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WATER BULLETIN NUMBER 20

Flow of the Rio Grande and Related Data

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

1950

WITH MAXIMUMS, MINIMUMS, AND NORMALS

STORAGE CAPACITIES AND WATER IN STORAGE

SOURCES OF RIVER FLOW

DIVERSIONS

SILT, CHEMICAL AND SANITARY ASPECTS OF WATER QUALITY

RAINFALL AND EVAPORATION

DRAINAGE BASIN AND IRRIGATED AREAS

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FOREWORD

This bulletin presents the 20th compilation of stream discharges and related data concerning the international portion of the Rio Grande, prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission. The stream flow data and kindred subjects pertain to the Rio Grande and its important tributaries near their confluence with the main stream from Elephant Butte Dam, New Mexico to the Gulf of Mexico. The first publication in the series was Water Bulletin No. 1 for the year 1931. The present volume contains the information for the year 1950.

International stream gaging on the Rio Grande was initiated in 1889 when the station at El Paso, Texas, was established. A number of 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 measurement was started.

During 1950 the United States Section of the Commission operated the stream gaging stations on the Rio Grande at El Paso, American Dam, Island, County Line, Fort Quitman, Upper Presidio, Lower Presidio, Johnson Ranch, Langtry, Del Rio, Zapata, Rio Grande City, Hidalgo, and Lower Brownsville. The Mexican Section operated the stream gaging stations on the main stream at Juárez, Eagle Pass, Laredo, Roma, and Matamoros. Each Section operated the gaging stations on tributary streams, floodways, and diversions within its own country.

The total drainage area within the outer rim of the Rio Grande Basin is 335,500 square miles. However, nearly half of this area yields no run-off to the river, the productive area of the watershed being estimated as 171,900 square miles. Approximately 8,300,000 acre-feet of storage has been provided. A present total of 2,700,000 acres are irrigated. The residual flow from the Rio Grande that escaped to the Gulf of Mexico averaged 3,000,000 acre-feet per year for the period 1934-1950.

A list of stream flow records concerning the Rio Grande and its tributaries from San Marcial, New Mexico to the Gulf of Mexico will be found on pages 96-98 of this bulletin.

An index to this and all previous issues of these bulletins will be found on pages 99-107.

Acknowledgments

Other agencies which have each contributed to some part of the data published herein include: the Bureau of Plant Industry, Division of Soils and Agricultural Engineering, and the Soil Conservation Service of the U. S. Department of Agriculture; the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the Weather Bureau of the U. S. Department of Commerce; Texas Board of Health; Colorado State Engineer; New Mexico State Engineer; Bluewater-Toltec Irrigation District; Red Bluff Water Power Control District; Willacy County Water Control and Improvement District No. 1; El Paso Department of Water and Sewerage; Laredo City Water Department; Ministry of Hydraulic Resources of Mexico; Mexican Department of Agriculture and Livestock; Meteorological Service of Mexico; Cía. Agrícola y de Fuerza Eléctrica del Río Conchos, S. A.; and Federal Board of Public Improvement Works of Nuevo Laredo, Tamaulipas.

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

General Hydrologic Conditions for 1950

Along and Adjacent to The International Portion of the Rio Grande

On the watershed of the Rio Grande below Elephant Butte Dam and in both countries the weather during the year 1950 was in general drier and warmer than usual. Mean annual temperatures averaged about 102% of normal on both the watershed and in the Lower Rio Grande Valley. Evaporation was about 104% of normal. Rainfall was about 76% of normal on the watershed and about 60% in the Lower Valley.

The volume of yearly flow of the Rio Grande was below normal at all places from El Paso to the Gulf. It varied from about 2,600,000 acre-feet below normal at Matamoros to lesser amounts elsewhere. The year's flow at Matamoros was the lowest ever recorded, being about half the previous low. A little less than 683,000 acre-feet (24% of the 1924-1950 normal) passed Lower Brownsville gaging station, the lowermost station on the Rio Grande. Of the measured tributaries on both sides of the Rio Grande the flows of only Terlingua and San Felipe Creeks were above normal. The annual flow of the measured Mexican tributaries, exclusive of the Río San Juan, was 874,000 acre-feet, or 49% of normal. The annual flow of the measured United States tributaries below Fort Quitman was 654,000 acre-feet, or 66% of normal.

Relatively large flows occurred on the Rio Grande near El Paso in July as a result of heavy rains in the vicinity of Caballo Dam, with flood stages extending to the El Paso-Juárez Valley. The crest discharge at El Paso was 7,740 second-feet on July 14, the greatest discharge at this point since September 1925.

For all reservoirs in the Rio Grande Basin of greater capacity than 15,000 acre-feet, the average amount of water in storage in 1950 was 2,755,800 acre-feet, which was only 68% of normal. This percentage was the lowest in many years. Such reservoirs on the United States side averaged only 59% of normal while those on the Mexican side averaged only 73% of normal. Elephant Butte and Caballo Reservoirs together held less water at the end of the year than at any year end since 1918, and except for 1947 they held less water on the average during the year than for any of the 32 years since 1918.

There was a shortage of irrigation water in the Lower Rio Grande Valley on both sides of the river. At the Lower Brownsville gaging station there was no flow in the river all day or part of the day, for 122 days of the year. After January, these periods of no flow occurred every month throughout the remainder of the year. The longest period of continuous no flow was five days in September. The diversions from the river for irrigation on the United States side below Rio Grande City were 186% of normal. The diversions into Retamal Canal were 47% of normal.

There was little change in total acreage irrigated from the Rio Grande on either side from Elephant Butte Dam to Roma. A large increase was recorded for land irrigated from the Río San Juan in Mexico. There was a small decrease on the United States side and a small increase on the Mexican side in lands irrigated from the Rio Grande between Roma and the Gulf.

The 1950 sanitary sampling and assaying program of Rio Grande water extended from above El Paso to Mercedes. The annual tonnage of salts, or total dissolved solids, carried by the river was below normal. The quantity of suspended silt passing down the Rio Grande was above normal at silt-sampling stations above the Pecos River confluence and below normal on the Pecos and at sampling points below the Pecos.

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

DESCRIPTION: Water-stage recorder 3,800 feet below dam, and cable with sit-down cable car and winch 100 feet below recorder. Zero of gage is 4,242.09 feet above mean sea level, U.S.C. & G.S. datum. Elephant Butte Dam is 135.1 river miles above the American Dam at El Paso, Texas.

RECORDS: Based on 53 current meter measurements during the year, a continuous record of gage heights and a stable rating curve. Records (marked "subject to revision") were furnished by the United States Geological Survey. Records available: January 1915 through December 1950.

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.

COMPARATIVE FLOWS FROM RECORDS:

Average Flow in Second-Feet

Daily:	Max.	8,220	May 22, 1942	Min.		sometimes dry
Monthly:	Max.	7,600	May 1942	Min.	3.0	Jan. 1930
Yearly:	Max.	2,510	1942	Min.	771	1947

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	688	950	1,060	1,200	1,270	1,290	1,520	1,190	990	24	132	129
2	740	983	1,020	966	1,360	1,310	1,420	1,070	608	85	79	52
3	921	994	1,120	1,130	1,370	1,100	1,540	942	450	183	426	98
4	1,000	876	1,060	1,160	1,200	916	1,170	975	440	314	455	98
5	994	747	914	1,160	1,250	1,340	1,520	912	622	115	114	196
6	1,010	942	1,120	1,150	1,080	1,340	1,540	720	604	79	174	290
7	817	972	1,150	1,150	820	1,450	1,370	828	669	42	116	216
8	770	1,030	1,150	1,060	1,240	1,470	1,320	762	974	29	110	74
9	928	1,000	1,160	863	1,350	1,390	1,020	813	736	71	166	74
10	950	995	1,140	1,080	1,380	1,300	1,450	772	162	204	141	12
11	944	884	860	1,150	1,290	1,050	1,640	840	532	162	128	111
12	1,000	786	886	1,150	1,320	1,520	1,720	896	590	125	33	116
13	1,000	1,010	1,090	1,260	1,140	1,560	1,430	391	581	124	134	111
14	830	1,020	1,130	1,540	772	1,570	1,140	520	577	41	187	112
15	656	970	1,230	1,200	1,270	1,600	1,180	784	478	12	153	97
16	966	990	1,140	1,040	1,410	1,640	909	885	438	105	212	43
17	967	982	1,220	1,100	1,300	1,230	1,130	854	370	102	144	17
18	1,010	834	997	1,090	1,140	1,020	1,180	826	576	114	96	175
19	1,000	694	722	1,070	1,190	1,470	1,240	764	572	103	73	94
20	936	910	1,240	1,060	1,260	1,580	1,060	448	514	106	167	160
21	844	922	1,350	1,060	1,070	1,560	898	773	360	141	180	120
22	708	852	1,350	978	1,440	1,440	858	844	326	53	143	120
23	924	898	1,380	804	1,480	1,440	660	944	52	74	68	66
24	944	921	1,360	1,260	1,440	1,460	951	1,120	160	197	118	32
25	918	839	1,120	1,340	1,460	1,200	850	1,040	92	325	54	14
26	986	669	870	1,440	1,450	1,580	932	1,110	180	312	38	86
27	958	866	1,380	1,510	1,300	1,650	938	870	142	142	126	88
28	862	974	1,370	1,400	1,060	1,660	1,020	1,330	234	219	184	154
29	709		1,530	984	1,460	1,660	1,020	1,230	106	30	91	114
30	926		1,530	932	1,380	1,620	750	899	125	307	117	98
31	978		1,410		1,390		1,250	794		223		43
Sum	27,884	25,510	36,059	34,287	39,342	42,416	36,626	27,146	13,260	4,163	4,359	3,210

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Maximum	Minimum	Normal 1938-1950
Jan.			‡ 6	1,010	15	656	899	55,300	25,398	86,500	184	49,820
Feb.			8	1,030	26	669	911	50,600	37,922	76,300	969	47,162
Mar.			‡29	1,530	19	722	1,160	71,500	64,156	95,300	1,520	62,717
Apr.			14	1,540	23	804	1,140	68,000	102,370	162,000	57,200	91,515
May			23	1,480	14	772	1,270	78,000	109,252	467,000	63,000	112,239
June			‡28	1,660	4	916	1,410	84,100	115,697	363,000	64,400	109,754
July			12	1,720	23	660	1,180	72,600	114,296	211,000	72,600	103,001
Aug.			28	1,330	13	391	876	53,800	107,389	161,000	53,800	91,508
Sept.			1	990	23	52.0	442	26,300	66,744	129,000	22,600	58,654
Oct.			25	325	15	12.0	134	8,260	30,707	72,100	506	47,504
Nov.			4	455	12	33.0	145	8,650	29,376	158,000	884	47,937
Dec.			6	290	10	12.0	104	6,370	28,948	87,300	916	49,247
Yearly				1,720		12.0	806	583,480	832,255	1,818,800	558,050	871,058

ϕ Mean daily ‡ And other days

RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and winch located .8 river mile below Caballo Dam, and 106.8 river miles above American Dam at El Paso, Texas. The zero of the gage is 4,140.90 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 104 meter measurements during the year and a continuous record of gage heights. Records available: February 26, 1938 through December 1950. Records furnished by the El Paso office of the United States Bureau of Reclamation.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 1,782 acre-feet of water was diverted in 1950 into a small irrigation canal (Bonito Lateral) just below Caballo Dam. This station is about 1.5 miles upstream from Percha Dam (a low diversion dam) at which point records have been kept in past years. Small accretions to the river take place between this station and Percha Dam.

COMPARATIVE FLOWS FROM RECORDS:

Average Flow in Second-Feet

Daily:	Max.	7,650	May 20, 1942	Min.	.8	Oct. 22-Nov. 1,	1950
Monthly:	Max.	6,710	May 1942	Min.	1.2	Oct. & Dec.	1950
Yearly:	Max.	2,480	1942	Min.	972		1941

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.1	14.7	1,200	2,920	1,440	1,070	2,560	1,300	2,110	1.5	0.8	1.4
2	6.4	13.7	1,090	2,880	1,420	1,020	2,610	1,530	2,280	1.5	0.9	1.4
3	6.2	12.7	979	2,790	1,420	1,190	2,600	1,610	2,340	1.5	1.0	1.3
4	5.3	15.0	970	2,580	1,420	1,260	2,600	1,510	2,220	1.4	1.2	1.3
5	5.5	17.9	982	2,310	1,810	1,190	2,500	2,080	2,040	1.4	1.4	1.3
6	4.6	19.2	992	2,040	2,560	1,230	2,290	2,320	1,900	1.4	1.6	1.2
7	5.3	20.6	990	1,840	2,800	1,320	1,680	2,400	1,820	1.4	1.6	1.1
8	5.5	20.6	984	1,730	2,800	1,320	1,770	2,610	1,840	1.4	1.6	1.0
9	6.3	19.0	919	1,680	2,770	1,290	1,720	2,750	1,980	1.4	1.6	1.0
10	5.2	19.9	873	1,570	2,680	1,550	1,610	2,780	1,960	1.4	1.6	1.0
11	7.1	19.8	1,230	1,380	2,450	1,700	1,340	2,930	1,800	1.4	1.6	1.1
12	7.0	21.3	1,560	1,190	2,220	1,700	1,140	2,840	1,230	1.4	1.6	1.1
13	7.9	20.2	1,520	1,120	1,940	1,670	653	2,740	10.3	1.5	1.6	1.1
14	8.7	24.2	1,480	1,150	1,790	1,680	691	2,610	3.4	1.5	1.5	1.1
15	8.6	26.1	1,700	1,240	1,600	1,790	1,060	2,440	3.4	1.4	1.5	1.1
16	8.5	28.1	1,710	1,320	1,360	1,860	1,400	2,290	3.3	1.4	1.5	1.1
17	8.4	30.0	1,840	1,270	1,120	2,110	1,440	2,250	3.2	1.3	1.5	1.1
18	9.3	28.4	2,270	1,230	998	2,240	1,500	2,230	3.1	1.2	1.5	1.2
19	9.2	29.8	2,520	1,190	919	2,210	1,860	1,800	3.0	1.1	1.5	1.2
20	9.6	30.2	2,510	1,210	1,120	2,170	1,870	1,610	2.9	1.0	1.5	1.2
21	10.0	275	2,700	1,190	1,260	2,340	1,560	2,010	2.8	0.9	1.5	1.2
22	12.4	545	2,840	1,250	1,240	2,280	1,660	2,340	2.7	0.8	1.4	1.2
23	12.8	640	2,740	1,300	1,210	2,040	1,660	2,210	2.6	0.8	1.4	1.2
24	11.8	714	2,910	1,270	1,240	2,170	931	2,130	2.5	0.8	1.4	1.2
25	10.7	830	3,080	1,230	1,160	2,350	663	2,240	2.4	0.8	1.4	1.2
26	10.6	1,180	3,010	1,300	1,030	2,350	1,070	2,540	2.4	0.8	1.4	1.1
27	11.5	1,320	2,920	1,320	1,220	2,270	1,170	2,620	2.4	0.8	1.4	1.1
28	12.4	1,280	3,020	1,260	1,280	2,200	1,150	2,560	2.4	0.8	1.4	1.1
29	12.3		3,070	1,370	1,250	2,130	1,460	2,430	2.4	0.8	1.4	1.1
30	13.2		3,050	1,460	1,180	2,310	1,560	2,240	2.4	0.8	1.4	1.1
31	16.0		3,030		1,150		1,510	2,100		0.8		1.2
Sum	274.4	7,215.4	60,689	47,590	49,857	54,010	49,288	70,050	23,577.6	36.4	42.7	36.0

Month	Current Year 1950: Extreme Gage Feet High	Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1950: Acre-Feet Normal	Maximum	Minimum
Jan.			31	16.0	6	4.6	8.9	544	1,221	4,850	97.0
Feb.			27	1,320	3	12.7	258	14,300	18,986	64,300	119
Mar.			25	3,080	10	873	1,960	120,000	83,023	120,000	49,300
Apr.			1	2,920	13	1,120	1,590	94,400	124,654	212,000	94,400
May			‡ 7	2,800	19	919	1,610	98,900	123,985	412,000	78,400
June			‡25	2,350	2	1,020	1,800	107,000	136,201	354,000	107,000
July			2	2,610	13	653	1,590	97,800	138,477	234,000	97,800
Aug			11	2,930	1	1,300	2,260	139,000	133,293	179,000	110,000
Sept.			3	2,340	‡25	2.4	786	46,800	69,208	181,000	31,600
Oct.			‡ 1	1.5	‡22	.8	1.2	72.2	12,741	35,400	72.2
Nov.			‡ 6	1.6	1	.8	1.4	84.7	6,788	14,400	84.7
Dec.			‡ 1	1.4	‡ 8	1.0	1.2	71.4	7,039	19,100	71.4
Yearly				3,080		.8	993	718,972.3	855,616	1,795,670	703,547

‡ And other days ϕ Mean daily

RIO GRANDE AT EL PASO, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights. The recorder is located 5 miles northwest of El Paso, Texas, 6 miles northwest of Juárez, Chihuahua, and 1.9 river miles above the American Dam. The cable and staff gage are located 1 mile downstream from the recorder in the pass opposite Courchesne-Quarry. The zeros of the gages at the recorder and at the cable are 3,722.30 feet and 3,720.51 feet respectively above mean sea level, U.S.C. & G.S. datum.

RECORDS: Discharges in 1950 were computed by taking the sum of the flows in the American Canal and the flows at the station below American Dam, except the momentary extreme high flow in July which was based on 3 current meter measurements and the gage-height hydrograph. Records available: 1889 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 24,000 second-feet on June 12, 1905, with 6.0 foot stage (lower gage). Min., sometimes dry. Since Elephant Butte Dam was closed in 1915, the largest peak flow to pass this station was 13,500 second-feet on September 3, 1925.

