA (Capacity 25.8)		LUIS L. LEON (Capacity 356.0)		CENTENARIO and SAN MIGUEL (Capacity 46.3)		LA FRAGUA (Capacity 45.0)		VENUSTIANO CARRANZA (Capacity 1,385.0)	
	1998	Average 1961-1998	1998	Average 1968-1998	1998	Average 1934-1998	1998	Average 1991-1998	1998	Average 1930-1998
Jan.	10.2	9.7	430.7	469.2	39.2	19.0	44.6	34.4	235.0	601.4
Feb.	9.8	9.3	430.7	466.5	38.8	18.8	45.4	34.3	232.1	577.8
Mar.	9.3	8.8	419.2	445.0	37.6	15.9	42.8	30.4	213.0	539.0
April	8.8	8.3	391.1	416.8	31.5	14.0	45.0	30.1	182.8	526.9
May	8.1	7.6	362.1	387.9	24.4	14.3	38.8	28.7	157.3	503.1
June	7.4	7.1	332.9	366.7	17.4	12.6	31.6	27.1	145.0	479.7
July	7.3	7.4	328.5	380.7	15.0	11.9	25.2	27.4	132.0	490.3
Aug.	7.2	9.3	332.9	378.4	19.1	12.5	40.7	29.0	131.0	497.6
Sept.	6.9	11.4	334.4	441.7	23.3	14.7	43.8	32.9	163.6	558.1
Oct.	6.5	11.7	361.3	461.9	28.6	17.0	45.9	35.4	173.0	599.8
Nov.	6.1	10.7	382.0	470.0	32.8	17.7	44.4	36.0	175.9	610.0
Dec.	5.8	10.2	392.6	482.3	33.7	18.2	44.6	35.6	175.4	606.6
Avg.	7.8	9.3	374.9	430.6	28.5	15.5	41.1	31.8	176.3	549.2
Max.	10.2	32.7	430.7	928.9	39.2	43.0	45.9	46.0	235.0	1,435.0
Min.	5.8	0.2	328.5	4.7	15.0	0	25.2	9.6	131.0	1.2

Month	LAGUNA DE SALINILLAS (Capacity 19.0)		RODRIGO GOMEZ (Capacity 41.0)		EL CUCHILLO (Capacity 1,123.1)		MARTE R. GOMEZ (Capacity 1,096.9)		TOTAL IN MEXICAN RESERVOIRS (Capacity 7,719.0)	
	1998	Average 1931-1998	1998	Average 1963-1998	1998	Average 1994-1998	1998	Average 1943-1998	1998	Average Estimated
Jan.	13.8	9.9	19.5	31.8	257.4	256.8	263.1	703.2	3,112.9	3,772.2
Feb.	12.8	11.4	18.9	31.1	242.6	250.1	230.2	658.8	3,049.4	3,643.2
Mar.	14.4	10.0	19.2	29.8	230.8	243.8	229.0	632.1	2,886.0	3,425.2
April	13.9	11.4	18.9	28.9	210.5	236.9	137.0	577.3	2,566.2	3,234.2
May	15.2	11.3	17.5	28.2	188.1	229.6	59.0	521.1	2,209.5	2,958.5
June	12.3	10.6	16.2	27.7	168.9	225.2	56.3	526.0	1,933.0	2,733.5
July	10.7	10.0	10.6	27.5	152.5	209.4	54.1	521.2	1,732.2	2,651.3
Aug.	14.6	10.1	14.1	27.5	140.5	262.6	53.7	559.5	1,869.5	2,932.9
Sept.	13.6	10.6	30.3	31.4	223.9	316.1	117.9	697.9	2,077.5	3,188.1
Oct.	10.1	9.9	36.0	35.6	253.2	359.1	154.2	740.7	2,180.8	3,327.7
Nov.	10.7	9.5	35.8	35.4	280.5	315.4	184.3	748.2	2,275.0	3,341.0
Dec.	9.8	9.4	33.7	32.7	279.0	311.1	188.5	745.4	2,284.9	3,350.9
Avg.	12.7	10.3	22.6	30.3	219.0	268.0	143.9	636.0	2,348.1	3,213.2
Max.	15.2	39.0	36.0	45.4	280.5	512.1	263.1	1,308.0	3,112.9	
Min.	9.8	0	10.6	0	140.5	140.5	53.7	22.0	1,732.2	

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

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 river kilometer 924, 20.8 river kilometers upstream from Del Rio, Texas and Cd. Acuna, Coahuila.

Maximum storage for period of record: 5,994.6 million cubic meters on September 22, 1974 with an elevation of 346.150 meters above mean sea level, U. S. C. & G. S. datum.

Storage Capacities
(1992 Survey)

Elevation Meters	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity— Thousand Cubic Meters	Reservoir Area— Hectares	Storage Volume— Thousand Cubic Meters	Type of Storage
273.710	Original River Bed at Dam Axis	0	0	0	
283.465	Lowest Outlet (United States Penstocks)	0	0	3,887,094	Silt & Conservation
340.462	Top of Conservation Storage *	3,887,094	26,077	2,138,052	Ordinary Flood
347.595	Top of Spillway Gates	6,025,146	34,124	499,553	Surcharge
349.025	Maximum Water Surface	6,524,699	35,770		

STORAGE IN MILLION CUBIC METERS AT 24:00 HOURS 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,830.0	1,830.0	1,818.0	1,798.6	1,518.8	1,163.4	1,012.7	947.7	1,423.1	1,500.0	1,569.1	1,666.2
2	1,830.7	1,828.5	1,817.2	1,799.3	1,505.2	1,154.4	1,008.2	945.5	1,426.7	1,501.3	1,571.1	1,648.3
3	1,831.5	1,828.5	1,815.0	1,797.8	1,491.7	1,146.4	1,005.3	943.0	1,431.5	1,503.3	1,574.4	1,651.8
4	1,831.5	1,827.7	1,815.7	1,796.4	1,476.5	1,138.4	999.7	941.3	1,435.8	1,505.2	1,577.8	1,653.9
5	1,833.0	1,828.5	1,815.7	1,794.1	1,462.7	1,130.5	998.4	941.3	1,439.4	1,507.8	1,578.5	1,656.7
6	1,833.7	1,827.0	1,815.0	1,794.9	1,450.4	1,122.7	995.7	947.7	1,442.4	1,509.1	1,579.8	1,658.8
7	1,833.0	1,827.0	1,815.0	1,794.1	1,449.2	1,115.8	994.4	949.4	1,445.5	1,510.4	1,582.5	1,660.9
8	1,833.0	1,826.2	1,812.7	1,792.7	1,449.2	1,114.6	992.6	949.4	1,449.2	1,511.7	1,585.2	1,661.6
9	1,833.0	1,827.0	1,811.3	1,790.5	1,434.6	1,106.5	992.2	948.1	1,452.9	1,511.7	1,587.9	1,662.0
10	1,833.0	1,826.2	1,809.0	1,787.5	1,421.3	1,105.0	992.2	948.9	1,454.7	1,513.0	1,590.0	1,666.5
11	1,833.0	1,826.2	1,807.5	1,784.5	1,399.8	1,101.1	990.9	948.5	1,457.8	1,513.6	1,590.6	1,668.6
12	1,833.7	1,825.5	1,806.0	1,783.8	1,380.4	1,097.7	989.6	947.7	1,459.6	1,515.6	1,594.0	1,669.3
13	1,833.0	1,824.7	1,805.3	1,785.3	1,361.2	1,093.4	987.4	947.2	1,461.5	1,516.9	1,599.4	1,671.4
14	1,833.7	1,824.0	1,805.3	1,782.3	1,343.4	1,090.0	986.0	945.5	1,466.5	1,517.5	1,601.5	1,672.1
15	1,833.0	1,824.7	1,811.3	1,782.3	1,323.5	1,085.1	984.7	947.2	1,468.4	1,518.8	1,604.9	1,674.2
16	1,833.0	1,824.7	1,812.0	1,779.4	1,305.5	1,080.3	983.0	948.1	1,469.6	1,520.8	1,610.4	1,677.1
17	1,833.0	1,824.0	1,812.7	1,777.9	1,286.0	1,075.5	980.8	946.0	1,475.2	1,522.7	1,613.8	1,678.5
18	1,832.2	1,824.0	1,812.7	1,761.0	1,266.3	1,071.2	979.1	946.8	1,479.0	1,524.7	1,617.2	1,680.6
19	1,831.5	1,822.5	1,809.8	1,741.4	1,259.2	1,066.4	976.0	948.9	1,480.3	1,526.7	1,620.0	1,682.7
20	1,832.2	1,821.0	1,809.8	1,724.0	1,252.2	1,061.2	973.0	948.1	1,482.2	1,528.6	1,622.0	1,684.8
21	1,833.0	1,821.7	1,809.0	1,704.7	1,245.2	1,056.5	971.2	953.2	1,484.7	1,531.3	1,624.1	1,688.3
22	1,831.5	1,821.0	1,808.3	1,686.9	1,237.7	1,052.2	969.5	956.6	1,486.0	1,531.9	1,626.2	1,688.3
23	1,831.5	1,821.0	1,807.5	1,669.3	1,231.3	1,047.6	966.9	1,060.3	1,488.5	1,532.6	1,628.2	1,689.8
24	1,830.0	1,821.0	1,806.8	1,649.0	1,223.9	1,043.4	964.3	1,304.9	1,489.8	1,535.2	1,630.3	1,690.5
25	1,830.7	1,821.0	1,805.3	1,629.6	1,216.5	1,039.2	961.8	1,338.8	1,491.7	1,543.1	1,633.1	1,691.9
26	1,830.7	1,820.2	1,805.3	1,611.1	1,206.6	1,035.0	959.6	1,353.7	1,493.6	1,547.1	1,633.8	1,694.0
27	1,830.0	1,819.5	1,804.5	1,592.0	1,200.3	1,030.4	957.5	1,384.5	1,494.9	1,551.7	1,636.5	1,696.9
28	1,830.0	1,818.7	1,804.5	1,571.1	1,193.0	1,025.4	955.7	1,398.6	1,496.2	1,554.4	1,639.3	1,699.0
29	1,830.0		1,803.8	1,551.7	1,185.8	1,020.8	953.6	1,406.9	1,497.5	1,557.7	1,642.1	1,700.4
30	1,830.0		1,804.5	1,533.2	1,178.6	1,016.8	951.5	1,414.1	1,498.7	1,560.4	1,644.1	1,702.6
31	1,830.0		1,801.6	1,171.0			949.4	1,418.9	1,418.9	1,564.4	1,705.4	

Month	1998						Period 1969-1998		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage	
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum
Jan.	330.345	1,833.7	1	330.320	1,830.0	1	1,831.9	3,519.9	4,971.4
Feb.	330.320	1,830.0	1	330.245	1,818.7	28	1,824.3	3,503.2	4,952.1
Mar.	330.240	1,818.0	1	330.130	1,801.6	31	1,809.6	3,459.7	4,954.1
April	330.115	1,799.3	2	328.215	1,533.2	30	1,728.2	3,395.0	4,910.5
May	328.105	1,518.8	1	325.065	1,171.0	31	1,326.7	3,281.6	4,723.6
June	324.990	1,163.4	1	323.465	1,016.8	30	1,082.8	3,209.5	4,696.8
July	323.420	1,012.7	1	322.695	949.4	31	980.0	3,184.9	4,745.6
Aug.	327.305	1,418.9	31	322.600	941.3	1	1,062.2	3,262.6	4,861.4
Sept.	327.950	1,498.7	30	327.340	1,423.1	1	1,467.4	3,357.9	5,078.5
Oct.	328.450	1,564.4	31	327.960	1,500.0	1	1,525.5	3,515.3	5,515.1
Nov.	329.035	1,644.1	30	328.485	1,569.1	1	1,606.9	3,535.4	5,231.7
Dec.	329.470	1,705.4	31	329.050	1,646.2	1	1,676.6	3,541.8	4,970.7
Yearly	330.345	1,833.7		322.600	941.3		1,493.5	3,397.2	4,873.4
									1,290.5

* When necessary, the Commission may set temporary conservation levels

! And other days

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

85

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 139 river kilometers downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas and 442 river kilometers upstream from the Gulf of Mexico.

Maximum storage for period of record: 4,305.6 million cubic meters on October 19, 1958 with an elevation of 93.910 meters above mean sea level, U. S. C. & G. S. datum.

Storage Capacities
(1992 Survey)

Elevation Meters	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Thousands of Cubic Meters	Reservoir Area Hectares	Storage Volume Thousands of Cubic Meters	Type of Storage
53.340	Original River Bed at Dam Axis	0	0	67	Dead
61.965	Lowest Outlet (Mexican Penstock)	67	10	3,273,351	Silt & Conservation
91.805	Top of Conservation Storage *	3,273,418	35,281	623,589	Ordinary Flood
93.480	Top of Spillway Gates	3,897,007	39,678	993,201	Surcharge
95.770	Maximum Water Surface	4,890,208	46,322		

STORAGE IN MILLION CUBIC METERS AT 24:00 HOURS 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	692.2	657.8	694.6	684.2	327.4	346.7	340.5	306.6	624.6	758.4	791.3	810.1
2	692.2	659.6	695.8	678.8	328.5	346.0	340.5	304.9	626.3	758.4	790.6	809.4
3	693.4	660.2	695.8	670.3	328.8	345.6	340.1	303.6	628.1	757.7	790.6	810.1
4	695.2	662.6	695.6	659.6	326.7	346.0	340.1	301.9	628.1	755.1	792.0	810.1
5	696.5	663.8	697.7	649.0	323.2	346.7	340.5	301.5	629.2	755.1	792.6	808.8
6	698.3	664.4	698.3	638.5	319.3	347.5	341.2	301.9	631.5	759.0	794.6	808.8
7	699.5	665.0	699.5	627.5	316.2	348.6	341.6	302.2	632.1	760.3	795.3	809.4
8	698.9	665.6	699.5	615.5	312.0	349.0	341.9	301.9	635.0	762.9	796.0	807.4
9	697.1	668.0	699.5	600.8	307.3	348.6	342.3	301.5	636.1	765.5	796.0	806.7
10	695.2	668.0	698.3	583.7	296.6	348.6	343.4	300.9	637.3	766.8	797.3	806.7
11	694.0	667.4	697.7	564.7	282.4	348.6	342.7	300.2	638.5	767.5	798.0	806.7
12	692.8	668.0	580.2	548.7	272.2	349.0	341.2	299.6	639.6	768.8	799.3	805.4
13	692.2	669.1	703.9	539.3	273.1	349.8	339.7	298.2	639.6	769.5	802.0	802.7
14	691.5	671.5	704.5	523.9	278.6	349.7	337.9	297.6	640.2	769.5	803.4	800.7
15	689.1	673.3	705.1	510.8	286.9	350.5	337.5	296.9	644.3	768.8	804.0	799.3
16	687.9	675.8	708.2	493.0	294.9	349.4	337.5	297.2	647.2	768.2	804.7	798.0
17	686.1	677.0	709.4	470.1	303.6	347.9	336.8	297.2	662.0	769.5	806.1	796.0
18	684.8	678.8	710.7	449.7	311.3	346.0	334.2	300.6	681.2	772.7	807.4	796.0
19	681.8	681.0	710.7	430.0	318.3	346.9	330.6	307.6	703.2	772.7	808.1	794.6
20	680.0	683.0	710.7	409.7	327.8	343.4	327.4	314.1	714.4	776.0	809.4	794.6
21	678.8	684.2	710.7	389.7	336.8	341.9	325.3	322.5	724.5	781.3	808.8	794.0
22	677.6	686.1	710.7	377.6	339.4	340.5	323.9	328.8	734.6	785.3	808.8	794.0
23	675.2	687.3	711.3	367.0	339.4	340.1	322.8	332.4	743.5	787.3	809.4	794.6
24	672.1	687.3	710.7	356.2	339.7	339.7	322.1	335.3	748.7	788.6	810.1	794.0
25	669.1	688.5	709.4	347.9	339.7	339.4	321.1	336.8	752.5	789.3	810.8	793.3
26	667.4	690.9	708.2	339.7	340.8	339.7	319.0	355.4	755.1	790.6	810.8	793.3
27	665.6	692.8	705.7	332.4	342.3	339.0	316.9	438.0	757.1	790.6	810.8	793.3
28	664.4	694.0	702.0	328.1	344.1	338.3	314.1	598.1	758.4	790.6	810.8	793.3
29	663.2	698.3	705.7	325.6	345.3	340.1	311.3	615.5	759.0	790.6	810.1	793.3
30	660.8	695.2	705.7	325.3	346.0	340.5	309.6	620.6	759.0	790.6	810.8	789.3
31	659.0	689.7	689.7		346.4		307.9	624.0		790.6		788.0

Month	1998						Period 1954-1998		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage	
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum
Jan.	80.410	699.5	7	80.075	659.0	31	683.6	2,470.7	3,787.8
Feb.	80.365	694.0	28	80.065	657.8	1	674.7	2,364.4	3,712.2
Mar.	80.505	711.3	23	80.330	689.7	31	702.9	2,362.6	3,689.1
April	80.285	684.2	1	76.540	325.3	30	494.6	2,257.8	3,644.4
May	76.830	346.4	31	75.735	272.2	12	319.2	2,078.9	3,540.0
June	76.885	350.5	15	76.720	338.3	28	345.1	1,994.7	3,440.3
July	76.790	343.4	10	76.290	307.9	31	331.3	2,056.0	3,321.4
Aug.	79.775	624.0	31	76.125	296.9	15	353.0	2,025.2	3,418.5
Sept.	80.880	759.0	29	79.780	624.6	1	680.4	2,128.5	3,541.4
Oct.	81.125	790.6	26	80.850	755.1	1	773.5	2,374.9	4,009.2
Nov.	81.270	810.8	25	81.120	790.6	1	802.7	2,462.3	3,854.0
Dec.	81.265	810.1	1	81.100	788.0	31	800.1	2,502.3	3,860.4
Yearly	81.270	810.8		75.735	272.2		577.8	2,256.5	3,410.6
									577.8

* When necessary, the Commission may set temporary conservation levels

† And other days

QUALITY OF WATER - 1998

08-3640.00 RIO GRANDE AT EL PASO, TEXAS

LOCATION: At gaging station on Courchesne Bridge at river kilometer 2,021, 2.7 river kilometers upstream from American Dam, and 8.9 kilometers upstream from Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua.

RECORDS: Chemical analyses, February 1930 through current year (prior to July 1986 sampling at American Dam); biochemical analyses, September 1943 through 1972 and February 1976 through current year (prior to 1976 samples taken from Franklin Canal at El Paso, Texas); specific conductance, 1930 through 1932 and 1937 through current year (prior to July 1986 samples taken at American Dam); suspended silt, 1947 through 1976 (samples taken at American Dam).

REMARKS: Sampling by International Boundary and Water Commission; chemical analyses by U. S. Geological Survey, biochemical analyses by Haskell R. Street Wastewater Treatment Plant laboratory in El Paso; specific conductance determinations by International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by U. S. Geological Survey.

1998 Date	Time Standard	Streamflow Momentary CMS	Specific Conductance Micro- siemens/ cm	pH Units	Water Temper- ature Deg C	Hardness, Total (as CaCO ₃) mg/L	Hardness, Noncarbonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 28	1315	9.60	1,260	8.2	10.0	270	80	78	17
Jan. 28	1330	9.60	1,260	8.2	10.0	270	82	79	17
Feb. 19	0815	7.79	1,360	8.2	6.5	300	100	86	20
Mar. 24	1200	28.9	861	8.3	15.0	200	53	57	13
April 28	0945	22.9	973	8.4	14.0	220	49	65	14
May 12	0930	19.3	1,020	8.6	17.0	230	55	66	15
June 23	0930	27.7	902	8.3	22.5	210	48	60	14
July 15	0945	30.9	878	8.4	25.5	190	31	57	13
Aug. 12	0915	29.2	966	8.3	26.0	210	52	62	14
Sept. 3	0930	29.3	938	8.3	22.5	210	45	60	14
Oct. 21	0845	10.4	1,500	8.3	13.3	340	130	100	23
Nov. 19	0900	5.25	1,800	8.4	13.7	370	N.R.	100	26
Dec. 22	1400	3.77	N.R.	8.2	6.5	400	N.R.	120	27

1998 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO ₃) mg/L	Sulfate ion (SO ₄) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO ₂) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 28	150	4	7.6	188	230	150	13	762
Jan. 28	150	4	8.0	188	230	150	13	760
Feb. 3	167	4	8.1	190	230	140	13	N.R.
Mar. 24	99	3	6.5	144	160	78	10	511
April 28	110	3	6.9	173	190	85	13	587
May 12	110	3	7.3	175	200	92	13	612
June 23	97	3	6.9	160	170	72	14	530
July 15	91	3	6.8	164	160	68	15	508
Aug. 12	110	3	6.5	162	190	84	16	577
Sept. 3	110	3	6.5	164	170	76	16	553
Oct. 21	189	4	9.5	218	320	150	20	N.R.
Nov. 19	249	6	11.0	N.R.	400	220	21	N.R.
Dec. 22	262	6	12.0	N.R.	420	220	24	N.R.

N.R. - Not Reported

QUALITY OF WATER - 1998

OB-3640.00 RIO GRANDE AT EL PASO, TEXAS

		Water Temperature	Oxygen Dissolved (DO)	pH	Coli-form, Fecal Colonies /100 mL	Oxygen Demand Bio-Chemical (BOD) 5 Day mg/L			Water Temperature	Oxygen Dissolved (DO)	pH	Coli-form, Fecal Colonies /100 mL	Oxygen Demand Bio-Chemical (BOD) 5 Day mg/L
1998	Date	Deg C	mg/L	Units			1998	Date	Deg C	mg/L	Units		
Jan.	8	4.4	14.1	8.2	590	2	July	9	25.0	12.0	7.6	960	3
	15	5.6	11.1	8.2	280	3		16	25.6	12.0	8.1	300	3
	22	7.8	10.3	7.9	430	3		23	25.0	11.4	7.8	320	2
	29	7.2	10.5	7.6	170	2		30	25.6	12.2	7.8	330	1
Feb.	5	6.7	10.5	8.0	180	3	Aug.	6	23.9	11.4	7.7	950	2
	12	7.8	10.3	7.8	130	3		13	25.6	12.0	7.5	150	3
	19	6.7	10.8	8.1	930	3		20	25.6	12.2	7.7	600	2
	26	6.1	10.8	7.7	240	4		27	26.1	12.2	7.5	1200	2
Mar.	5	10.6	9.6	7.7	250	3	Sept.	3	22.8	10.9	7.8	1080	2
	12	8.3	10.3	7.8	70	4		10	22.2	10.6	7.8	360	2
	19	11.1	9.6	7.8	130	5		17	22.8	10.8	7.6	730	3
	26	16.7	8.4	7.7	380	3		24	22.2	10.6	7.9	1070	3
April	2	11.7	9.4	7.8	180	3	Oct.	1	22.2	8.6	8.0	20800	5
	9	16.1	9.5	7.4	250	4		8	16.1	7.6	7.5	<1	2
	16	12.2	9.4	7.6	80	4		15	18.3	8.6	7.8	1130	4
	23	16.1	9.3	7.8	180	2		22	12.8	6.4	7.6	1130	3
	30	16.7	8.2	7.9	140	3		29	15.6	7.4	7.7	2070	3
May	7	17.2	8.4	7.5	180	2	Nov.	5	11.7	6.0	7.9	450	1
	14	18.3	9.0	6.9	110	2		12	11.7	6.0	7.8	410	3
	21	21.1	10.2	7.9	210	4		19	12.2	N.R.	8.0	580	2
	28	20.6	9.8	7.5	180	4		26	NST	NST	NST	NST	NST
June	4	20.6	10.2	7.9	170	2	Dec.	3	9.4	10.3	7.7	250	5
	11	17.2	8.6	7.3	390	8		10	5.6	11.1	7.9	300	2
	18	20.6	10.0	7.7	360	4		17	7.8	10.5	7.5	80	2
	25	23.9	11.4	8.0	330	3		24	NST	NST	NST	NST	NST
July	2	24.4	11.6	8.0	280	2							

NST - No Sample Taken

N.R. - Not Reported

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				990	1,080	1,020	890					
2		1,310	1,130			960		1,040	1,290		1,990	1,970
3				980	1,130			970	1,070	1,280	2,010	1,940
4	2,010				1,040							
5												
6		1,330	1,140	990	1,180		970	990		1,290	2,030	
7	1,970										1,970	
8				980	1,150	900	970	990	1,040	1,290	1,920	
9	1,960	1,540	990			940	970	1,010	1,050	1,230	1,960	1,940
10				980							1,980	1,900
11					1,050	910		1,000	1,150			
12	1,950	1,410	1,010	1,060	950						1,970	
13					1,010	1,100	1,020	880	1,090	1,610		
14	1,340				1,100		920			1,590		1,910
15												
16	1,970		970						1,110	1,580	1,960	1,920
17		1,230				990	900	980				
18		1,430	940	1,020	1,090			1,280			1,960	1,930
19					930			950		1,630	1,970	
20	1,400	1,400	900	1,010	1,100	920						
21	1,380							960	1,270	1,570		
22				1,060	1,190	950	950					
23	1,380	1,160	880			950	950	930	1,260	1,630	1,930	
24									1,250		1,950	
25		1,290	960	1,110								
26	1,330				1,100			940		2,010		
27		1,270	960	1,150	1,140							
28	1,370				1,060	1,080		930	1,170	2,020		
29									1,300			
30	1,370			980					1,990	1,970		
31								1,040	980			

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

QUALITY OF WATER - 1988

RIO GRANDE AT RIVERSIDE CANAL HEADING NEAR EL PASO, TEXAS AND CD. JUAREZ, CHIHUAHUA

LOCATION: At river kilometer 1,991, 15.3 kilometers downstream from the Haskell R. Street Wastewater Treatment Plant and 26.8 river kilometers downstream from the American Dam at El Paso, Texas.