Average Flow in Second-Feet

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

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	175	143	698	1,320	899	726	890	1,190	1,050	362	206	175
2	178	145	636	1,290	990	730	926	1,120	1,060	371	204	173
3	177	147	526	1,280	804	703	1,170	1,010	1,110	334	193	171
4	193	144	579	1,310	770	728	1,110	1,620	1,310	332	180	174
5	186	146	437	1,240	850	784	1,110	900	1,200	714	190	162
6	171	142	501	1,100	871	826	1,140	796	1,190	609	198	161
7	162	141	459	1,060	936	752	1,360	1,080	1,070	480	200	164
8	159	139	476	1,100	1,160	740	1,550	1,090	1,020	365	200	164
9	166	133	533	1,010	1,120	855	2,240	1,030	1,020	326	196	162
10	167	128	459	1,120	1,080	948	1,540	1,140	1,000	324	204	161
11	164	122	412	1,140	1,100	954	1,360	1,260	1,090	294	200	163
12	170	117	495	1,100	1,070	1,060	1,380	1,180	883	277	202	160
13	175	141	633	1,020	1,050	982	1,890	1,320	748	272	194	158
14	169	144	767	890	1,030	1,010	2,460	1,380	722	268	192	156
15	167	144	709	853	1,120	987	1,150	1,220	558	268	186	156
16	165	143	606	926	1,070	1,030	855	1,180	481	260	180	152
17	163	142	582	987	1,030	1,070	965	1,070	460	249	176	149
18	163	140	608	871	978	1,230	917	1,000	511	246	157	152
19	150	140	650	846	817	1,350	899	1,080	468	245	156	150
20	144	144	1,090	782	811	1,280	984	1,120	449	236	150	151
21	134	141	783	799	781	1,220	1,050	1,060	528	235	168	149
22	134	138	912	872	843	1,190	1,130	844	466	237	179	150
23	139	140	1,060	891	769	1,340	1,330	856	527	228	177	152
24	147	137	879	896	773	1,180	1,530	1,180	648	219	173	154
25	155	229	873	738	753	1,040	2,180	1,040	529	216	175	155
26	156	448	1,580	714	980	1,110	1,080	981	469	214	176	153
27	153	445	1,570	705	832	1,190	937	1,030	623	210	176	153
28	140	666	1,010	722	832	1,070	1,120	1,400	474	212	174	154
29	141		1,080	705	833	988	1,110	1,230	416	210	175	153
30	146		1,230	797	829	959	945	1,170	366	213	176	152
31	147		1,390		787		1,220	1,110		210		153
Sum	4,956	5,129	24,223	29,084	28,568	30,032	39,528	34,687	22,446	9,236	5,515	4,892

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	3.21	2.95	3	206	22	121	160	9,830	11,047	17,500	7,770	10,928
Feb.	4.60	2.75	28	835	11	107	183	10,200	18,699	52,200	6,510	15,986
Mar.	5.98	3.39	26	1,640	11	386	781	48,000	40,181	62,500	18,400	41,254
Apr.	5.73	4.57	3	1,650	27	662	969	57,700	66,063	139,000	44,900	68,830
May	5.59	4.48	15	1,200	25	704	922	56,700	75,987	357,000	47,600	84,408
June	5.84	4.48	19	1,420	3	668	1,000	59,600	76,942	304,000	56,200	84,177
July	9.40	3.98	14	7,740	16	744	1,280	78,400	83,630	198,000	68,900	85,061
Aug.	6.12	4.45	4	2,670	6	743	1,120	68,800	86,102	158,000	61,000	81,915
Sept.	5.70	3.73	4	1,360	30	319	748	44,500	64,200	171,000	40,600	64,092
Oct.	4.93	3.36	5	889	31	204	298	18,300	26,297	57,900	14,600	26,661
Nov.	3.42	3.25	9	217	20	138	184	10,900	17,236	29,500	10,400	15,815
Dec.	3.30	3.11	4	183	21	139	158	9,700	16,205	27,700	9,460	15,351
Yearly	9.40	2.75		7,740		107	653	472,630	582,589	1,559,200	431,680	594,478

RIO GRANDE BELOW AMERICAN DAM

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights located 3,200 feet below the American Dam and 1.5 miles above the International Dam, west of El Paso, Texas. The American Dam is 1,241.4 river miles above the Gulf of Mexico. The zero of the gage is 3,712.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 55 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 1, 1938 through December 1950.

REMARKS: The operation of this station began June 2, 1938, when the American Dam first began operating. At this dam, part of the flow passing the El Paso gaging station was diverted into the American Canal (see records of "Diversions from the Rio Grande") and the remainder, including excess flood flows, passed this station. Reservoirs, diversions, and drainage returns modify the river flow at this station.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 6,770 second-feet on May 18, 1942, with a gage height of 9.77 feet. Min. ¤ .3 second-foot on February 14, 1941.

Average Flow in Second-Feet

Daily:	Max.	6,040	May 20, 1942	Min.	1.2	Oct. 28-31, 1939
Monthly:	Max.	4,880	May 1942	Min.	2.0	Dec. 1942
Yearly:	Max.	1,510	1942	Min.	106	1945

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	* Dec.
1	3.4	143	11.5	88.7	149	196	160	177	191	192	7.2	6.2
2	3.5	145	9.2	112	182	* 175	179	212	176	70.2	9.1	6.4
3	121	147	8.5	115	180	187	161	216	180	10.4	9.4	6.6
4	193	144	7.7	113	207	189	150	754	181	15.9	45.4	6.8
5	186	146	6.8	112	211	186	154	169	176	21.4	190	6.9
6	171	142	8.1	108	205	183	160	147	177	13.6	197	6.9
7	162	141	9.1	105	208	179	156	177	168	16.3	200	6.9
8	159	139	9.2	105	205	174	361	212	169	16.3	199	6.9
9	166	133	8.6	106	205	174	1,340	244	170	15.5	198	6.8
10	167	128	7.3	110	197	170	200	258	171	14.2	204	6.8
11	164	122	7.7	110	200	170	145	288	171	13.6	200	6.8
12	170	117	7.8	104	190	169	175	263	164	13.2	202	6.8
13	175	57.0	8.4	107	180	169	809	258	179	12.7	194	6.8
14	169	8.5	9.1	111	176	177	1,510	272	184	12.3	192	6.8
15	167	6.8	9.4	110	189	173	236	209	151	11.5	185	6.8
16	165	6.0	8.2	106	213	174	184	198	160	11.1	179	6.8
17	163	8.8	7.5	109	209	169	193	194	157	11.4	* 88.5	6.9
18	163	7.0	8.2	108	200	177	164	193	166	11.7	* 7.0	6.9
19	150	6.2	7.5	111	217	186	146	195	162	11.3	* 6.5	6.9
20	144	5.8	71.8	111	230	178	158	188	173	9.7	* 6.0	6.9
21	134	5.3	14.2	120	214	162	171	190	178	9.2	* 6.0	6.9
22	134	5.4	13.0	123	203	164	182	195	173	8.7	* 6.0	7.0
23	139	5.5	69.8	118	192	161	172	211	178	8.4	* 6.0	7.7
24	147	5.9	10.1	118	229	157	182	214	177	8.3	* 6.0	7.7
25	155	6.0	7.3	119	246	158	1,010	215	168	8.2	* 6.0	7.7
26	156	11.6	317	119	258	165	280	201	164	8.0	* 6.0	7.7
27	153	8.0	568	114	256	166	144	202	173	8.2	* 6.0	7.6
28	140	20.5	15.9	119	249	147	126	208	172	8.0	* 6.0	7.5
29	141		20.0	113	235	143	140	209	171	7.5	* 6.0	7.4
30	146		20.4	108	240	175	129	224	187	7.0	* 6.0	7.3
31	147		218		258		139	248		7.2		7.2
Sum		1,821.3	3,332.7			5,153		7,141		593.0		*217.3
	4,553.9		1,505.3		6,533		9,416		5,167		2,579.1	

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period June 1938-1950: Acre-Feet Normal	Maximum	Minimum
Jan.	5.55	4.28	4	206	1	3.2	147	9,030	8,785	12,000	4,170
Feb.	5.41	4.53	3	154	21	5.0	65.0	3,610	5,262	32,800	521
Mar.	6.70	4.42	27	1,980	6	6.3	48.6	2,990	3,719	17,500	* 1,390
Apr.	5.40	4.48	1	277	1	19.9	111	6,610	13,495	74,500	6,360
May	5.76	5.18	27	315	1	104	211	13,000	37,075	300,000	11,700
June	5.85	5.32	30	374	12	113	172	10,200	30,968	250,000	9,660
July	10.70	4.96	14	6,240	28	52.7	304	18,700	24,449	155,000	9,800
Aug	7.35	5.40	4	1,630	7	107	230	14,200	20,993	114,000	6,040
Sept.	5.95	5.55	1	250	5	126	172	10,200	21,409	124,000	3,530
Oct.	5.85	4.45	2	216	4	5.0	19.1	1,180	4,034	19,000	197
Nov.	5.92		9	217	‡20	ϕ¤ 6.0	86.0	5,120	2,779	8,700	¤ 119
Dec.			‡23	ϕ¤ 7.7	1	ϕ¤ 6.2	* 7.0	* 431	1,752	7,760	120
Yearly				6,240		3.2	132	95,271	174,720	1,093,553	76,919

¤ Estimated * Partly estimated ‡ And other days ϕ Mean daily

RIO GRANDE AT JUAREZ, CHIHUAHUA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 2.9 river miles downstream from El Paso, Texas, and Juárez, Chihuahua. This station is 7.0 river miles below the American Dam at El Paso, Texas and 4.9 river miles below the International Dam. The zero of the gage is 3,683.98 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 182 meter measurements during the year, 137 by the Mexican and 45 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1, 1938 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 6,600 second-feet on May 18, 1942 with a gage height of 11.15 feet. Min. 15.2 second-feet on December 22, 1944 with a gage height of 2.17 feet.

Average Flow in Second-Feet

Daily:	Max.	6,460	May 20, 1942	Min.	17.0	Dec. 21, 1944
Monthly:	Max.	5,290	May 1942	Min.	45.9	Dec. 1947
Yearly:	Max.	1,820	1942	Min.	335	1948

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	173	137	516	911	449	253	431	770	516	259	64.6	55.8
2	173	135	438	841	509	284	456	639	526	364	66.4	56.9
3	195	* 139	341	837	364	266	699	558	537	315	68.2	53.3
4	161	* 141	367	819	299	273	675	¤1,190	745	307	75.6	54.4
5	148	* 148	248	805	364	344	660	¤ 410	710	614	184	53.3
6	135	* 155	301	689	388	388	692	¤ 360	717	413	187	54.0
7	142	153	237	625	399	327	999	558	629	261	208	159
8	148	139	230	667	646	290	* 950	622	547	¤ 166	205	135
9	164	135	297	558	643	392	¤ 1,220	519	526	¤ 120	180	141
10	171	129	239	692	569	494	* 1,120	572	516	¤ 116	174	146
11	160	131	174	664	604	547	1,080	682	600	86.5	167	161
12	179	132	238	675	565	622	1,040	565	477	86.2	161	157
13	173	144	371	597	590	586	¤ 1,160	* 727	299	¤ 81.2	155	157
14	156	135	632	505	547	565	¤ 2,410	756	227	58.6	158	157
15	156	132	533	441	675	554	¤ 459	682	121	55.1	169	157
16	155	150	378	491	597	530	¤ 434	675	80.5	¤ 81.2	163	150
17	164	123	306	540	533	533	¤ 491	579	75.2	¤ 117	157	106
18	160	95.7	331	413	505	735	¤ 533	480	85.1	¤ 247	131	79.5
19	156	69.6	332	385	320	830	* 438	487	88.6	234	99.6	75.2
20	145	76.3	876	332	286	784	501	523	62.9	219	97.8	74.9
21	147	66.0	516	351	277	738	600	572	¤ 177	219	82.3	74.5
22	142	66.0	622	374	331	713	647	¤ 357	¤ 124	212	61.8	74.5
23	144	66.4	749	424	307	833	¤ 950	¤ 364	¤ 184	222	47.7	74.2
24	144	62.2	604	417	283	738	¤ 1,090	611	¤ 307	207	44.5	69.2
25	137	102	572	320	241	579	¤ 1,860	463	¤ 187	203	48.7	69.2
26	154	293	1,350	287	249	540	* 1,070	388	280	¤ 215	49.1	68.9
27	146	324	1,380	301	283	720	* 661	473	466	¤ 91.8	56.5	68.9
28	145	452	685	328	329	569	721	784	317	¤ 56.5	60.4	68.5
29	144		752	320	291	516	731	720	244	¤ 49.4	63.2	68.2
30	149		890	381	349	494	509	646	175	59.3	55.4	67.8
31	162		1,030		288		717	554		68.9		72.4
Sum	4,828	4,031.2	16,535	15,990	13,080	16,037	*26,004	*18,286	*10,546.3	*5,805.7	3,440.8	2,959.6

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period April 1938-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	3.81	3.38	12	205	14	111	156	9,580	11,082	13,270	7,860
Feb.	4.95	2.95	28	657	22	57.2	144	8,000	11,134	42,690	4,730
Mar.	5.71	3.61	27	2,110	11	149	533	32,800	27,237	45,790	14,140
Apr.	4.92	3.64	3	1,110	26	280	533	31,720	44,010	111,500	30,900
May	5.54	3.54	13	819	26	214	422	25,940	52,369	325,100	19,590
June	5.68	3.58	19	897	2	230	535	31,810	54,919	272,400	29,740
July	10.83	4.04	14	¤ 6,140	2	374	* 839	* 51,580	55,414	162,500	40,830
Aug	5.84	3.54	4	¤ 2,270	23	277	* 590	* 36,270	52,699	127,300	* 36,270
Sept.	5.35	2.62	5	791	20	52.6	* 352	* 20,920	40,072	143,800	15,850
Oct.	5.48	2.62	5	862	#	49.4	* 187	* 11,510	18,154	45,390	8,610
Nov.	3.51	2.76	8	226	24	41.7	115	6,820	9,521	13,670	3,570
Dec.	3.64	2.69	7	233	5	44.1	95.5	5,870	9,961	18,060	2,820
Yearly	10.83	2.62		¤ 6,140		41.7	377	272,820	386,572	1,315,890	243,050

¤ Estimated * Partly estimated # Various days of the month

RIO GRANDE AT ISLAND STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located near Clint, Texas, and San Augustín, Chihuahua. This station is on the rectified channel of the Rio Grande 27.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,608.99 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 77 meter measurements during the year, 57 by the United States and 20 by the Mexican Section of this Commission, and a continuous record of gage heights. The gage height-discharge relationship was very unstable during January and February. Computations by shifting channel methods. Records available: August 17, 1938 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 6,490 second-feet on May 19, 1942 with a gage height of 16.06 feet. Min., sometimes dry.

Average Flow in Second-Feet

Daily:	Max.	6,140	May 19, 1942	Min.		sometimes dry	
Monthly:	Max.	4,880	May 1942	Min.	.2	Nov.	1940
Yearly:	Max.	1,490	1942	Min.	48.8		1948

Mean Daily Discharge in Second-Feet 1950 —— Annual and Period Summary

Day	* Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	117	*103	49.1	35.6	10.4	19.5	10.5	289	13.6	16.8	10.3	6.1
2	117	*106	20.5	13.6	10.5	17.5	9.9	* 44.1	12.6	17.9	9.6	6.1
3	114	*106	17.9	25.6	10.3	16.6	10.5	¤ 28.0	12.2	18.5	8.3	5.8
4	103	*108	14.5	* 11.3	8.9	15.6	12.1	* 687	77.5	20.5	7.4	6.0
5	114	*103	18.1	¤ 12.4	7.4	15.3	11.6	¤ 21.7	160	208	7.6	6.4
6	117	* 96.3	15.4	* 13.4	6.5	15.7	12.2	¤ 22.8	198	386	9.6	6.4
7	117	* 96.3	15.0	¤ 13.4	5.5	14.8	309	¤ 23.9	232	336	9.8	6.6
8	106	* 91.6	15.3	¤ 13.4	4.6	12.1	402	¤ 25.0	118	204	10.1	7.5
9	108	* 91.6	16.4	¤ 13.4	5.7	11.7	835	26.1	44.9	179	10.0	7.6
10	108	* 94.0	16.1	¤ 30.0	7.0	11.7	606	15.3	42.8	138	8.4	7.8
11	106	* 96.3	14.8	¤ 13.5	7.5	11.7	460	11.9	124	118	9.2	7.6
12	122	* 96.3	13.2	¤ 20.0	9.7	50.4	487	10.1	105	91.5	9.6	8.2
13	125	*108	13.0	* 13.5	47.0	21.2	819	5.5	24.3	110	9.9	8.3
14	114	*108	14.3	9.8	29.8	18.1	2,400	94.2	19.5	148	8.2	8.1
15	108	* 86.2	14.4	7.6	52.4	17.1	211	25.9	16.5	74.8	6.8	9.0
16	103	54.9	13.2	7.4	71.8	15.5	87.7	14.7	15.4	54.4	6.8	10.2
17	103	19.3	12.4	8.1	145	13.3	13.3	15.5	40.6	35.9	6.7	9.6
18	108	16.3	11.7	8.8	64.0	12.4	53.9	12.3	55.8	28.9	6.7	8.6
19	108	15.3	11.7	8.6	17.1	22.5	22.3	10.4	129	18.9	5.8	8.8
20	106	14.3	335	8.8	10.1	15.6	10.7	9.8	82.9	15.4	5.3	8.1
21	108	12.9	41.5	9.1	¤ 10.2	14.1	143	10.6	38.1	13.2	5.0	7.7
22	108	53.1	15.2	8.8	¤ 10.3	13.8	182	10.2	150	13.8	5.8	8.2
23	108	26.9	49.9	52.9	¤ 10.4	20.2	557	8.3	113	14.4	65.1	10.7
24	114	12.2	78.5	36.1	¤ 10.5	62.2	747	8.5	280	15.5	74.1	67.7
25	108	11.8	14.5	11.8	* 10.6	12.9	1,320	10.0	650	16.1	10.4	88.0
26	108	43.5	445	* 10.3	10.4	66.7	702	11.6	21.5	14.8	7.0	50.3
27	108	17.6	490	* 10.0	25.8	17.3	116	11.0	18.4	12.5	6.4	11.3
28	108	16.8	52.0	9.8	28.9	13.9	* 9.5	11.7	52.6	11.0	6.0	9.6
29	106		16.2	9.5	52.9	12.2	122	100	19.0	10.9	6.1	23.3
30	103		23.5	9.6	22.1	10.7	5.1	16.4	17.8	10.3	6.5	30.8
31	106		170		21.5		33.8	14.9		10.2		29.8
Sum	*3,409	*1,805.5	2,048.3	*456.1	744.8	529.3	10,721.1	*1,606.4	2,885	2,363.2	358.5	490.2

Current Year 1950 — Period September 1938-1950

Month	Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	10.41	9.83	13	ϕ* 125	‡ 4	ϕ*103	* 110	* 6,760	9,068	11,900	5,990
Feb.	10.21	9.24	‡ 4	ϕ 108	25	11.3	* 64.5	* 3,580	7,490	37,000	2,930
Mar.	11.38	9.25	27	1,100	‡18	11.7	66.1	4,060	4,927	21,000	876
Apr.	11.02	9.31	23	657	15	5.8	* 15.2	* 905	9,488	70,500	905
May	10.70	9.20	13	360	9	3.8	24.0	1,480	28,293	299,800	1,050
June	10.87	9.47	26	496	30	9.8	17.6	1,050	23,906	241,000	1,170
July	14.76		14	4,770	31	¤ 1.0	346	21,300	18,144	118,500	2,100
Aug	12.02		4	1,660	14	4.5	51.8	3,190	16,515	* 99,400	2,200
Sept.	10.87	9.15	25	1,220	16	11.8	96.2	5,720	19,238	119,200	1,090
Oct.	10.71	9.00	5	882	31	9.9	76.2	4,690	8,696	42,800	1,170
Nov.	9.97	8.97	23	95.2	22	4.9	12.0	711	2,040	7,270	11.5
Dec.	9.94	8.99	26	90.0	13	4.8	15.8	972	3,941	12,900	972
Yearly	14.76			4,770		¤ 1.0	75.3	54,538	151,746	1,079,340	35,430

¤ Estimated * Partly estimated ‡ And other days ϕ Mean daily

RIO GRANDE AT COUNTY LINE

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located .8 mile downstream from the El Paso-Hudspeth county line. This gaging station is on the rectified channel of the Rio Grande 47.3 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,547.59 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 55 meter measurements during the year, 40 by the United States and 15 by the Mexican Section of this Commission and a continuous record of gage heights. The gage height-discharge relationship was very unstable during the period January 18 to February 12. Computations by shifting channel methods. Records available: January 1, 1938 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 6,340 second-feet on May 19, 1942 with a gage height of 8.66 feet. Min. sometimes dry.