RECORDS: Biochemical analyses, February 1976 through current year. Samples also collected quarterly and analyses made by the Texas Natural Resource Conservation Commission at a location 1.6 km. upstream at Ysleta-Zaragoza Bridge, through 1972 and May 1975 through current year.

REMARKS: Sampling by International Boundary and Water Commission. Analyses by the Haskell R. Street Wastewater Treatment Plant laboratory in El Paso.

1998 Date	Water Temper- ature Deg C	Oxygen Dissolved (DO) mg/L	pH	Coli- form, Fecal Colonies	Oxygen Demand Bio- Chemical (BOD) 5 Day mg/L	1998 Date	Water Temper- ature Deg C	Oxygen Dissolved (DO) mg/L	pH	Coli- form, Fecal Colonies	Oxygen Demand Bio- Chemical (BOD) 5 Day mg/L
				/100 mL						/100 mL	
Jan. 15 22 29 Feb. 5 12 19 26 Mar. 5 12 19 26 Apr. 2 9 16 17 23 30 May 7 14 21 28 June 4 11 18 25 July 2	8	10.5	7.9	<1	12	July 16 23 30 Aug. 6 13 20 27 Sept. 3 10 17 24 Oct. 1 8 15 22 29 Nov. 5 12 19 26 Dec. 3 10 17 24	25.0	11.8	6.9	<1	8
	15	8.9	10.2	8.0	60		23.3	11.0	7.5	<1	9
	22	10.0	9.8	8.0	20		24.4	11.6	7.3	230	6
	29	9.4	10.0	7.5	20		25.6	12.2	7.1	320	7
	Feb. 5	8.3	10.3	7.6	10		23.9	11.2	7.3	350	8
	12	10.0	9.8	7.5	10		25.6	12.0	7.0	5,200	15
Feb. 19 26 Mar. 5 12 19 26 Apr. 2 9 16 17 23 30 May 7 14 21 28 June 4 11 18 25 July 2	8.9	10.3	7.6	30	8		25.0	11.8	7.3	540	11
	19	8.9	10.3	7.6	8		25.0	11.8	7.3	540	11
	26	6.7	10.3	7.7	<1		26.7	12.6	7.4	490	8
	Mar. 5	12.8	9.4	7.8	50		22.8	11.0	7.4	<1	10
	12	9.4	10.0	7.8	30		22.2	11.0	8.0	230	24
	19	12.8	9.2	7.7	10		22.2	10.6	7.3	1,240	11
April 2 9 16 23 30 May 7 14 21 28 June 4 11 18 25 July 2	18.3	8.2	7.6	60	9		22.2	10.6	7.6	450	11
	2	12.2	9.4	7.5	20		23.3	11.0	7.3	44,500	19
	9	25.0	9.7	7.6	<1		16.7	8.0	7.2	960	7
	16	13.3	9.4	7.5	10		20.0	9.6	7.5	100	9
	23	18.3	9.0	7.6	10		13.9	7.0	7.4	700	8
	30	17.8	8.3	7.6	90		17.8	8.4	7.6	920	7
May 7 14 21 28 June 4 11 18 25 July 2	18.3	8.4	7.7	190	8		14.4	7.4	7.7	340	6
	14	18.3	9.0	7.2	300		13.9	7.0	7.5	50	8
	21	21.7	10.4	7.7	310		15.0	7.2	7.6	160	4
	28	22.8	10.8	7.9	210		NST	NST	NST	NST	NST
	June 4	18.9	8.1	8.1	480		12.2	9.6	7.3	50	19
	11	18.3	9.2	7.3	1,400		5.6	10.8	7.4	270	7
June 18 25 July 2	20.6	10.0	8.0	730	7		9.4	10.0	7.7	370	18
	25	25.0	12.0	8.1	140		NST	NST	NST	NST	NST
	July 2	24.4	11.6	7.6	520		24	NST	NST	NST	NST

NST= No Sample Taken

08-3715.00 RIO GRANDE ABOVE RIO CONCHOS NEAR PRESIDIO, TEXAS AND OJINAGA, CHIHUAHUA

LOCATION: Gaging station at river kilometer 1,555; 10.5 river kilometers upstream from the Rio Conchos.

RECORDS: Chemical analyses, February 1933 through 1981; specific conductance, 1931 and 1935 through current year.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U.S. Geological Survey; determinations for specific conductance by International Boundary and Water Commission. Results of biochemical analyses by the International Boundary and Water Commission and the Texas Natural Resource Conservation Commission, November 1977 through current year, available upon request.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

January 6 20	March 3 16	May 5 18	July 8 23	September 3 14	November 3 10
2,810 3,070	3,850 3,650	3,550 4,470	2,050 3,110	1,860 2,570	2,510 2,510
February 3 17	April 2 20	June 2 16	August 4 5 27	October 5 19 21	December 2 21
2,840 2,900	4,360 4,000	4,140 2,760	2,980 1,970 2,840	2,840 2,730 1,020	2,750 2,800

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

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QUALITY OF WATER - 1998

08-3730.00 RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

LOCATION: At gaging station, 2.5 river kilometers from the confluence with the Rio Grande, which located at river kilometer 1,547.

RECORDS: Chemical analyses, February 1935 through 1981; suspended silt, 1956 through 1979, specific conductance, 1935 through current year.

REMARKS: Sampling and determinations for suspended silt and specific conductance by the International Boundary and Water Commission; chemical analyses by the U. S. Geological Survey.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1							1,600					
2												
3												
4												
5												
6							1,660					
7							1,640					
8						1,930						
9												
10												
11					1,590							
12					2,040							
13					1,590							
14					1,600							2,310
15				2,200								
16							2,660					
17							1,640					
18							1,650					
19							1,670					
20											2,300	
21							1,660		2,550			
22							1,580					
23												
24												
25				2,090								
26												
27												
28												
29												
30												
31												

08-3742.00 RIO GRANDE BELOW RIO CONCHOS NEAR PRESIDIO, TEXAS AND OJINAGA, CHIHUAHUA

LOCATION: Gaging station at river kilometer 1,259; 0.6 river kilometer downstream from Alamito Creek and 18.7 river kilometers downstream from the Rio Conchos.

RECORDS: Specific conductance, 1956 through current year.

REMARKS: Sampling and determinations for specific conductance by the International Boundary and Water Commission. Results of biochemical analyses by the International Boundary and Water Commission and the Texas Natural Resource Conservation Commission, November 1977 through current year, available upon request.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

January	March	May	July	September	November
6 2,740 21 2,940	4 3,530 18 3,070	6 3,000 20 2,340	7 1,790 22 1,400	8 2,330 21 2,780	4 2,500 9 2,410 18 2,750
February	April	June	August	October	December
4 2,830 19 3,010	6 3,190 22 3,000	4 2,240 18 2,330	6 1,370 24 1,660	6 2,720 21 830 26 1,660	3 2,760 16 2,670

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

QUALITY OF WATER - 1998

08-3772.00 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TEXAS AND RANCHO SANTA ROSA, COAHUILA

LOCATION: Gaging station at river kilometer 1,058, about 20.8 kilometers west of Langtry, Texas.
RECORDS: Chemical analyses, March 1969 through 1970 and October 1974 through current year; biochemical, October 1974 through 1995; suspended silt, 1969 through current year; specific conductance, 1969 through 1981, 1983, 1985 through current year.

REMARKS: Sampling and analyses by U. S. Geological Survey; sampling and determinations for suspended silt and specific conductance by the International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey.

1998 Date	Time Std.	* Stream flow, Momen- tary CMS	Specific Conduct- ance Micro- siemens	pH	Water Temper- ature Deg C	Hard- ness, Total (as CaCO ₃) mg/L	Hard- ness, Noncar- bonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dis- solved mg/L	Magne- sium ion (Mg), Dis- solved mg/L	Sodium ion (Na), Dis- solved mg/L	Sodium Adsorp- tion Ratio (SAR)	Potassium Ion (K) Dissolved mg/L
Jan. 28	1110	11.9	1,700	8.3	14.5	320	180	82	28.0	215	5	7.0
Mar. 11	1130	8.64	1,610	8.1	13.5	330	180	86	28.0	195	5	6.8
April 29	0950	6.91	1,260	8.1	20.5	310	160	78	27.0	135	3	6.2
May 27	1130	7.76	711	8.2	26.5	210	64	59	16.0	71	2	4.9
June 23	1020	10.1	822	8.2	27.0	220	87	65	14.0	76	2	4.8
July 29	1000	11.9	812	8.3	26.0	260	120	77	16.0	71	2	5.0
Aug. 21	1450	113	1,500	7.7	28.0	320	210	110	12.0	186	5	7.4
Sept. 1	1230	12.4	850	8.0	29.0	260	130	85	11.0	67	2	5.1
Dec. 16	1210	12.7	1,620	8.0	13.0	330	170	86	27.0	211	5	7.3

1998 Date	Alka- linity Total (as CaCO ₃) mg/L	Sulfate ion (SO ₄) Dis- solved mg/L	Chloride ion (Cl), Dis- solved mg/L	Silica (SiO ₂), Dis- solved mg/L	Oxygen, Dis- solved (DO) mg/L	Coli- form, Fecal Cols./ 100 mL	Tur- bidity NTU	Solids Dis- solved (Calcu- lated) mg/L	Solids Dis- solved (Residue + 180 Deg C) mg/L	Sus- pended Sedi- ment mg/L
Jan. 28	140	340	230	2.7	12.1	N.A.	64.0	991	1,030	151
Mar. 11	147	310	220	12.0	10.7	N.A.	65.0	957	998	172
April 29	144	280	140	19.0	8.2	N.A.	65.0	778	820	150
May 27	151	130	54	16.0	7.9	N.A.	78.0	448	458	170
June 23	133	170	58	16.0	7.5	N.A.	160	489	526	330
July 29	140	210	46	16.0	7.2	N.A.	250	531	555	N.R.
Aug. 21	115	390	140	13.0	4.2	N.A.	N.R.	N.R.	N.R.	N.R.
Sept. 1	125	200	48	14.0	6.6	N.A.	N.R.	N.R.	N.R.	N.R.
Dec. 16	158	340	210	12.0	10.0	N.A.	N.R.	N.R.	N.R.	N.R.

* Flow provided by the US Geological Survey

N.A.- Not Analyzed

N.R.- Not Reported

SUSPENDED SILT - 1998

1998 Date	Time Std.	Stream- flow, Momen- tary CMS	Gravimetric Percent	1998 Date	Time Std.	Stream- flow, Momen- tary CMS	Gravimetric Percent	1998 Date	Time Std.	Stream- flow, Momen- tary CMS	Gravi- metric Percent
Jan. 16	1100	15.6	0.0200	June 01	0900	9.09	0.0102	Oct. 19	1100	10.1	0.0158
Feb. 03	1045	14.0	0.0243	June 15	0930	9.74	0.0308	Nov. 03	1030	19.4	0.2649
Feb. 13	1200	14.2	0.0195	July 06	1115	17.9	1.0030	Nov. 13	1030	18.3	0.0124
Mar. 02	1100	13.3	0.0151	July 20	1000	10.6	0.0230	Nov. 16	1200	36.2	1.4560
Mar. 16	1130	18.5	0.0853	Aug. 03	1100	9.66	0.1026	Dec. 07	1015	15.1	0.0113
Apr. 06	1000	8.86	0.0134	Aug. 17	1100	11.7	0.0807	Dec. 21	1200	16.6	0.0084
Apr. 20	0915	8.41	0.0046	Aug. 31	1130	16.4	0.1210				
Apr. 04	0930	11.4	0.0206	Sep. 21	1100	8.55	0.6848				
May 18	0945	8.27	0.0110	Oct. 01	1015	7.87	0.0135				

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

January 5 16	March 2 16	May 4 18	July 6 20	September 22	November 3 13
1,760 1,770	1,750 1,240	1,410 1,300	1,160 770	950	900 1,640
February 3 13	April 6 20	June 1 18	August 3 17 31	October 1 19	December 7 21
1,590 1,860	1,640 1,290	720 640	770 500 360	930 1,170	1,680 1,740

QUALITY OF WATER - 1998

08-4474.10 PECOS RIVER NEAR LANGTRY, TEXAS

LOCATION: At gaging station, 24.1 river kilometers from the confluence with the Rio Grande, which is located at river kilometer 991.4.

RECORDS: Chemical analyses, 1967 through current year; biochemical analyses, October 1974 through 1995; suspended silt, November 1954 through 1976; specific conductance daily, 1969 through September 1985 and biweekly through current year.

REMARKS: Sampling and analyses by U.S. Geological Survey; sampling and determinations for specific conductance by the International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey.

1998 Date	Time Std. Date	Stream flow, Momen- tary CMS	Specific Conduct- ance Micro- siemens /cm	pH Units	Water Temper- ature Deg C	Hard- ness, Total (as CaCO ₃) mg/L	Hard- ness, Noncar- bonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dis- solved mg/L	Magne- sium ion (Mg), Dis- solved mg/L	Sodium ion (Na), Dis- solved mg/L	Sodium Adsorp- tion Ratio (SAR)	Potassium ion (K) Dissolved mg/L
Jan. 29	1410	4.02	4,010	8.2	14.0	760	610	160	84	538	8	8.1
Mar. 10	1530	3.62	4,280	8.1	15.0	780	650	170	86	552	9	8.6
Apr. 28	1410	2.80	4,170	8.2	23.5	760	650	160	88	544	9	8.9
May 26	1600	2.32	3,590	8.2	27.5	650	550	130	77	487	8	7.9
June 24	0950	2.07	3,330	8.0	28.0	580	490	120	69	425	8	8.3
July 28	1310	1.42	2,980	8.1	29.5	540	450	110	64	400	8	7.0
Aug. 27	0940	242	716	7.9	25.0	150	73	44	10	62	2	5.4
Sept. 2	1210	12.3	3,080	8.3	29.0	630	470	150	62	382	7	8.8
Dec. 15	1400	4.45	3,660	8.5	11.0	740	590	170	78	461	7	8.8

1998 Date	Alka- linity Total (as CaCO ₃) Dis- solved mg/L	Sulfate ion (SO ₄) Dis- solved mg/L	Chloride ion (Cl) Dis- solved mg/L	Silica (SiO ₂) Dis- solved mg/L	Oxygen, Dis- solved (DO) mg/L	Coli- form, Fecal Cols./ 100 mL	Oxygen Demand, Bio- Chemical (BOD) 5 Day mg/L	Tur- bidity NTU	Solids Dis- solved (Calcu- lated) mg/L	Solids Dis- solved (Residue at 180 Deg C) mg/L	Solids Dis- solved mg/L	Sus- pended Sedi- ment mg/L
Jan. 29	155	530	900	12.0	9.8	N.A.	N.A.	0.35	2,340	2,430	66	
Mar. 10	134	570	990	9.8	10.4	N.A.	N.A.	0.22	2,470	2,560	12	
Apr. 28	112	560	950	9.1	8.7	N.A.	N.A.	0.67	2,400	2,350	<1	
May 26	100	470	800	11.0	8.0	N.A.	N.A.	0.34	2,060	2,140	5	
June 24	96	430	730	15.0	7.3	N.A.	N.A.	0.32	1,850	2,010	1	
July 28	91	380	660	17.0	N.R.	N.A.	N.A.	N.R.	N.R.	N.R.	N.R.	
Aug. 27	77	68	100	8.8	6.6	N.A.	N.A.	N.R.	N.R.	N.R.	N.R.	
Sept. 2	162	380	640	17.0	7.3	N.A.	N.A.	N.R.	N.R.	N.R.	N.R.	
Dec. 16	155	490	800	15.0	10.1	N.A.	N.A.	N.R.	N.R.	N.R.	N.R.	

N.A. - Not Analyzed

N.R. - Not Reported

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

January 5 16	March 2 17	May 4 18	July 6 20	September 4 21	November 3 16
3,510 1,150	4,200 3,920	3,970 3,760	3,180 3,010	3,170 3,090	2,740 3,400
February 2 13	April 6 20	June 1 15	August 3 17	October 5 19	December 4 14
3,950 4,050	4,370 4,290	3,540 3,180	2,980 2,450	3,050 2,800	3,550 3,440

08-4494.00 DEVILS RIVER AT PAFFORD CROSSING NEAR COMSTOCK, TEXAS

LOCATION: At gaging station 41.0 river kilometers from the confluence with the Rio Grande, which is located at river kilometer 925.

RECORDS: Daily specific conductance, 1968 through September 1985; weekly or biweekly specific conductance through current year.

REMARKS: Sampling and determinations for specific conductance by the U. S. Geological Survey through September 1985. Sampling prior to 1978 and since October 1985 by the International Boundary and Water Commission. Chemical and biochemical analyses, 1978 through current year, available from U. S. Geological Survey.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

January 5 16	March 2 16	May 4 18	July 6 20	September 4 21	November 2 17
360 350	390 290	370 350	300 340	380 310	400 380
February 2 13	April 6 20	June 1 15	August 3 17	October 5 19	December 7 21
410 420	410 380	360 370	340 280	370 390	390 420

08-4509.00 RIO GRANDE BELOW AMISTAD DAM NEAR CD. ACUNA, COAHUILA AND DEL RIO, TEXAS

LOCATION: Gaging station at river kilometer 920.3, 3.4 river kilometers downstream from Amistad Dam.

RECORDS: Chemical analyses, July 1968 through current year; suspended silt, 1969 through 1976; specific conductance 1968 through current year.

REMARKS: Sampling for chemical analyses by the International Boundary and Water Commission—analyses by the

REMARKS: Sampling for chemical analyses by the International Boundary and Water Commission, analyses by the U. S. Geological Survey. Sampling and determinations for specific conductance by the International Boundary and Water Commission.

1998	Time	Streamflow Momentary	Specific Conductance	Water Temper- ature	Hardness, Total (as CaCO ₃)	Hardness, Noncarbonate (as CaCO ₃)	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	CMS	Micro- siemens /cm	pH	Deg C	mg/L	mg/L	mg/L
Jan. 29	0920	15.5	1,180	8.0	12.5	270	150	72
Feb. 18	0815	6.29	1,120	8.0	13.0	260	190	70
Mar. 12	1020	41.3	1,170	8.2	13.5	270	150	72
April. 30	0900	260	1,180	8.0	17.5	280	110	73
May 28	1030	112	1,160	7.9	20.0	290	160	75
June 17	0930	113	1,220	7.8	22.0	270	160	71
July 30	0900	49.0	1,210	7.6	24.0	290	150	74
Aug. 19	0800	51.8	1,150	7.7	25.0	270	160	69
Sept. 3	1200	2.10	645	N.R.	26.0	N.R.	N.R.	N.R.

1998	Sodium ion (Na ⁺), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K ⁺) Dissolved	Alkalinity Total (as CaCO ₃)	Sulfate ion (SO ₄ ²⁻) Dissolved	Chloride ion (Cl ⁻), Dissolved	Silica (SiO ₂) Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 29	130	3	4.8	N.R.	230	150	12	703
Feb. 18	121	3	4.9	72	220	160	12	650
Mar. 12	122	3	5.1	N.R.	220	150	11	680
Apr. 30	124	3	5.2	N.R.	220	160	11	717
May 28	132	3	5.4	N.R.	220	160	12	716
June 17	129	3	5.7	N.R.	220	170	13	696
July 30	133	3	5.0	133	220	170	14	718
Aug. 19	128	3	5.0	N.R.	200	150	15	658
Sept. 3	52	N.R.	N.R.	113	N.R.	N.R.	N.R.	N.R.

N.R.- Not Reported

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	1,140	1,270	1,150	1,220	1,190	1,260	1,230	1,220	630	490	910	1,020	
2													
3													
4								1,220	600	570	920		
5													
6	1,170	1,200	1,150	1,190	1,190	1,260	1,230	1,240	1,250	720	920	1,000	
7													
8													
9								1,200	500	710	920		
10													
11	1,160	1,170	1,150	1,210	1,210	1,260	1,230	1,230	1,170	580	820	930	
12													
13													
14								1,220	1,200	620	900		
15													
16	1,210	1,180	1,160	1,210	1,210	1,260	1,230	1,250	1,190	620	900	960	
17													
18													
19								1,240	1,120	510	890		
20													
21	1,240	1,160	1,150	1,190	1,240	1,260	1,230	1,220	1,190	530	860	950	
22													
23													
24								1,210	790	590	920		
25													
26	1,210	1,150	1,210	1,210	1,250	1,260	1,230	1,240	940	910	1,000	960	
27													
28													
29								1,240	590	490	930		
30													
31								1,220	680	480	930	1,020	

QUALITY OF WATER - 1998

08-4557.00 RIO GRANDE NEAR JIMENEZ, COAHUILA AND QUEMADO, TEXAS

LOCATION: Near gaging station at Maverick Canal Headgates. The canal intake is at river kilometer 875, 21.5 river kilometers above the gaging station.