Average Flow in Second-Feet

Daily:	Max.	6,180	May 18, 1942	Min.		sometimes dry	
Monthly:	Max.	4,920	May 1942	Min.	3.0	Aug. 1949	
Yearly:	Max.	1,720	1942	Min.	82.9	1948	

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	159	*202	56.8	13.7	0	58.8	0	191	0	116	67.3	129
2	146	*202	127	28.5	0	65.1	0	147	0	113	63.4	121
3	146	*202	87.7	47.2	0	68.6	0	91.5	0	108	82.6	113
4	145	*200	70.7	14.3	0	96.4	0	393	0	115	112	90.0
5	150	*194	44.6	96.1	0	84.7	0	140	55.1	124	116	11.2
6	145	*188	40.3	91.4	0	143	0	41.7	93.5	269	139	30.4
7	148	*186	39.4	42.3	0	68.5	20.7	27.0	112	273	114	34.8
8	146	*188	26.1	14.4	0	48.8	268	7.0	60.3	150	136	81.8
9	148	*178	30.5	23.4	0	9.6	479	6.0	67.5	98.9	153	71.5
10	147	*200	30.6	16.2	0	0	493	3.2	95.0	89.0	140	34.4
11	146	*208	22.6	11.0	0	2.3	402	.3	89.6	88.9	133	38.4
12	155	205	7.2	10.8	0	1.3	495	3.6	66.0	90.4	157	37.2
13	156	182	13.1	11.0	0	0	545	1.6	36.0	89.1	161	37.7
14	152	127	11.0	7.4	0	0	1,940	0	6.5	79.9	148	24.0
15	149	55.9	25.4	8.0	0	0	250	0	3.1	70.6	128	41.4
16	149	35.4	19.2	6.2	17.3	0	116	0	2.4	73.9	141	36.5
17	149	29.7	11.7	7.0	63.1	0	74.3	0	0	50.8	142	41.9
18	150	33.5	6.0	9.0	70.8	0	27.6	0	19.6	56.1	175	39.1
19	* 160	21.4	10.4	9.5	78.6	0	4.3	0	6.4	61.0	184	24.3
20	* 166	45.2	98.5	5.5	36.3	0	2.1	0	.8	54.5	170	9.7
21	* 171	34.6	49.5	3.5	10.5	0	1.7	0	0	53.7	152	8.6
22	* 173	17.1	15.8	4.9	39.0	0	75.5	0	1.3	56.4	139	7.2
23	* 176	6.0	14.6	6.5	16.5	2.2	225	0	0	64.8	115	33.7
24	* 180	0.1	17.5	73.1	5.2	72.6	629	0	23.5	62.7	97.0	35.3
25	* 191	0	13.9	79.5	0	84.0	649	0	108	61.6	98.6	38.0
26	* 194	0	94.9	16.9	0	100	1,110	0	149	91.7	108	73.7
27	* 200	29.5	379	7.2	0	38.4	196	0	118	94.8	116	93.8
28	* 205	28.1	137	5.6	17.1	4.6	140	0	191	73.6	122	103
29	* 197		15.7	4.4	94.7	0	162	0	227	70.8	133	97.6
30	* 200		0.7	3.5	52.6	0	195	0	174	67.4	134	94.5
31	* 202		30.2		65.1		145	0		67.8		104
Sum	*5,101	*2,998.5	1,547.6	678.0	566.8	948.9	8,645.2	1,052.9	1,705.6	2,936.4	3,876.9	1,736.7

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1938-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	3.16	2.62	28	ϕ* 205	‡ 4	ϕ 145	* 165	* 10,100	14,100	20,000	9,730
Feb.	3.17		11	ϕ* 208	‡23	0	* 107	* 5,950	13,139	47,900	3,430
Mar.	3.74		27	502	30	0	49.9	3,070	11,518	38,900	360
Apr.	2.93		5	188	30	0	22.6	1,340	17,448	84,200	290
May	3.06		28	229	‡ 1	0	18.3	1,120	33,632	303,000	200
June	2.91		6	180	‡ 9	0	31.6	1,880	29,707	239,000	1,880
July	6.83		14	3,530	‡ 1	0	279	17,100	27,127	140,000	1,320
Aug	4.45		4	868	10	0	34.0	2,090	26,008	123,000	182
Sept.	3.54		28	241	‡ 1	0	56.9	3,380	29,755	140,000	3,220
Oct.	3.82	2.53	7	392	17	48.1	94.7	5,820	19,841	61,400	1,590
Nov.	3.32	2.58	12	191	2	62.0	129	7,690	13,384	20,400	7,690
Dec.	3.20		2	152	‡ 5	0	56.0	3,440	14,764	29,700	3,440
Yearly	6.83			3,530		0	* 87.1	* 62,980	251,110	1,247,500	* 60,160

* Partly estimated ϕ Mean daily ‡ And other days

RIO GRANDE AT FORT QUITMAN, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights located on the rectified channel of the Rio Grande 1.5 miles below Old Fort Quitman and 81.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,450.57 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 72 meter measurements during the year, 51 by the United States and 21 by the Mexican Section of this Commission, and a continuous record of gage heights. The gage height-discharge relationship was very unstable during the periods: January 1 to 18, and October 8 to December 12. Computations by shifting channel methods. Records available: January 1923 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 10,600 second-feet October 5, 1946, with a gage height of 10.00 feet. Min., dry March 30, 1935.

Average Flow in Second-Feet

Daily:	Max.	5,890	May 19, 1942	Min.	* .9	May 31 to June 4,	1935
Monthly:	Max.	5,030	May 1942	Min.	* 14.3	May	1935
Yearly:	Max.	1,750	1942	Min.	*104		1948

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	* Nov.	Dec.
1	* 196	137	66.4	55.6	115	124	133	‡ 486	66.5	309	144	*193
2	* 188	135	70.8	56.6	86.6	168	142	* 453	55.4	178	150	*193
3	* 177	128	74.5	54.7	79.4	162	130	514	61.7	158	150	*189
4	* 204	123	79.8	48.3	80.4	227	138	522	147	167	122	*182
5	* 188	116	79.9	48.2	96.2	226	104	662	185	218	108	*193
6	* 204	141	64.2	47.1	81.0	216	103	271	182	386	117	*186
7	* 196	177	59.5	59.1	90.9	199	158	285	170	387	156	*182
8	* 185	108	65.6	61.4	82.8	132	178	220	129	* 156	153	*156
9	* 167	86.6	88.4	68.8	71.4	112	122	144	142	* 160	172	*175
10	* 192	80.1	73.5	58.8	79.0	137	454	120	155	* 193	193	*175
11	* 196	84.1	68.7	63.4	97.3	138	611	94.2	196	* 172	197	*175
12	* 160	103	67.0	79.2	85.9	140	946	77.5	201	* 139	197	*144
13	* 177	99.9	65.2	‡ 83.5	92.5	112	480	79.5	175	* 128	215	128
14	* 204	115	70.7	‡ 78.7	91.7	100	1,340	61.6	172	* 122	223	132
15	* 174	142	68.9	* 74.0	99.8	86.7	1,320	73.9	167	* 141	211	146
16	* 181	128	59.7	85.7	89.9	71.2	218	67.6	126	* 136	200	113
17	* 226	119	57.8	84.0	101	64.3	202	72.5	154	* 130	197	121
18	* 233	116	54.6	68.2	108	64.3	174	79.4	173	* 90.6	197	128
19	* 193	105	54.6	73.5	126	73.7	184	78.0	139	* 79.1	232	114
20	* 179	109	57.0	74.6	135	70.6	116	91.1	146	* 92.6	248	114
21	* 181	107	57.0	75.8	153	72.3	382	94.3	144	* 122	232	118
22	* 169	96.9	61.8	71.6	181	78.8	209	78.2	232	* 122	223	121
23	* 161	80.4	60.1	78.2	153	84.4	336	83.0	213	* 130	207	159
24	* 154	73.2	56.1	81.0	150	78.2	1,520	82.7	983	* 133	197	112
25	148	80.8	54.6	94.5	137	91.3	1,270	77.3	* 226	* 144	163	112
26	134	79.0	53.0	92.6	106	109	2,230	68.3	237	* 136	160	118
27	119	73.1	118	92.9	122	95.4	* 960	80.5	214	* 141	163	122
28	121	72.7	160	78.1	122	112	* 530	77.5	148	* 169	172	98.8
29	135		74.8	85.9	151	128	506	81.0	208	* 147	169	85.0
30	143		65.0	102	109	106	* 474	67.9	321	* 130	193	85.3
31	140		60.9		87.8		* 888	63.0		* 128		98.0
Sum	*5,425	3,015.8	2,168.1	2,176	3,361.6	3,579.2	16,558	5,306	5,868.6	*5,044.3	*5,461	*4,368.1

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	3.45	2.61	18	ϕ* 233	27	ϕ 119	* 175	* 10,800	13,205	20,900	5,370	14,777
Feb.	2.95	2.19	7	208	28	60.8	108	5,980	13,229	50,100	3,510	13,896
Mar.	3.20	2.13	27	313	25	49.3	69.9	4,300	11,012	38,900	1,090	10,958
Apr.	2.68	2.01	30	130	5	35.7	72.5	4,320	13,769	77,000	1,200	13,777
May	2.90	2.30	22	190	8	66.4	108	6,670	24,981	309,000	880	33,523
June	3.85	2.09	4	706	20	53.7	119	7,100	22,760	240,000	3,630	30,229
July	7.51	2.37	26	4,640	7	87.0	534	32,800	23,036	140,000	2,000	27,873
Aug.	4.46	2.35	5	1,160	16	49.2	171	10,500	28,511	* 127,000	2,490	25,451
Sept.	8.03	2.38	24	5,490	2	51.2	196	11,600	32,857	147,000	5,480	34,103
Oct.	3.57	2.68	6	606	19	ϕ* 79.1	* 163	* 10,000	24,208	66,500	4,520	26,138
Nov.	3.35	2.83	20	ϕ* 248	5	ϕ*108	* 182	* 10,800	15,549	24,500	4,990	16,069
Dec.	3.21	2.64	‡ 1	ϕ* 193	30	80.5	* 141	* 8,660	16,044	31,000	5,640	16,483
Yearly	8.03	2.01		5,490		35.7	* 171	*123,530	239,161	1,270,400	* 75,340	263,277

‡ Estimated * Partly estimated ϕ Mean daily ‡ And other days

RIO GRANDE AT UPPER PRESIDIO STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 7.8 river miles above the confluence of the Río Conchos and about 10 miles northwest of the towns of Presidio, Texas, and Ojinaga, Chihuahua, and 285.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,576.66 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 40 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to March 1914, and August 1923 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 15,200 second-feet on June 12, 1912. On May 26, 1942, a gage height of 10.57 feet was reached with a flow of 5,160 second-feet. This level was the highest reached during the years 1923-1950, inclusive. Min., sometimes dry.

Average Flow in Second-Feet

Daily:	Max.	15,200	June 12, 1912	Min.		sometimes dry
Monthly:	Max.	10,150	June 1912	Min.		sometimes dry
Yearly:	Max.	1,970	1907	Min.	43.7	1948

CORRECTIONS: See page 108.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	176	98.9	28.1	¤ 3.0	0	0	0	1,280	65.4	1,430	98.5	105
2	171	93.0	28.7	* 3.0	0	¤ 0.5	0	1,180	5.8	817	95.3	105
3	174	92.7	* 28.4	¤ 3.0	0	0	0	* 663	3.3	1,380	84.5	102
4	187	92.4	* 20.9	¤ 2.7	0	0	0	¤ 524	3.2	1,320	82.6	110
5	189	86.9	10.3	¤ 2.3	0	0	0	¤ 404	3.1	862	83.1	118
6	188	85.3	9.6	¤ 3.0	0	293	0	* 358	3.0	* 375	87.2	111
7	181	80.7	9.1	¤ 2.5	0	674	0	469	191	¤ 276	90.2	104
8	166	75.9	8.3	¤ 2.0	0	113	0	316	38.1	¤ 222	89.5	107
9	156	75.9	* 7.5	¤ 1.8	0	47.5	0	217	16.2	* 218	83.9	108
10	159	75.8	* 6.8	¤ 1.0	0	12.8	0	156	11.8	273	77.3	102
11	176	81.6	* 6.3	¤ 0.3	0	404	8.6	113	16.0	239	83.6	112
12	172	83.9	* 5.6	¤ 0	0	307	83.6	¤ 75.9	22.1	210	96.7	112
13	175	75.6	5.4	¤ 0.5	0	367	37.4	* 58.2	5.3	198	102	106
14	169	¤ 71.8	* 5.4	¤ 0.2	0	* 107	317	38.5	3.3	* 186	112	106
15	184	¤ 67.1	* 4.9	¤ 0.1	0	¤ 15.0	512	14.6	2.4	170	119	111
16	182	¤ 62.5	* 4.4	¤ 0	0	¤ 1.1	344	* 6.0	5.2	154	114	99.9
17	193	¤ 57.9	* 3.8	0	0	* 0.1	782	* 4.3	2.6	139	125	87.1
18	187	¤ 53.2	* 3.3	¤ 3.0	0	0	866	65.9	2.4	130	130	78.8
19	169	* 48.6	* 2.7	¤ 2.2	0	1.5	346	32.9	31.5	130	127	73.1
20	149	56.7	* 2.7	¤ 1.5	0	0	347	10.6	447	127	122	76.7
21	147	55.7	* 2.7	¤ 1.2	0	0	585	5.0	341	117	113	73.3
22	154	45.2	* 2.8	¤ 1.0	0	0.9	127	2.8	926	108	108	69.0
23	132	38.5	* 2.8	¤ 0.5	0	3.7	452	* 1.2	1,280	93.6	134	67.0
24	114	36.1	* 2.8	¤ 0.2	0	5.3	272	¤ .1	1,180	84.5	131	63.7
25	104	36.1	* 2.8	¤ 0	0	21.7	670	* .1	521	88.1	125	64.5
26	105	41.2	* 2.8	¤ 0	0	0.6	902	.1	350	94.2	124	63.4
27	98.5	39.8	* 2.9	0	0	0	1,190	0	695	96.5	126	68.5
28	97.1	28.3	* 2.9	0	0	0	1,120	16.6	321	100	121	76.2
29	104		* 2.9	0	0	0	1,150	2.1	296	105	108	69.3
30	105		* 2.9	0	0	0	1,100	.5	310	101	120	66.0
31	98.9		* 3.0		0		1,420	97.0		92.9		62.9
Sum	4,762.5	1,837.3	*233.5	¤35.0	0	2,375.7	12,631.6	*6,112.4	7,098.7	9,936.8	3,213.4	2,778.4

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	3.60	2.89	17	205	27	90.3	154	9,450	12,482	24,400	644	14,487
Feb.	2.98	2.35	1	102	27	25.0	65.6	3,640	11,637	40,800	1,420	12,585
Mar.	2.40	-	3	32.0	‡19	*ϕ 2.7	* 7.5	* 463	9,249	39,100	285	9,480
Apr.	-	-	‡ 1	¤ 3.0	‡12	¤ 0	¤ 1.2	¤ 69.4	7,592	41,600	0	7,003
May	-	-	-	-	‡ 1	0	0	0	18,175	240,000	0	24,591
June	6.80	-	7	1,040	‡ 1	0	79.2	4,710	17,583	216,000	* 218	24,951
July	10.08	-	31	1,580	‡ 1	0	407	25,100	23,930	158,000	* 13.1	30,890
Aug.	9.64	-	1	1,460	‡26	0	*197	*12,100	30,729	133,000	* 128	27,070
Sept.	10.70	1.61	23	1,510	18	.9	237	14,100	35,289	* 151,000	602	34,140
Oct.	10.93	2.85	1	1,720	24	78.7	321	19,700	30,319	105,000	0	30,884
Nov.	3.37	2.81	23	144	10	76.2	107	6,370	14,680	34,500	0	13,852
Dec.	3.18	2.67	5	121	31	58.9	89.6	5,510	14,262	30,900	374	14,600
Yearly	10.93			1,720		0	140	101,212.4	225,927	1,176,700	31,731.1	244,533

¤ Estimated * Partly estimated ‡ And other days ϕ Mean daily

RIO CONCHOS AT CUCHILLO PARADO, CHIHUAHUA

DESCRIPTION: Water-stage recorder and cable with cable car, located in Salineta Canyon 3.1 miles north of the town of Cuchillo Parado, Chihuahua, and 28.6 air-line miles westward from Ojinaga, Chihuahua, and 49.1 river miles above the confluence of the Río Conchos with the Rio Grande which is 293.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,914.23 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 164 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1, 1945 through December 1950.

REMARKS: The flow of this stream is modified by irrigation diversions and drainage returns and is affected by the operation of La Rosetilla, La Colina, and La Boquilla reservoirs situated 139, 199, and 206 river miles respectively above this station and also by Madero Reservoir located on the San Pedro River, which enters the Río Conchos 122 river miles above this station.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 34,360 second-feet on October 9, 1945 with a gage height of 15.85 feet. Min., 53.3 second-feet on September 17, 1945, with a gage height of 2.00 feet.