RECORDS: Specific conductance, 1954 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,130	1,070	1,180	1,280	1,240	1,250	1,200	1,140	740	750	920	960
2	1,160	1,090	1,170	1,340	1,240	1,240	1,200	1,160	750	710	930	880
3	1,160	1,090	1,180	1,310	1,190	1,200	1,210	1,160	750	770	930	900
4	1,150	1,090	1,170	1,350	1,240	1,240	1,200	1,180	750	780	930	910
5	1,160	1,090	1,180	1,280	1,230	1,240	1,200	1,170	750	710	930	910
6	1,160	1,090	1,140	1,340	1,190	1,230	1,190	1,160	750	790	930	930
7	1,160	1,100	1,160	1,340	1,230	1,240	1,200	1,170	760	790	920	900
8	1,160	1,100	1,160	1,300	1,240	1,210	1,200	1,170	760	790	920	920
9	1,160	1,100	1,140	1,320	1,210	1,240	1,210	1,160	750	790	930	910
10	1,160	1,090	1,150	1,340	1,230	1,240	1,200	1,180	750	790	920	920
11	1,160	1,100	1,130	1,330	1,210	1,240	1,200	1,170	750	790	930	910
12	1,160	1,100	1,150	1,340	1,240	1,240	1,200	1,160	760	760	920	920
13	1,160	1,100	1,140	1,290	1,240	1,230	1,200	1,160	750	730	930	920
14	1,160	1,100	1,140	1,340	1,240	1,220	1,190	1,160	740	790	930	910
15	1,160	1,090	1,140	1,340	1,210	1,240	1,200	1,160	750	740	940	920
16	1,170	1,100	1,140	1,290	1,240	1,240	1,200	1,170	740	790	930	920
17	1,160	1,090	1,140	1,330	1,230	1,240	1,210	1,160	760	790	930	930
18	1,160	1,100	1,140	1,290	1,240	1,240	1,200	1,170	760	790	930	910
19	1,160	1,090	1,140	1,340	1,210	1,210	1,200	1,170	740	790	930	900
20	1,160	1,100	1,140	1,310	1,190	1,240	1,210	1,170	740	730	940	920
21	1,160	1,090	1,140	1,280	1,220	1,250	1,200	1,170	750	760	930	910
22	1,160	1,100	1,140	1,270	1,240	1,240	1,200	1,170	750	790	940	910
23	1,160	1,090	1,150	1,340	1,250	1,240	1,210	1,160	750	790	940	920
24	1,160	1,090	1,150	1,270	1,240	1,250	1,230	240	750	790	930	920
25	1,160	1,090	1,140	1,300	1,200	1,240	1,200	290	750	790	930	910
26	1,160	1,090	1,140	1,350	1,240	1,240	1,200	210	750	790	930	920
27	1,160	1,090	1,140	1,280	1,200	1,230	1,190	250	750	790	930	920
28	1,160	1,090	1,130	1,270	1,250	1,240	1,200	900	750	720	930	920
29	1,170		1,140	1,340	1,240	1,260	1,200	950	750	790	940	910
30	1,160		1,140	1,280	1,230	1,230	1,200	970	750	790	930	900
31	1,160		1,150		1,250		1,200	1,160				930

08-4587.00 RIO GRANDE NEAR EL INDIO, TEXAS AND VILLA GUERRERO, COAHUILA

LOCATION: Gaging station at river kilometer 741, 57.8 river kilometers downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila.

RECORDS: Specific conductance 1954 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

January	March	May	July	September	November
7 1,100	4 1,120	6 1,200	15 1,190	16 1,160	4 1,060
21 1,150	18 1,130				18 1,020
February	April	June	August	October	December
4 1,110	1 1,190	3 1,230	5 1,190	7 900	2 1,060
18 1,110	15 1,160	30 1,240	19 990	21 830	16 1,070

QUALITY OF WATER - 1998

08-4590.00 RIO GRANDE AT LAREDO, TEXAS AND NUEVO LAREDO TAMAULIPAS

LOCATION: Samples for biochemical analyses, specific conductance, and suspended silt collected at the Laredo Water Plant, river kilometer 586.

RECORDS: Chemical analyses, 1955 through 1976; chemical and biochemical analyses, 1973 through September 1986; biochemical analyses, September 1968 through current year; suspended silt, 1953 through current year; specific conductance, 1948-1949 and 1955 through current year.

REMARKS: Field parameter samples for biochemical analyses, suspended silt and specific conductance collected and analyzed by the International Boundary and Water Commission and the Texas Natural Resource Conservation Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, available from U. S. Geological Survey through September 1986.

1998 Date	Time Standard	Streamflow Momentary CMS	Specific Conductance Micro- siemens /cm	pH Units	Water Tempera- ture Deg C	Hardness, Total (as CaCO ₃) mg/L	Hardness, Noncarbonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 28	0930	36.0	1,250	8.1	14.0	290	180	79	23
Feb. 24	1310	36.0	1,170	8.0	19.0	310	170	84	22
Mar. 31	1030	30.0	1,210	8.1	22.0	290	170	79	23
Apr. 27	1300	246	1,200	8.0	25.0	290	170	77	23
May 27	1100	110	1,240	8.1	27.0	290	160	76	24
June 16	1030	99.4	1,200	8.4	30.5	280	160	75	23
July 21	1230	35.4	1,280	8.0	29.5	290	180	71	26
Aug. 12	1130	36.0	1,260	8.3	28.5	290	180	72	26
Aug. 26	1500	3,140	219	7.5	27.0	80	15	28	3
Sept. 22	1000	39.1	720	7.9	27.0	190	100	57	11
Oct. 14	1050	2.32	1,190	8.0	N.R.	330	210	93	23
Nov. 19	1000	24.9	1,100	8.1	22.0	290	170	82	21
Dec. 16	1025	18.7	1,280	8.0	14.0	350	200	100	25

1998 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO ₃) mg/L	Sulfate ion (SO ₄) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO ₂) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 28	125	3	4.3	N.R.	230	150	8.2	N.A.
Feb. 24	126	3	4.7	138	220	150	10.0	N.A.
Mar. 31	128	3	5.0	125	230	150	10.0	N.A.
Apr. 27	128	3	5.2	121	220	160	12.0	N.A.
May 27	136	3	5.3	126	230	170	11.0	N.A.
June 16	131	3	5.6	126	220	160	12.0	N.A.
July 21	145	4	5.5	109	230	170	14.0	N.A.
Aug. 12	144	4	5.5	106	230	170	14.0	N.A.
Aug. 26	6	0	2.7	65	16	6	5.7	N.A.
Sept. 22	58	2	4.9	88	120	78	7.8	N.A.
Oct. 14	116	3	5.0	N.R.	210	160	14.0	N.A.
Nov. 19	101	3	3.8	121	200	140	9.6	N.A.
Dec. 16	116	3	4.2	N.R.	240	170	14.0	N.A.

N.A. - Not Analyzed

N.R. - Not Reported

QUALITY OF WATER - 1998

08-4590.00 RIO GRANDE AT LAREDO WATER PLANT, LAREDO, TEXAS AND NUEVO LAREDO, TAMAULIPAS

SUSPENDED SILT - 1998

Month	Monthly Weight Megagrams		Number of Samples	Gravimetric Percentages			Silt Volume Thousand Cubic Meters**		
	Water	Silt		Composite	Maximum Sample*	Minimum Sample*			
Jan.	105,391,000	6,430	31	0.0061	0.0095	0.0066	6.0		
Feb.	86,244,000	1,980	28	0.0023	0.0081	0.0085	1.8		
Mar.	91,653,000	4,310	31	0.0047	0.0149	0.0068	4.0		
April	256,798,000	53,160	30	0.0207	0.0311	0.0060	49.8		
May	448,312,000	38,110	31	0.0085	0.0139	0.0097	35.7		
June	231,777,000	6,720	30	0.0029	0.0062	0.0063	6.3		
July	118,584,000	3,200	31	0.0027	0.0068	0.0145	3.0		
Aug.	528,371,000	504,160	31	0.0954	0.0543	0.0049	472.0		
Sept.	99,870,000	18,780	30	0.0188	0.0624	0.0014	17.6		
Oct.	70,563,000	2,610	31	0.0037	0.0115	0.0045	2.4		
Nov.	53,153,000	1,490	30	0.0028	0.0023	0.0042	1.4		
Dec.	48,064,000	673	31	0.0014	0.0025	0.0018	0.6		
Year	2,138,780,000	641,563	365				600.6		

* Represents the gravimetric percentages at the maximum flow and minimum flow of the month

** Volume calculated at 1.068 megagrams per cubic meter

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,330	1,140	1,130	1,110	1,210	1,240	1,240	1,270	1,170	1,290	1,130	1,000
2	1,090	1,100	1,140	1,110	1,200	1,240	1,230	1,260	1,220	1,200	1,190	1,000
3	1,090	1,470	1,160	1,120	1,200	1,210	1,210	1,240	1,220	1,210	1,210	1,100
4	1,360	1,460	1,080	1,120	1,200	1,180	1,210	1,240	1,360	1,280	1,220	1,080
5	1,410	1,320	1,080	1,160	1,200	1,180	1,260	1,230	1,390	1,270	1,230	1,140
6	1,350	1,430	1,090	1,160	1,190	1,220	1,260	1,150	1,480	1,060	1,230	1,150
7	1,060	1,070	1,090	1,220	1,200	1,220	1,210	1,210	1,480	1,210	1,210	1,000
8	1,050	1,110	1,110	1,180	1,200	1,210	1,240	1,230	1,490	1,100	1,200	1,130
9	960	1,080	1,110	1,230	1,220	1,250	1,210	1,210	1,480	890	1,220	1,050
10	1,240	1,110	1,140	1,220	1,240	1,270	1,230	1,210	1,540	940	1,200	1,180
11	980	1,160	1,110	1,180	1,260	1,260	1,200	1,210	1,570	930	1,190	1,190
12	1,530	1,100	1,100	1,200	1,230	1,210	1,240	1,220	1,330	910	1,160	1,200
13	1,010	1,100	1,100	1,170	1,200	1,150	1,240	1,110	1,580	1,040		1,150
14	1,300	1,130	1,110	1,170	1,220	1,120	1,240	1,180	1,600	1,020		1,190
15	1,040	1,090	1,130	1,200	1,200	1,110	1,260	1,180	1,580	1,110		1,170
16	990	1,080	1,100	1,180	1,270	1,180	1,260	1,100	1,570	1,160		1,190
17	970	1,060	1,100	1,210	1,250	1,190	1,250	1,190	1,480	1,130		1,070
18	1,220	1,110	1,080	1,210	1,300	1,210	1,230	1,080	1,090	1,110		1,200
19	1,030	1,160	1,080	1,180	1,240	1,180	1,250	990	590	1,070		1,130
20	1,250	1,080	1,140	1,170	1,230	1,220	1,230	930	560	940		1,130
21	1,340	1,060	1,150	1,170	1,250	1,270	1,230	970	590	970		1,150
22	1,360	1,160	1,100	1,210	1,210	1,220	1,260	940	680	970		1,170
23	1,120	1,090	1,090	1,180	1,250	1,220	1,250	700	890	870		1,180
24	1,100	1,090	1,090	1,210	1,250	1,230	1,250	630	1,010	890		1,160
25	1,450	1,110	1,140	1,220	1,230	1,250	1,260	880	1,150	960		1,190
26	1,540	1,100	1,120	1,170	1,250	1,240	1,250	510	1,290	1,000		1,150
27	1,530	1,110	1,150	1,200	1,230	1,220	1,250	360	1,290	1,090		1,150
28	1,300	1,130	1,160	1,210	1,280	1,230	1,260	510	1,320	1,080		1,150
29	1,570		1,170	1,240	1,240	1,240	1,260	720	1,300	990		1,140
30	1,220		1,160	1,220	1,220	1,230	1,260	920	1,310	990		1,150
31	1,170		1,180		1,240		1,260	1,050		1,120		1,150

WATER BULLETIN NUMBER 68 -- INTERNATIONAL BOUNDARY AND WATER COMMISSION

QUALITY OF WATER - 1998

08-4613.00 RIO GRANDE BELOW FALCON DAM NEAR FALCON, TEXAS AND NUEVA CD. GUERRERO, TAMAULIPAS

LOCATION: Chemical, specific conductance, and biochemical sampling at the Chapeno gaging station 4.1 river kilometers below Falcon Dam; latitude 26°31'45", longitude 99°09'30".

RECORDS: Chemical analyses, July 1955 through current year; biochemical analyses, July 1975 through current year; suspended silt, July 1955 through 1976; specific conductance 1955 through current year.

REMARKS: Sampling for chemical analyses by the International Boundary and Water Commission at Falcon Village Water Plant, analyses by the U. S. Geological Survey; sampling and determinations for specific conductance by the International Boundary and Water Commission at Falcon Dam Power Plant tailrace; biochemical analyses, collected and analyzed by the International Boundary and Water Commission and the Texas Natural Resource Conservation Commission.

1998 Date	Time Standard	Streamflow Momentary * CMS	Specific Conductance Micro- siemens /cm	pH Units	Water Temper- ature Deg C	Hardness, Total (as CaCO ₃) mg/L	Hardness, Noncarbonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 13	0735	43.7	1,120	7.7	16.5	230	130	62	19
Jan. 28	1420	53.3	1,150	8.3	17.5	250	140	66	22
Feb. 23	1230	13.0	1,140	7.9	19.0	270	160	70	22
Apr. 22	1050	326	1,160	8.2	23.5	270	160	70	23
May 26	1600	95.9	1,210	7.9	27.0	280	180	71	25
June 15	1420	79.1	1,250	8.1	30.0	280	180	68	25
July 15	1100	35.9	1,240	8.2	32.0	270	170	66	25
Aug. 11	1530	36.5	1,280	8.0	30.0	270	190	65	27
Sept. 21	1515	0.50	915	7.9	33.0	210	110	57	16
Nov. 18	1600	13.5	920	8.1	22.5	230	120	63	17

1998 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO ₃) mg/L	Sulfate ion (SO ₄) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO ₂) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 13	112	3	4.9	N.R.	220	150	9.6	640
Jan. 28	121	3	5.3	N.R.	220	150	9.7	653
Feb. 23	126	3	5.4	110	220	150	9.1	663
Apr. 22	125	3	5.5	108	230	150	9.4	674
May 26	143	4	5.7	103	230	170	12.0	721
June 15	146	4	5.8	95	240	180	11.0	735
July 15	146	4	5.6	97	240	180	12.0	735
Aug. 11	154	4	5.9	80	250	180	12.0	744
Sept. 21	98	3	5.9	103	150	120	9.2	N.R.
Nov. 18	85	2	5.1	110	160	110	9.2	N.R.

1998 Date	Time Std. Time	* Stream- flow, Momen- tary CMS	Specific Conduct- ance Micro- siemens /cm	pH Units	Water Temper- ature Deg C	Oxygen, Dis- solved (DO) mg/L	Coli- form, Fecal Cols./ 100 mL mg/L	Oxygen, Demand, Bio- Chemical (BOD) 5 Day mg/L	Alka- Linity Total (as CaCO ₃) mg/L	Sulfate ion (SO ₄) Dis- solved mg/L	Chloride ion (Cl), Dis- solved mg/L	Solids Dis- solved (Residue @ 180 Deg C) mg/L	Sus- pended Solids mg/L
Feb. 12	1400	47.0	1,150	8.0	17.2	8.9	14	N.A.	109	212	138	664	19

N.A. - Not Analyzed

N.R. - Not Reported

* - Mean Daily

QUALITY OF WATER - 1998

08-4613.00 RIO GRANDE BELOW FALCON DAM NEAR FALCON, TEXAS AND NUEVA CD. GUERRERO, TAMAULIPAS

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				1,160	1,260	1,280	1,250		990	880	920	910
2	1,100	1,120	1,120	1,180	1,230	1,250	1,310	870		900	900	910
3					1,260			1,310				
4						1,220						
5	1,130											
6							1,250					
7	1,120	1,130	1,130	1,160	1,220			1,320	880	860	910	900
8					1,160	1,220	1,270					
9	1,130	1,120	1,140	1,160	1,230	1,270	1,310	960	870	880	910	
10												
11									940		890	910
12	1,120									860		
13		1,120	1,120	1,140	1,160	1,200	1,250	1,270	1,310		890	
14	1,120								920	870		930
15					1,170	1,220	1,250	1,260				
16	1,120	1,130	1,140						930	890	890	930
17				1,160		1,250	1,230	1,320	900		900	
18	1,120	1,130	1,130	1,180	1,220	1,250	1,280	1,310		900		940
19	1,130									880		
20		1,130	1,130	1,180	1,250							
21	1,100							1,330	880	880		930
22	1,120								860	900	890	930
23		1,120	1,140	1,140	1,220	1,240	1,270					
24				1,170		1,250	1,280	1,380	870		890	940
25		1,120	1,150		1,220							
26	1,140					1,270		1,330		890		
27		1,130	1,140	1,190	1,230		1,290			890	890	930
28	1,130				1,180	1,240	1,260	1,300	1,000	880	890	
29									870	910	910	930
30	1,130				1,150			1,300	1,160			
31												

08-4645.00 RANCHERIAS DRAIN NEAR CAMARGO, TAMAULIPAS

LOCATION: At a point about 600 meters from the confluence with the Rio Grande, which is located at river kilometer 389. This drain carries waste water from the Lower Rio San Juan Irrigation District in Mexico.

RECORDS: Specific conductance, 1948 and 1960 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

January 15 7,140	March 4 5,770	May 6 3,140 12 5,590	July	September	November 4 6,850
February 18 5,420	April 3 5,820 16 5,850	June 2 5,920	August	October	December

QUALITY OF WATER - 1998

08-4647.00 RIO GRANDE AT RIO GRANDE CITY, TEXAS NEAR CAMARGO, TAMAULIPAS

LOCATION: Gaging station at river kilometer 378, 6.0 river kilometers downstream from Rio San Juan.
RECORDS: Chemical analyses, 1959 through current year; specific conductance, 1958 through current year; suspended silt, 1959 through 1977.
REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U.S. Geological Survey; specific conductance determinations by the International Boundary and Water Commission.

1998	Time	Streamflow Momentary	Specific Conductance Micro- siemens /cm	pH	Water Temper- ature	Hardness, Total (as CaCO ₃)	Hardness, Noncarbonate (as CaCO ₃)	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	CMS	Units	Deg C	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 13	0915	54.9	1,140	7.3	18.0	260	150	69	22
Feb. 19	0840	13.0	1,380	7.5	19.5	280	180	75	23
Mar. 24	0930	30.0	1,290	8.0	21.5	240	140	63	21
April 16	0855	216	1,160	7.6	24.0	250	160	66	22
May 19	0910	145	910	7.6	27.0	270	170	69	24
June 23	0850	62.3	1,250	7.7	29.0	270	180	65	25
July 15	0840	52.1	1,270	8.3	30.0	260	160	63	25
Aug. 25	0910	15.0	1,320	8.4	30.0	270	180	66	26
Sept. 22	0915	11.0	480	7.8	30.0	N.R.	47	43	6
Oct. 21	0845	15.9	747	7.7	23.3	N.R.	76	48	9
Nov. 24	0830	13.6	1,100	8.1	23.0	N.R.	150	71	19

1998	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved	Alkalinity Total (as CaCO3)	Sulfate ion (SO4) Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO2) Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 13	126	3	8.0	110	200	140	8.8	632
Feb. 19	159	4	6.3	110	260	200	7.4	794
Mar. 24	125	3	6.3	100	230	160	2.6	665
Apr. 16	123	3	6.2	95	220	150	9.4	658
May 19	139	4	5.6	98	190	140	9.6	637
June 23	144	4	6.0	89	230	170	11.0	709
July 15	146	4	5.3	95	240	180	12.0	734
Aug. 25	171	5	6.4	95	250	210	13.0	803
Sept. 23	43	2	5.0	85	60	44	N.R.	N.R.
Oct. 21	85	3	6.0	79	110	93	N.R.	N.R.
Nov. 24	120	3	6.2	110	190	150	N.R.	N.R.

N.R.- Not Reported

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

QUALITY OF WATER - 1998

PUERTECITOS DRAIN AND LOS INDIOS DRAIN NEAR CO. DIAZ ORDAZ, TAMAULIPAS

LOCATION: For Puertecitos Drain, at a point about 2,600 meters from the confluence with the Rio Grande, which is located at river kilometer 353; and, for Los Indios Drain, at a point about 650 meters from its confluence with Puertecitos Drain. These two drains join at a point about 1,300 meters from the confluence with the Rio Grande. These drains carry waste water from the lower Rio San Juan Irrigation District in Mexico.

RECORDS: Specific conductance, 1960 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

1998 Date	Puerte- citos Drain	Los Indios Drain									
Jan. 06	2,600		Apr. 16	2,920							
Jan. 15	2,570		May 06	2,660							
Feb. 03	2,390		May 12	3,980							
Feb. 18	2,940		June 02	2,960							
Mar. 04	3,510		Nov. 04	2,870							
Apr. 03	3,010										

08-4663.00 RIO GRANDE AT LOS EBANOS, TEXAS NEAR CO. DIAZ ORDAZ, TAMAULIPAS

LOCATION: Gaging station at river kilometer 329, 54.7 river kilometers upstream from Anzalduas Dam.

RECORDS: Chemical analyses, June 1977 through current year; specific conductance, 1956 through current year.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U. S. Geological Survey; specific conductance determinations by the International Boundary and Water Commission.

1998 Date	Time Standard	Streamflow Momentary CMS	Specific Conductance Micro- siemens /cm	pH Units	Water Temper- ature Deg C	Hardness, Total (as CaCO ₃) mg/L	Hardness, Noncarbonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 21	1045	66.6	1,150	7.3	18.0	270	160	70	22
Mar. 18	1100	3.12	1,650	7.8	23.0	310	190	81	26
May 12	1025	195	1,170	7.6	26.0	270	170	68	24
July 22	1120	0.07	1,290	8.0	29.0	280	190	68	26
Sept. 15	1145	4.47	1,290	N.R.	31.0	N.R.	N.R.	N.R.	N.R.

1998 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO ₃) mg/L	Sulfate ion (SO ₄) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO ₂) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 21	129	3	5.9	110	210	N.R.	9.9	659
Mar. 18	171	4	5.3	120	290	N.R.	8.2	875
May 12	136	4	5.5	95	220	N.R.	10.0	675
July 22	153	4	5.7	89	250	N.R.	13.0	757
Sept. 15	N.R.	N.R.	N.R.	100	N.R.	N.R.	N.R.	N.R.

N.R. - Not Reported

QUALITY OF WATER - 1998

08-4663.00 RIO GRANDE AT LOS EBANOS, TEXAS NEAR CD. DIAZ ORDAZ. TAMAULIPAS

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,430	1,210	1,550	1,160	1,280	1,210	1,290	1,340	1,340	1,090	1,770	1,200
2	1,390	1,190	1,550	1,170	1,200	1,220	1,310	1,370	1,330	1,080	1,760	1,200
3	1,380	1,230	1,540	1,470	1,220	1,290	1,410	1,340	1,340	1,080	1,190	1,190
4	1,300	1,230	1,540	1,160	1,200	1,220	1,320	1,420	1,360	1,090	1,750	1,190
5	1,290	1,270	1,550	1,190	1,200	1,280	1,290	1,420	1,340	1,060	1,760	1,210
6	1,300	1,330	1,550	1,160	1,200	1,280	1,310	1,410	1,180	1,030	1,310	1,210
7	1,300	1,320	1,280	1,220	1,210	1,250	1,310	1,340	1,130	1,030	1,230	1,210
8	1,150	1,330	1,270	1,160	1,240	1,280	1,300	1,430	1,140	1,020	1,240	1,220
9	1,250	1,340	1,260	1,160	1,210	1,290	1,320	1,340	1,150	1,020	1,250	1,220
10	1,250	1,420	1,210	1,190	1,200	1,280	1,310	1,340	1,120	1,090	1,270	1,260
11	1,240	1,420	1,240	1,150	1,190	1,260	1,310	1,360	1,130	1,020	1,300	1,220
12	1,230	1,430	1,210	1,180	1,190	1,250	1,300	1,360	1,120	1,020	1,250	1,220
13	1,150	1,390	1,200	1,180	1,190	1,260	1,300	1,380	1,130	1,030	1,240	1,250
14	1,200	1,410	1,210	1,170	1,230	1,280	1,310	1,350	1,140	1,020	1,270	1,210
15	1,150	1,430	1,210	1,220	1,190	1,270	1,300	1,410	1,340	1,030	1,250	1,240
16	1,220	1,440	1,260	1,150	1,220	1,260	1,340	1,370	1,360	1,020	1,260	1,250
17	1,260	1,430	1,250	1,150	1,200	1,280	1,280	1,360	1,350	1,030	1,250	1,210
18	1,310	1,430	1,260	1,160	1,190	1,290	1,300	1,430	1,350	1,040	1,760	1,210
19	1,240	1,230	1,260	1,190	1,200	1,260	1,300	1,380	1,340	1,030	1,190	1,220
20	1,240	1,230	1,260	1,150	1,200	1,270	1,290	1,420	1,330	1,040	1,190	1,240
21	1,200	1,230	1,500	1,160	1,200	1,250	1,310	1,420	1,340	1,800	1,250	1,250
22	1,310	1,250	1,500	1,180	1,230	1,260	1,320	1,420	1,340	1,830	1,260	1,270
23	1,190	1,630	1,500	1,150	1,230	1,260	1,310	1,440	1,140	1,770	1,210	1,250
24	1,210	1,630	1,500	1,150	1,450	1,300	1,300	1,420	1,120	1,770	1,250	1,260
25	1,190	1,650	1,450	1,160	1,300	1,240	1,310	1,350	1,140	1,790	1,190	1,260
26	1,200	1,540	1,230	1,160	1,230	1,260	1,340	1,340	1,120	1,800	1,200	1,260
27	1,190	1,540	1,240	1,180	1,460	1,260	1,340	1,380	1,120	1,770	1,190	1,230
28	1,280	1,520	1,240	1,190	1,230	1,270	1,340	1,410	1,120	1,800	1,180	1,260
29	1,450	1,220	1,220	1,190	1,240	1,300	1,330	1,340	1,120	1,840	1,190	1,290
30	1,340	1,190	1,210	1,210	1,240	1,300	1,310	1,410	1,130	1,800	1,260	1,260
31	1,170	1,170	1,170	1,220	1,220	1,320	1,320	1,360	1,120	1,820	1,250	1,250

08-4675.00 RIO GRANDE AT PENITAS, TEXAS AND REYNOSA DIAZ, TAMAULIPAS

LOCATION: At the H.C.W.C. & I. District No. 1 (Edinburg) pumping plant, river kilometer 300, 26.2 river kilometers upstream from Anzalduas Dam.

RECORDS: Specific conductance, 1963 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

QUALITY OF WATER - 1998

08-4678.00 MORILLO DRAIN NEAR ANZALDUAS DAM

LOCATION: At the Morillo Drain Project pumping plant located about 0.6 river kilometer from the confluence with the Rio Grande or at the gaging station on the bypass canal 0.6 kilometer from the pumping plant. Morillo Drain enters the Rio Grande at river kilometer 288, 14.2 river kilometers upstream from Anzalduas Dam. This drain carries waste water from the lower Rio San Juan Irrigation District in Mexico and surface runoff during periods of heavy precipitation.

RECORDS: Chemical analyses, 1962 through current year; specific conductance, 1956 through current year.
REMARKS: Sampling by the International Boundary and Water Commission and chemical analyses by the U.S. Geological Survey. Determinations for specific conductance by International Boundary and Water Commission.

1998	Time	Streamflow Momentary	Specific Conductance Micro- siemens /cm	pH	Water Temper- ature	Hardness, Total (as CaCO ₃)	Hardness, Noncarbonate (as CaCO ₃)	Calcium Ion (Ca), Dissolved	Magnesium Ion (Mg), Dissolved
Date	Standard	CMS		Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 21	1140	N.R.	4,750	7.7	19.5	700	530	160	72
Feb. 17	1200	0.99	3,200	7.7	17.5	490	330	130	43
Mar. 12	1200	N.R.	4,360	7.9	22.0	630	470	160	59
April 14	1255	0.99	5,580	7.9	26.0	880	690	200	89
May 12	1200	0.99	4,080	7.5	26.0	760	590	190	69
June 17	0850	0.99	6,250	N.R.	31.0	N.R.	N.R.	N.R.	N.R.
June 17	1140	0.99	6,250	8.1	31.0	430	310	100	43
July 22	1000	0.00	7,370	7.9	27.0	1,100	940	240	126
Aug. 12	1025	0.99	6,650	7.8	30.0	960	810	200	110
Sept. 15	1025	0.99	457	7.9	27.0	N.R.	8	28	5
Oct. 28	1030	0.99	3,680	8.0	25.0	N.R.	360	150	45
Nov. 18	1035	0.99	7,170	8.0	23.0	N.R.	870	270	102
Dec. 16	1030	0.99	7,790	8.0	14.0	N.R.	950	270	120

Date	Sodium ion (Na ⁺) Dissolved	Sodium Adsorption Ratio (SAR)	Potassium ion (K ⁺) Dissolved	Alkalinity Total (as CaCO ₃)	Sulfate ion (SO ₄ ²⁻) Dissolved	Chloride ion (Cl ⁻) Dissolved	Silica (SiO ₂) Dissolved	Solids Dissolved (Calculated)
	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 21	772	13	6.1	170	940	790	15	2,860
Feb. 17	440	9	6.8	160	690	520	16	1,940
Mar. 12	609	11	5.9	160	880	730	14	2,560
April 14	963	14	36.0	180	1,400	1,100	20	3,870
May 12	584	9	10.0	180	1,000	670	19	2,660
June 17	N.R.	N.R.	N.R.	110	N.R.	N.R.	N.R.	N.R.
June 17	364	8	7.2	110	530	420	15	1,550
July 22	1,310	17	6.7	180	1,800	1,400	29	5,070
Aug. 12	1,170	16	7.0	150	1,600	1,200	25	4,360
Sept. 15	46	2	6.4	85	59	58	N.R.	N.R.
Oct. 28	588	11	12.0	180	680	610	N.R.	N.R.
Nov. 18	1,290	17	8.9	210	1,500	1,500	N.R.	N.R.
Dec. 16	1,380	18	7.4	230	1,800	1,600	N.R.	N.R.

N.R. - Not Reported

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	7,440					7,360	8,340		7,070	3,610		2,450	
2		4,610	6,320	7,830		7,430	7,980		8,920	4,420		4,130	
3		4,370	6,790	7,880			8,010		8,980		5,430	8,050	
4		4,210	6,870		4,680	7,610		8,310	7,700		5,110	7,980	
5	7,370	4,180	6,920			7,770		8,360		5,340	3,460		
6	7,400		6,890	2,610	4,440		5,220	8,380		5,630	7,120		
7	7,260			7,630	4,350		5,130	5,310	6,800	2,170		7,850	
8	7,610			7,570	4,210	7,510	8,320		5,950	5,290		8,140	
9	7,650	4,470	7,140			7,600	7,860		7,760	5,790	3,570	8,160	
10		4,480	7,050			7,640	4,650	6,250	7,110	2,660	2,660	7,890	
11		4,220	7,210		4,370	7,750		8,730	3,900	7,680	7,680	7,820	
12	3,360	4,800	7,220		4,210	7,790		8,740		4,470			
13	4,710	5,020	7,320	7,490	4,400		8,080	8,240		1,440			
14	7,800			6,880	4,740		6,210	8,090	2,000	1,440		8,040	
15	8,730			7,170	4,540	6,270	7,480		5,500	2,060		8,160	
16	9,380	3,370	7,210	8,000		8,010	6,680			3,180	7,460	7,930	
17		3,960	7,250	7,970		8,080	3,390	8,290	5,910		7,580	7,790	
18		4,720	7,200		5,250	7,810		8,200	4,160		7,120	7,890	
19	7,380	5,360		2,560		8,170		8,210		5,880		7,290	
20	8,960	5,890	7,220	5,440			8,560	8,480		530			
21	7,690			5,430	6,080		8,930	3,740	990	460		5,750	
22	8,770			5,790	6,350	8,390	8,170		610	450		6,340	
23	8,920	3,660	7,480	2,630		7,860	8,200		790		820	7,680	
24		4,430	7,680	5,890		7,470	8,430	8,450	1,270		7,480	7,540	
25		4,810	7,420		6,830	7,770		8,730	1,860			7,570	
26	6,740	5,490	7,590		6,980	4,030		8,780		2,270	7,190		
27	4,890	6,010	7,630	5,980		7,220		8,040	9,070	2,360	4,950	7,880	
28	5,460			5,800		7,220		8,130	9,030	1,550	3,930		
29	5,810			5,550	7,110	8,080	8,110		2,140	2,890		7,780	
30	5,440			5,280		8,320		8,090		2,510	1,390	4,710	7,920
31				7,860			8,310	8,560					

QUALITY OF WATER - 1998

08-4692.00 RIO GRANDE BELOW ANZALDUAS DAM NEAR REYNOSA, TAMAULIPAS AND MISSION, TEXAS

LOCATION: At Anzalduas Dam, 0.8 river kilometer above the gaging station, located at river kilometer 273.

RECORDS: Chemical analyses, March 1959 through current year; specific conductance 1948 and 1956 through current year; suspended silt, May 1956 through 1977.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U.S. Geological Survey; determinations for specific conductance by the International Boundary and Water Commission.

1998 Date	Time Standard	Streamflow Momentary CMS	Specific Conductance Micro- siemens /cm	pH Units	Water Tempera- ture Deg C	Hardness, Total (as CaCO ₃) mg/L	Hardness, Noncarbonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 21	1200	37.1	1,170	7.4	18.5	270	170	71	23
Mar. 18	1220	12.4	1,580	7.8	20.0	310	190	79	26
May 12	1220	87.2	1,190	7.5	27.0	270	180	67	24
July 22	1030	0.62	1,410	8.1	30.0	280	180	71	25
Aug. 12	1045	19.1	1,350	8.0	31.0	290	190	70	28
Sept. 15	1045	5.32	1,020	N.R.	29.0	N.R.	N.R.	N.R.	N.R.

1998 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO ₃) mg/L	Sulfate ion (SO ₄) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO ₂) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 21	135	4	5.8	100	220	N.A.	8.7	684
Mar. 18	160	4	5.3	110	280	N.A.	3.9	831
May 12	138	4	5.8	89	230	N.A.	10.0	684
July 22	174	5	6.4	100	250	N.A.	13.0	821
Aug. 12	167	4	6.3	95	250	N.A.	13.0	781
Sept. 15	N.R.	N.R.	N.R.	82	N.R.	N.A.	N.R.	N.R.

N.A.- Not Analyzed
N.R.- Not Reported

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,350	1,170	1,500	1,180	1,210	1,320	1,350	1,400	1,460	540	610	2,080
2	1,300	1,180	1,560	1,170	1,210	1,260	1,340	1,370	1,410	570	630	2,090
3	1,270	1,190	1,630	1,170	1,260	1,330	1,340	1,370	1,380	600	630	2,050
4	1,240	1,190	1,630	1,180	1,220	1,260	1,350	1,360	1,360	560	630	1,800
5	1,230	1,170	1,620	1,180	1,220	1,260	1,320	1,350	1,370	530	610	1,580
6	1,220	1,190	1,640	1,170	1,210	1,230	1,310	1,380	1,370	510	650	1,600
7	1,230	1,200	1,630	1,170	1,220	1,270	1,330	1,370	1,350	530	640	1,500
8	1,270	1,180	1,670	1,160	1,230	1,250	1,310	1,370	1,330	520	770	1,440
9	1,280	1,190	1,650	1,160	1,230	1,280	1,310	1,370	1,220	500	910	1,390
10	1,260	1,250	1,610	1,190	1,230	1,280	1,310	1,420	1,080	710	1,470	1,750
11	1,260	1,230	1,610	1,180	1,250	1,290	1,290	1,380	1,100	900	1,240	1,540
12	1,280	1,220	1,520	1,160	1,240	1,290	1,310	1,370	1,100	1,070	1,420	1,510
13	1,260	1,330	1,400	1,170	1,220	1,280	1,320	1,390	1,070	1,120	1,480	1,450
14	1,190	1,450	1,390	1,180	1,220	1,300	1,320	1,410	1,060	1,210	1,580	1,420
15	1,160	1,500	1,400	1,170	1,220	1,270	1,330	1,420	1,040	1,230	1,720	1,380
16	1,180	1,490	1,410	1,170	1,250	1,290	1,330	1,480	1,050	1,160	1,770	1,370
17	1,150	1,460	1,450	1,170	1,220	1,290	1,320	1,400	1,050	1,100	1,670	1,280
18	1,170	1,490	N/S	1,180	1,230	1,250	1,320	1,420	1,090	1,110	1,480	1,270
19	1,190	1,510	1,480	1,170	1,240	1,280	1,320	1,380	940	1,090	1,440	1,280
20	1,190	1,440	1,370	1,170	1,240	1,270	1,320	1,370	550	1,150	1,330	1,260
21	1,190	1,320	1,280	1,170	1,240	1,280	1,340	1,130	380	350	1,320	1,260
22	1,170	1,290	1,220	1,180	1,240	1,270	1,400	560	340	420	1,340	1,270
23	1,180	1,250	1,230	1,180	1,180	1,280	1,420	440	350	410	1,360	1,270
24	1,200	1,220	1,230	1,170	1,250	1,290	1,420	370	360	500	1,420	1,310
25	1,180	1,210	1,440	1,180	1,240	1,280	1,420	390	360	430	1,490	1,250
26	1,210	1,220	1,480	1,190	1,250	1,280	1,370	450	400	430	1,600	1,240
27	1,190	1,300	1,260	1,200	1,210	1,290	1,340	5,810	400	450	1,930	1,220
28	1,190	1,490	1,300	1,260	1,260	1,290	1,350	710	400	470	2,070	1,190
29	1,180	1,270	1,220	1,250	1,250	1,310	1,340	890	450	510	2,110	1,180
30	1,160	1,240	1,190	1,250	1,310	1,400	1,050	480	550	2,110	1,170	
31	1,150	1,220		1,280		1,410	1,640		590			1,180

QUALITY OF WATER - 1998

08-4733.90 RIO GRANDE AT MERCEDES IRRIGATION DISTRICT PUMPS NEAR MERCEDES, TEXAS AND RIO RICO, TAMAULIPAS

LOCATION: At river kilometer 190, 84.6 river kilometers downstream from Anzalduas Dam.

RECORDS: Specific conductance, 1945 through current year.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1998

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,420	1,210	1,690	1,290	1,220	1,330	1,350	1,390	930	840	1,490	1,720
2	1,450	1,190	1,730	1,250	1,210	1,290	1,300	1,440	1,280	1,150	1,340	1,760
3	1,510	1,170	1,670	1,210	1,210	1,280	1,360	1,430	1,590	1,010	1,450	1,840
4	1,490	1,190	1,630	1,200	1,210	1,300	1,340	1,390	1,460	1,010	1,570	1,950
5	1,480	1,240	1,580	1,190	1,240	1,280	1,360	1,380	1,440	960	1,630	2,160
6	1,470	1,230	1,630	1,210	1,230	1,280	1,370	1,370	1,400	940	1,160	2,250
7	1,430	1,250	1,730	1,190	1,230	1,290	1,360	1,380	1,360	1,010	1,200	2,220
8	1,400	1,280	1,830	1,210	1,230	1,290	1,350	1,390	1,320	1,080	1,150	2,230
9	1,400	1,280	1,770	1,180	1,240	1,280	1,420	1,410	1,360	1,080	1,160	2,250
10	1,360	1,320	1,770	1,170	1,210	1,280	1,340	1,410	1,390	1,100	1,220	2,360
11	1,330	1,390	1,810	1,170	1,290	1,310	1,350	1,410	1,390	1,280	1,350	2,340
12	1,370	1,410	1,820	1,180	1,240	1,310	1,370	1,410	1,410	990	1,590	1,970
13	1,320	1,350	1,830	1,150	1,240	1,300	1,350	1,410	1,360	1,040	1,990	1,810
14	1,310	1,400	1,710	1,190	1,220	1,320	1,370	1,430	1,230	990	1,770	1,750
15	1,320	1,280	1,730	1,170	1,240	1,280	1,390	1,430	1,360	990	1,660	1,830
16	1,300	1,280	1,690	1,170	1,240	1,280	1,380	1,420	1,320	1,080	1,420	1,880
17	1,260	1,350	1,630	1,180	1,220	1,280	1,360	1,440	1,260	1,150	1,420	1,770
18	1,240	1,370	1,580	1,190	1,250	1,300	1,380	1,440	1,060	1,270	1,560	1,730
19	1,230	1,520	1,570	1,180	1,230	1,310	1,370	1,500	1,110	1,370	1,670	1,680
20	1,200	1,650	1,580	1,190	1,260	1,310	1,380	1,440	1,280	1,640	1,680	1,670
21	1,210	1,730	1,600	1,180	1,260	1,330	1,360	1,460	600	1,220	1,790	1,650
22	1,270	1,720	1,650	1,210	1,260	1,300	1,380	1,440	570	720	1,840	1,560
23	1,250	1,680	1,630	1,180	1,270	1,300	1,360	1,540	570	460	1,900	1,470
24	1,230	1,720	1,700	1,180	1,270	1,320	1,380	1,390	600	510	1,950	1,450
25	1,230	1,790	1,680	1,210	1,260	1,310	1,460	850	750	580	1,990	1,460
26	1,240	1,780	1,570	1,190	1,270	1,310	1,450	620	690	660	1,650	1,480
27	1,210	1,770	1,420	1,200	1,250	1,300	1,380	560	530	750	1,630	1,550
28	1,200	1,720	1,380	1,190	1,250	1,310	1,390	550	600	840	1,600	1,520
29	1,230		1,550	1,200	1,280	1,330	1,380	560	580	1,030	1,620	1,530
30	1,220		1,310	1,210	1,260	1,360	1,390	650	680	1,380	1,650	1,560
31	1,210		1,330		1,260		1,370	750		1,460		1,470

QUALITY OF WATER - 1998

08-4750.00 RIO GRANDE NEAR BROWNSVILLE, TEXAS AND MATAMOROS, TAMAULIPAS

LOCATION: Gaging station at river kilometer 78.3, 0.3 river kilometer downstream from El Jardin pumping plant and 11.2 river kilometers downstream from the international highway bridge between Brownsville, Texas and Matamoros, Tamaulipas.

RECORDS: Chemical and biochemical analyses, October 1967 through January 1968 and October 1974 through current year; biochemical, December 1976 through current year; specific conductance, 1955 through September 1983; suspended silt, 1955 through 1977.

REMARKS: Sampling and analyses by the U. S. Geological Survey. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey. Sampling and determinations for specific conductance prior to 1978 by the International Boundary and Water Commission.

1998 Date	Time Standard	Streamflow Momentary CMS	Specific Conductance Micro- siemens/ cm	pH Units	Water Temper- ature Deg C	Hardness, Total (as CaCO ₃) mg/L	Hardness, Noncarbonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Feb. 10	0910	5.35	1,240	8.0	20.5	N.A.	170	74	23
Mar. 25	0940	0.18	1,940	8.2	22.0	N.A.	260	120	38
April 21	1000	0.76	1,300	8.1	24.0	N.A.	190	82	25
May 20	0900	1.25	1,340	7.3	27.5	N.A.	180	81	26
June 22	1100	0.20	1,420	7.9	33.0	N.A.	200	80	28
July 6	1010	2.24	1,420	8.2	31.0	N.A.	190	82	28
Aug. 4	1210	0.85	1,580	8.0	34.5	N.A.	230	100	35
Sept. 30	1430	6.71	782	8.1	30.5	N.A.	68	59	12
Dec. 17	1400	1.64	1,730	8.7	18.0	N.A.	240	120	33

1998 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K) Dissolved mg/L	Alkalinity Total (as CaCO ₃) mg/L	Sulfate ion (SO ₄) Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO ₂) Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Feb. 10	136	4	5.8	116	240	170	5.0	N.A.
Mar. 25	215	4	7.2	195	340	300	5.5	N.A.
April 21	142	4	5.7	121	250	170	13.0	N.A.
May 20	149	4	6.9	135	260	180	13.0	N.A.
June 22	164	4	6.3	122	270	210	15.0	N.A.
July 6	161	4	6.7	127	270	200	N.R.	N.A.
Aug. 4	201	4	5.8	168	280	230	N.R.	N.A.
Sept. 30	76	2	6.8	132	N.R.	N.R.	N.R.	N.A.
Dec. 17	184	4	7.1	202	290	280	N.R.	N.A.

N.A.- Not Analyzed

N.R.- Not Reported

RAINFALL ON THE RIO GRANDE WATERSHED

IN THE UNITED STATES

IN MILLIMETERS

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 following rainfall data 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.

Month	Las Cruces, New Mexico		American Dam		Fort Hancock Bridge		Guayuco Arroyo		Bill Shannon Ranch	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	7	17	3	11	0	10	0	8	0	10
Feb.	3	11	8	9	9	8	6	6	0	9
Mar.	4	5	7	8	5	7	6	6	1	6
April	0	5	2	5	0	7	0	5	0	7
May	0	12	0	8	5	11	3	12	6	18
June	7	17	8	15	11	23	8	15	4	40
July	30	29	28	36	17	34	29	35	40	51
Aug.	10	62	17	39	8	40	49	42	42	63
Sept.	0	33	7	30	7	34	15	30	0	58
Oct.	78	24	76	20	53	25	19	21	46	30
Nov.	14	15	11	8	0	10	3	7	0	10
Dec.	4	23	7	14	0	12	4	10	9	11
Yearly	157	253	174	203		221	142	197	148	313

Month	Adobes Ranch		H. T. Fletcher Ranch		Kerr Mitchell Ranch		Shafter		Presidio (IBWC Gage)	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	9	0	17	0	13	0	8	0	8
Feb.	0	6	0	10	0	10	0	12	0	8
Mar.	0	4	0	8	7	5	0	8	5	4
April	0	5	0	13	0	15	0	17	0	7
May	5	15	6	29	9	33	7	28	2	15
June	17	34	30	44	12	46	15	54	3	32
July	3	49	20	75	39	54	48	68	19	41
Aug.	40	47	87	81	22	58	110	62	44	36
Sept.	3	53	23	62	25	53	0	68	13	38
Oct.	54	17	65	35	52	32	0	30	56	20
Nov.	5	6	0	11	0	9	48	10	1	8
Dec.	0	7	10	13	0	12	0	11	0	10
Yearly	127	252	241	398	166	340	228	376	143	227

Month	Redford		Study Butte		Terlingua Creek Station		Johnson Ranch		Owens Ranch	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	8	0	10	0	8	0	9	24	15
Feb.	0	5	0	8	0	6	0	5	8	20
Mar.	0	4	0	5	0	3	0	3	11	21
April	0	6	0	11	0	8	0	10	0	46
May	0	15	1	28	0	18	0	23	0	58
June	2	25	47	27	10	27	13	28	20	47
July	5	40	68	41	0	33	0	30	0	34
Aug.	29	34	100	42	5	32	15	25	272	56
Sept.	15	44	0	34	0	32	0	35	0	65
Oct.	79	20	50	24	35	18	28	18	75	51
Nov.	0	8	34	8	15	6	0	5	33	27
Dec.	0	7	0	6	0	7	8	8	0	18
Yearly	130	216	300	244	65	198	64	199	443	458

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RAINFALL ON THE RIO GRANDE WATERSHED

IN THE UNITED STATES

IN MILLIMETERS

	Lewis Ranch		Rio Grande near Dryden		Ross Foster Ranch		Pecos River near Langtry Station		Prosser Ranch No. 3	
Month	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	18	16	0	13	0	9	5	9	0	12
Feb.	29	3	13	3	13	5	5	20	24	26
Mar.	46	26	16	6	13	7	69	14	66	16
April	0	48	1	17	0	18	0	25	0	52
May	0	63	6	26	9	29	4	38	0	58
June	39	69	13	32	11	32	0	43	8	43
July	0	44	12	23	0	14	0	44	0	45
Aug.	609	67	189	46	84	31	72	33	3	46
Sept.	22	69	11	54	28	35	61	54	39	70
Oct.	90	65	9	23	10	24	20	38	51	43
Nov.	29	29	28	12	14	16	69	19	48	23
Dec.	9	21	1	11	5	11	5	13	8	16
Yearly		546	288	276	177	239	310	350	247	430