Average Flow in Second-Feet

Daily:	Max.	17,660	Oct. 9, 1945	Min.	57.2	Sept. 17, 1945
Monthly:	Max.	3,580	Sept. 1946	Min.	120	Sept. 1945
Yearly:	Max.	972	1946	Min.	494	1948

Mean Daily Discharge in Second-Feet 1950 —— Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	759	572	724	385	413	441	316	3,310	562	1,880	558	844
2	664	996	1,120	316	399	424	378	1,190	516	4,170	703	978
3	572	791	1,180	249	350	735	309	2,890	392	1,250	699	946
4	455	703	675	241	299	724	268	1,910	360	1,550	501	731
5	441	862	957	259	265	1,540	268	1,340	452	2,010	558	650
6	491	1,060	777	227	413	745	713	1,580	417	1,400	932	530
7	551	812	954	228	590	554	1,300	1,370	371	939	780	498
8	604	724	1,170	298	484	544	1,040	1,150	816	907	685	1,140
9	812	614	802	279	399	639	872	929	717	840	837	689
10	886	597	968	312	364	678	713	886	985	780	756	491
11	1,010	869	992	558	427	576	2,710	812	908	720	918	452
12	1,050	773	971	321	452	968	1,300	635	699	1,080	1,180	434
13	925	982	1,040	448	344	639	1,890	515	717	812	939	441
14	1,120	805	1,020	434	277	738	2,860	378	667	695	720	547
15	1,010	632	1,250	505	284	1,160	2,440	301	622	561	533	484
16	1,060	727	1,120	406	332	1,230	1,550	284	731	812	703	455
17	777	756	1,090	452	342	1,270	5,330	501	699	1,020	622	636
18	689	862	1,010	597	292	1,150	2,420	537	834	1,170	696	537
19	890	865	805	357	299	1,090	2,220	427	2,670	1,310	826	526
20	745	1,010	749	280	319	904	2,720	568	1,980	858	1,150	530
21	639	964	678	261	309	494	2,720	438	2,700	628	798	703
22	851	982	551	271	329	639	1,270	515	3,410	540	586	536
23	978	1,150	678	272	343	855	1,320	357	4,730	830	590	699
24	763	763	526	307	357	706	1,610	427	4,030	763	547	812
25	614	1,420	484	298	371	745	1,240	392	3,090	636	569	900
26	932	985	435	305	392	618	1,170	1,260	2,240	547	576	738
27	833	639	367	288	345	388	1,340	3,780	1,560	650	579	569
28	727	999	424	378	396	345	1,260	795	1,280	547	569	420
29	819		364	349	438	324	1,290	678	1,230	660	731	438
30	886		378	320	364	336	1,490	516	1,080	837	795	561
31	770		347		352		3,310	583		791		427
Sum	24,323	23,914	24,606	10,201	11,340	22,199	49,637	31,254	41,465	32,193	21,636	19,342

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1945-1950: Acre-Feet Average	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	4.79	2.62	14	1,410	5	410	785	48,240	45,373	55,810	36,350
Feb.	5.64	2.82	25	1,980	1	487	854	47,430	45,960	62,420	35,130
Mar.	5.71	2.26	2	2,090	31	309	794	48,810	41,688	49,780	32,280
Apr.	3.64	1.84	17	826	7	193	340	20,230	16,538	29,110	8,420
May	3.35	2.17	7	682	5	265	366	22,490	15,623	22,490	9,540
June	8.14	2.17	5	5,610	29	286	740	44,030	21,933	44,030	13,990
July	11.68	2.00	17	15,860	5	254	1,600	98,450	73,180	178,500	11,570
Aug	9.58	2.07	27	9,820	17	241	1,010	61,990	65,080	142,100	19,830
Sept.	8.66	2.40	21	7,380	#	327	1,380	82,250	102,905	213,300	7,150
Oct.	9.22	2.89	2	8,580	28	494	1,040	63,850	88,777	180,200	28,930
Nov.	4.76	2.69	11	1,530	15	417	721	42,920	52,247	62,870	40,820
Dec.	4.59	2.56	8	1,440	29	353	624	38,360	36,135	45,570	19,610
Yearly	11.68	1.84		15,860		193	855	619,050	605,439	703,660	358,630

Various days of the month.

RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

DESCRIPTION: The Río Conchos enters the Rio Grande 3.7 miles above the international highway bridge between Presidio, Texas, and Ojinaga, Chihuahua, 2.0 miles above the Lower Presidio gaging station on the Rio Grande, 7.8 miles below the Upper Presidio gaging station on the Rio Grande, and 293.5 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on discharge records of the Rio Grande at Upper Presidio and Lower Presidio stations and estimated irrigation diversions and arroyo inflow between these two stations. Records available: May 1900 to March 1914, and August 1923 through December 1950.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. La Colina Reservoir with 21,900 acre-feet capacity and a maximum surface area of 1,160 acres located about 10.5 miles downstream from La Boquilla Dam, and La Rosetilla Reservoir located about 52.7 miles farther downstream with a capacity of 15,400 acre-feet and a maximum surface area of 840 acres, are used for power development. Francisco I. Madero Reservoir located on the San Pedro River, a tributary to the Río Conchos, has a total capacity of about 344,550 acre-feet. Power generation facilities: La Boquilla 14,647 kw., La Colina 3,620 kw., La Rosetilla 5,150 kw., Francisco I. Madero, none.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 162,000 second-feet on September 11, 1904. Min. 3.0 second-feet on May 14, 1904.

Average Flow in Second-Feet

Daily:	Max.	148,900	Sept. 11, 1904	Min.	5.0	May 14, 1904
Monthly:	Max.	24,540	Sept. 1904	Min.	11.0	May 1902
Yearly:	Max.	3,710	1906	Min.	511	1948

CORRECTION: The August, September, and annual discharges for 1932 at this station as previously published are erroneous. The correct values are: 136,000, 505,000, and 1,785,220 acre-feet, respectively.

Current Year 1950							Period 1924-1950			Acre-Feet	
Month	Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Normal 1938-1950	Average 1945-1950
	Day	High	Day	Low			Normal	Maximum	Minimum		
Jan.	15	1,450	6	452	849	52,200	59,089	147,000	20,300	51,054	46,567
Feb.	26	1,930	28	540	874	48,500	50,985	87,700	29,100	47,030	46,333
Mar.	3	1,940	31	301	795	48,900	46,037	80,800	20,800	41,677	42,067
Apr.	18	590	8	195	303	18,000	31,610	79,700	5,000	19,688	15,933
May	27	638	1	237	316	19,500	37,529	148,000	3,950	28,086	15,287
June	5	2,780	29	278	694	41,300	42,542	91,900	8,720	32,792	20,233
July	18	9,470	6	182	1,650	101,000	90,971	502,000	8,890	115,777	76,465
Aug.	27	7,330	18	245	1,090	67,200	129,300	601,000	11,300	121,946	65,383
Sept.	22	‡ 10,400	5	‡ 282	*1,660	* 98,800	264,633	1,173,000	6,770	304,205	105,345
Oct.	1	* 7,600	28	530	*1,200	* 73,700	163,148	798,000	33,200	161,154	97,133
Nov.	13	1,330	6	482	702	41,800	62,726	110,000	29,000	60,792	54,000
Dec.	9	1,210	30	399	617	38,000	54,237	97,700	22,200	45,653	38,517
Yearly		‡ 10,400		182	* 896	*648,900	1,032,807	2,431,850	371,000	1,029,854	623,263

‡ Estimated * Partly estimated # Cuchillo Parado Station began operating Jan. 1, 1945

RIO GRANDE AT LOWER PRESIDIO STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located about 1.7 miles above the international highway bridge between Presidio, Texas, and Ojinaga, Chihuahua, 2.0 miles below the confluence of the Río Conchos with the Rio Grande and 295.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,556.42 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 103 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to July 1915, and August 1923 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 162,000 second-feet on September 11, 1904. Min. 3.0 second-feet on May 14, 1904.

Average Flow in Second-Feet

Daily:	Max.	149,200	Sept. 11, 1904	Min.	5.0	May 14, 1904
Monthly:	Max.	24,870	Sept. 1904	Min.	11.0	May 1902
Yearly:	Max.	4,870	1906	Min.	553	1948

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,090	874	1,160	303	260	302	299	5,170	¤ 608	* 4,620	758	846
2	928	788	672	330	302	544	289	3,900	¤ 494	* 5,210	654	890
3	863	1,160	1,380	302	317	354	349	3,350	¤ 372	* 4,190	807	991
4	789	876	897	252	301	643	298	2,740	¤ 332	2,580	716	983
5	698	826	759	223	263	1,150	207	2,060	¤ 313	* 2,790	620	776
6	668	1,060	807	215	244	955	198	1,620	* 422	2,210	750	726
7	699	901	841	214	352	1,210	943	1,820	* 513	1,630	1,020	648
8	752	1,240	962	205	468	763	* 779	1,560	407	1,260	766	692
9	858	762	1,070	253	400	581	¤ 680	1,310	669	1,280	849	1,160
10	1,030	715	749	242	340	673	* 771	1,040	541	1,230	859	742
11	1,150	723	1,000	283	324	778	682	1,020	982	1,050	834	639
12	1,280	1,030	1,030	430	353	1,090	* 3,590	740	711	1,110	1,070	610
13	1,310	821	1,010	304	390	* 1,210	* 1,860	648	749	1,370	1,220	558
14	1,170	1,100	1,070	379	330	* 812	* 2,710	534	641	1,040	998	550
15	1,390	804	1,030	370	287	720	3,730	408	881	917	799	652
16	1,290	740	1,190	423	266	* 1,210	1,950	314	570	816	768	597
17	1,350	782	1,100	358	288	¤ 1,380	4,180	283	640	1,070	763	588
18	971	806	1,140	412	288	* 1,180	6,580	580	599	1,170	795	645
19	1,000	945	984	476	267	1,010	2,230	426	1,120	1,340	782	579
20	1,110	950	799	330	262	966	2,630	424	3,440	1,420	955	574
21	895	1,150	693	273	288	729	3,570	491	* 4,830	964	1,190	641
22	852	1,050	594	251	266	503	2,180	386	¤ 6,090	778	771	656
23	1,060	1,110	593	264	276	692	1,330	426	¤ 8,000	* 745	679	612
24	1,160	1,080	578	274	281	684	1,660	308	¤ 8,200	965	673	783
25	856	933	489	268	285	708	2,030	365	* 4,260	801	638	842
26	881	1,460	457	254	280	675	1,920	1,070	3,120	727	650	908
27	1,090	970	420	238	418	550	2,690	2,450	2,570	697	645	705
28	929	646	362	229	316	384	2,510	2,540	1,820	717	651	647
29	861		373	266	316	299	2,350	* 636	1,590	708	662	519
30	1,010		343	271	346	306	3,140	¤ 616	1,460	716	947	534
31	1,080		325		307		4,990	¤ 548		1,010		621
Sum	31,070	26,302	24,877	8,892	9,681	*23,061	63,325	39,783	*56,944	*47,131	24,289	21,914

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	3.45	2.14	15	1,640	6	645	1,000	61,600	71,667	164,000	30,400	65,739
Feb.	3.83	2.03	26	1,970	28	566	939	52,200	62,618	99,700	33,900	59,616
Mar.	3.82	1.56	3	1,970	31	304	802	49,300	55,263	89,400	21,200	51,146
Apr.	2.06	1.34	18	593	8	197	296	17,600	38,614	84,100	4,460	26,186
May	2.11	1.45	27	638	1	237	312	19,200	55,403	270,000	3,660	52,454
June	4.56	1.48	5	2,780	29	278	* 769	* 45,700	59,839	267,000	9,250	57,546
July	8.95	1.31	18	10,400	6	182	2,040	126,000	114,081	564,000	8,910	145,939
Aug.	7.46	1.51	28	7,330	18	248	1,280	78,900	159,952	675,000	18,400	148,777
Sept.	-	¤1.60	22	¤ 11,000	5	¤ 285	* 1,900	*113,000	300,077	1,324,000	7,370	338,329
Oct.	8.67	2.30	1	* 8,310	28	630	* 1,520	* 93,500	193,478	864,000	33,800	192,062
Nov.	3.41	2.18	13	1,430	6	567	810	48,200	77,418	141,000	37,800	74,662
Dec.	3.29	1.98	9	1,320	30	465	707	43,500	68,493	116,000	31,400	60,231
Yearly	-	1.31		¤ 11,000		182	* 1,030	*748,700	1,256,903	3,466,700	401,500	1,272,687

¤ Estimated * Partly estimated

ALAMITO CREEK NEAR PRESIDIO, TEXAS

DESCRIPTION: Water-stage recorder about 1,800 feet above the confluence with the Rio Grande and 6 miles below Presidio, Texas, and Ojinaga, Chihuahua. This creek enters the Rio Grande near the lower end of Presidio Valley and 306.9 river miles below the American Dam at El Paso, Texas. Zero of gage is 2,541.42 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 7 meter measurements of low and medium flows and frequent estimates by the hydrographer of steady low flows, a continuous record of gage heights and a rating curve, the higher points of which were determined by slope-area calculations and the medium and low points of which were determined by meter measurements and hydrographer's estimates. Computations by shifting channel methods.

REMARKS: A small irrigation reservoir (San Estaban) 10.5 miles south of Marfa, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. On October 2, 1932, backwater from the Rio Grande reached a gage height of 8.33 feet at this station. This is the highest recorded gage height.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 9,670 second-feet on July 20, 1937 with a gage height of 5.33 feet. Min. .87 second-foot in May 1932.

Average Flow in Second-Feet

Daily:	Max.	3,290	Oct. 24, 1941	Min.	.87	May 1-22, 1932
Monthly:	Max.	329	Sept. 1936	Min.	1.3	Nov. 1950
Yearly:	Max.	55.9	1941	Min.	8.8	1934

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	# Jan.	# Feb.	# March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	* 67.3	* 15.4	# 3.5	* 916	1.2	1.4
2	3.0	3.0	3.0	# 3.0	# 3.5	* 78.9	# 3.5	* 31.9	# 3.5	* 33.7	1.2	1.4
3	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	* 121	1.2	1.4
4	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	* 23.0	1.3	1.4
5	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	* 5.4	1.3	1.4
6	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	* 3.3	1.3	1.4
7	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	# 2.1	1.3	1.4
8	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	# 2.1	1.3	1.4
9	3.0	3.0	3.0	# 3.0	# 3.5	*153	# 3.5	# 3.5	# 3.5	# 2.1	1.3	1.4
10	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	# 3.5	# 3.5	* 6.2	# 2.1	1.3	1.4
11	3.0	3.0	3.0	# 3.0	# 3.5	# 3.5	* 19.0	# 3.5	# 3.5	# 2.1	1.3	1.4
12	3.5	3.0	3.0	# 3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	# 2.1	1.3	1.4
13	3.0	3.5	3.0	* 97.2	# 3.5	* 15.7	# 54.2	# 3.5	* 18.4	# 2.1	1.3	1.4
14	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	# 3.8	# 3.5	* 9.8	# 2.1	1.4	1.4
15	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	* 5.9	2.1	1.4	1.4
16	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	2.0	1.4	1.4
17	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	* 12.0	# 3.5	# 3.5	2.0	1.4	1.4
18	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	* 7.4	# 3.5	# 3.5	1.9	1.4	1.4
19	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.5	* 12.6	1.8	1.4	1.4
20	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	* 4.6	# 3.5	* 17.5	1.8	1.4	1.4
21	3.0	3.0	3.0	# 3.5	*129	# 3.5	* 4.8	# 3.5	* 13.2	1.7	1.4	1.4
22	3.0	3.0	3.0	# 3.5	* 64.9	# 3.5	# 3.5	# 3.5	* 251	1.6	1.4	1.4
23	3.0	3.0	3.0	# 3.5	# 3.5	* 25.9	* 5.5	# 3.5	# 3.5	1.6	1.4	1.3
24	3.0	3.0	3.0	# 3.5	# 3.5	* 5.1	# 3.5	# 3.5	* 391	1.5	1.4	1.3
25	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	# 3.5	# 3.7	* 431	1.5	1.4	1.3
26	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	# 3.5	* 67.8	* 82.0	1.4	1.4	1.3
27	3.0	3.0	3.0	# 3.5	# 3.5	# 3.5	* 15.4	* 13.0	* 16.2	1.3	1.4	1.3
28	3.0	3.0	3.0	# 3.5	* 58.8	# 3.5	* 21.5	* 15.4	# 2.0	1.3	1.4	1.3
29	3.0		3.0	# 3.5	# 3.5	# 3.5	* 6.3	# 3.5	# 2.0	1.2	1.4	1.3
30	3.0		3.0	# 3.5	# 3.5	# 3.5	* 8.4	# 3.5	* 18.9	1.2	1.4	1.3
31	3.0		3.0		# 3.5		* 725	# 3.5		1.2		1.3
Sum	#93.5	#84.5	#93.0	*192.7	*350.7	*366.1	*1,014.7	* 234.7	*1,330.2	*1,146.3	40.4	42.5

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High	Day	Extreme Second-Feet Low	Day	Average Second-Feet	Total Acre-Feet	Period 1932-1950: Acre-Feet Normal	Maximum	Minimum	Normal 1938-1950
Jan.	2.80	2.68	# 5.3	12	# 3.0	‡ 1	# 3.0	# 185	205	273	123	212
Feb.	2.77	2.67	# 4.6	13	# 3.0	‡ 1	# 3.0	# 168	188	234	111	192
Mar.	2.72	2.68	# 3.0	‡ 1	# 3.0	‡ 1	# 3.0	# 184	202	270	123	210
Apr.	4.95	2.70	*2,240	13	# 3.0	‡ 1	* 6.4	* 382	249	743	119	285
May	5.78	2.58	*6,740	21	# 3.5	‡ 1	* 11.3	* 696	1,316	8,520	184	1,127
June	5.17	2.34	*3,670	9	# 3.5	‡ 1	* 12.2	* 726	1,759	* 6,360	206	1,538
July	5.95	2.34	*7,250	31	# 3.5	‡ 1	* 32.7	*2,010	2,764	6,650	232	2,525
Aug.	4.99	3.20	*1,380	26	# 3.5	‡ 1	* 7.6	* 466	3,301	16,330	216	2,004
Sept.	5.88	3.00	*7,040	24	# 2.0	‡24	* 44.3	*2,640	3,674	19,600	179	2,214
Oct.	6.20	3.03	*8,000	1	1.2	‡29	* 37.0	*2,270	2,409	19,200	157	3,041
Nov.	3.04	3.02	1.4	‡14	1.2	‡ 1	1.3	80.1	245	807	80.1	235
Dec.	3.04	3.02	1.4	‡ 1	1.3	‡23	1.4	84.3	219	408	84.3	225
Yearly	6.20	2.34	*8,000		1.2		* 13.7	*9,891.4	16,531	40,444	* 6,397	13,808

Estimated * Partly estimated ‡ And other days

TERLINGUA CREEK NEAR TERLINGUA, TEXAS

DESCRIPTION: Water-stage recorder located about 12 miles south of Terlingua, Texas, 2.4 river miles above the confluence with the Rio Grande at the lower end of Santa Helena Canyon. This creek enters the Rio Grande 371.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,195.99 feet above mean sea level, U.S.C. & G.S. datum, determined by levels run in January 1950 and tied to a U.S.C. & G.S. bench mark elevation established in 1943. Previously published elevations are erroneous.

RECORDS: Based on 47 meter measurements during the year at low flow, a continuous record of gage heights for medium and high flows, and a rating curve, the higher points of which were determined by slope-area calculations and the medium and low points of which were determined by meter measurements. Computations by shifting channel methods. Records available: January 1, 1932 through December 1950.

REMARKS: Irrigation diversions modify the flow of this spring-fed creek at this station.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 34,900 second-feet on May 24, 1935 with a gage height of 17.59 feet. Min., ¤ 0 second-feet on September 29-30, 1937.

Average Flow in Second-Feet

Daily:	Max.	17,200	June 1, 1937	Min.	¤ 0	Sept. 29-30, 1937
Monthly:	Max.	921	June 1937	Min.	.83	Oct. 1934
Yearly:	Max.	146	1937	Min.	5.5	1943

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	2.7	3.3	2.7	2.0	2.8	¤ 0.9	* 519	4.1	* 853	3.9	3.8
2	2.7	2.7	3.6	2.5	2.1	* 1,410	¤ 1.3	* 356	2.8	*1,230	3.9	3.8
3	2.7	2.7	3.5	2.4	2.2	28.1	* 1.6	46.8	2.3	* 301	3.7	3.7
4	2.2	2.6	3.7	2.4	2.7	2.7	* 31.5	19.2	8.6	64.7	3.8	3.9
5	2.2	2.6	3.7	2.8	2.2	.4	4.9	9.2	3.2	* 158	3.8	3.6
6	2.2	2.7	3.6	3.1	2.3	.3	0.3	5.1	8.0	16.6	3.8	3.5
7	2.3	2.9	3.6	3.1	2.5	7.3	* 209	3.6	5.3	9.6	3.8	3.7
8	2.3	2.8	3.4	3.2	2.9	* 481	37.0	3.1	4.7	5.6	3.8	3.4
9	2.4	3.0	3.3	3.5	3.0	* 1,050	14.3	3.2	4.0	4.9	3.5	3.3
10	2.5	3.1	3.5	3.2	3.8	* 199	5.4	2.7	* 143	4.9	3.5	3.3
11	2.6	3.4	3.5	* 126	3.0	10.4	* 559	3.7	22.9	4.3	3.7	3.2
12	3.1	3.4	3.4	* 31.4	3.1	3.3	* 177	4.1	13.7	4.5	3.7	3.2
13	2.8	3.5	2.9	* 125	3.3	5.4	* 313	4.8	13.9	4.4	3.7	3.2
14	2.9	3.3	3.2	* 58.4	3.5	* 123	* 919	5.6	13.6	4.3	3.7	3.2
15	3.0	3.0	3.3	* 16.2	3.6	* 544	* 135	66.1	* 174	4.4	3.8	3.2
16	3.1	2.8	3.3	¤ 3.6	3.6	* 251	26.9	* 230	11.9	4.4	3.6	3.2
17	3.1	2.8	3.1	* 3.6	3.8	23.6	* 2,630	43.7	10.6	4.3	3.8	3.2
18	3.0	2.1	3.1	3.5	3.5	6.6	¤ 446	* 208	10.2	4.2	3.8	3.2
19	3.0	2.1	3.2	3.2	3.4	3.8	¤ 250	16.5	9.9	4.1	3.6	3.2
20	3.0	1.7	2.9	3.1	3.4	3.0	¤ 156	6.4	10.0	4.0	3.7	3.3
21	2.9	1.9	2.8	3.4	* 69.0	3.0	¤ 91.7	4.6	* 757	4.0	3.9	3.3
22	2.9	2.1	3.0	3.6	* 184	* 674	* 43.6	3.7	* 2,430	4.0	3.9	3.4
23	2.9	2.5	3.1	3.3	21.5	* 441	4.9	2.9	* 1,600	4.0	4.0	3.4
24	2.8	2.7	3.2	2.9	7.0	* 163	* 0.1	3.2	* 3,260	4.0	4.0	3.3
25	3.2	2.9	3.3	2.8	12.5	10.3	* 0.1	84.8	* 765	4.0	4.0	3.3
26	2.8	3.1	3.2	2.6	3.8	4.2	* 0.1	* 529	328	4.0	4.1	3.4
27	2.7	3.4	3.4	2.5	2.5	2.4	* 636	* 1,340	51.3	4.0	4.1	3.4
28	2.9	3.4	3.3	2.4	2.3	1.4	* 165	* 206	24.2	4.0	4.0	3.4
29	2.8		3.1	2.3	2.1	* 1.1	68.1	56.9	19.4	4.0	4.0	3.3
30	2.8		3.4	2.1	2.1	* 0.6	31.0	22.7	13.4	4.1	3.9	3.3
31	2.8		3.0		2.3		* 135	8.4		3.9		3.2
Sum	85.3	77.9	101.9	* 430.8	* 369.0	* 5,456.7	* 7,093.7	* 3,819.0	* 9,725.0	*2,735.2	114.5	104.8

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High	Day	Extreme Second-Feet Low	Day	Average Second-Feet	Total Acre-Feet	Period 1932-1950: Acre-Feet Normal	Maximum	Minimum	Normal 1938-1950 Acre-Feet
Jan.	1.68	1.57	4.5	12	4	1.9	2.8	169	201	743	82.7	224
Feb.	1.68	1.59	5.0	11	‡18	1.7	2.8	155	141	267	73.4	146
Mar.	1.70	1.53	4.9	25	26	2.0	3.3	202	177	489	72.4	177
Apr.	4.38	1.55	* 1,950	11	4	1.5	* 14.4	* 854	1,133	15,500	55.1	1,561
May	3.68	1.56	* 1,200	21	5	1.1	* 11.9	* 732	4,548	* 26,000	117	2,807
June	7.50	1.02	* 6,660	2	‡27	* 0.1	*182	*10,800	7,089	54,800	59.5	4,061
July	9.85	.87	*11,700	17	‡ 6	* 0.1	*229	*14,100	6,582	26,800	621	7,783
Aug.	7.08	.81	* 5,880	1	10	2.5	*123	* 7,570	4,479	* 26,680	123	3,300
Sept.	8.01	.70	* 7,640	24	3	2.0	*324	*19,300	7,006	24,600	223	3,761
Oct.	6.32	1.86	* 4,620	1	19	3.7	* 88.2	* 5,430	2,534	8,100	50.8	1,872
Nov.	1.90	1.84	4.1	‡26	‡ 9	2.6	3.8	227	367	¤ 2,980	64.9	383
Dec.	1.91	1.87	4.4	2	26	3.1	3.4	208	346	3,080	90.0	207
Yearly	9.85	.70	*11,700		* 0.1		82.5	*59,747	34,603	105,807	3,958.0	26,282

¤ Estimated * Partly estimated ‡ And other days

RIO GRANDE AT JOHNSON RANCH, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located about 2 miles above Johnson Ranch, 14 miles below Castolon, Brewster County, Texas and Santa Helena Ranch, Chihuahua and 392.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,045.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 116 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1936 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 58,800 second-feet on September 23, 1938 with a gage height of 19.75 feet. Min. 23.1 second-feet on June 6, 1938 with a gage height of .84 foot.

Average Flow in Second-Feet

Daily:	Max.	56,900	Sept. 10, 1942	Min.	27.2	June 14, 1938
Monthly:	Max.	23,600	Sept. 1942	Min.	133	April 1947
Yearly:	Max.	4,780	1942	Min.	574	1948

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	950	1,060	838	358	187	337	255	7,520	* 595	5,860	862	798
2	1,070	1,050	913	330	256	5,920	234	8,460	604	9,360	972	933
3	1,100	817	868	314	241	2,420	271	4,340	560	6,980	770	864
4	931	1,040	1,030	305	245	* 715	248	3,610	478	4,010	754	962
5	843	1,060	1,160	293	260	* 439	327	2,700	497	2,860	864	1,010
6	796	904	804	252	255	857	272	2,150	390	2,910	739	959
7	733	926	890	222	250	1,040	420	1,830	599	2,300	700	815
8	736	1,160	794	213	231	1,840	255	1,910	704	1,800	918	739
9	785	1,060	878	212	266	1,810	728	1,660	574	1,430	963	698
10	826	902	1,050	194	386	* 1,230	760	1,330	535	1,360	761	996
11	924	792	882	202	356	* 627	1,020	1,130	906	1,340	898	962
12	1,120	767	854	460	312	669	957	973	804	1,260	861	765
13	1,300	910	997	319	280	1,070	4,220	929	1,090	1,160	972	698
14	1,350	1,010	994	732	285	1,300	4,650	745	892	1,350	1,180	674
15	1,220	1,010	1,070	394	339	1,300	3,350	674	960	1,220	1,090	633
16	1,400	1,030	1,070	330	328	1,030	3,220	654	1,010	1,050	963	654
17	1,330	818	1,210	341	275	824	5,820	628	849	928	780	676
18	1,370	838	1,190	394	412	937	6,180	735	762	1,000	854	637
19	1,160	821	1,200	348	349	927	4,580	602	712	1,200	790	716
20	961	907	1,130	354	249	935	4,500	631	1,680	1,330	848	669
21	1,100	986	920	396	229	1,000	3,400	481	4,350	1,450	862	645
22	1,070	1,090	826	283	679	2,010	3,220	435	5,960	1,150	1,160	639
23	887	1,080	739	230	741	2,180	2,070	458	12,900	925	1,030	741
24	992	1,060	601	195	354	820	1,540	393	19,400	821	809	701
25	1,130	1,170	681	196	295	651	1,800	400	10,200	909	775	702
26	1,050	886	564	206	286	617	2,030	920	4,750	984	749	854
27	815	1,420	507	216	281	667	2,700	3,440	3,240	848	741	885
28	1,050	1,110	480	204	286	545	2,970	4,700	2,740	777	733	908
29	1,060		447	193	481	439	2,800	2,160	2,100	805	719	739
30	944		390	200	400	319	2,740	* 956	1,810	764	722	671
31	929		385		311		7,300	‡ 676		817		574
Sum	31,932	27,684	26,362	8,886	10,105	35,475	74,747	58,230	82,651	60,958	25,839	23,917

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period April 1936-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	2.70	1.77	16	1,560	7	716	1,030	63,300	64,256	86,400	35,900	64,908
Feb.	2.79	1.82	27	1,620	12	758	989	54,900	58,793	80,900	44,600	59,285
Mar.	2.72	1.25	4	1,540	31	361	850	52,300	49,672	85,300	31,100	50,446
Apr.	2.19	.88	12	1,140	11	176	296	17,600	25,308	79,300	7,940	27,542
May	2.15	.85	23	1,100	1	174	326	20,000	56,735	240,000	8,830	57,994
June	7.90	1.11	2	13,400	30	283	1,180	70,400	70,913	251,000	12,600	71,923
July	10.11	.84	17	16,700	2	206	2,410	148,000	145,967	620,000	10,700	161,100
Aug.	9.80	1.16	2	13,200	26	342	1,880	115,000	148,167	485,000	17,000	161,100
Sept.	13.25	1.30	24	28,200	7	314	2,760	164,000	355,940	1,404,000	20,000	353,392
Oct.	10.35	1.79	2	17,900	30	748	1,970	121,000	205,600	929,000	39,200	216,077
Nov.	2.42	1.68	14	1,300	7	669	861	51,300	75,820	164,000	40,500	78,338
Dec.	2.27	1.60	10	1,180	31	559	772	47,400	64,340	110,000	29,600	62,608
Yearly	13.25	.84		28,200		174	1,280	925,200	1,321,511	3,461,400	416,500	1,364,713

‡ Estimated * Partly estimated

SPECIAL STATIONS IN BIG BEND AREA

During part of the year 1950 nine special gaging stations, equipped with water-stage recorders, were operated on the Rio Grande between the lower end of Santa Helena Canyon and Langtry in conjunction with an investigation of dry weather losses and gains in the river channel. 1950 records are based on current meter measurements and a continuous record of gage heights. Computations were by shifting channel methods. These stations are described as follows:

LOWER END SANTA HELENA CANYON STATION: .9 river mile below the confluence of Terlingua Creek with the Rio Grande and 372.5 river miles below the American Dam at El Paso, Texas. 15 meter measurements by wading, by the U.S. Section.

LOWER END MARISCAL CANYON STATION: About 1,000 feet above the confluence of Glenn Draw with the Rio Grande and 432.2 river miles below the American Dam at El Paso. 29 meter measurements, 27 by boat and 2 by wading, by the U.S. Section.

BOQUILLAS STATION: One quarter mile east of Boquillas, Texas and 447.7 river miles below the American Dam at El Paso. Zero of gage is 1,802.73 feet above mean sea level, U.S. G.S. datum. 40 meter measurements by wading by the U.S. Section.

MARAVILLAS STATION: .4 mile above the confluence of Maravillas Creek with the Rio Grande and 489.2 river miles below the American Dam at El Paso. 53 meter measurements, 44 by boat and 8 by wading by the U.S. Section and 1 by wading by the Mexican Section.

HORN PUMP STATION: 4.8 river miles above the confluence of Reagan Canyon with the Rio Grande and 501.4 river miles below the American Dam at El Paso. 40 meter measurements by wading, 39 by the U.S. Section and 1 by the Mexican Section.

SAN FRANCISCO STATION: 2.4 river miles above the confluence of San Francisco Creek with the Rio Grande and 542.0 river miles below the American Dam at El Paso. 32 meter measurements; 12 by wading and 7 by boat by the Mexican Section and 13 by boat by the U.S. Section.

AGUA VERDE STATION: Cable with stand-up cable car equipped for winch and heavy weights located at the Agua Verde Dam Site 571.7 river miles below the American Dam at El Paso. Zero of gage is 1,241.07 feet above mean sea level U.S.C. & G.S. datum. 54 meter measurements; 17 by cable and 32 by wading by the Mexican Section, and 5 by wading by the U.S. Section.

UPPER LOZIER STATION: 5.2 river miles above the confluence of Lozier Creek with the Rio Grande and 586.6 river miles below the American Dam at El Paso. 24 meter measurements by wading, 22 by the Mexican Section and 2 by the U.S. Section.

LOWER LOZIER STATION: 3.5 river miles below the confluence of Lozier Creek with the Rio Grande and 595.3 river miles below the American Dam at El Paso. 37 meter measurements, 20 by wading by the Mexican Section and 16 by wading and 1 by boat by the U.S. Section.

CORRECTION: See page 108.

Mean Daily Discharge in Second-Feet 1950

	Lower End Santa Helena Canyon Station					Lower End Mariscal Canyon Station					Boquillas Station				
Day	Jan.	Feb.	March	April	May	Jan.	Feb.	March	April	May	Jan.	Feb.	March	April	May
1		1,010	705	339	233		965	986	378	182		969	1,100	457	267
2		897	988	321	245		1,040	763	350	186		1,060	857	‡ 438	263
3		757	745	294	221		909	1,030	329	229		981	1,020	‡ 508	294
4		1,070	#	296	282		819	823	294	219		849	883	‡ 441	300
5		899	956	270	264		1,070	‡1,330	287	215		1,100	1,140	‡ 367	291
6		848	741	226	247		925	1,020	265	238		1,010	1,090	‡ 356	321
7		970	852	198	236	722	879	839	237	239		936	838	334	322
8		#	775	186	220	703	978	921	210	218		1,010	918	312	318
9		918	879	182	364	724	1,110	854	190	219		1,210	833	293	320
10		820	1,010	170	371	765	922	956	188	260		1,020	919	284	608
11		735	757	#	345	828	833	1,050	173	355		919	1,070	277	445
12		717	879	#	279	1,010	753	839	509	369		831	881	500	394
13		975	981	494	254	1,110	744	940	446	418		800	914	544	521
14		875	959	669	307	1,210	966	1,000	435	257		968	1,030	438	355
15		1,060	1,020	395	326	1,210	874	995	596	258		951	1,020	731	327
16		876	998	374	285	1,160	1,040	1,040	344	314		1,070	1,080	450	353
17		750	#	377	316	1,280	870	1,030	318	297		968	1,070	374	354
18		785	1,080	376	374	1,220	789	1,110	339	336	1,260	838	1,200	399	474
19		800	1,110	355	266	1,250	813	1,080	366	382	1,300	846	1,140	469	412
20		916	999	413	209	1,020	829	1,090	327	310	1,070	847	1,170	390	381
21		916	821	355	203	1,010	926	1,000	354	243	997	936	1,080	376	323
22		1,060	733	‡ 274	895	1,080	924	852	348	273	1,100	963	917	424	343
23		990	668	‡ 202	498	946	1,050	769	261	825	1,000	1,090	849	338	681
24		1,020	571	* 192	* 295	888	1,000	705	215	560	928	1,050	783	303	655
25		1,050	647	203	273	1,010	1,060	611	188	366	1,060	1,070	686	276	436
26	875	877	528	202	267	1,090	1,030	645	200	323	1,190	1,150	727	271	355
27	814	#	484	204	270	898	998	523	210	439	1,000	951	641	275	442
28	1,030	988	460	188	301	872	1,240	488	208	330	880	1,430	605	276	373
29	931		421	180	506	1,050		461	196	317	1,080		562	276	351
30	858		373	179	314	955		423	183	538	1,010		514	272	486
31	941		373		304	900		380		399	933		470		460

‡ Estimated * Partly estimated # Limits of rating curve exceeded

SPECIAL STATIONS IN BIG BEND AREA

Mean Daily Discharge in Second-Feet 1950

Day	Maravillas Station					Horn Pump Station				San Francisco Station			
	Jan.	Feb.	March	April	May	Feb.	March	April	May	Feb.	March	April	May
1		953	1,280	397	221		‡1,340	469	279		1,430	622	413
2		1,020	962	402	220		‡1,020	462	281		1,250	579	406
3		1,060	816	369	215		‡ 874	429	274		1,040	579	406
4		886	1,020	347	244		1,040	399	286		1,070	540	406
5		880	823	333	240		872	382	295		1,070	516	427
6		1,130	1,320	334	236		1,230	382	290		1,240	498	424
7		935	935	327	265		994	392	315		1,330	509	431
8		892	856	299	264		890	356	320		1,040	498	459
9		1,050	834	276	253		906	332	310		1,050	473	459
10		1,160	845	260	529		880	309	389		950	445	448
11		953	982	247	406		990	287	594	1,350	1,040	413	
12		845	987	274	359		1,040	286	452	1,140	1,170	410	554
13		803	779	532	385		859	529	403	961	1,030	491	565
14		832	‡ 939	489	430	* 858	984	576	514	946	971	639	583
15		1,070	988	518	301	*1,030	1,040	489	363	1,060	1,140	583	558
16		938	993	605	288	956	1,040	699	331	1,160	1,150	710	477
17		1,120	1,010	394	374	1,130	1,070	467	364	1,190	1,190	678	466
18		882	1,060	351	416	939	1,070	399	443	1,180	1,210	540	547
19		825	1,130	366	379	861	1,140	413	483	1,010	1,290	516	572
20		838	1,080	398	387	866	1,110	441	419	1,040	1,290	526	526
21		868	1,090	366	379	883	1,120	424	402	1,040	1,300	544	533
22		952	946	386	318	937	1,020	497	426	1,090	1,270	523	583
23		948	811	391	304	919	902	480	363	1,140	1,140	590	487
24		1,070	712	315	773	1,040	821	376	706	1,230	1,050	540	544
25	984	1,030	644	270	540	1,020	766	329	634	1,230	946	466	922
26	1,130	1,110	575	241	384	1,080	672	306	447	1,230	840	427	636
27	1,150	1,000	594	239	302	1,040	698	299	353	1,330	830	413	537
28	928	1,120	519	241	396	‡1,180	616	301	429	1,090	798	417	480
29	981		491	239	316		568	299	376		731	410	576
30	1,130		466	232	291		545	296	344		685	410	484
31	1,010		439		416		516		476		664		463