	Devils River at Caughorn Ranch		Prosser Ranch No. 1		Dead Man's Canyon near Comstock		Prosser Ranch No. 2		Walker Ranch		
Month	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average	
Jan.	2	12	15	12	0	10	0	11	5	12	
Feb.	53	23	0	21	0	20	0	24	0	21	
Mar.	49	21	0	13	36	13	0	13	36	15	
April	0	26	0	26	0	26	0	27	0	24	
May	19	53	0	57	0	50	0	55	0	62	
June	25	50	3	40	0	46	3	42	6	51	
July	14	23	0	50	0	53	0	45	0	43	
Aug.	182	35	109	41	94	40	4	48	121	30	
Sept.	15	50	0	60	10	50	T	62	0	58	
Oct.	10	48	52	39	13	41	34	37	65	36	
Nov.	46	22	28	21	0	16	13	18	13	18	
Dec.	7	17	0	12	0	13	0	13	0	13	
Yearly		422	380	207	392	153	378	54	395	246	383

	Harlow Ranch		Ed Crane Ranch		H. K. Fawcett Ranch		Brothertown Ranch		A. A. Baker Ranch		
Month	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average	
Jan.	6	10	21	21	4	16	7	16	15	13	
Feb.	7	20	17	27	36	21	17	25	19	21	
Mar.	61	13	47	18	42	20	35	17	35	16	
April	0	26	0	38	0	39	0	24	0	29	
May	0	51	13	67	19	61	7	48	9	51	
June	0	50	34	48	56	37	41	44	20	42	
July	0	35	16	47	3	43	1	38	1	43	
Aug.	117	37	304	39	406	59	113	42	202	46	
Sept.	0	54	20	67	21	73	26	61	17	69	
Oct.	52	41	41	47	46	53	43	40	52	41	
Nov.	24	17	68	26	85	23	43	17	30	20	
Dec.	0	14	12	21	15	17	7	13	8	14	
Yearly		267	368	593	466	733	462	340	385	408	405

	Zuberbueler Ranch		Comstock		Martin King Ranch		Goldwire Ranch		H. T. Miers Ranch Headquarters		
Month	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average	
Jan.	8	16	15	14	0	14	11	14	36	15	
Feb.	13	30	10	21	9	20	4	19	15	26	
Mar.	45	19	35	17	61	13	32	21	56	23	
April	0	27	0	32	0	23	0	39	0	41	
May	10	60	19	49	6	46	11	60	10	63	
June	28	47	25	49	25	41	25	49	58	60	
July	0	53	8	38	1	37	0	53	13	43	
Aug.	173	36	311	46	128	40	456	66	478	58	
Sept.	32	64	38	58	44	62	25	53	23	59	
Oct.	48	34	44	41	61	47	69	47	74	61	
Nov.	42	22	22	17	20	16	28	27	33	24	
Dec.	11	20	6	16	26	14	13	18	18	19	
Yearly		410	428	533	398	381	373	674	466	814	492

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IN THE UNITED STATES

IN MILLIMETERS

Month	H. T. Miers Ranch No. 2		Gillis Ranch Headquarters		Pafford Crossing		Tuffy Whitehead Ranch		Hutto Ranch No. 2	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	20	13	14	18	8	14	2	9	0	14
Feb.	18	23	9	28	0	19	9	21	15	25
Mar.	51	26	51	26	34	18	40	20	27	20
April	0	36	0	45	0	33	0	34	0	44
May	16	66	2	72	6	47	12	47	13	54
June	65	53	73	63	51	50	31	44	58	57
July	9	43	17	63	0	49	18	41	0	50
Aug.	481	61	597	71	444	58	249	41	523	60
Sept.	22	68	15	59	48	65	30	66	39	79
Oct.	95	50	32	59	61	48	49	38	25	46
Nov.	26	23	66	33	22	23	24	20	45	24
Dec.	19	21	9	22	14	17	7	13	8	17
Yearly	822	483	885	559	688	441	471	394	753	490

Month	Lowry Ranch No. 2		Amistad Reservoir near Comstock		Evans Creek near Comstock		Sellers Ranch		J. G. Brite Ranch	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	10	13	2	10	0	10	0	10	0	11
Feb.	11	20	7	20	1	19	19	19	6	21
Mar.	24	22	30	12	10	15	46	15	35	18
April	0	35	0	30	0	23	0	29	0	33
May	5	58	7	39	0	40	0	46	9	53
June	38	53	28	38	0	37	71	57	66	53
July	9	48	0	27	0	43	4	35	10	39
Aug.	430	63	128	38	102	45	287	45	253	48
Sept.	44	62	38	49	50	55	56	56	40	70
Oct.	16	45	26	38	28	41	33	46	39	45
Nov.	59	25	18	17	8	19	22	20	23	20
Dec.	15	18	4	11	0	14	10	15	10	16
Yearly	661	462	288	329	198	361	548	393	491	427

Month	Devils Lake		Big Satan Creek Station		Rough Canyon near Del Rio		Stewart Ranch		Gillis Ranch	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	1	15	31	15	4	13	2	12	7	13
Feb.	18	21	10	23	15	23	3	22	8	24
Mar.	26	18	28	25	51	23	34	19	42	26
April	0	38	0	37	0	29	0	36	0	36
May	6	55	0	52	5	64	4	52	15	60
June	42	58	56	48	46	54	50	54	62	52
July	3	37	0	54	8	47	3	48	1	52
Aug.	396	46	420	70	420	58	448	48	352	48
Sept.	29	59	31	55	51	67	44	65	45	73
Oct.	10	46	60	51	61	58	7	47	34	41
Nov.	52	21	32	26	22	27	20	23	58	27
Dec.	14	19	15	20	0	21	0	16	9	20
Yearly	597	433	683	476	683	484	615	442	633	472

Month	Buoy No. 11		North Fork San Pedro		Amistad Dam		Long Ranch		Middle Fork San Pedro	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	2	12	3	13	4	14	0	15	0	12
Feb.	12	20	9	21	12	22	10	24	11	22
Mar.	39	17	36	22	31	21	31	23	9	22
April	0	34	0	37	1	40	0	37	0	34
May	14	52	10	60	6	58	12	60	0	57
June	42	46	53	56	63	54	46	55	41	53
July	0	35	8	59	2	44	4	49	0	49
Aug.	161	41	601	61	271	52	251	44	404	53
Sept.	53	52	81	66	40	87	37	60	32	60
Oct.	19	40	53	49	39	43	47	43	53	53
Nov.	5	18	20	25	53	24	20	22	10	20
Dec.	0	12	9	20	9	18	8	19	0	18
Yearly	347	379	883	489	530	477	466	451	560	453

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IN MILLIMETERS

Month	Cliff Lowry Ranch No. 1		Hutto Ranch No. 1		Lewis James Ranch		Laughlin Air Force Base		Wardlaw Standard Ranch	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	11	14	1	13	0	13	9	16	9	21
Feb.	19	25	12	22	6	17	10	28	11	32
Mar.	59	23	33	20	16	9	60	21	36	31
April	0	39	0	42	0	26	1	50	0	44
May	8	66	10	57	0	43	3	58	1	66
June	53	56	65	59	83	35	22	69	25	74
July	11	48	5	53	0	32	8	62	7	40
Aug.	392	56	525	56	132	50	427	53	473	49
Sept.	37	76	36	72	17	73	28	65	9	57
Oct.	73	52	30	48	24	35	59	60	50	53
Nov.	25	26	33	22	32	17	55	27	27	33
Dec.	10	18	8	16	6	14	12	18	9	23
Yearly	698	499	758	480	316	364	693	527	657	523

Month	Maverick County Canal Headgate		Pinto Creek Station		Las Moras Creek		Eagle Pass		Trees Farm	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	13	14	37	13	8	19	4	21	18	17
Feb.	0	26	13	19	11	25	4	25	15	23
Mar.	38	17	27	17	13	18	27	20	20	14
April	0	40	0	41	0	36	T	45	0	45
May	0	60	0	60	0	55	0	84	2	72
June	33	55	51	56	10	67	65	77	53	58
July	0	43	0	39	0	38	T	49	14	37
Aug.	140	38	406	51	99	43	101	54	79	39
Sept.	28	62	23	68	38	84	54	80	111	66
Oct.	31	54	10	51	T	54	46	54	57	60
Nov.	8	24	69	27	51	26	34	25	45	22
Dec.	20	19	10	16	15	19	8	22	6	19
Yearly	311	452	646	458	245	484	343	556	420	472

Month	El Indio		Van Dalsem Farm		Keisling Farm		Apache Ranch		Corralitos Ranch	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	13	21	21	18	13	20	68	22	1	22
Feb.	20	25	18	23	13	24	32	23	54	25
Mar.	26	18	25	15	23	18	22	13	28	17
April	0	45	0	50	0	47	0	48	3	30
May	0	80	0	72	0	70	0	64	0	59
June	28	59	14	54	27	65	10	52	15	56
July	0	34	0	36	0	35	0	49	19	39
Aug.	78	46	123	40	108	39	92	45	103	53
Sept.	155	77	177	78	116	70	47	74	146	77
Oct.	103	57	133	59	95	54	94	64	36	51
Nov.	71	21	74	21	49	21	43	24	26	25
Dec.	5	19	8	20	8	23	4	23	4	20
Yearly	499	502	593	486	452	486	412	501	435	474

Month	Huiscache Ranch		Zapata		Falcon Dam		Roma (Int'l. Bridge)		Garciasville	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	23	0	24	0	23	3	22	0	23
Feb.	43	26	30	25	30	25	55	26	61	27
Mar.	33	18	53	16	47	16	39	15	26	14
April	0	33	0	37	1	35	0	35	0	30
May	0	60	0	67	0	63	0	51	0	69
June	0	60	17	58	45	63	27	57	12	75
July	13	36	0	39	12	33	35	33	40	31
Aug.	99	45	43	50	22	58	8	46	0	42
Sept.	114	92	131	98	176	102	325	105	223	86
Oct.	41	52	44	47	32	49	93	49	94	43
Nov.	33	24	31	26	44	28	55	23	46	25
Dec.	4	22	11	25	9	21	4	15	4	20
Yearly	380	491	360	512	418	516	644	477	506	485

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Month	Los Ebanos		La Joya		Edinburg City Water Plant		HCWCID #6 Goodwin Pump No. 3		HCWCID #6 Goodwin Pump No. 4B	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
	Jan.	14	25	0	25	0	37	0	31	0
Feb.	15	22	0	23	115	31	102	30	114	27
Mar.	89	15	86	14	15	22	13	19	29	17
April	0	30	0	21	0	37	0	38	0	31
May	0	53	0	51	0	61	0	61	0	56
June	0	59	0	62	0	61	0	67	0	67
July	1	29	0	24	0	37	0	36	0	29
Aug.	10	40	8	31	58	56	56	47	102	43
Sept.	157	75	148	74	169	92	217	83	215	90
Oct.	181	46	96	45	51	56	108	70	114	67
Nov.	1	20	0	18	18	24	45	26	25	24
Dec.	40	22	36	24	0	32	0	28	0	28
Yearly	508	436	374	412	426	546	541	536	599	509

Month	United Irrigation District		Penitas (Edinburg Pumping Plant)		Anzalduas Dam		Mercedes (IBWC) LRGFCP Office		Mercedes Pump	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
	Jan.	0	31	31	1	28	1	14	1	39
Feb.	82	29	107	27	71	35	69	23	56	18
Mar.	38	24	18	18	98	21	10	63	7	42
April	120	34	1	30	1	41	T	46	0	37
May	0	80	0	61	0	64	0	67	0	86
June	5	66	0	71	4	60	2	49	0	68
July	0	34	1	34	30	36	14	8	3	45
Aug.	46	49	69	55	26	50	19	36	30	61
Sept.	200	76	133	88	153	93	271	127	171	82
Oct.	156	60	60	64	83	54	124	93	141	65
Nov.	80	21	40	23	56	22	47	42	69	26
Dec.	0	25	8	26	2	21	11	30	5	50
Yearly	727	529	468	528	525	525	568	598	483	619

Month	La Feria Pumping Plant		La Feria Materials Yard		San Benito Pump		CCWCID #11 Bayview Dist. Off.		Brownsville Irrig. and Drainage Dist.	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
	Jan.	0	43	0	43	0	36	0	43	0
Feb.	45	43	45	49	63	28	30	38	33	32
Mar.	0	29	0	29	0	24	0	21	15	39
April	0	54	0	48	0	36	0	46	0	42
May	0	75	0	70	0	71	0	61	0	41
June	0	79	0	89	0	64	0	58	0	82
July	0	52	0	55	9	40	0	40	0	2
Aug.	0	80	0	69	11	64	0	65	33	81
Sept.	291	152	300	129	227	112	128	138	132	108
Oct.	179	102	252	84	163	73	0	71	77	125
Nov.	239	52	89	39	77	33	0	42	50	40
Dec.	0	42	0	43	0	34	0	36	0	16
Yearly	754	803	686	747	550	615	158	659	340	642

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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 following rainfall data. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the offices 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, 26, and Supplement 40A.

	Cd. Juarez, Chihuahua		Jimenez, Chihuahua		La Boquilla, Chihuahua		Camargo, Chihuahua		Delicias, Chihuahua	
Month	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	2	11	0	8	0	7	0	10	0	9
Feb.	7	11	2	5	0	5	70	7	0	4
Mar.	6	9	1	3	0	3	38	5	0	3
April	1	7	0	4	0	6	0	5	0	8
May	0	9	0	13	0	14	0	13	0	9
June	10	16	61	37	3	34	0	37	2	32
July	17	39	51	80	69	71	0	72	15	62
Aug.	33	43	39	65	26	73	3	67	43	63
Sept.	22	35	13	57	4	71	249	68	49	58
Oct.	60	26	55	27	25	21	63	24	85	22
Nov.	11	12	30	6	17	8	12	10	13	7
Dec.	9	15	0	6	1	8	2	11	0	9
Yearly	178	233	252	311	145	321	437	329	207	286

	Colonia Anahuac, Chihuahua		Las Burras, Chihuahua		Presa Chihuahua, Chihuahua		Chihuahua, Chihuahua		Villa Aldama, Chihuahua	
Month	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	1	9	0	7	0	7	0	8	0	7
Feb.	65	8	0	5	0	5	1	5	20	6
Mar.	25	8	0	3	1	6	1	5	22	7
April	0	10	0	7	0	8	0	7	0	10
May	0	16	0	11	0	19	3	13	0	14
June	4	41	6	30	20	46	18	39	55	39
July	2	106	42	68	125	98	114	90	19	62
Aug.	37	118	51	64	65	112	92	92	141	78
Sept.	59	84	10	58	33	85	33	76	176	78
Oct.	73	32	62	20	51	25	41	24	43	30
Nov.	21	10	7	6	7	7	15	10	17	13
Dec.	3	8	0	9	0	10	3	11	3	8
Yearly	290	450	178	288	302	428	319	380	496	352

	Presa Luis L. Leon, Chihuahua		Sierra Mojada, Coahuila		El Guaje, Coahuila		La Chuparrosa, Coahuila		La Amistad, Coahuila	
Month	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	6	0	15	0	23	1	9	1	17
Feb.	0	5	3	7	0	10	6	16	10	25
Mar.	0	3	0	7	0	9	15	12	38	26
April	0	7	0	9	5	24	0	28	0	36
May	0	15	10	25	2	25	7	36	7	63
June	14	31	24	54	25	16	18	34	91	54
July	37	56	119	69	17	62	0	29	0	44
Aug.	71	72	77	74	30	43	66	43	233	30
Sept.	7	51	18	73	2	73	37	52	31	70
Oct.	77	21	25	31	29	18	16	33	60	46
Nov.	4	8	0	12	0	7	20	17	26	27
Dec.	1	10	0	16	0	5	1	10	9	20
Yearly	211	285	276	392	110	315	187	319	506	458

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Month	Cd. Acuna, Coahuila		Presa Centenario, Coahuila		Palestina, Coahuila		Jimenez, Coahuila		Presa Cabeceras, Coahuila	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	8	15	5	14	16	19	23	18	13	12
Feb.	9	24	8	23	12	26	10	24	0	18
Mar.	30	22	34	25	25	21	32	21	30	19
April	0	45	0	38	0	44	0	43	0	43
May	0	64	0	67	0	68	0	60	0	63
June	30	55	10	64	10	60	33	64	55	61
July	11	45	20	42	0	53	0	42	0	66
Aug.	370	47	90	53	198	56	195	48	196	75
Sept.	43	80	16	79	40	81	47	74	0	107
Oct.	57	59	69	61	49	56	29	59	45	63
Nov.	38	21	18	24	20	23	36	27	26	29
Dec.	3	17	8	16	0	19	7	18	7	14
Yearly	599	494	278	506	370	526	412	498	372	570

Month	Presa San Miguel, Coahuila		Ejido San Miguel, Coahuila		Emiliano Zapata, Coahuila		Piedras Negras, Coahuila		Zaragoza, Coahuila	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	13	15	0	10	16	22	6	19	0	27
Feb.	8	24	0	8	8	30	6	22	11	23
Mar.	28	23	0	8	30	35	35	18	30	22
April	0	38	0	17	0	41	0	49	0	51
May	0	68	20	28	0	82	0	89	0	75
June	55	72	26	38	51	81	81	68	113	67
July	7	62	88	35	20	57	0	55	13	53
Aug.	450	70	1	41	310	61	61	54	179	60
Sept.	58	95	0	33	54	65	59	80	34	73
Oct.	62	56	16	13	17	45	43	62	4	40
Nov.	30	30	0	8	39	43	46	23	35	25
Dec.	3	16	0	8	0	21	9	19	5	18
Yearly	714	569	151	247	545	583	346	558	424	534

Month	Allende, Coahuila		Villa Hidalgo, Coahuila		Jarita, Nuevo Leon		Nv. Laredo (IB&WC), Tamaulipas		Muzquiz, Coahuila	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	8	14	23	20	1	18	23	20	0	20
Feb.	18	22	39	23	37	28	39	25	16	16
Mar.	14	16	32	17	28	18	32	17	23	20
April	9	42	0	46	1	44	0	38	0	33
May	0	66	0	72	0	75	0	74	3	91
June	13	53	0	59	22	44	0	64	31	81
July	28	45	0	31	0	37	0	37	129	73
Aug.	262	59	31	51	30	58	31	57	151	76
Sept.	232	80	76	78	58	63	76	78	156	125
Oct.	39	45	46	53	37	52	46	57	55	54
Nov.	63	21	14	23	43	31	14	29	36	29
Dec.	5	16	4	18	26	4	21	0	0	19
Yearly	691	479	265	491		494	265	517	600	637

Month	Sabinas, Coahuila		Juarez, Coahuila		Presa Carranza, Coahuila		Progreso, Coahuila		Ocampo, Coahuila	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	1	15	0	15	0	18	2	13	8	12
Feb.	7	17	2	15	7	17	3	18	5	7
Mar.	27	13	8	12	23	13	12	10	0	6
April	0	33	0	38	0	31	0	29	0	17
May	53	70	0	55	0	51	0	51	38	34
June	72	54	29	43	4	46	5	53	48	40
July	20	44	0	24	5	26	1	30	72	39
Aug.	197	54	131	35	39	47	55	47	62	40
Sept.	110	83	112	78	103	77	86	74	5	46
Oct.	55	45	48	42	21	42	43	45	15	27
Nov.	28	17	45	16	28	15	51	16	26	11
Dec.	0	12	0	13	0	15	0	13	0	12
Yearly	570	457	375	386	230	398	258	399	279	291

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Month	Ejido Iro de Mayo, Coahuila		Lampazos, Nuevo Leon		Cuatro Cienegas, Coahuila		Monclova, Coahuila		Candela, Coahuila	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	18	1	18	1	9	1	12	0	18
Feb.	3	7	13	17	0	8	3	13	9	11
Mar.	8	11	3	14	0	4	11	8	12	6
April	0	26	1	28	0	9	0	15	3	28
May	0	36	0	47	5	21	4	35	0	38
June	28	37	7	52	0	20	2	35	8	50
July	26	26	0	42	6	25	0	44	9	51
Aug.	59	18	50	37	35	31	39	58	60	57
Sept.	79	37	155	114	32	36	69	79	100	66
Oct.	36	23	97	52	14	19	94	32	48	35
Nov.	37	7	18	25	32	11	31	15	13	16
Dec.	0	4	6	18	0	11	2	15	5	11
Yearly	276	250	351	464	125	204	256	361	267	387

Month	Vallecillo, Nuevo Leon		Nueva Cd. Guerrero, Tamaulipas		Garza Ayala, Nuevo Leon		Cd. Mier, Km. 8 SW, Tamaulipas		El Alamo, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	21	0	24	0	23	0	24	0	30
Feb.	25	19	26	25	25	16	31	36	27	19
Mar.	27	15	50	14	21	17	47	16	39	28
April	0	45	0	37	0	38	0	34	0	47
May	0	50	0	67	0	50	0	72	0	54
June	16	73	0	61	5	62	30	74	0	60
July	4	38	21	35	0	71	56	41	17	22
Aug.	82	54	27	51	86	62	55	64	116	42
Sept.	167	103	206	99	224	99	298	123	261	88
Oct.	51	50	11	46	37	55	44	73	59	46
Nov.	32	20	31	28	39	35	86	27	43	19
Dec.	3	16	4	20	0	27	0	18	0	17
Yearly	407	504	376	507	437	555	647	602	562	472

Month	Agualegas, Nuevo Leon		La Escondida, Nuevo Leon		General Trevino, Nuevo Leon		Parras, Coahuila		Mina, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	37	37	0	42	0	29	0	19	0	14
Feb.	18	18	42	28	21	24	0	8	23	10
Mar.	16	16	35	27	53	19	0	8	6	6
April	42	42	0	61	0	47	1	11	0	22
May	56	56	0	46	0	67	2	30	2	22
June	52	52	14	68	5	53	15	45	3	35
July	41	38	24	41	30	29	36	64	0	26
Aug.	68	63	182	97	72	59	52	66	81	39
Sept.	54	51	216	111	116	89	30	65	136	81
Oct.	41	38	92	56	27	39	9	31	26	26
Nov.	16	16	106	27	41	16	6	15	9	15
Dec.	20	20	0	35	0	24	0	16	1	12
Yearly	461	447	711	639	365	495	151	378	287	308

Month	Icamole, Nuevo Leon		Santa Catarina, Nuevo Leon		Pajonal, Nuevo Leon		La Cruz, Nuevo Leon		Hipolito, Coahuila	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	1	11	0	18	0	18	0	32	3	16
Feb.	17	8	5	11	8	15	14	16	3	8
Mar.	0	6	14	9	0	10	0	13	0	10
April	0	11	1	21	3	28	6	36	0	13
May	1	21	0	28	10	54	14	51	0	20
June	30	23	24	47	70	64	109	83	30	9
July	3	14	8	38	52	62	72	87	20	16
Aug.	29	19	97	65	213	88	105	186	31	
Sept.	43	49	145	120	249	137	266	165	26	26
Oct.	23	22	37	43	74	47	14	56	7	18
Nov.	5	14	16	13	16	14	0	22	3	10
Dec.	0	13		14	0	15	16	0	0	4
Yearly	152	211		427	695	552		682	278	181

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Month	San Juan de Vaqueria, Coahuila		Espinazo, Nuevo Leon		Reata, Coahuila		Gomez Farias, Coahuila		Saltillo, Coahuila	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	25	1	29	3	12	0	39	0	16
Feb.	11	12	2	11	9	7	6	17	11	13
Mar.	0	8	4	7	0	6	6	8	0	9
April	0	19	0	29	0	14	3	24	0	17
May	1	41	14	50	4	23	0	43	0	29
June	56	60	22	28	40	28	63	51	20	50
July	55	79	9	35	56	29	64	55	50	64
Aug.	79	88		40	34	37	55	57	57	61
Sept.	65	70	66	51	29	42	33	53	93	63
Oct.	31	37	26	29	0	22	10	27	36	30
Nov.	1	11	11	14	11	12	8	13	5	19
Dec.	1	11	2	14	0	10	0	20	2	16
Yearly	300	461		337	186	242	248	407	274	387