Day	Agua Verde Station					Upper Lozier Station				Lower Lozier Station				
	Jan.	Feb.	March	April	May	Feb.	March	April	May	Jan.	Feb.	March	April	May
1		1,120	1,320	653	410	1,200	1,250	650	410		1,140	1,190	667	420
2			1,350	614	406	1,130	1,480	607	413		1,100	1,490	618	417
3		1,150	1,110	586	399	1,190	1,210	590	417		1,130	1,190	576	406
4		1,210	989	558	392	1,250	1,010	569	406		1,200	975	569	406
5			1,160	523	388	1,140	1,210	530	396		1,110	1,140	537	396
6			1,000	509	420	1,060	1,020	523	427		988	996	498	417
7		1,290	1,440	498	410	1,330	1,420	509	427		1,230	1,310	487	420
8			1,070	519	438	1,160	1,160	519	431		1,120	1,190	494	424
9			992	491	452	1,100	1,010	498	448		1,050	982	480	441
10		1,160	996	466	533	1,210	1,070	470	480		1,140	1,050	456	456
11		1,250	1,020	434		1,370	1,020	438			1,320	982	434	
12			1,180	406		1,180	1,130	420			1,150	1,090	410	
13			1,190	403		1,070	1,190	420			1,060	1,190	424	745
14			971	614		982	985	568			974	992	516	604
15			1,160	738		968	1,090	763			962	1,050	710	636
16			1,220	611		1,210	1,180	611			1,170	1,160	597	569
17	1,350		1,220	780	445	1,130	1,180	812			1,130	1,150	745	505
18	1,390	1,130	1,250	586	586	1,290	1,230	650			1,270	1,210	657	498
19	1,440		1,290	505	618	1,130	1,230	551			1,130	1,190	561	727
20	1,420		1,360	519	583	1,020	1,310	547			1,010	1,300	544	593
21	1,360	1,030	1,310	519	501	1,030	1,280	565			1,040	1,260	554	516
22	1,090	1,060	1,320	533	491	1,060	1,310	569			1,020	1,270	569	512
23	1,150	1,150	1,190	625	551	1,170	1,210	597			1,090	1,190	579	540
24	1,180	1,170	1,040	643	509	1,170	1,070	696			1,130	1,050	650	466
25		1,280	946	494	812	1,310	975	526		1,170	1,260	964	544	689
26		1,240	883	448	752	1,260	883	466		1,080	1,230	882	484	992
27	1,170	1,340	798	424	600	1,320	756	434		1,180	1,270	773	452	604
28	1,250	1,200	791	410	516	1,270	795	417		1,280	1,310	787	434	537
29			735	403	569		724	417	519	1,110		749	424	494
30			699	403	498		699	410	558	1,030		713	420	565
31	1,260		675		459		682		498	1,210		696		505

‡ Estimated * Partly estimated

RIO GRANDE AT LANGTRY, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch located at Langtry, Texas, 24.1 river miles above the confluence with the Pecos River, and 614.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 1,091.69 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 53 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to October 1914; December 1919 to March 1920; and January 1924 through December 1950.

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

EXTREME FLOWS: The highest gage height known is 56.9 feet which occurred about 3:00 P.M. on June 17, 1922. The discharge for this stage was 204,000 second-feet which was estimated by extension of the rating curve. The lowest flow of record is 270 second-feet which occurred in May 1904.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,410	1,280	1,230	782	509	642	896	3,430	1,690	2,750	1,110	1,050
2	1,230	1,230	1,520	748	515	799	814	8,380	1,280	2,710	1,080	1,040
3	1,190	1,230	1,360	716	514	765	713	8,900	1,120	7,020	1,080	1,030
4	1,220	1,320	1,180	701	508	4,000	645	6,110	1,000	5,360	1,110	1,080
5	1,290	1,320	1,230	652	490	2,220	589	3,810	946	5,400	1,220	1,220
6	1,280	1,210	1,210	617	503	1,400	554	* 3,620	3,780	‡3,680	1,090	1,150
7	1,190	1,340	1,300	610	529	1,090	580	‡ 3,250	1,100	‡3,190	1,070	1,210
8	1,140	1,350	1,360	615	518	891	578	* 2,640	* 952	‡2,810	1,150	1,280
9	1,110	1,250	1,120	608	544	2,910	570	2,120	* 888	‡2,470	1,060	1,230
10	1,060	1,250	1,170	593	551	3,730	548	2,100	* 865	*2,220	994	1,120
11	1,060	1,420	1,110	569	786	1,930	607	2,050	* 976	1,940	1,140	1,070
12	1,090	1,330	1,190	539	3,060	1,910	774	1,770	* 860	1,730	1,220	1,030
13	1,160	1,220	1,310	535	972	1,400	8,020	1,590	* 821	1,690	1,100	1,230
14	1,270	1,110	1,200	576	768	1,060	6,280	1,420	1,030	1,650	1,190	1,230
15	1,390	1,080	1,160	845	710	1,360	7,530	1,300	1,050	1,550	1,190	1,100
16	1,510	1,190	1,310	765	716	2,450	5,650	1,290	2,380	1,480	1,260	1,020
17	1,540	1,270	1,310	828	623	1,630	*3,490	1,150	1,310	1,640	1,430	989
18	1,460	1,300	1,350	846	595	1,420	4,590	1,330	1,270	1,480	1,350	936
19	1,590	1,290	1,350	696	800	1,210	6,260	1,400	1,720	1,380	1,250	940
20	1,540	1,150	1,440	637	718	1,050	6,760	1,120	1,560	1,290	1,110	978
21	1,580	1,160	1,420	656	660	1,150	‡4,850	1,010	1,600	1,330	1,130	949
22	1,390	1,130	1,390	682	638	1,080	*4,780	1,030	2,060	1,480	1,080	971
23	1,280	1,170	1,330	687	667	1,580	‡4,000	859	5,070	1,640	1,130	983
24	1,360	1,240	1,200	771	619	2,910	*3,500	847	16,100	1,690	1,130	954
25	1,290	1,320	1,120	682	904	2,610	2,710	758	16,900	1,440	1,360	959
26	1,180	1,330	1,010	598	1,430	1,500	2,120	777	16,300	1,280	1,280	1,030
27	1,230	1,340	903	564	819	1,200	2,200	744	7,110	1,180	1,120	1,020
28	1,320	1,420	899	530	701	1,040	2,300	1,340	4,050	1,230	1,080	994
29	1,250		884	524	618	934	3,210	4,980	* 3,340	1,270	1,060	1,110
30	1,120		838	517	689	922	3,100	4,360	3,120	1,160	1,050	1,160
31	1,280		801		641		3,040	2,560		1,100		1,180
Sum	40,010	35,250	37,205	19,689	23,315	48,793	92,258	78,045	102,248	68,240	34,624	33,243

Month	Current Year 1950								Period 1924-1950			Acre-Feet
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Normal 1938-1950
	High	Low	High Day	High	Low Day	Low			Normal	Maximum	Minimum	
Jan.	1.76	1.15	19	1,640	‡10	1,060	1,290	79,400	93,444	* 245,000	52,300	82,477
Feb.	1.58	1.15	11	1,480	15	1,070	1,260	69,900	80,962	* 117,000	48,900	77,138
Mar.	1.68	.85	2	1,570	31	793	1,200	73,800	77,204	118,000	48,100	71,185
Apr.	1.12	.43	14	1,030	30	510	656	39,100	61,426	105,000	28,500	51,038
May	4.82	.39	12	6,200	‡ 5	484	752	46,200	96,502	271,000	26,900	91,392
June	4.86	.57	10	6,300	‡ 1	608	1,630	96,800	100,962	299,000	25,400	100,500
July	14.00	.48	13	27,500	11	539	2,980	183,000	156,779	719,000	31,700	201,061
Aug.	7.16	.73	3	10,600	27	721	2,520	155,000	201,970	* 730,000	33,800	195,408
Sept.	14.78	.88	24	23,900	13	805	3,410	203,000	363,669	1,410,000	35,700	365,307
Oct.	8.02	1.27	3	10,300	31	1,090	2,200	135,000	251,471	1,063,000	55,200	267,069
Nov.	1.68	1.15	17	1,460	10	986	1,150	68,700	102,055	* 211,000	56,600	101,123
Dec.	1.57	1.07	13	1,370	19	916	1,070	65,900	89,820	135,000	49,800	82,215
Yearly	14.78	.39		27,500		484	1,680	1,215,800	1,676,264	3,851,500	633,900	1,685,913

‡ Estimated * Partly estimated ‡ And other days

PECOS RIVER NEAR COMSTOCK, TEXAS

DESCRIPTION: Water-stage recorder, and cable with sit-down cable car and winch, located at the Pecos High Bridge on the railroad 12 miles northwest of Comstock, Texas, 5.5 miles above the confluence with the Rio Grande. This river enters the Rio Grande 638.2 river miles below the American Dam at El Paso, Texas. Zero of the gage is 1,058.01 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 24 meter measurements during the year and a continuous record of gage heights. Water-stage recorder installed May 11, 1942. Computations by shifting channel methods. Records available: March 17, 1898 to December 3, 1898, and May 1900 through December 1950.

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

EXTREME FLOWS: The greatest recorded flow was on September 1, 1932, when the extreme gage height was 38.25 feet and the extreme flow was 116,000 second-feet. The lowest flow recorded was on August 31, 1930, when the extreme gage height was - .15 foot and the extreme flow was 97 second-feet.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	244	194	* 199	180	167	321	123	188	173	271	206	216
2	240	195	* 194	186	172	686	118	191	173	253	206	219
3	238	197	* 197	186	175	650	113	192	168	246	200	216
4	235	198	* 196	179	177	367	113	268	165	240	192	213
5	230	200	* 196	172	163	276	112	388	168	243	194	213
6	229	201	* 198	168	162	234	110	281	177	249	194	210
7	226	203	* 198	166	163	216	110	232	177	252	195	211
8	222	204	* 197	176	161	204	108	211	* 190	246	201	214
9	221	201	* 194	177	160	198	104	199	* 245	255	197	219
10	220	194	* 193	173	159	188	102	188	* 241	270	189	221
11	220	195	* 190	165	163	180	149	181	* 205	270	188	222
12	224	199	* 189	157	181	171	327	180	* 191	262	191	221
13	219	201	* 186	157	341	166	10,200	175	* 191	268	192	224
14	218	202	* 185	167	403	164	749	184	* 187	262	201	229
15	218	201	* 188	232	306	159	1,070	193	* 182	256	208	228
16	222	202	* 187	219	264	156	612	184	* 174	244	208	227
17	221	203	* 184	315	243	153	498	178	* 176	238	204	226
18	216	204	182	565	244	148	344	170	* 175	232	204	226
19	216	205	180	311	210	142	285	173	175	227	211	225
20	215	205	178	235	203	142	257	195	170	224	209	224
21	211	212	179	211	193	141	236	215	164	224	206	228
22	208	204	180	199	203	141	222	189	167	224	206	229
23	207	214	181	190	261	147	214	184	287	224	209	233
24	206	215	210	183	204	143	208	178	2,740	224	207	236
25	205	213	210	172	183	135	199	175	1,300	218	207	240
26	202	211	200	169	247	166	194	171	1,000	216	210	241
27	191	* 208	186	171	169	172	191	163	485	211	215	242
28	184	‡ 206	179	173	162	150	186	160	386	211	215	243
29	186		179	173	475	137	180	170	342	211	215	247
30	196		175	170	608	128	180	205	300	211	215	248
31	195		176		408		180	193		208		245
Sum	6,685	5,687	*5,866	6,097	7,330	6,381	17,794	6,154	10,874	7,390	6,095	7,036

Month	Current Year 1950								Period 1924-1950			Acre-Feet
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Normal 1938-1950
	High	Low	High Day	High	Low Day	Low			Normal	Maximum	Minimum	
Jan.	.76	.59	1	249	28	184	216	13,300	24,021	78,200	12,900	24,746
Feb.	.63	‡ .57	23	221	‡ 1	194	203	11,300	19,189	62,300	10,900	20,147
Mar	.60	.44	‡24	211	30	175	* 189	* 11,600	18,256	40,700	11,100	18,162
Apr.	2.08	.38	17	952	12	154	203	12,100	17,675	42,400	9,520	18,955
May	1.74	.28	29	742	11	158	236	14,500	34,011	156,000	10,800	24,792
June	2.77	.22	2	1,530	30	124	213	12,700	33,860	197,000	8,840	32,375
July	20.00	.13	13	44,900	11	100	574	35,300	26,420	84,200	7,620	34,061
Aug.	1.22	.25	4	459	‡27	160	199	12,200	19,830	50,400	7,620	21,266
Sept.	9.31	.28	24	11,600	22	160	362	21,600	41,475	324,420	6,190	25,193
Oct.	.75	.48	1	284	31	206	238	14,700	51,506	486,000	9,520	63,992
Nov.	.56	.42	28	221	13	187	203	12,100	28,244	209,000	10,300	33,762
Dec.	.67	.52	30	251	7	209	227	14,000	23,609	91,800	12,200	24,461
Yearly	20.00	.13		44,900		100	256	185,400	338,096	1,330,900	167,420	341,912

‡ Estimated * Partly estimated ‡ And other days

GOODENOUGH SPRING NEAR COMSTOCK, TEXAS

DESCRIPTION: Staff gage located 4,000 feet above the confluence with the Rio Grande and 11.75 miles southwest of Comstock, Val Verde County, Texas. The stream from this spring enters the Rio Grande 664.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 968.42 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 23 meter measurements during the year with the discharge estimated between measurements. Records available: February 23, 1929 through December 1950.

REMARKS: The flow of this spring is very uniform and not modified by diversions or storage. Backwater reaches the station when the Rio Grande reaches a discharge of about 35,000 second-feet near this spring. A maximum gage height of 17.30 feet was reached by backwater on September 1, 1932.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 846 second-feet on September 18, 1941 with a gage height of 4.57 feet. Min. 75.7 second-feet on August 28, 1944 with a gage height of .47 foot.

		Average Flow in Second-Feet				
Daily:	Max.	¤ 455	Oct. 1, 1932	Min.	77.2	Aug. 28, 1944
Monthly:	Max.	* 421	Oct. 1932	Min.	88.6	Aug. 1944
Yearly:	Max.	266	1933	Min.	105	1950

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	¤ 121	¤ 115	¤ 112	¤ 103	¤ 104	¤ 103	¤ 105	¤ 107	¤ 105	¤ 105	¤ 99.0	¤100
2	¤ 121	¤ 115	¤ 112	¤ 103	¤ 104	¤ 103	¤ 105	¤ 106	¤ 105	¤ 105	¤ 98.2	¤100
3	¤ 121	¤ 115	¤ 112	¤ 103	¤ 104	¤ 103	¤ 105	¤ 106	¤ 105	¤ 105	¤ 97.5	¤100
4	¤ 121	¤ 115	¤ 112	¤ 103	¤ 104	¤ 103	¤ 105	¤ 106	¤ 105	¤ 105	¤ 96.7	¤100
5	¤ 120	¤ 116	¤ 112	¤ 103	¤ 104	¤ 103	¤ 105	¤ 106	¤ 105	¤ 105	¤ 96.0	¤101
6	¤ 120	¤ 116	¤ 112	¤ 103	¤ 104	¤ 103	¤ 105	¤ 106	¤ 105	¤ 105	¤ 95.2	¤101
7	¤ 120	116	112	¤ 103	¤ 104	¤ 102	¤ 105	¤ 105	¤ 105	¤ 105	¤ 94.5	¤101
8	¤ 120	¤ 116	¤ 112	¤ 102	104	¤ 102	¤ 105	¤ 105	¤ 104	¤ 105	¤ 93.7	¤101
9	¤ 120	¤ 116	¤ 111	¤ 102	¤ 104	102	¤ 105	105	¤ 104	105	¤ 93.0	¤101
10	120	¤ 115	¤ 110	¤ 102	¤ 104	¤ 102	¤ 105	¤ 105	¤ 104	¤ 105	92.2	¤101
11	¤ 119	¤ 115	¤ 110	¤ 102	¤ 104	¤ 102	¤ 105	¤ 105	¤ 104	¤ 106	¤ 92.6	101
12	¤ 119	¤ 115	¤ 110	¤ 102	¤ 104	¤ 102	105	¤ 106	104	¤ 106	¤ 93.1	¤101
13	¤ 118	¤ 115	¤ 109	¤ 102	¤ 104	¤ 103	¤ 105	¤ 106	¤ 104	¤ 106	¤ 93.5	¤100
14	¤ 117	¤ 115	¤ 108	¤ 103	¤ 104	¤ 103	¤ 105	¤ 106	¤ 104	¤ 106	¤ 93.9	¤ 99.6
15	¤ 116	¤ 114	¤ 108	¤ 103	¤ 104	¤ 103	¤ 106	¤ 106	¤ 104	¤ 107	¤ 94.4	¤ 99.1
16	¤ 116	¤ 114	¤ 108	¤ 103	¤ 105	¤ 103	¤ 106	¤ 106	¤ 104	¤ 107	¤ 94.8	¤ 98.6
17	¤ 115	¤ 114	¤ 107	¤ 103	¤ 105	¤ 103	¤ 106	¤ 107	¤ 104	¤ 107	¤ 95.2	¤ 98.1
18	¤ 114	¤ 114	¤ 106	¤ 104	¤ 105	¤ 103	¤ 106	¤ 107	¤ 104	¤ 107	¤ 95.7	¤ 97.6
19	¤ 114	¤ 114	¤ 106	¤ 104	¤ 105	¤ 104	¤ 106	107	¤ 104	¤ 108	¤ 96.1	¤ 97.2
20	113	¤ 113	¤ 106	104	¤ 105	¤ 104	¤ 107	¤ 107	¤ 104	108	¤ 96.5	¤ 96.7
21	¤ 113	¤ 113	105	¤ 104	¤ 105	¤ 104	¤ 107	¤ 107	¤ 104	¤ 107	¤ 97.0	¤ 96.2
22	¤ 113	113	¤ 105	¤ 104	¤ 105	¤ 104	¤ 107	¤ 107	¤ 104	¤ 106	¤ 97.4	¤ 95.7
23	¤ 113	¤ 113	¤ 105	¤ 104	105	¤ 104	¤ 107	¤ 106	¤ 104	¤ 106	¤ 97.8	¤ 95.2
24	¤ 114	¤ 113	¤ 105	¤ 104	¤ 105	¤ 104	¤ 108	¤ 106	¤ 104	¤ 105	¤ 98.3	¤ 94.7
25	¤ 114	¤ 113	¤ 104	¤ 104	¤ 105	¤ 105	¤ 108	¤ 106	¤ 104	¤ 104	¤ 98.7	¤ 94.3
26	¤ 114	¤ 113	¤ 104	¤ 104	¤ 104	¤ 105	108	¤ 106	¤ 104	¤ 103	¤ 99.1	¤ 93.8
27	¤ 114	¤ 113	¤ 104	¤ 104	¤ 104	¤ 105	¤ 108	¤ 106	¤ 105	¤ 103	¤ 99.6	93.3
28	¤ 114	¤ 113	¤ 104	¤ 104	¤ 104	105	¤ 108	¤ 106	¤ 105	¤ 102	100	¤ 93.2
29	¤ 114		¤ 104	¤ 104	¤ 104	¤ 105	¤ 107	¤ 106	¤ 105	¤ 101	¤100	¤ 93.0
30	¤ 115		¤ 104	¤ 104	¤ 104	¤ 105	¤ 107	¤ 106	¤ 105	¤ 100	¤100	¤ 92.9
31	¤ 115		¤ 104		¤ 104		¤ 107	¤ 106		99.7		¤ 92.7
Sum	* 3,202		* 3,097		* 3,102		* 3,288		* 3,254.7		*3,029.9	
	*3,618		* 3,343		* 3,234		* 3,289		* 3,131		*2,889.7	

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	ϕ Extreme Second-Feet High Day	High	ϕ Extreme Second-Feet Low Day	Low	Average Second-Feet	Total Acre-Feet	Period March 1929-1950 Acre-Feet Normal	Maximum	Minimum	Acre-Feet Normal 1938-1950
Jan.			‡ 1	¤ 121	‡20	113	*117	* 7,180	8,530	19,620	6,130	7,499
Feb.			‡ 5	¤ 116	‡20	¤ 113	*114	* 6,350	7,563	17,030	5,350	6,615
Mar.			‡ 1	¤ 112	‡25	¤ 104	*108	* 6,630	8,199	17,770	5,900	7,338
Apr.			‡18	¤ 104	‡ 8	¤ 102	*103	* 6,140	7,855	16,580	5,560	7,232
May			‡16	¤ 105	‡ 1	¤ 104	*104	* 6,410	8,539	16,840	5,850	7,968
June			‡25	¤ 105	‡ 7	¤ 102	*103	* 6,150	8,526	16,040	5,330	7,716
July			‡24	¤ 108	‡ 1	¤ 105	*106	* 6,520	9,100	16,460	5,930	8,588
Aug.			‡ 1	¤ 107	‡ 7	¤ 105	*106	* 6,520	8,734	15,840	5,450	8,159
Sept.			‡ 1	¤ 105	‡ 8	¤ 104	*104	* 6,210	9,446	¤ 25,000	* 6,210	8,258
Oct.			‡19	¤ 108	31	¤ 99.7	*105	* 6,460	9,749	* 25,870	* 6,460	8,640
Nov.			‡28	100	10	92.2	* 96.3	* 5,730	8,975	21,850	* 5,730	7,947
Dec.			‡ 5	101	31	¤ 92.7	* 97.7	* 6,010	8,827	20,470	* 6,010	7,844
Yearly				¤ 121		92.2	*105	*76,310	104,043	192,840	* 76,310	93,804

¤ Estimated * Partly estimated ‡ And other days ϕ Mean daily

DEVILS RIVER NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder on main highway bridge, 12 miles northwest of Del Rio, Texas, and 4.5 miles above the confluence with the Rio Grande. Devils River enters the Rio Grande 680.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 951.80 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 16 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to March 1914 at a point .8 mile below Southern Pacific railroad bridge; December 1923 to September 1, 1932, at a point .2 mile above Southern Pacific railroad bridge; September 2, 1932 through December 1950 at highway bridge 2 miles upstream from railroad bridge.

REMARKS: The monthly flow of this spring-fed river is not modified but the daily flow is modified by two power dams with a combined hydroelectric generating capacity of 3,100 kva, the operation of which began in 1929.

EXTREME FLOWS: The highest recorded gage height was on September 1, 1932, when the extreme was 41.0 feet at the present station and the extreme flow was 597,000 second-feet. Zero flow sometimes occurs for a few hours at this station.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	558	469	387	¤ 370	353	338	289	372	324	313	290	299
2	490	418	368	¤ 370	362	322	289	380	308	359	305	290
3	472	430	377	¤ 370	331	307	289	381	308	289	345	290
4	490	415	386	¤ 370	316	307	289	366	330	336	279	277
5	428	392	385	* 370	324	315	274	343	299	335	266	337
6	442	447	389	* 363	308	293	289	367	320	318	293	270
7	421	415	391	322	308	299	276	353	319	334	302	277
8	429	435	372	229	308	299	276	344	296	310	302	305
9	429	443	364	320	315	299	277	351	303	295	332	229
10	443	398	358	476	314	286	270	375	282	310	287	276
11	422	433	381	350	368	286	270	365	281	310	286	269
12	474	432	393	334	376	294	364	349	293	316	273	269
13	458	493	364	304	321	294	5,820	355	280	316	301	282
14	431	358	351	285	313	294	3,210	339	279	316	293	282
15	444	419	367	343	328	294	1,060	338	292	309	308	276
16	414	437	368	367	299	287	732	346	285	301	308	289
17	397	402	365	402	328	287	640	322	306	301	280	269
18	432	410	364	356	384	294	588	321	305	309	285	269
19	445	426	367	274	312	281	520	328	284	309	315	270
20	397	408	356	261	304	281	486	319	296	302	307	264
21	425	433	359	262	298	288	442	318	283	309	266	270
22	425	418	352	275	298	301	443	326	288	301	285	270
23	425	384	378	275	297	316	395	317	303	300	300	277
24	425	376	356	283	297	316	436	316	992	293	300	277
25	417	425	366	283	284	301	374	315	938	285	271	283
26	426	398	375	320	290	288	397	314	602	300	278	305
27	586	388	¤ 375	318	302	248	398	313	479	294	291	257
28	437	397	¤ 375	311	302	288	391	313	346	302	299	277
29	342		¤ 370	330	296	288	385	327	329	310	291	283
30	419		¤ 370	396	295	289	378	358	281	296	284	283
31	431		¤ 370		308		371	325		312		283
Sum	13,674	11,699	11,499	9,889	9,839	8,880	20,918	10,556	10,831	9,590	8,822	8,654

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High	Day	Extreme Second-Feet Low	Day	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Maximum	Minimum	Acre-Feet Normal 1938-1950
Jan.	1.51	1.19	4	640	29	289	441	27,100	22,728	45,250	12,700	19,223
Feb.	1.46	.99	15	595	1	177	418	23,200	21,615	54,500	12,000	19,861
Mar.	1.49	1.13	26	632	26	256	371	22,800	21,986	43,300	11,100	19,408
Apr.	1.64	.57	9	805	8	34.3	330	19,600	24,515	67,800	9,910	21,147
May	1.72	1.02	17	906	‡30	194	317	19,500	42,094	356,900	10,500	25,600
June	1.44	.73	1	548	27	75.7	296	17,600	50,144	380,000	11,100	49,315
July	6.75	.92	13	22,800	5	146	675	41,500	51,459	377,000	13,900	71,646
Aug.	1.46	1.01	9	602	‡21	199	341	20,900	26,949	107,000	12,100	27,962
Sept.	2.42	.98	24	2,010	5	172	361	21,500	77,790	895,990	11,200	26,077
Oct.	1.43	.75	7	509	28	59.9	309	19,000	47,554	349,000	13,200	35,654
Nov.	1.43	1.03	20	514	1	182	294	17,500	25,198	60,300	13,900	22,492
Dec.	1.45	1.03	5	547	15	181	279	17,200	23,384	49,520	13,500	19,231
Yearly	6.75	.57		22,800		34.3	369	267,400	435,416	1,284,080	180,000	357,616

¤ Estimated * Partly estimated ‡ And other days

ARROYO LAS VACAS NEAR VILLA ACUNA, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, located 1.5 miles upstream from Villa Acuña, Coahuila and 1.8 miles upstream from the confluence of Arroyo las Vacas with the Rio Grande at a point just above the Del Rio-Villa Acuña International Bridge. This confluence is 693.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 884.15 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 164 meter measurements during the year, 157 by the Mexican and 7 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: occasional estimates from June 1935 to March 19, 1938, continuous record March 20, 1938 through December 1950.

REMARKS: The low flow of this stream is from springs. Backwater from the Rio Grande reaches this station when the stage at Del Rio Station reaches about 21.0 feet, or a flow of about 110,000 second-feet.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 25,640 second-feet on October 3, 1944 with a gage height of 17.45 feet. Min. .7 second-foot on various days in November 1938 and on March 16, 1940 with a gage height of .98 foot.

Average Flow in Second-Feet

Daily:	Max.	3,530	Oct. 3, 1944	Min.	.7	Nov. 1938 & March 1940
Monthly:	Max.	153	Oct. 1944	Min.	1.1	Jan. 1938
Yearly:	Max.	25.9	1944	Min.	5.8	1950

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.8	6.7	6.3	5.0	3.6	3.6	4.2	2.9	2.1	2.1	1.8	2.1
2	10.6	6.7	6.4	5.0	3.6	3.6	3.9	2.9	2.1	2.1	1.4	2.1
3	11.3	7.1	6.4	5.0	3.6	11.3	3.9	2.8	2.1	2.1	1.4	2.1
4	12.0	7.1	6.0	3.9	3.9	18.4	3.5	2.5	2.1	2.1	1.4	2.1
5	12.0	6.7	6.0	3.9	2.8	4.9	3.5	2.5	2.1	2.1	1.8	2.1
6	12.0	8.8	5.7	4.6	3.9	4.2	3.5	2.5	2.1	2.1	1.8	2.1
7	11.7	8.8	5.7	4.6	3.6	4.2	3.5	2.5	2.1	2.1	2.5	2.1
8	11.7	8.8	5.7	5.0	3.2	4.2	2.8	2.5	2.1	2.1	2.1	2.1
9	11.3	9.2	6.0	4.9	3.2	4.2	3.2	2.5	2.1	2.1	1.8	2.1
10	11.7	7.1	6.4	4.2	3.2	4.2	3.5	2.1	2.1	2.1	1.8	2.1
11	11.7	7.1	6.7	4.2	3.5	3.9	5.7	2.1	2.1	2.1	1.8	2.1
12	14.1	6.7	6.4	4.2	4.3	3.9	4.2	2.1	2.1	1.8	2.1	2.1
13	12.7	6.7	6.0	5.3	3.9	3.6	491	2.5	2.1	1.8	2.1	1.8
14	12.7	6.7	6.7	4.2	3.9	3.5	20.1	2.5	2.1	1.8	2.1	2.1
15	12.7	6.4	7.1	5.3	3.5	3.2	5.3	2.8	2.1	1.8	2.1	2.1
16	12.7	7.1	6.4	4.2	3.5	2.8	3.2	2.8	2.1	1.8	2.1	2.1
17	12.0	7.8	7.8	4.2	3.2	3.2	3.2	2.8	2.1	1.8	2.1	1.8
18	11.3	7.4	8.1	4.2	3.5	3.2	3.2	2.5	2.1	1.8	2.1	1.8
19	12.0	7.4	6.4	4.2	3.5	3.5	3.2	2.5	1.8	1.8	1.8	2.1
20	9.5	7.1	6.4	4.2	3.5	3.5	3.5	2.1	1.8	1.8	1.8	2.1
21	9.9	6.7	5.7	4.2	3.5	3.2	3.5	2.1	1.8	1.8	1.8	2.1
22	10.6	6.7	4.9	4.2	3.5	49.1	3.2	2.1	1.8	1.8	1.8	1.8
23	10.9	6.7	5.3	4.2	3.5	27.5	2.8	2.1	1.8	1.8	1.8	1.8
24	10.9	6.4	5.7	4.2	3.2	8.1	2.5	2.1	30.0	1.8	2.1	1.8
25	8.8	6.4	6.0	4.2	3.5	4.9	2.8	2.1	3.9	1.8	2.1	1.8
26	9.5	6.4	6.4	3.9	3.5	5.3	2.8	2.1	2.9	1.8	2.1	1.8
27	7.8	6.3	4.9	3.9	3.5	4.9	2.8	2.1	2.5	1.8	2.1	1.8
28	7.4	6.3	5.3	3.9	4.6	4.6	3.2	2.1	2.5	1.8	2.1	1.8
29	7.4		5.3	3.9	3.5	4.2	3.2	2.1	2.5	1.7	2.1	1.8
30	7.1		5.3	3.5	3.5	4.2	2.8	2.1	2.5	1.7	2.1	1.8
31	8.1		4.9		3.5		2.8	2.5		2.1		1.8
Sum	337.9	199.3	188.3	130.4	110.2	213.1	610.5	73.9	93.6	59.2	58.0	61.2

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period April 1938-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum
Jan.	1.48	1.41	12	14.1	30	7.1	10.9	670	423	910	‡ 79.4
Feb.	1.41	1.38	9	9.2	#	6.3	7.1	395	844	5,950	‡ 113
Mar.	1.41	1.35	18	8.1	22	4.6	6.1	373	870	2,600	161
Apr.	1.35	1.31	#	5.3	30	3.5	4.3	259	1,120	4,580	168
May	1.35	1.28	11	4.6	5	2.8	3.6	219	1,188	4,310	156
June	3.18	1.28	22	530	#	2.8	7.1	423	909	3,900	118
July	5.74	1.12	13	3,400	24	2.5	19.7	1,210	1,818	8,230	176
Aug	1.12	1.08	#	2.9	31	1.8	2.4	147	985	3,850	129
Sept.	2.10	1.08	24	145	#	1.8	3.1	186	1,491	6,850	95.6
Oct.	1.08	1.08	#	2.1	#	1.7	1.9	117	1,097	9,390	117
Nov.	1.08	1.02	7	2.5	3	1.1	1.9	115	402	‡ 1,670	106
Dec.	1.08	1.02	5	3.2	5	1.4	2.0	121	350	704	121
Yearly	5.74	1.02		3,400		1.1	5.8	4,235	11,497	18,808	4,235

‡ Estimated # Various days of the month

RIO GRANDE NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder located on the downstream side of a pier of the international highway bridge between Del Rio, Texas, and Villa Acuña, Coahuila and 693.6 river miles below the American Dam at El Paso, Texas. Measurements from highway bridge. The zero of gage is 864.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 53 meter measurements during the year, 50 by the United States and 3 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: July 2, 1941 through December 1950. Records are also available for a station 11 miles upstream from May 1900 to April 1915 and for a station 7.5 miles upstream at McKee's Switch, from December 1919 to March 1920, and for a station 900 feet above the international highway bridge from December 1923 to July 2, 1941.

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

EXTREME FLOWS: The highest recorded gage height was on September 1, 1932, when the gage height was 34.5 feet with a discharge of 605,000 second-feet. This is the greatest rate of discharge recorded at any point on the Rio Grande. The lowest flow of record was on May 8, 1948, when the gage height was .40 foot and the flow was 732 second-feet.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,690	2,340	2,270	1,610	1,400	1,710	1,520	3,660	2,910	* 4,350	1,930	1,800
2	2,580	2,300	2,050	1,610	1,300	1,650	1,510	5,330	2,340	* 3,890	1,920	1,810
3	2,380	2,230	2,350	1,580	1,300	2,180	1,420	8,540	1,990	4,460	1,920	1,820
4	2,330	2,210	2,230	1,560	1,280	2,120	1,350	9,010	1,820	9,490	1,860	1,810
5	2,310	2,290	2,060	1,490	1,250	4,690	1,260	5,450	* 1,670	7,460	1,850	1,860
6	2,410	2,320	2,080	1,430	1,220	2,910	1,220	4,300	2,200	6,270	1,980	1,960
7	2,380	2,200	2,080	1,390	1,200	2,220	1,160	4,010	3,490	* 4,540	1,870	1,900
8	2,310	2,330	2,130	1,410	1,220	1,920	1,170	3,420	* 1,810	* 4,200	1,840	2,080
9	2,260	2,350	2,210	1,230	1,200	1,690	1,210	3,120	* 1,670	* 4,010	1,890	2,000
10	2,220	2,200	1,980	1,650	1,210	4,200	1,230	2,810	* 1,810	* 3,550	1,800	1,980
11	2,180	2,200	2,020	1,450	1,830	3,400	1,250	2,760	* 1,570	* 3,220	1,750	1,930
12	2,200	2,390	1,960	1,390	1,840	2,580	1,400	2,690	1,620	* 2,970	1,800	1,860
13	2,250	2,350	2,000	1,370	3,300	2,490	12,100	2,490	1,580	* 2,780	1,930	1,810
14	2,230	2,140	2,070	1,350	1,970	2,050	20,500	2,330	1,460	* 2,700	1,850	1,960
15	2,360	2,020	1,990	1,410	1,730	1,720	10,800	2,220	1,630	* 2,630	1,930	2,000
16	2,460	2,030	1,940	1,740	1,570	1,960	8,210	2,060	1,680	* 2,530	1,960	1,870
17	2,560	2,080	2,100	1,780	1,560	2,810	6,150	2,040	2,850	2,460	2,010	1,800
18	2,630	2,180	2,090	1,890	1,910	2,260	4,660	1,870	2,040	2,560	2,120	1,770
19	2,570	2,180	2,120	2,020	1,440	2,040	6,740	1,960	1,960	2,420	2,100	1,760
20	2,630	2,200	2,110	1,670	1,500	1,860	6,610	2,080	2,300	2,290	2,050	1,760
21	2,600	2,110	2,200	1,550	1,470	1,680	6,660	1,820	2,170	2,180	1,860	1,770
22	2,660	2,080	2,170	1,530	1,390	1,890	5,400	1,650	2,240	2,150	1,860	1,750
23	2,480	2,000	2,190	1,530	1,340	1,910	5,040	1,700	3,210	2,260	1,860	1,760
24	2,370	2,040	2,190	1,530	1,380	2,240	4,420	1,520	12,600	2,360	1,880	1,770
25	2,440	2,150	2,090	1,580	1,330	3,580	3,940	1,530	20,000	2,440	1,860	1,750
26	2,370	2,190	2,000	1,510	1,540	2,980	3,250	1,450	19,600	2,190	2,070	1,730
27	2,310	2,210	1,850	1,410	2,170	2,170	2,810	1,440	15,300	2,070	2,030	1,760
28	2,320	2,220	1,760	1,350	1,600	1,880	2,890	1,430	7,750	1,970	1,890	1,740
29	2,270		1,660	1,350	1,470	1,690	2,950	2,390	* 6,210	2,010	1,840	1,740
30	2,300		1,690	1,350	1,690	1,580	3,790	5,350	* 5,030	2,060	1,810	1,830
31	2,180		1,640		1,820		3,460	4,490		1,980		1,890
Sum	74,240	61,540	63,280	45,720	48,430	70,060	136,080	96,920	134,510	*102,450	57,320	57,030