Month	Arteaga, Coahuila		Rodrigo Gomez Res., Nuevo Leon		Ramos Arizpe, Coahuila		Huachichil, Coahuila		Carbonera, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	5	0	25	2	14	0	71	8	21
Feb.	0	10	8	24	15	9	5	38	0	13
Mar.	1	3	17	27	0	7	1	17	0	12
April	0	16	9	49	0	14	0	30	0	26
May	2	28	1	74	0	24	0	100	0	41
June	19	41	53	135	15	25	117	105	23	63
July	55	63	60	97	8	37	26	94	8	68
Aug.	55	64	169	157	37	33	209	73	69	70
Sept.	88	73	388	249	98	47	53	84	49	62
Oct.	31	35	156	123	24	21	42	45	0	36
Nov.	0	10	61	32	5	12	7	18	0	20
Dec.	0	14	7	23	3	14	0	22	3	20
Yearly	251	362	929	1,015	207	257	460	697	160	452

Month	Rusio, Nuevo Leon		San Antonio de las Alazanas, Coahuila		San Rafael, Nuevo Leon		La Huasteca, Nuevo Leon		Agua Blanca, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	21	0	31	0	29	0	15	1	24
Feb.	0	15	3	18	2	21	4	4	7	13
Mar.	0	13	0	13	2	15	0	7	0	15
April	12	32	0	26	0	24	0	16	14	23
May	11	48	10	51	10	44	2	45	1	50
June	37	54	134	67	87	54	51	37	62	59
July	20	44	14	80	34	60	9	28	126	82
Aug.	36	46	97	76	55	64	156	44	156	86
Sept.	19	47	13	65	0	54	203	94	326	132
Oct.	21	32	25	43	14	43	51	43	67	60
Nov.	1	18	7	26	5	27	0	6	2	21
Dec.	0	24	0	24	0	22	0	14	0	16
Yearly	157	394	303	518	209	457	476	353	762	581

Month	Potrero de Abrego, Coahuila		Cienega del Toro, Nuevo Leon		El Canada, Nuevo Leon		Mimbres, Nuevo Leon		Hacienda Mamulique, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	4	27	0	33	0	15	0	39	0	25
Feb.	0	14	3	15	24	17	0	26	31	12
Mar.	0	27	3	20	34	25	0	25	59	16
April	9	40	12	39	9	30	15	40	3	40
May	15	38	12	63	0	68	46	71	0	44
June	88	50	43	61	6	62	53	88	12	68
July	50	25	47	69	14	21	10	67	47	61
Aug.	26	64	110	76	67	56	136	91	151	73
Sept.	136	64	23	83	106	108	47	95	173	107
Oct.	40	30	62	48	32	72	74	54	67	45
Nov.	0	26	0	19	48	22	7	29	38	29
Dec.	0	22	0	19	1	10	0	30	0	23
Yearly	368	427	315	545	341	506	388	655	581	543

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Month	Cerritos, Nuevo Leon		Los Ramones, Nuevo Leon		Ejido Marin, Nuevo Leon		Dr. Gonzales, Nuevo Leon		Cienega de Flores, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	30	0	24	0	32	0	42	0	29
Feb.	12	16	5	19	25	18	28	15	31	23
Mar.	16	16	42	19	41	21	41	20	38	25
April	7	48	2	38	0	31	2	40	0	36
May	1	92	0	70	0	55	0	66	0	63
June	89	138	60	83	36	62	63	74	9	80
July	58	110	52	47	18	42	15	36	23	55
Aug.	341	151	54	80	148	66	138	73	68	102
Sept.	358	282	74	140	110	100	133	86	169	135
Oct.	90	117	25	62	29	38	27	34	37	60
Nov.	34	30	57	19	35	18	44	27	30	27
Dec.		15	4	17	8	27	10	46	12	28
Yearly		1,045	375	618	450	510	501	559	417	663

Month	Higueras, Nuevo Leon		Monterrey, Nuevo Leon		Laguna de Sanchez, Nuevo Leon		Casillas, Nuevo Leon		Montemorelos, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	21	0	18	0	21	0	25	1	26
Feb.	28	16	14	17	0	15	0	14	4	24
Mar.	25	19	26	20	0	10	0	14	27	29
April	1	32	3	31	0	30	8	29	8	58
May	0	53	0	47	16	48	8	58	3	86
June	7	67	22	71	0	81	54	78	35	98
July	6	54	7	55	64	52	64	40	40	60
Aug.	94	84	91	78	103	57	79	141	105	
Sept.	145	126	115	152	226	164	81	115	171	174
Oct.	21	48	120	77	149	65	47	62	83	94
Nov.	27	20	43	29	0	21	0	17		39
Dec.		20	3	18	0	16	0	16	6	25
Yearly		560	444	613		638	307	571		818

Month	Cabezones, Nuevo Leon		Rayones, Nuevo Leon		Potosi, Nuevo Leon		Galeana, Nuevo Leon		Linares, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	31	0	14	0	26	0	19	6	25
Feb.	14	20	0	10	0	16	0	16	3	22
Mar.	24	27	0	9	8	11	4	12	30	27
April	4	61	4	27	14	34	12	32	3	57
May	0	92	2	47	9	50	10	50	1	93
June	17	97	52	52	21	29	87	59	35	102
July	62	64	52	31	11	34	39	46	6	66
Aug.	120	142	87	68	30	34	37	65	61	95
Sept.	207	205	200	92	0	35	110	84	199	162
Oct.	66	89	35	40	15	34	85	43	75	83
Nov.	57	26	0	11	0	27	0	16	25	28
Dec.		20	0	11	0	35	0	21	5	27
Yearly		874	432	412	108	365	384	463	449	787

Month	Cerro Prieto, Nuevo Leon		Las Enramadas, Nuevo Leon		Cerralvo, Nuevo Leon		Madero(Los Aldamas) Nuevo Leon		La Pormona, Nuevo Leon	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	3	29	5	25	0	22	0	30	2	31
Feb.	3	15	25	17	0	17	31	20	0	14
Mar.	19	19	36	20	41	23	36	19	16	26
April	4	60	0	44	0	44	0	36	0	55
May	0	98	0	73	0	84	0	71	0	94
June	31	91	48	82	26	87	3	74	41	79
July	43	43	51	55	35	50	26	53	18	47
Aug.	45	78	40	88	173	88	26	87	97	74
Sept.	117	152	115	153	167	130	138	115	208	123
Oct.	150	61	63	64	20	59	84	39	102	42
Nov.	53	20	60	19	72	19	48	17	34	16
Dec.	3	24	0	20	0	14	0	22	2	29
Yearly	471	650	443	660	534	637		583	520	630

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Month	General Bravo, Nuevo Leon		Vaquerias, Nuevo Leon		El Brasil, Nuevo Leon		Villa Cardenas, Tamaulipas		Control, Tamaulipas	
	1998	Average	1998	Average	1998	Average	1998	Average	1998	Average
Jan.	0	22	6	36	0	28	15	40	8	35
Feb.	45	16	1	19	42	25	58	29	63	28
Mar.	23	14	17	24	39	17	10	21	10	21
April	0	37	0	42	0	48	0	54	0	43
May	0	72	0	87	0	62	0	61	0	72
June	42	69	4	69	10	59	0	72	0	69
July	0	51	1	28	0	35	30	42	13	43
Aug.	20	67	69	62	80	52	0	68	8	81
Sept.	131	108	200	103	213	90	283	119	284	129
Oct.	174	49	27	48	144	48	134	75	195	78
Nov.	70	22	71	21	84	23	119	33	137	35
Dec.	0	20		43	8	16	22	30	28	29
Yearly	505	547		582	620	503	671	644	746	663

Month	Matamoros, Tamaulipas		Valle Hermoso, Tamaulipas							
	1998	Average	1998	Average						
Jan.	9	47	13	30						
Feb.	70	41	91	31						
Mar.	21	22	15	22						
April	4	51	0	53						
May	0	66	0	67						
June	0	81	15	74						
July	0	58	3	48						
Aug.	62	107	31	68						
Sept.	297	164	213	128						
Oct.	96	103	208	77						
Nov.	114	39	239	36						
Dec.	13	45	16	26						
Yearly	686	824	844	660						

AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED
With Averages for the 127 Years 1871 - 1998, Inclusive

In Millimeters

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 (6,933 Square Km)		Fort Quitman to Above Rio Conchos (7,915 Square Km)		* Above Rio Conchos to Johnson Ranch (9,795 Square Km)		Johnson Ranch to Foster Ranch (33,623 Square Km)	
	1998	Period Average	1998	Period Average	1998	Period Average	1998	Period Average
Jan.	11	12	1	10	0	9	0	12
Feb.	5	10	5	7	0	8	3	10
Mar.	6	8	3	6	1	5	5	10
April	0	7	0	9	2	10	0	19
May	2	11	6	16	3	20	3	37
June	8	20	11	32	12	30	18	42
July	35	55	42	71	13	47	12	45
Aug.	41	48	61	61	35	49	68	51
Sept.	15	37	4	50	8	41	3	54
Oct.	36	23	45	26	54	22	27	31
Nov.	6	11	5	10	8	9	23	15
Dec.	5	15	5	14	1	10	3	14
Yearly	170	257	188	312	137	260	165	340

Month	Pecos River below Sheffield (8,780 Square Km)		# Foster Ranch to Amistad Dam (7,249 Square Km)		Devils River (11,150 Square Km)		+ Amistad Dam to Eagle Pass (4,209 Square Km)	
	1998	Period Average	1998	Period Average	1998	Period Average	1998	Period Average
Jan.	4	17	2	18	12	18	6	19
Feb.	16	22	7	23	30	20	5	23
Mar.	36	19	18	24	47	26	23	25
April	0	44	0	41	3	43	0	43
May	2	48	8	71	14	66	6	72
June	31	60	20	61	53	65	27	63
July	5	46	2	45	5	46	26	47
Aug.	93	51	89	47	243	55	219	49
Sept.	29	63	36	74	19	74	20	76
Oct.	35	46	19	50	21	55	28	52
Nov.	53	23	22	26	52	37	23	26
Dec.	8	19	3	21	13	25	9	22
Yearly	312	458	226	501	512	530	392	517

Month	! Eagle Pass to Laredo (9,829 Square Km)		** Laredo to Falcon Dam (8,726 Square Km)		## Falcon Dam to Rio Grande City (1,212 Square Km)		United States Side Below Rio Grande City (2,554 Square Km)	
	1998	Period Average	1998	Period Average	1998	Period Average	1998	Period Average
Jan.	37	19	0	21	0	23	6	33
Feb.	22	21	40	22	58	22	58	29
Mar.	21	23	41	20	44	23	24	26
April	2	42	1	36	0	32	9	36
May	0	77	0	80	0	61	0	71
June	19	62	19	52	26	55	3	65
July	5	38	10	51	13	46	7	44
Aug.	128	56	67	49	9	52	21	58
Sept.	101	75	142	77	314	89	214	110
Oct.	81	48	39	44	128	49	119	65
Nov.	48	25	32	38	42	21	60	34
Dec.	6	25	7	22	7	18	12	32
Yearly	470	511	398	512	641	491	533	603

* Excluding Rio Conchos, Alamito Creek, and Terlingua Creek

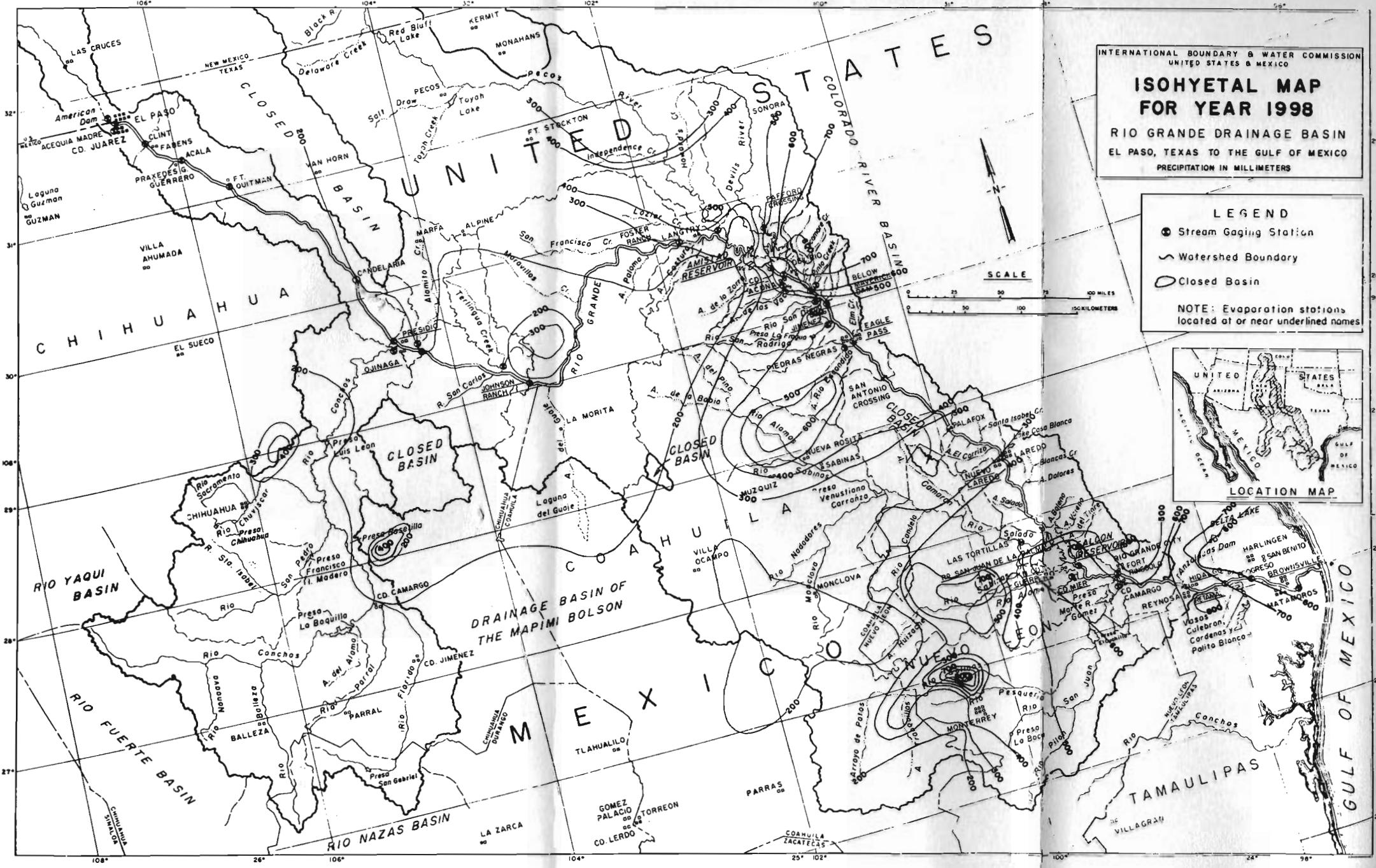
Excluding Pecos and Devils Rivers

+ Excluding Arroyo Las Vacas, San Felipe Creek, Pinto Creek, Rio San Diego, and Rio San Rodrigo

! Excluding Rio Escondido

** 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 the current year. 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 THE UNITED STATES

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. METERS	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
A.A. Baker Ranch	R	29° 44'	101° 08'	524	July 1962	Devils River - Fort Quitman -	I. B. & W. C.
Adobes Ranch	C	29° 46'	104° 34'	777	# 1950	Above Rio Conchos	I. B. & W. C.
American Dam	S	31° 47'	106° 32'	1,137	# 1938	El Paso - Fort Quitman	I. B. & W. C.
Amistad Dam	R	29° 27'	101° 01'	351	July 1962	Foster Ranch - Amistad Dam	I. B. & W. C.
Amistad Reservoir near Comstock	C	29° 32'	101° 12'	344	# 1970	Foster Ranch - Amistad Dam	I. B. & W. C.
Anzalduas Dam	S	26° 08'	98° 20'	39	1972	Lower Rio Grande Valley	I. B. & W. C.
Apache Ranch	C	27° 56'	99° 56'	152	#May 1953	Eagle Pass - Laredo	Ranch Foreman
Big Satan Creek Station	C	29° 34'	100° 57'	351	Nov. 1968	Devils River	I. B. & W. C.
Bill Shannon Ranch	C	29° 57'	104° 40'	817	#July 1956	Fort Quitman - Above Rio Conchos	Bill Shannon
Brothertown Ranch	S	29° 42'	101° 19'	427	1961	Langtry - Below Amistad Dam	Perry Calk
Brownsville Irrigation and Drainage District	S	25° 52'	97° 27'	!	1992	Lower Rio Grande Valley	Joe Barrera
Buoy No. 11	C	29° 30'	101° 10'	**	#Dec. 1969	Foster Ranch - Amistad Dam	I. B. & W. C.
CCWID # 11 (Bayview Dist. Off.)	S	26° 08'	97° 21'	8	# 1952	Lower Rio Grande Valley	CCWID #11
Cliff Lowry Ranch No. 1	R	29° 28'	100° 52'	454	July 1962	Devils River	I. B. & W. C.
Comstock	R	29° 41'	101° 10'	466	#May 1939	Foster Ranch - Amistad Dam	I. B. & W. C.
Corralitos Ranch	C	27° 07'	99° 25'	105	1953	Laredo - Falcon Dam	I. B. & W. C.
Dead Man's Canyon near Comstock	C	29° 47'	101° 19'	399	Sept. 1967	below Sheffield	I. B. & W. C.
Devils Lake	R	29° 34'	100° 58'	349	#May 1939	Devils River	I. B. & W. C.
Devils River at Caughorn Ranch	S	30° 04'	101° 06'	505	#April 1976	Devils River	I. B. & W. C.
Eagle Pass	S	28° 42'	100° 30'	248	1964	Eagle Pass - Laredo	I. B. & W. C.
Ed Crane Ranch	S	29° 50'	101° 05'	497	# 1955	Devils River	E. J. Crane Jr.
Edinburg City Water Plant	S	26° 18'	98° 10'	30	# 1934	Lower Rio Grande Valley	City of Edinburg
El Indio	S	28° 31'	100° 19'	221	#June 1941	Eagle Pass - Laredo	Mrs. Courtney
Evans Creek near Comstock	C	29° 32'	101° 06'	360	#July 1969	Devils River	I. B. & W. C.
Falcon Dam	S	26° 33'	99° 08'	498	April 1950	Laredo - Falcon Dam	I. B. & W. C.
Fort Hancock Bridge	S	31° 16'	105° 51'	1,067	#April 1940	El Paso - Fort Quitman	I. B. & W. C.
Garciasville	R	26° 20'	98° 41'	61	#April 1957	Lower Rio Grande Valley	I. B. & W. C.
Gillis Headquarters	S	29° 36'	100° 47'	430	1968	Amistad Dam - Eagle Pass	Jake Schiller
Gillis Ranch	S	29° 40'	101° 03'	439	# 1965	Devils River	Walter Gillis
Goldwire Ranch	C	29° 44'	100° 57'	514	Nov. 1968	Devils River	I. B. & W. C.
Guayuco Arroyo	R	31° 10'	105° 40'	1,097	#May 1940	El Paso - Fort Quitman	I. B. & W. C.
HWCID No. 6	S	26° 16'	98° 24'	53	1953	Lower Rio Grande Valley	HWCID No. 6
Goodwin Pump No. 3							
HWCID No. 6	S	26° 18'	98° 22'	64	1953	Lower Rio Grande Valley	HWCID No. 6
Goodwin Pump No. 4B							
H.K. Fawcett Ranch	C	29° 52'	100° 53'	488	# 1941	Devils River	I. B. & W. C.
H.T. Fletcher Ranch	S	30° 12'	104° 16'	1,554	# 1939	Alamito Creek	Hayes Mitchell
H.T. Miers							Jr.
Ranch Headquarters	C	29° 44'	100° 50'	536	# 1957	Devils River	I. B. & W. C.
H.T. Miers Ranch No. 2	R	29° 43'	100° 53'	488	April 1964	Devils River	I. B. & W. C.
Harlow Ranch	C	29° 49'	101° 10'	517	#Mar. 1969	Devils River	I. B. & W. C.
Huisache Ranch	C	26° 57'	99° 21'	117	Aug. 1953	Laredo - Falcon Dam	I. B. & W. C.
Hutto Ranch No. 1	R	29° 30'	100° 50'	378	# 1964	Devils River	I. B. & W. C.
Hutto Ranch No. 2	R	29° 38'	100° 54'	369	# 1964	Devils River	I. B. & W. C.
J.G. Brite Ranch	R	29° 33'	101° 01'	351	#Sept. 1962	Devils River	I. B. & W. C.
Johnson Ranch	C	29° 01'	103° 23'	625	#July 1933	Johnson Ranch - Foster Ranch	I. B. & W. C.
Keisling Ranch	S	28° 23'	100° 17'	226	Dec. 1958	Eagle Pass - Laredo	I. B. & W. C.
Kerr Mitchell Ranch	S	30° 13'	104° 00'	1,356	#Mar. 1941	Alamito Creek	Mrs. K. Mitchell
La Feria Materials Yard	V	26° 10'	97° 50'	18	# 1960	Lower Rio Grande Valley	CCWID #3
La Feria Pumping Plant	S	26° 03'	97° 50'	18	# 1952	Lower Rio Grande Valley	CCWID #5
La Joya	C	26° 15'	98° 29'	46	#April 1957	Lower Rio Grande Valley	I. B. & W. C.
Las Cruces	S	32° 19'	106° 47'	1,187	1975	Caballo Dam - El Paso	I. B. & W. C.
Las Moras Creek	S	29° 00'	100° 38'	244	1958	Amistad Dam - Eagle Pass	I. B. & W. C.
Laughlin Air Force Base	S	29° 21'	100° 47'	329	Dec. 1958	Amistad Dam - Eagle Pass	U. S. A. F.

S Standard R Recording C Cumulative

V Visual

** Reservoir surface

Some months or years missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

IN THE UNITED STATES

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. METERS	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Lewis Ranch	S	29° 32'	100° 40'	427	# 1964	Amistad Dam - Eagle Pass	B.C. Lewis Jr.
Lewis James Ranch	S	30° 11'	102° 07'	998	# 1966	Johnson Ranch - Foster Ranch	Lewis James
Long Ranch	R	29° 27'	100° 56'	347	Oct. 1971	Devils River	I. B. & W. C.
Los Ebanos	C	26° 14'	98° 34'	46	#April 1957	Lower Rio Grande Valley	I. B. & W. C.
Lowry Ranch No. 2	R	29° 37'	100° 55'	354	May 1965	Devils River	I. B. & W. C.
Martin King Ranch	R	29° 43'	101° 02'	445	#Nov. 1954	Foster Ranch - Amistad Dam	I. B. & W. C.
Maverick County Canal Headgate	S	29° 10'	100° 46'	265	#Mar. 1948	Amistad Dam - Eagle Pass	MCWCID #1
Mercedes LRGFCP Office	S	26° 07'	97° 56'	22	1994	Lower Rio Grande Valley	I. B. & W. C.
Mercedes Pump	S	26° 04'	97° 54'	1	1938	Lower Rio Grande Valley	I. B. & W. C.
Middle Fork San Pedro	C	29° 29'	100° 52'	357	#June 1969	Devils River	I. B. & W. C.
North Fork San Pedro	C	29° 31'	100° 53'	349	#June 1969	Devils River	I. B. & W. C.
Owens Ranch	S	30° 48'	102° 42'	686	#July 1963	Pecos River below Sheffield	I. B. & W. C.
Pafford Crossing	C	29° 40'	101° 00'	360	Mar. 1960	Devils River	Mrs. W. Owens
Pecos River near Langtry Station	C	29° 48'	101° 26'	384	July 1967	Pecos River below Sheffield	I. B. & W. C.
Penitas							
(Edinburg Pumping Plant)	S	26° 14'	98° 27'	30	July 1957	Lower Rio Grande Valley	M. Stevens
Pinto Creek Station	C	29° 09'	100° 43'	265	#Dec. 1958	Amistad Dam - Eagle Pass	I. B. & W. C.
Presidio (IBWC)	S	29° 34'	100° 23'	792	#Nov. 1949	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Prosser Ranch No. 1	C	29° 53'	101° 14'	521	Mar. 1965	Pecos River below Sheffield	I. B. & W. C.
Prosser Ranch No. 2	C	29° 48'	101° 15'	564	#Mar. 1965	Devils River	I. B. & W. C.
prosser Ranch No. 3	C	30° 02'	101° 16'	616	#Mar. 1965	Pecos River below Sheffield	I. B. & W. C.
Redford	C	29° 29'	104° 13'	762	#July 1954	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Rio Grande near Dryden	R	29° 48'	102° 08'	411	May 1976	Johnson Ranch - Foster Ranch	National Weather Service
Roma							
(International Bridge)	S	26° 24'	99° 01'	70	# 1941	Falcon Dam - Rio Grande City	I. B. & W. C.
Ross Foster Ranch	C	29° 45'	101° 46'	375	May 1961	Johnson Ranch - Foster Ranch	I. B. & W. C.
Rough Canyon near Del Rio	C	29° 34'	100° 56'	350	#June 1969	Devils River	I. B. & W. C.
San Benito Pump	S	26° 03'	97° 45'	15	Oct. 1933	Lower Rio Grande Valley	CCWCID No. 2
Sellers Ranch	C	29° 34'	101° 02'	363	#Mar. 1960	Devils River	I. B. & W. C.
Shafter	S	29° 49'	104° 19'	1,195	#July 1968	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Stewart Ranch	R	29° 35'	100° 52'	405	#April 1960	Devils River	Raymond Wylic
Study Butte	S	29° 19'	103° 32'	777	July 1977	Terlingua Creek	I. B. & W. C.
Terlingua Creek Station	C	29° 12'	103° 36'	675	#Mar. 1952	Terlingua Creek	Shirley Willard
Trees Farm	R	28° 38'	100° 25'	219	#Mar. 1959	Eagle Pass - Laredo	I. B. & W. C.
Tuffy Whitehead Ranch	R	29° 37'	101° 07'	433	July 1962	Devils River	I. B. & W. C.
United Irrigation District	S	26° 11'	98° 24'	!	#Aug. 1961	Lower Rio Grande Valley	United Irrig. District
Van Dalsem Farm	C	28° 27'	100° 19'	213	# 1958	Eagle Pass - Laredo	I. B. & W. C.
Walker Ranch	C	29° 49'	101° 13'	466	#Aug. 1969	Devils River	I. B. & W. C.
Wardlaw Standart Ranch	S	29° 18'	100° 38'	326	April 1977	Pinto Creek	Hadly Wardlaw
Zapata	S	26° 54'	99° 16'	116	1992	Laredo - Falcon Dam	I. B. & W. C.
Zuberbueler Ranch	S	29° 41'	101° 14'	445	#Feb. 1975	Foster Ranch - Amistad Dam	J.U. Zuberbueler

S Standard

R Recording

C Cumulative

! Not Available

Some months or years missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

IN MEXICO

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. METERS	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Agualeguas, Nuevo Leon	S	26° 19'	99° 33'	184	# 1979	Rio Alamo	S. A. R. H.
Allende, Coahuila	S	28° 21'	100° 51'	357	1947	Eagle Pass-Laredo	C. N. A.
Agua Blanca, Nuevo Leon	S	25° 32'	100° 31'	2,690	1958	Rio San Juan	C. N. A.
Anahuac, Nuevo Leon	S	27° 15'	100° 08'	200	#June 1953	Rio Salado	C. N. A.
Arteaga, Coahuila	S	25° 24'	101° 00'	1,600	#Jan. 1958	Rio San Juan	C. N. A.
Cabezonas, Nuevo Leon	S	24° 59'	99° 45'	!	# 1962	Adjacent to Rio San Juan	S. A. R. H.
Camargo, Chihuahua	S	27° 42'	105° 10'	1,204	#May 1903	Rio Conchos	Meteor. Service of Mexico
Candela, Coahuila	S	26° 50'	100° 40'	!	# 1970	Rio Salado	C. N. A.
Carbonera, Nuevo Leon	S	24° 49'	100° 47'	!	# 1958	Rio San Juan	S. A. R. H.
Casillas, Nuevo Leon	S	25° 11'	100° 12'	1,237	# 1958	Rio San Juan	C. N. A.
Cd. Acuna, Coahuila	S	29° 20'	100° 57'	274	1951	Amistad Dam-Eagle Pass	C. I. L. A.
Cd. Juarez, Chihuahua	S	31° 45'	106° 27'	1,131	1903	El Paso-Ft Quitman	I. B. & W. C.
Cd. Mier, Tamaulipas	S	26° 26'	99° 09'	80	#Oct. 1955	Falcon Dam-Rio Grande C.	I. B. & W. C.
Cerralvo	R	26° 05'	99° 37'	345	#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'	270	#May 1959	Rio San Juan	S. A. R. H.
Chihuahua, Chihuahua	S	28° 38'	106° 04'	1,450	1900	Rio Conchos	Meteor. Service of Chihuahua
Cienega de Flores, Nuevo Leon	R	25° 57'	100° 10'	540	#April 1938	Rio San Juan	S.A.R.H.
Cienega del Toro, N. L.	S	25° 05'	100° 20'	2,137	# 1958	Rio San Juan	S. A. R. H.
Control, Tamaulipas	S	25° 58'	97° 49'	18	#June 1942	Lower Rio Grande Valley	S. A. R. H.
Cuatro Cienegas, Coahuila	S	26° 59'	102° 04'	742	1923	Rio Salado	C. N. A.
Delicias, Chihuahua	S	28° 11'	105° 28'	1,130	#Aug. 1933	Rio Conchos	C. N. A.
Dr. Gonzalez, N. L.	S	25° 48'	99° 52'	318	1992	Rio San Juan	C. N. A.
Ejido Iro de Mayo, Coah.	S	27° 13'	101° 13'	!	1980	Rio Salado	C. N. A.
Ejido Marin, Nuevo Leon	S	25° 50'	100° 00'	!	#Mar. 1979	Rio San Juan	S. A. R. H.
Ejido San Miguel, Coah.	S	29° 02'	100° 58'	!	1976	Amistad-Eagle Pass	C. N. A.
El Alamo, Nuevo Leon	S	26° 24'	100° 24'	!	# 1981	Rio Salado	I. B. & W. C.
El Brasil, Nuevo Leon	S	25° 53'	98° 59'	!	#July 1979	Rio San Juan	S. A. R. H.
El Canada, Nuevo Leon	S	25° 48'	100° 16'	!	#Jan. 1958	Rio San Juan	C. N. A.
El Guaje, Coahuila	S	28° 05'	103° 17'	970	1992	Johnson Ranch-Langtry	C. N. A.
Emiliano, Zapata, Coah.	S	29° 01'	100° 49'	!	1964	Amistad-Eagle Pass	C. N. A.
Espiniano, Nuevo Leon	S	26° 15'	101° 05'	!	# 1980	Rio Salado	S. A. R. H.
Galeana, Nuevo Leon	S	24° 50'	100° 04'	1,656	#Oct. 1904	Adjacent to Rio San Juan	C. N. A.
Garza Ayala, Nuevo Leon	S	26° 29'	100° 03'	!	# 1968	Rio San Juan	S. A. R. H.
General Bravo, Nuevo Leon	S	25° 48'	99° 11'	180	#Sept. 1906	Rio San Juan	S. A. R. H.
General Trevino, N. L.	S	26° 13'	99° 28'	!	#Oct. 1976	Rio Alamo	S. A. R. H.
Gomez Farias, Coahuila	S	24° 58'	101° 03'	!	# 1979	Rio San Juan	C. N. A.
Hacienda Mamulique, N. L.	S	26° 07'	100° 14'	!	#Sept. 1973	Rio San Juan	S. A. R. H.
Higueras, Nuevo Leon	S	25° 58'	100° 01'	500	#Sept. 1906	Rio San Juan	Meteor. Service of Mexico
Hipolito, Coahuila	S	25° 42'	101° 24'	!	# 1980	Rio San Juan	S. A. R. H.
Huachichil, Coahuila	S	25° 12'	100° 50'	2,100	1980	Rio San Juan	C. N. A.
Icamole, Nuevo Leon	S	25° 55'	100° 43'	1,494	# 1958	Rio San Juan	C. N. A.
Jarita, Nuevo Leon	C	27° 26'	99° 48'	207	#Mar. 1961	Laredo-Falcon Dam	S. A. R. H.
Jimenez, Chihuahua	S	27° 08'	104° 56'	1,377	# 1951	Amistad Dam-Eagle Pass	Meteor. Service of Mexico
Jimenez, Coahuila	S	29° 04'	100° 40'	248	1951	Amistad Dam-Eagle Pass	C. I. L. A.
Juarez, Coahuila	S	27° 37'	100° 44'	275	1969	Rio Salado	C. N. A.
La Amistad, Coahuila	S	29° 27'	101° 05'	316	#Feb. 1977	Amistad Dam-Eagle Pass	I. B. & W. C.
La Boquilla, Chihuahua	S	27° 33'	105° 38'	1,240	#June 1910	Rio Conchos	C. N. A.
La Chuparrosa, Coahuila	R	29° 30'	101° 15'	350	# 1970	Foster Ranch-Amistad Dam	I. B. & W. C.
La Cruz, Nuevo Leon	S	25° 28'	100° 26'	1,500	# 1958	Rio San Juan	C. N. A.
La Escobida, Nuevo Leon	S	26° 16'	99° 46'	300	#Feb. 1979	Rio San Juan	S. A. R. H.
La Huasteca, Nuevo Leon	S	25° 32'	100° 30'	!	# 1979	Rio San Juan	S. A. R. H.
La Pionera, Nuevo Leon	S	24° 59'	99° 12'	!	#Mar. 1979	Rio San Juan	S. A. R. H.
Laguna de Sanchez, NL	R	25° 21'	100° 16'	1,600	#April 1941	Rio Salado	C. N. A.
Lampazos, Nuevo Leon	S	27° 02'	100° 30'	341	#May 1903	Rio Salado	S. A. R. H.
Las Burras, Chihuahua	S	29° 31'	105° 25'	1,096	#July 1949	Rio Conchos	C. N. A.
Las Enramadas, Nuevo Leon	S	25° 48'	99° 16'	222	#Sept. 1926	Rio San Juan	C. N. A.
Linares, Nuevo Leon	R	24° 52'	99° 34'	360	# 1900	Adjacent to Rio San Juan	C. N. A.
Los Ramones, Nuevo Leon	R	25° 42'	99° 38'	80	#Sept. 1939	Rio San Juan	S. A. R. H.

S Standard R Recording C Cumulative ! Not Available # Some months or years missing

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

IN MEXICO

NAME OF STATION	TYPE GAGE	LATI- TUD	LONGI- TUD	ELEV. METERS	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Madero (Los Aldamas), NL	S	26° 02'	99° 12'	!	#May 1970	Rio San Juan	C. N. A.
Matamoros, Tamaulipas	S	25° 52'	97° 30'	10	# 1958	Lower Rio Grande Valley	Meteor. Service of Mexico
Mimbre Nuevo Leon	S	24° 58'	100° 16'	1,750	# 1958	Rio San Juan	S. A. R. H.
Mina, Nuevo Leon	S	26° 00'	100° 31'	500	# 1958	Rio San Juan	C. N. A.
Monclova, Coahuila	S	26° 54'	101° 25'	586	1897	Rio Salado	C. N. A.
Montemorelos, Nuevo Leon	S	25° 12'	99° 50'	433	#Mar. 1904	Rio San Juan	C. N. A.
Monterrey, Nuevo Leon	S	25° 40'	100° 18'	530	# 1896	Rio San Juan	C. N. A.
Muzquiz, Coahuila	S	27° 53'	101° 31'	504	#June 1923	Rio Salado	S. A. R. H.
Nueva Cd. Guerrero, Tamps.	S	26° 35'	99° 15'	106	#May 1954	Laredo - Falcon Dam	I. B. & W. C.
Nuevo Laredo, Tamps.	S	27° 30'	99° 30'	126	# 1950	Laredo - Falcon Dam	S. M. N.
Ocampo, Coahuila	S	27° 19'	102° 24'	1,149	#May 1960	Adjacent to Rio Salado	S. A. R. H.
pajonial, Nuevo Leon	S	25° 29'	100° 23'	1,531	# 1958	Rio San Juan	C. N. A.
palestina, Coahuila	S	29° 09'	100° 59'	330	1931	Amistad-Eagle Pass	S. A. R. H.
Parras, Coahuila	S	25° 27'	102° 10'	1,680	1958	Rio San Juan	S. A. R. H.
Piedras Negras, Coahuila	S	28° 43'	100° 31'	249	1951	Eagle Pass-Laredo	Meteor. Service of Mexico
Potosi, Nuevo Leon	S	24° 51'	100° 19'	!	# 1958	Adjacent to Rio San Juan	C. N. A.
Potro de Abrego, Coah.	S	25° 17'	100° 21'	!	# 1982	Rio San Juan	S. A. R. H.
presa Cabeceras, Coah.	S	29° 09'	101° 07'	!	1964	Amistad-Eagle Pass	C. N. A.
presa Carranza, Coah.	S	27° 31'	100° 37'	240	1927	Rio Salado	C. N. A.
presa Centenario, Coah.	S	29° 13'	100° 57'	!	1964	Amistad-Eagle Pass	C. N. A.
presa Chihuahua, Chih.	S	28° 34'	105° 10'	1,595	Oct. 1961	Rio Conchos	C. N. A.
presa Luis L. Leon, Chih.	S	28° 57'	105° 17'	!	Oct. 1964	Rio Conchos	S. A. R. H.
presa San Miguel, Coah.	S	29° 02'	100° 57'	!	1964	Amistad-Eagle Pass	C. N. A.
Progreso, Coahuila	S	27° 25'	101° 00'	370	#Feb. 1943	Rio Salado	S. A. R. H.
Ramos Arizpe, Coahuila	S	25° 32'	100° 57'	1,399	#April 1907	Rio San Juan	Meteor. Service of Mexico
Rayones, Nuevo Leon	S	25° 01'	100° 05'	600	#Oct. 1926	Rio San Juan	C. N. A.
Reata, Coahuila	S	26° 08'	101° 05'	936	#July 1944	Rio San Juan	S. A. R. H.
Rodrigo Gomez Res. N. L.	S	25° 25'	100° 07'	445	# 1923	Rio San Juan	C. N. A.
Rusio, Nuevo Leon	S	24° 42'	100° 26'	2,004	#June 1956	Rio San Juan	C. N. A.
Sabinas, Coahuila	S	27° 51'	101° 07'	340	1922	Rio Salado	C. N. A.
Saltillo, Coahuila	S	25° 26'	101° 00'	1,610	1886	Rio San Juan	C. N. A.
San Antonio de las Alazanas, Coahuila	S	25° 15'	100° 35'	2,170	# 1958	Rio San Juan	S. A. R. H.
San Juan de Vaqueria, Coah.	S	25° 15'	101° 13'	!	# 1980	Rio San Juan	C. N. A.
San Rafael, Nuevo Leon	C	25° 02'	100° 33'	1,714	1958	Rio San Juan	C. N. A.
Santa Catarina, NL	R	25° 40'	100° 28'	880	#Oct. 1937	Rio San Juan	C. N. A.
Sierra Mojada, Coahuila	S	27° 07'	103° 42'	1,256	1897	Johnson Ranch-Langtry	C. N. A.
Vaqueria, Nuevo Leon	S	25° 08'	99° 04'	!	#Mar. 1979	Rio San Juan	S. A. R. H.
valle Hermoso, Tamaulipas	S	25° 41'	97° 48'	16	#June 1948	Lower Rio Grande Valley	C. N. A.
Vallecillo, Nuevo Leon	S	26° 40'	99° 59'	274	#June 1958	Rio Salado	S. A. R. H.
Villa Aldama, Chihuahua	S	28° 50'	105° 55'	1,262	#Aug. 1906	Rio Conchos	Meteor. Service of Chihuahua
Villa Cardenas, Tamps.	S	23° 56'	98° 55'		1953	Lower Rio Grande Valley	C. N. A.
Villa Hidalgo, Coahuila	S	27° 47'	99° 52'	200	# 1951	Eagle Pass-Laredo	I. B. & W. C.
Zaragoza, Coahuila	S	23° 58'	99° 46'	1,370	#Aug. 1977	Eagle Pass-Laredo	C. N. A.

S Standard R Recording C Cumulative ! Not Available # Some months or years missing

EVAPORATION IN THE RIO GRANDE BASIN
IN THE UNITED STATES

In Millimeters

Tabulated below are records of evaporation observed at seven 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 46 meters, and all brush, tall weeds, and other obstructions within 30 meters of the fenced enclosures. Within the enclosures all vegetation has been eradicated or kept trimmed to within 0.10 meter 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," on preceding pages of this bulletin.

Records were obtained by means of:

1. Standard National Weather Service pan. A circular pan, 1.22 meters in diameter and 0.25 meter deep, made of 22-gage galvanized iron, is set on a wooden platform with the rim of the pan 0.41 meter above the ground. The water level is maintained between 0.05 and 0.08 meter 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, 0.61 meter in diameter and 0.91 meter deep, made of 22-gage galvanized iron, is set in the ground with the rim of the pan 0.08 meter above the ground surface and the top covered with a circular screen of No. 4 (6 millimeter) galvanized hardware cloth. This type of pan, equipped with an automatic feed tank that maintains the water at a level 0.08 meter below the rim of the pan, was in operation at Martin King Ranch and Eagle Pass.
3. An evapometer, developed by the United States Section of the Commission and calibrated against a 0.61 meter pan described above, was in operation at Presidio, Johnson Ranch, Long Ranch, and at a site 11.3 kilometers east of Brownsville.

Month	Presidio		Johnson Ranch		Martin King Ranch		Long Ranch	
	1998	Average 1949-1998	1998	Average 1949-1998	1998	Average 1956-1998	1998	Average 1971-1998
Jan.	51	82	167	93	116	85	44	56
Feb.	90	113	228	133	130	100	45	69
Mar.	147	178	357	215	311	168	66	111
April	209	219	626	268	378	208	247	148
May	241	262	617	325	414	231	259	160
June	279	280	755	335	478	276	304	198
July	251	267	875	343	513	313	336	226
Aug.	228	245	580	300	354	302	282	210
Sept.	204	198	520	243	264	220	179	157
Oct.	131	157	366	191	259	174	200	118
Nov.	63	107	135	122	105	113	83	70
Dec.	62	78	155	90	124	88	121	55
Total	1,956	2,186	5,381	2,658	3,446	2,278	2,166	1,578

Month	Amistad Dam		Falcon Dam		Brownsville		
	1998	Average 1963-1998	1998	Average 1956-1998	1998	Average 1958-1998	
Jan.	102	95	119	102	83	77	
Feb.	148	120	150	130	87	90	
Mar.	209	202	203	208	94	120	
April	337	252	277	253	133	148	
May	358	276	349	292	132	148	
June	406	325	409	335	165	158	
July	493	371	449	386	234	185	
Aug.	299	341	362	350	182	174	
Sept.	208	248	203	246	87	136	
Oct.	154	190	164	190	90	122	
Nov.	80	124	91	132	64	96	
Dec.	77	91	101	100	83	83	
Total	2,871	2,635	2,877	2,724	1,434	1,537	

EVAPORATION IN THE RIO GRANDE BASIN
IN MEXICO

In Millimeters

Tabulated below are records of evaporation observed at eight stations operated and maintained by the Mexican Section of the Commission. Seven stations are along the Rio Grande from Cd. Acuna, Coahuila to Cd. Mier, 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 46 meters and of all brush and tall weeds within 30 meters of the fenced enclosures. The Ojinaga station is 9 meters landward of the east Rio Conchos levee with a concrete V-shaped irrigation ditch and road between the levee and the 8 x 8-meter woven wire pen, which encloses a 150-cm evaporation pan and a 70 x 50-cm shelter with thermometers. Inside the enclosures, all vegetation has been eradicated or kept trimmed to within 0.08 meter of the ground surface. 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."

The type of pan used at all these stations was a standard National Weather Service-type pan, 1.22 meters in diameter and 254 millimeters inches deep, made of 22-gage galvanized iron, set on a wooden platform with the rim of the pan 406 millimeters above the ground. The water level was maintained between 51 and 76 millimeters 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 a Spanish water bulletin published by the Mexican Section of the Commission.

Month	Ojinaga, Chihuahua		La Amistad, Coahuila		Cd. Acuna, Coahuila		Jimenez, Coahuila	
	1998	Average 1951-1998	1998	Average 1977-1998	1998	Average 1951-1998	1998	Average 1951-1998
Jan.	43	87	94	88	76	81	68	92
Feb.	87	124	147	115	117	109	104	118
Mar.	160	201	203	182	166	183	147	182
April	257	250	294	231	229	213	217	206
May	417	316	321	252	247	238	220	233
June	480	332	352	293	278	279	236	275
July	406	318	404	358	330	315	308	310
Aug.	164	272	260	313	207	286	208	284
Sept.	185	213	187	231	153	206	126	207
Oct.	190	167	131	171	101	148	81	151
Nov.	128	105	68	109	57	92	45	99
Dec.	69	79	71	83	61	72	45	82
Total	2,586	2,464	2,532	2,406	2,022	2,222	1,805	2,239

Month	Villa Hidalgo, Coahuila		Nuevo Laredo, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas		Cd. Mier, Tamaulipas	
	1998	Average 1951-1998	1998	Average 1964-1998	1998	Average 1954-1998	1998	Average 1955-1998
Jan.	75	89	117	97		85		91
Feb.	114	117	48	123		108		121
Mar.	169	177	207	198		181		196
April	258	226	281	251	281	218	279	235
May	281	257	341	276	314	252	276	265
June	346	300	400	326	392	291	330	308
July	374	341	381	368	445	335	323	352
Aug.	241	309	329	338	322	304	340	316
Sept.	153	225	190	248	165	220	136	234
Oct.	139	171	167	191	147	166	150	182
Nov.	58	111	108	126	76	115	76	120
Dec.	68	84	79	95	78	86	78	90
Total	2,276	2,407	2,648	2,637		2,361		2,510

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 0.41 meters above the ground and 2.74 meters southwest of either a 0.61 or 1.22-meter 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 kilometers 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 ... In Degrees Celsius

In The United States

Month	Amistad Dam, Texas				Falcon Dam, Texas			
	Mean 1998	Average 1963-1998	1998		Mean 1998	Average 1950-1998	1998	
			Max.	Min.			Max.	Min.
Jan.	15	11	26	2	14	13	33	-4
Feb.	16	13	31	1	14	15	39	-2
Mar.	19	17	34	2	16	19	36	-1
April	24	22	36	8	21	24	42	6
May	30	25	41	17	26	27	41	15
June	33	28	42	18	30	29	42	22
July	34	30	42	24	33	30	42	22
Aug.	30	29	41	21	36	30	43	19
Sept.	29	26	36	19	32	27	41	14
Oct.	23	22	34	7	29	23	36	7
Nov.	18	16	28	5	24	18	36	5
Dec.	13	12	25	-4	20	14	31	-7
Yearly	24	21	42	-4	25	22	43	-7

In Mexico

Month	Ojinaga, Chihuahua				La Amistad, Coahuila				Cd. Acuna, Coahuila			
	Mean 1998	Average 1954-1998	1998		Mean 1998	Average 1977-1998	1998		Mean 1998	Average 1951-1998	1998	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	10	10	24	-3	14	11	25	2	13	10	26	-1
Feb.	11	12	30	-2	14	13	30	0	14	12	3	0
Mar.	14	16	36	-1	16	17	31	3	17	17	33	0
April	19	21	37	2	22	22	34	9	22	22	36	8
May	25	26	42	10	28	26	41	15	28	25	41	13
June	32	30	44	19	31	29	41	2	31	29	42	20
July	31	30	44	20	32	31	41	22	32	30	43	23
Aug.	31	29	40	17	29	31	40	20	29	30	41	20
Sept.	29	26	42	15	28	27	39	20	28	27	38	18
Oct.	23	21	39	7	22	22	33	8	22	22	37	7
Nov.	17	14	30	4	16	16	25	7	17	16	26	7
Dec.	10	11	28	-4	11	12	24	-2	11	12	25	3
Yearly	21	21	44	-4	22	21	41	-2	22	22	43	-1

Month	Jimenez, Coahuila				Villa Hidalgo, Coahuila				Nuevo Laredo, Tamaulipas (13-20)			
	Mean 1998	Average 1951-1998	1998		Mean 1998	Average 1951-1998	1998		Mean 1998	Average 1964-1998	1998	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	15	12	28	0	16	12	29	0	17	13	29	2
Feb.	15	14	32	0	16	14	33	2	17	15	34	5
Mar.	18	18	35	0	19	19	40	1	20	20	38	4
April	22	22	36	6	24	23	38	6	25	24	38	11
May	29	26	41	12	31	27	44	16	30	27	42	13
June	32	29	41	20	34	30	45	22	33	30	45	23
July	33	30	42	16	34	31	44	25	33	31	43	23
Aug.	30	30	43	22	32	30	44	22	32	31	43	23
Sept.	28	27	40	18	29	27	40	21	30	28	40	22
Oct.	23	22	36	8	24	22	38	9	25	24	36	10
Nov.	19	16	29	8	20	17	35	9	20	19	30	8
Dec.	11	12	25	-4	14	13	39	2	14	15	30	0
Yearly	23	22	43	-4	24	22	45	0	25	23	45	0

TEMPERATURE, HUMIDITY, AND WIND

Temperature - In Degrees Celsius

In Mexico

Month	Nuevo Cd. Guerrero, Tamaulipas				Cd. Mier, Tamaulipas							
	Mean 1998	Average 1958-1998	1998		Mean 1998	Average 1955-1998	1998		Max.	Min.		
			Max.	Min.			Max.	Min.				
Jan.	18	14	30	4	20	14	32	12				
Feb.	19	16	35	6	20	16	36	5				
Mar.	20	20	38	6	22	20	41	6				
April	24	24	39	11	24	25	38	11				
May	30	27	42	16	32	28	46	20				
June	33	30	45	23	34	30	49	22				
July	33	31	43	21	34	31	47	20				
Aug.	32	31	41	20	34	31	48	20				
Sept.	28	28	38	25	31	29	48	22				
Oct.	25	24	37	11	25	24	40	10				
Nov.	21	19	31	12	21	19	35	10				
Dec.	16	15	33	0	14	15	35	1				
Yearly	25	23	45	0	26	24	49	1				

TEMPERATURE, HUMIDITY AND WIND

Mean Wind Speed - Kilometers Per Hour

In the United States

Month	Martin King Ranch, Texas		Amistad Dam, Texas		Falcon Dam, Texas	
	1998	Average 1956-1998	1998	Average 1963-1998	1998	Average 1950-1998
Jan.	5.6	4.0	4.0	3.2	4.4	3.5
Feb.	7.1	4.8	5.0	3.7	4.6	4.0
Mar.	10.0	6.2	6.6	4.3	5.4	4.5
April	9.5	6.6	6.6	4.4	5.4	5.0
May	10.2	7.1	6.5	4.4	6.6	5.3
June	12.1	7.7	7.2	4.5	8.2	5.3
July	11.3	7.2	6.6	4.3	5.1	5.6
Aug.	7.9	6.6	4.9	3.8	6.1	4.9
Sept.	6.2	5.3	3.5	3.4	3.4	3.7
Oct.	9.2	5.1	5.0	3.3	4.1	3.2
Nov.	6.2	4.4	3.7	3.2	2.9	3.5
Dec.	6.0	3.8	4.2	3.1	4.5	3.2
Yearly	8.4	5.7	5.3	3.8	5.1	4.3

Mean Relative Humidity - Percent

In the United States

Month	Amistad Dam, Texas		Falcon Dam, Texas	
	1998	Average 1963-1998	1998	Average 1950-1998
Jan.	57	60	83	67
Feb.	49	58	78	65
Mar.	47	53	78	62
April	37	55	74	62
May	48	62	76	66
June	52	61	87	64
July	48	58	86	61
Aug.	65	58	87	62
Sept.	67	63	87	66
Oct.	73	62	86	66
Nov.	76	62	88	67
Dec.	65	60	82	68
Yearly	57	59	83	65

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries - 1998

The total area within the outer rim of the Rio Grande basin is about 868,945 square kilometers, 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 456,701 square kilometers of productive watershed which is listed in the tabulation below.

The irrigated areas shown below are listed in accordance with the location of their diversions 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 1998 are shown, except that in some reaches the figures shown represent acreages which were subject to irrigation in 1998 but for which data on the portion actually irrigated is not known. On the Mexican side, part of the data may have been gathered prior to 1998. The irrigated area data tabulated are the best data that could be obtained.

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Kilometers			Irrigated Areas - Hectares		
	United States	Mexico	Total	United States	Mexico	Total
Above Elephant Butte Dam	67,141	0	67,141			
Elephant Butte Dam to Caballo Dam	3,354	0	3,354	0	0	0
Above Caballo Dam	70,495	0	70,495	0	0	0
Caballo Dam to American Dam	5,317	0	5,317	33,656	0	33,656
Above American Dam	75,812	0	75,812	33,656	0	33,656
American Dam to Acala Station (Discontinued)	1,740	1,409	3,149	19,170	4,744	23,914
Above Acala Gaging Station (Discontinued)	77,552	1,409	78,961	52,826	4,744	57,570
Acala Station to Fort Quitman Station	1,717	2,056	3,773	6,226	0	6,226
Above Fort Quitman Gaging Station	79,269	3,465	82,734	59,052	4,744	63,796
Fort Quitman Station to Above Presidio Station	4,263	3,652	7,915 a)	1,671	49	1,720
Above Presidio Station above Rio Conchos	83,532	7,117	90,649	60,723	4,793	65,516
Rio San Pedro above Francisco I. Madero Dam	0	10,778	10,778	0	31,198	31,198
Rio Conchos above Boquilla Dam	0	10,282	10,282	0	18,035	18,035
Boquilla Dam to Luis L. Leon Dam	0	38,490	38,490	0	27,848	27,848
Luis L. Leon Dam to mouth of river	0	8,837	8,837	0	5,975	5,975
Rio Conchos - Total	0	68,387	68,387	0	83,056	83,056
Alamito Creek above Gaging Station	3,895	0	3,895	0	0	0
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - excluding above tributaries	881	235	1,116	616	73	689
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - Total	4,776	68,622	73,398	616	83,129	83,745
Above Presidio Station below Rio Conchos	88,308	75,739	164,047	61,339	87,922	149,261
Terlingua Creek above Gaging Station	2,771	0	2,771	0	0	0
Presidio Station below Rio Conchos to Johnson Ranch Station - excluding Terlingua Creek	2,831	5,848	8,679	217	595	812
Presidio Station below Rio Conchos to Johnson Ranch Station - Total	5,602	5,848	11,450	217	595	812
Above Johnson Ranch Gaging Station	93,910	81,587	175,497	61,556	88,517	150,073
Johnson Ranch Station to Foster Ranch Station	16,607	17,016	33,623	127	0	127
Above Foster Ranch Gaging Station	110,517	98,603	209,120	61,683	88,517	150,200
Pecos River above Girvin (In the State of Texas)	76,566	0	76,566	3,237	0	3,237
Pecos River, Girvin to Station near Langtry	14,548	0	14,548	0	0	0
Station near Langtry to Station at Mouth (Discontinued)	334	0	334	0	0	0
Pecos River - Total	91,448	0	91,448	3,237	0	3,237
Devils River above Pafford Crossing	10,259	0	10,259	0	0	0
Pafford Crossing to Station at Mouth (Discontinued)	891	0	891	0	0	0
Devils River - Total	11,150	0	11,150	0	0	0
Foster Ranch Station to Amistad Dam excluding above tributaries	1,033	6,164	7,197	0	0	0
Foster Ranch Station to Amistad Dam - Total	103,631	6,164	109,795	3,237	0	3,237
Above Amistad Dam	214,148	104,767	318,915	64,920	88,517	153,437
Amistad Dam to Below Amistad Dam Gaging Station	13	10	23	0	0	0
Above the Below Amistad Dam Gaging Station	214,161	104,777	318,938	64,920	88,517	153,437
Below Amistad Dam Station to Del Rio Station	155	259	414	96	0	96
Above Del Rio Gaging Station	214,316	105,036	319,352	65,016	88,517	153,533
Arroyo Las Vacas above Gaging Station	0	906	906	0	111	111
San Felipe Creek above Gaging Station	119	0	119	660	0	660

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries - 1998

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Kilometers			Irrigated Areas - Hectares		
	United States	Mexico	Total	United States	Mexico	Total
Pinto Creek Above Gaging Station	645	0	645	101	0	101
Rio San Diego above Gaging Station	0	2,209	2,209	0	4,345	4,345
Gaging Station to mouth of river	0	16	16	0	16	16
Rio San Diego - Total	0	2,225	2,225	0	4,361	4,361
Del Rio Station to Jimenez Station - excluding above tributaries	1,733	285	2,018	b)	15,790	260
Del Rio Station to Jimenez Station - Total	2,497	3,416	5,913	15,790	4,732	20,522
Above the Jimenez Gaging Station	216,813	108,452	325,265	81,567	93,249	174,816
Rio San Rodrigo - Total	0	2,717	2,717	0	787	787
Jimenez Station to Piedras Negras Station - excluding Rio San Rodrigo	1,375	378	1,753	165	163	328
Jimenez Station to Piedras Negras Station - Total	1,375	3,095	4,470	165	950	1,115
Above Piedras Negras Gaging Station	218,188	111,547	329,735	81,732	94,199	175,931
Rio Escondido above Gaging Station	0	3,779	3,779	0	0	0
Rio Escondido - Total	0	3,810	3,810	0	0	0
Piedras Negras Station to El Indio Station - excluding Rio Escondido	614	533	1,147	0	177	177
Piedras Negras Station to El Indio Station - Total	614	4,343	4,957	0	177	177
Above El Indio Gaging Station	218,802	115,890	334,692	81,732	94,376	176,108
El Indio Gaging Station to Laredo Gaging Station	3,201	5,481	8,682	3,491	1,685	5,176
Above Laredo Gaging Station	222,003	121,371	343,374	85,223	96,061	181,284
Rio Salado above Venustiano Carranza Dam	0	41,002	41,002	0	1,798	1,798
Rio Salado-Venustiano Carranza Dam to Las Tortillas Gaging Station	0	18,969	18,969	0	6,743	6,743
Rio Salado-Las Tortillas Gaging Station to River Road Crossing	0	435	435	0	1,170	1,170
Rio Salado- Total	0	60,406	60,406	0	9,711	9,711
Laredo Station to Falcon Dam - excluding Rio Salado	5,289	3,437	8,726	c)	5,600	1,085
Laredo Station to Falcon Dam - Total	5,289	63,843	69,132	5,600	10,796	16,396
Amistad Dam to Falcon Dam - excluding above tributaries	12,380	10,383	22,763	25,142	3,370	28,512
Above Falcon Dam	227,292	185,214	412,506	90,823	106,857	197,680
Rio Alamo above Gaging Station	0	4,339	4,339	0	0	0
Rio San Juan above Marte Gomez Dam	0	33,010	33,010	0	2,381	2,381
Rio San Juan - Marte Gomez Dam to Camargo Gaging Station	0	505	505	0	53,748	53,748
Rio San Juan - Total	0	33,538	33,538	0	56,129	56,129
Falcon Dam to Rio Grande City Station - excluding above tributaries	575	637	1,212	1,704	1,360	3,064
Falcon Dam to Rio Grande City Station - Total	575	38,514	39,089	1,704	57,489	59,193
Above Rio Grande City Gaging Station	227,867	223,728	451,595	92,527	164,346	256,873
Rio Grande City Station to Anzalduas Dam	2,466	2,067	4,533	68,072	4,980	73,052
Anzalduas Canal				0	185,333	185,333
Above Anzalduas Dam	230,333	225,795	456,128	160,599	354,659	515,258
Anzalduas Dam to Progreso Station(Discontinued)	34	423	457	47,547	692	48,239
Above Progreso Gaging Station	230,367	226,218	456,585	208,146	355,351	563,497
Progreso Station to San Benito Station	18	23	41	126,463	1,729	128,192
Above San Benito Gaging Station	230,385	226,241	456,626	354,609	357,080	691,689
San Benito Station to Brownsville Station	36	39	75	28,538	739	29,277
Above Brownsville Gaging Station	230,421	226,280	456,701	363,147	357,819	720,966
Brownsville Station to Gulf of Mexico				1,653	0	1,653
Falcon Dam to Gulf of Mexico - excluding Rio Alamo and Rio San Juan				273,977	194,833	468,810
Amistad Dam to Gulf of Mexico excluding above tributaries				299,119	198,203	497,322
Above Gulf of Mexico				364,800	357,819	722,619

a) Area subject to irrigation during the year.

b) Includes 15,592 hectares irrigated from the Maverick Canal below Mile 13 gaging station.

c) Includes 45 hectares irrigated from small reservoirs.

08-4507.00 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 1998 showing the flows as closely 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) filtrations; d) elevation-area-capacity tables based on 1992 survey; and e) rate of evaporation measured at the dam.

Flow contributions from different sources, 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 CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	36.7	37.9	37.5	33.5	46.8	43.1	39.9	34.8	61.8	33.7	60.1	40.1
2	36.4	36.2	36.8	35.5	47.9	40.0	38.6	35.8	64.7	34.0	58.2	39.9
3	36.1	38.7	35.7	35.0	47.2	42.1	40.5	33.9	64.4	35.9	52.0	41.3
4	35.1	37.5	36.0	30.8	45.7	40.5	69.2	31.9	57.4	39.3	52.6	41.2
5	36.6	39.3	38.4	33.5	46.1	44.0	44.5	152	57.6	42.3	49.6	40.7
6	39.5	38.8	39.1	42.2	49.6	39.8	43.3	49.4	52.5	42.1	45.8	41.9
7	38.0	38.4	40.7	39.2	51.4	36.0	49.3	29.3	49.9	39.8	43.8	40.6
8	38.2	37.1	37.3	38.9	48.6	40.2	62.0	68.4	50.4	37.5	39.9	38.0
9	38.1	37.5	36.7	36.8	31.9	45.5	48.6	75.6	52.7	33.0	42.1	35.7
10	38.8	36.6	37.0	34.9	34.1	63.6	40.6	56.1	48.0	30.6	41.0	39.6
11	40.0	36.4	33.3	26.6	26.2	77.6	46.3	36.9	46.2	30.0	35.5	40.3
12	40.3	37.3	31.0	27.6	41.1	63.0	46.2	43.1	39.8	31.8	40.5	38.8
13	39.0	36.4	31.6	35.5	35.9	55.9	37.8	42.9	41.1	32.1	50.8	37.3
14	40.0	36.7	32.5	33.7	48.7	67.2	41.1	69.8	46.7	33.6	51.1	35.7
15	37.1	36.9	49.5	40.1	42.5	51.4	42.1	57.5	46.9	33.2	80.6	35.1
16	36.8	38.9	66.1	39.4	53.5	58.4	43.7	33.6	46.0	36.2	65.2	36.2
17	37.8	37.4	60.0	37.8	48.8	44.1	38.3	48.0	51.3	36.7	51.3	36.2
18	37.1	38.5	56.5	30.1	50.3	41.6	37.6	53.6	60.0	37.9	53.7	38.6
19	36.5	35.8	54.5	31.9	62.0	45.5	33.8	66.5	60.7	40.7	51.1	40.5
20	37.6	34.8	54.7	32.4	55.5	47.1	31.0	94.5	46.3	41.8	44.4	37.6
21	38.7	36.2	53.5	35.2	51.3	42.6	31.0	180	42.9	43.5	43.9	39.4
22	36.5	36.3	42.4	36.1	44.4	44.1	35.8	38.7	42.7	40.3	46.2	37.5
23	37.0	37.2	41.9	37.9	47.7	37.1	37.1	1,090	43.6	37.4	42.9	36.3
24	34.7	37.9	40.0	36.1	46.2	36.6	35.1	2,950	37.4	117	40.8	36.1
25	36.5	37.6	37.6	35.7	48.2	37.1	32.4	480	40.0	78.0	40.0	35.6
26	35.8	37.1	39.6	41.0	36.0	40.1	33.9	250	38.3	54.8	37.5	35.0
27	34.2	36.8	38.6	42.3	42.5	39.3	34.9	318	38.6	45.2	38.9	36.8
28	36.1	35.6	39.9	40.7	37.6	34.6	39.7	118	36.5	40.9	40.1	36.9
29	37.2		40.7	45.5	45.3	35.0	36.9	128	34.2	55.5	41.3	36.5
30	36.0		42.9	46.1	40.1	37.5	36.5	128	34.3	49.5	41.8	37.1
31	36.3		38.2	41.6			32.9	74.2	54.2			36.7
Sum	1,041.8		1,092.0	1,370.6		6,868.5		1,338.5		1,179.2		
	1,154.7		1,298.2	1,394.7		1,260.6		1,432.9		1,422.7		

Current Year 1998 Period 1977-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second			Average	Volume-Thousand Cubic Meters				
			High		Low		Total	Average	Maximum	Minimum	
	High	Low	Day	Day	Day						
Jan.			12	40.3	27	34.2	37.2	99,766	155,517	368,798	98,358
Feb.			5	39.3	20	34.8	37.2	90,012	153,452	432,864	90,012
Mar.			16	66.1	12	31.0	41.9	112,164	169,599	322,164	94,167
April			30	46.1	11	26.6	36.4	94,349	182,245	437,055	94,349
May			19	62.0	11	26.2	45.0	120,502	234,578	472,211	120,502
June			11	77.6	28	34.6	45.7	118,420	250,714	562,118	118,420
July			4	69.2	120	31.0	40.7	108,916	242,025	496,282	107,307
Aug.			24	2,950	7	29.3	222	593,438	332,718	1,037,318	124,908
Sept.			2	64.7	29	34.2	47.8	123,803	358,211	1,624,752	101,736
Oct.			24	117	11	30.0	43.2	115,646	357,734	1,172,715	107,283
Nov.			15	80.6	11	35.5	47.4	122,921	171,818	560,631	88,007
Dec.			6	41.9	26	35.0	38.0	101,883	138,758	321,211	92,733
Yearly				2,950		26.2	57.1	1,801,820	2,747,369	5,003,493	1,595,141

φ Mean daily

! And other days

08-4611.00 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 1998 showing the flows as closely 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 1992 survey; and d) rate of evaporation measured at the dam and Nueva Cd. Guerrero.

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 CUBIC METERS PER SECOND 1998 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.4	49.9	31.0	17.5	253	111	69.7	42.8	59.6	17.7	34.0	13.4
2	34.3	67.5	40.1	56.6	234	97.4	69.1	41.9	62.2	23.8	17.8	14.0
3	49.9	33.7	29.4	26.9	234	103	63.6	44.2	60.0	17.0	20.4	31.4
4	56.3	52.7	40.8	28.2	204	116	69.0	36.0	45.1	1.20	28.2	23.8
5	51.4	35.2	49.0	30.1	180	112	65.0	46.9	52.3	82.6	14.9	10.2
6	56.9	30.4	35.1	32.8	184	101	69.6	50.0	60.1	134	27.6	26.4
7	52.9	31.7	40.0	28.3	194	102	65.1	29.5	34.3	31.5	12.2	34.9
8	44.5	34.8	30.4	42.3	187	98.8	63.2	42.9	55.4	48.6	11.4	4.04
9	48.2	59.0	32.5	36.4	172	99.4	70.8	42.3	30.6	50.0	8.70	12.7
10	50.3	38.2	20.2	34.7	114	106	70.4	37.1	23.6	34.1	33.3	28.8
11	45.0	35.0	38.1	0	70.7	95.4	54.7	39.5	25.6	27.5	21.6	22.5
12	43.7	52.5	97.6	11.5	69.9	90.8	50.4	42.0	31.5	37.3	26.3	7.31
13	40.4	56.6	39.1	87.9	175	101	45.7	35.7	18.1	27.3	36.3	0
14	44.0	56.8	20.9	24.2	220	97.7	41.1	41.7	31.0	18.2	21.2	4.27
15	27.0	40.2	21.1	68.6	251	102	43.2	41.1	68.0	11.6	16.7	12.0
16	44.5	49.6	56.9	37.7	224	81.0	42.6	52.1	42.8	12.1	18.1	12.3
17	38.4	36.3	41.7	2.13	235	87.6	34.5	45.0	179	37.0	28.9	4.51
18	44.9	41.9	45.4	35.9	235	82.8	44.9	71.3	227	55.5	33.8	27.2
19	25.3	43.8	53.5	51.9	239	83.8	37.3	111	261	11.5	27.3	11.8
20	40.2	41.0	32.4	74.8	253	81.4	25.7	109	137	43.8	37.6	28.1
21	42.3	38.1	37.1	104	224	78.1	35.9	117	127	66.2	11.6	19.6
22	36.2	41.8	39.5	194	157	73.6	40.8	92.7	129	52.7	21.1	24.0
23	32.0	34.9	48.6	213	117	81.2	38.3	62.6	111	32.4	27.1	25.7
24	40.3	26.4	42.6	213	121	75.4	39.6	63.1	66.0	23.1	23.6	8.39
25	39.4	40.8	46.4	242	110	67.6	37.5	60.6	55.8	17.8	25.7	6.85
26	50.3	50.3	55.3	239	117	71.5	32.4	259	43.2	31.2	19.6	14.2
27	43.5	42.1	51.5	254	105	61.3	32.9	1,000	42.2	15.8	20.0	16.0
28	47.6	39.8	40.7	261	112	61.1	34.6	1,920	35.9	20.2	20.1	18.2
29	43.8		39.8	254	111	83.4	35.6	281	27.1	19.0	15.4	22.2
30	32.9		49.8	254	114	69.0	42.6	131	22.8	18.4	31.6	0
31	44.1		20.1		110		37.4	103		23.1		13.3
Sum	1,201.0		2,956.43		2,672.3		5,092.0		1,042.20		498.07	
	1,311.9		1,266.6		5,326.6		1,503.2		2,164.2		692.10	

Current Year 1998

Period 1968-1998

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			6	56.9	1	21.4	42.3	113,348	165,231	311,728	62,457
Feb.			2	67.5	24	26.4	42.9	103,766	198,922	558,835	67,760
Mar.			12	97.6	31	20.1	40.9	109,434	214,808	552,528	65,454
April			28	261	11	0	98.5	255,436	254,852	705,205	61,564
May			20	253	12	69.9	172	460,218	396,520	948,240	125,635
June			4	116	28	61.1	89.1	230,887	352,764	950,659	57,491
July			9	70.8	20	25.7	48.5	129,876	308,791	1,302,981	41,298
Aug.			28	1,920	7	29.5	164	439,949	282,261	1,262,218	69,984
Sept.			19	261	13	18.1	72.1	186,987	414,514	1,779,529	91,679
Oct.			6	134	4	1.20	33.6	90,046	369,169	1,684,800	69,890
Nov.			20	37.6	9	8.70	25.1	59,797	193,446	664,762	50,154
Dec.			7	34.9	113	0	16.1	43,033	161,271	376,047	43,033
Yearly				1,920		0	70.5	2,222,777	3,312,549	7,690,727	1,419,986

φ Mean daily

Water Bulletin And Page Number	Heading	Reference
#67-1997 Page 76	Outfalls from Sewers	El Paso Sewage Outfall

Correction

Treated sewage effluent enters the Rio Grande through the outfall of the Haskell Street Wastewater Treatment Plant located 11.4 river kilometers downstream from the American Dam and the Northwest Wastewater Treatment Plant which enters the Rio Grande 0.5 miles upstream from the American Dam. Outfalls from both Plants are measured by means of ultrasonic flow meters with a Parshall flume at the Northwest Plant. The records are furnished by the City of El Paso, Texas.