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	2.23	1.86	1	2,720	11	2,130	2,390	147,000	161,813	344,000	98,200	144,630
Feb.	2.10	1.74	2	2,470	23	1,900	2,200	122,000	144,351	261,000	96,200	140,385
Mar.	2.10	1.48	3	2,460	31	1,540	2,040	126,000	139,469	224,670	94,700	128,315
Apr.	1.98	1.14	18	2,360	9	1,150	1,520	90,700	127,546	222,000	* 70,200	117,393
May	3.25	1.10	13	4,930	9	1,080	1,560	96,100	197,835	* 742,000	68,200	168,577
June	3.77	1.36	10	6,220	30	1,470	2,340	139,000	217,505	704,000	61,700	210,970
July	15.80	1.07	14	58,200	7	1,070	4,390	270,000	255,986	*1,228,000	* 82,400	330,861
Aug.	5.20	1.28	4	10,000	28	1,290	3,130	192,000	269,002	865,000	* 74,700	264,823
Sept.	9.00	1.33	25	22,200	14	1,370	4,480	267,000	522,510	2,754,590	72,600	435,746
Oct.	5.81	1.66	4	12,000	28	1,810	*3,300	* 203,000	387,036	1,634,000	110,000	392,000
Nov.	1.95	1.56	‡18	2,240	11	1,640	1,910	114,000	179,397	467,000	108,000	176,154
Dec.	1.88	1.54	15	2,150	26	1,650	1,840	113,000	160,931	295,180	102,000	147,461
Yearly	15.80	1.07		58,200		1,070	2,600	1,879,800	2,763,381	6,041,720	1,639,000	2,657,315

* Partly estimated ‡ And other days

SAN FELIPE CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder at Silos farm road bridge 1.75 miles south of Del Rio, Texas, 2 miles above the confluence with the Rio Grande which is 1.6 river miles below the Del Rio gaging station on the Rio Grande. This stream enters the Rio Grande 695.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 875.05 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 13 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Rating curves based on low and medium-flow measurements by wading or from bridge, and high-flow measurements by slope-area computations. Records available: September 1, 1931 through December 1950.

REMARKS: The flow of this spring-fed creek is greatly modified by municipal diversions at Del Rio and by irrigation diversions above this station. Backwater from the Rio Grande reaches this station when the stage at Del Rio Station reaches 15 feet or a flow of about 60,000 second-feet.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 45,000 second-feet on June 14, 1935, with a gage height of 23.20 feet. Min. 2.2 second-feet on December 19, 1934.

Average Flow in Second-Feet

Daily:	Max.	#16,200	June 14, 1935	Min.	2.4	Dec. ‡ 1,	1934
Monthly:	Max.	* 805	June 1935	Min.	8.8	Feb.	1935
Yearly:	Max.	* 136	1935	Min.	30.7		1934

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	113	107	76.7	77.7	81.7	73.1	65.9	59.1	57.3	79.5	50.7	45.2
2	113	104	77.7	78.7	80.6	72.0	64.9	60.3	58.2	65.3	50.7	45.3
3	112	105	79.8	77.6	80.6	70.9	63.7	61.2	59.1	64.3	51.6	45.3
4	111	105	85.5	78.7	77.2	71.0	63.7	61.0	56.9	65.3	51.6	46.2
5	111	105	86.5	79.9	75.0	69.9	63.7	60.9	56.8	65.3	51.7	46.3
6	111	105	87.6	84.4	78.3	71.0	63.6	57.7	57.7	62.8	51.7	48.2
7	111	105	87.6	84.3	78.2	76.4	62.6	56.5	57.5	66.4	50.8	50.1
8	111	105	87.5	83.1	78.2	77.5	64.8	57.4	58.4	74.6	49.9	51.1
9	111	105	88.7	82.0	80.5	72.0	67.0	57.3	58.4	69.7	50.9	52.3
10	110	104	86.4	80.9	81.6	73.1	66.0	59.2	60.5	65.9	51.0	52.4
11	108	106	82.9	79.8	104	77.4	76.2	58.0	59.5	68.6	51.0	50.6
12	108	105	84.0	78.6	89.6	75.1	99.2	62.0	55.4	68.1	51.0	48.9
13	108	103	83.9	79.8	86.1	71.9	71.7	63.9	56.4	66.0	51.1	49.1
14	107	98.5	81.7	79.8	90.9	71.9	73.0	61.7	54.3	64.4	51.1	48.2
15	108	87.9	72.9	80.8	88.5	70.7	66.6	57.5	53.3	62.8	49.2	46.9
16	108	85.5	70.6	79.7	84.0	70.7	66.7	58.4	53.3	58.2	47.4	44.2
17	108	92.4	71.7	80.8	82.8	67.5	65.8	59.3	55.4	56.6	47.4	43.3
18	108	95.9	72.8	83.0	85.1	66.3	65.9	62.3	54.3	55.2	47.5	42.4
19	108	95.8	73.8	85.3	84.0	67.4	64.9	60.0	53.3	56.1	47.5	43.6
20	107	95.7	77.0	87.6	84.0	65.3	65.0	60.9	52.3	58.2	46.6	45.7
21	107	96.8	81.5	86.4	84.1	65.2	64.1	62.9	53.3	58.2	45.7	47.8
22	108	93.1	82.5	85.2	84.1	78.6	64.2	64.9	78.1	57.2	45.8	52.9
23	108	89.6	82.5	84.1	81.8	74.8	65.3	64.7	60.8	56.2	45.8	53.1
24	108	86.1	82.5	82.9	79.6	72.6	69.7	62.5	174	56.3	46.7	52.2
25	108	84.8	83.5	81.8	79.6	72.6	69.8	62.4	89.6	56.3	50.6	51.3
26	108	85.9	85.8	84.1	74.1	72.6	65.6	63.2	78.4	56.3	49.6	51.5
27	107	86.9	84.6	85.2	76.2	76.8	61.7	63.1	80.6	55.4	49.7	51.6
28	108	86.9	84.6	86.3	78.5	71.4	60.8	64.1	80.6	55.5	49.7	49.8
29	109		83.4	85.1	79.7	69.2	60.9	66.0	80.6	55.5	46.0	48.0
30	109		84.5	84.0	78.5	67.0	61.0	69.1	80.6	54.5	44.3	49.1
31	109		83.3		76.3		60.1	64.7		53.5		51.2
Sum	3,381	2,725.8	2,534.0	2,467.6	2,543.4	2,151.9	2,064.1	1,902.2	1,984.9	1,908.2	1,474.3	1,503.8

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Sept. 1931-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	1.30	1.22	‡ 1	115	14	105	109	6,710	4,015	7,070	934	3,816
Feb.	1.26	.96	1	112	28	74.7	97.4	5,410	3,189	8,630	487	3,173
Mar.	1.12	.88	9	92.2	16	65.3	81.7	5,030	2,674	5,030	798	2,512
Apr.	1.11	.95	13	90.0	12	72.1	82.3	4,890	3,028	* 8,120	566	3,056
May	1.49	.88	11	136	26	64.4	82.0	5,040	3,777	6,700	1,400	3,677
June	1.95	.84	22	200	20	60.1	71.7	4,270	6,211	* 47,900	1,110	4,193
July	3.01	.78	12	371	29	55.8	66.6	4,090	3,542	* 8,800	1,080	3,581
Aug.	1.08	.75	30	84.6	8	52.5	61.4	3,770	3,173	6,060	838	3,043
Sept.	3.39	.74	24	440	19	47.4	66.2	3,940	4,459	19,100	872	3,384
Oct.	.95	.71	1	81.8	‡30	49.6	61.6	3,780	4,020	8,470	1,710	4,093
Nov.	.76	.62	4	54.6	30	42.4	49.1	2,920	3,178	5,570	526	3,035
Dec.	.74	.57	30	57.3	18	38.6	48.5	2,980	3,201	5,870	496	2,995
Yearly	3.39	.57		440		38.6	73.0	52,830	44,467	98,137	22,202	40,558

‡ Estimated * Partly estimated # And other days

PINTO CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Water-stage recorder and concrete control dam, .6 mile below the Del Rio-Eagle Pass highway and 5.5 miles above the confluence with the Rio Grande. This creek enters the Rio Grande 717.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is 854.61 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 12 meter measurements during the year by wading and continuous record of gage heights. The station has a stable rating curve defined by low-flow measurements by wading, medium-flow measurements made from the cable prior to its destruction in 1948, and high-flow measurements by slope-area computations. Records available: November 22, 1928 through December 1950.

REMARKS: The flow of this spring-fed creek is modified by small irrigation diversions above the gaging station.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 186,000 second-feet on June 24, 1948 with a gage height of 32.0 feet. Min. sometimes dry.

Average Flow in Second-Feet

Daily:	Max.	*28,200	June 24, 1948	Min.		sometimes dry
Monthly:	Max.	* 953	June 1948	Min.		sometimes dry
Yearly:	Max.	105	1932	Min.	1.8	1945

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.5	8.7	8.4	4.6	3.1	10.7	0.3	0	0	¤ .8	0	0
2	15.6	8.5	8.2	4.5	2.9	5.0	0.1	0	0	¤ .8	0	0
3	15.2	8.5	8.4	4.4	2.8	3.4	0	0	0	¤ .8	0	0
4	14.4	9.9	8.4	4.2	2.7	2.9	0	0	0	¤ .7	0	0
5	13.2	10.7	8.2	4.2	2.2	2.7	0	0	0	¤ .5	0	0
6	13.2	10.8	8.2	4.3	1.8	2.4	0	0	0	¤ .3	0	0
7	12.6	10.6	7.9	4.3	1.7	2.3	0	0	0	¤ .1	0	0
8	12.7	10.4	7.5	¤ 4.2	1.7	2.3	0	0	0	0	0	0
9	13.2	9.8	7.3	¤ 4.1	1.8	2.3	0	0	0	0	0	0
10	13.5	9.5	7.4	¤ 4.0	1.8	2.2	0	0	0	0	0	0
11	12.9	9.6	7.5	¤ 3.9	3.2	1.7	0	0	0	0	0	0
12	12.8	10.0	7.5	¤ 3.8	4.9	1.4	25.1	0	0	0	0	0
13	12.8	10.3	6.9	¤ 3.7	3.0	1.2	3.7	0	0	0	0	0
14	12.3	9.9	6.6	¤ 3.6	2.5	1.0	1.3	0	0	0	0	0
15	12.2	9.2	6.7	¤ 3.5	2.4	.9	1.0	0	0	0	0	0
16	11.9	8.8	6.7	¤ 3.4	2.2	.9	1.0	0	0	0	0	0
17	11.9	8.5	6.4	* 4.5	2.1	.8	1.0	0	0	0	0	0
18	11.7	8.4	6.4	* 4.2	3.3	.7	1.0	0	0	0	0	0
19	11.5	8.5	6.1	* 3.4	2.9	.6	0.5	0	0	0	0	0
20	10.9	8.4	5.9	3.2	2.5	.5	0	0	0	0	0	0
21	11.1	9.2	5.9	3.2	2.2	.4	0	0	0	0	0	0
22	11.4	8.8	5.6	3.4	2.0	.9	0	0	0	0	0	0
23	11.6	8.1	5.5	3.4	1.9	5.9	0	0	0	0	0	0
24	11.6	8.2	5.5	3.1	1.7	2.9	0	0	0	0	0	0
25	11.1	8.1	5.5	2.8	1.7	1.9	0	0	17.3	0	0	0
26	10.2	8.3	5.3	2.6	1.9	1.5	0	0	14.1	0	0	0
27	8.6	8.3	4.9	2.6	1.9	1.1	0	0	2.3	0	0	0
28	8.2	8.5	4.6	2.7	2.0	.8	0	0	1.1	0	0	0
29	8.4		4.9	2.8	2.0	.6	0	0	0.9	0	0	0
30	8.6		4.8	2.8	1.9	.4	0	0	¤ 0.8	0	0	0
31	8.6		4.8		1.7		0	0		0		0
Sum	370.4	256.5	203.9	*109.4	72.4	62.3	35.0	0	36.5	¤ 4.0	0	0

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Dec. 1928-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	3.16	2.79	1	16.5	‡27	8.2	11.9	735	415	2,110	0	243
Feb.	2.96	2.71	13	11.4	24	8.0	9.2	509	647	5,760	0	714
Mar.	2.71	2.42	1	8.5	28	4.6	6.6	404	511	2,500	0	331
Apr.	2.49	2.24	17	6.2	26	2.4	* 3.6	* 217	737	3,600	43.0	636
May	2.42	2.14	12	5.5	‡24	1.6	2.3	144	2,220	20,500	28.0	1,446
June	3.00	1.86	1	22.8	30	.3	2.1	124	* 4,651	* 56,700	0	* 5,173
July	3.79		12	46.8	‡ 3	0	1.1	69.4	2,779	30,000	0	3,768
Aug.				0		0	0	0	2,534	48,700	0	361
Sept.	3.58		25	29.3	‡ 1	0	1.2	72.4	1,625	17,300	0	375
Oct.			‡ 1	.8	‡ 8	0	¤ .1	¤ 7.9	737	4,000	0	290
Nov.				0		0	0	0	347	2,150	0	157
Dec.				0		0	0	0	431	2,180	0	189
Yearly	3.79			46.8		0	3.2	2,282.7	* 17,634	76,259.3	1,325.2	*13,683

¤ Estimated * Partly estimated ‡ And other days

RIO SAN DIEGO AT JIMENEZ, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car. Masonry and concrete Cipoletti weir control for measuring discharges up to 700 second-feet. The station is located 4.4 miles west of Jiménez, Coahuila, and 5.0 miles above the confluence with the Rio Grande. This stream enters the Rio Grande 722.4 river miles below the American Dam at El Paso, Texas. The zero of the gage is 828.90 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on the weir discharge table and a continuous record of gage heights. No meter measurements were made in 1950 because the discharge did not exceed the capacity of the weir except for two hours on May 17 and 18. Records available: 1922 through December 1950. The records from 1922 to September 1932 are considered doubtful.

REMARKS: Reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station.

COMPARATIVE FLOWS FROM RECORDS: ⊕ Momentary Peak: Max. about 75,200 second-feet on September 18, 1941, with a gage height of 20.96 feet. Min., the river was dry on several occasions from April to June 1939.

Average Flow in Second-Feet

Daily:	Max.	*23,200	Sept. 18, 1941	Min.		sometimes dry	
Monthly:	Max.	2,380	Oct. 1932	Min.	18.7	April	1939
Yearly:	Max.	527	1935	Min.	37.9		1939

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	143	128	74.9	63.2	74.9	74.9	52.3	32.9	42.0	63.2	42.0	63.2
2	143	128	87.2	63.2	87.2	74.9	42.0	42.0	32.8	74.9	42.0	52.3
3	129	128	87.2	63.2	74.9	74.9	42.0	42.0	42.0	74.9	42.0	52.3
4	129	128	74.9	74.9	74.9	74.9	42.0	42.0	42.0	74.9	42.0	52.3
5	129	129	74.9	74.9	63.2	74.9	32.8	42.0	42.0	74.9	42.0	52.3
6	129	129	74.9	63.2	63.2	74.9	32.8	42.0	42.0	74.9	42.0	52.3
7	129	129	63.2	63.2	63.2	74.9	32.8	42.0	42.0	63.2	42.0	52.3
8	129	129	63.2	52.3	63.2	74.9	32.8	42.0	42.0	63.2	52.3	52.3
9	114	129	63.2	52.3	63.2	74.9	32.8	42.0	42.0	74.9	42.0	63.2
10	114	129	74.9	52.3	63.2	63.2	32.8	32.9	42.0	74.9	42.0	63.2
11	114	129	74.9	52.3	74.9	63.2	32.8	42.0	42.0	74.9	52.3	52.3
12	114	143	74.9	52.3	100	63.2	42.0	42.0	42.0	74.9	52.3	52.3
13	114	143	74.9	52.3	87.2	52.3	42.0	42.0	42.0	74.9	52.3	52.3
14	114	143	63.2	63.2	87.2	52.3	52.3	42.0	32.8	74.9	52.3	52.3
15	114	129	63.2	63.2	63.2	42.0	74.9	42.0	24.0	74.9	52.3	63.2
16	114	114	63.2	63.2	63.2	42.0	63.2	42.0	32.8	74.9	52.3	52.3
17	114	100	63.2	63.2	100	52.3	63.2	42.0	32.8	52.3	42.0	52.3
18	114	74.9	63.2	63.2	388	52.3	63.2	42.0	32.8	42.0	42.0	52.3
19	114	74.9	63.2	63.2	143	52.3	63.2	42.1	42.0	42.0	52.3	52.3
20	114	74.9	63.2	63.2	115	74.9	63.2	52.3	42.0	42.0	63.2	52.3
21	114	74.9	63.2	63.2	87.2	42.0	63.2	52.3	42.0	52.3	63.2	52.3
22	114	74.9	63.2	63.2	87.2	52.3	63.2	52.3	42.0	52.3	63.2	52.3
23	114	74.9	52.3	63.2	87.2	63.2	42.0	52.3	52.3	52.3	52.3	52.3
24	114	74.9	52.3	63.2	74.9	52.3	52.3	52.3	52.3	52.3	52.3	52.3
25	114	74.9	52.3	63.2	74.9	52.3	42.0	52.3	74.9	52.3	63.2	52.3
26	114	74.9	52.3	63.2	74.9	63.2	42.0	52.3	63.2	52.3	63.2	52.3
27	129	74.9	52.3	63.2	74.9	52.3	42.0	52.3	63.2	52.3	63.2	52.3
28	114	74.9	52.3	63.2	74.9	52.3	32.8	52.3	52.3	52.3	63.2	52.3
29	100		63.2	52.3	74.9	52.3	42.0	63.2	52.3	52.3	63.2	52.3
30	100		63.2	87.2	74.9	52.3	32.8	63.2	63.2	52.3	63.2	52.3
31	100		63.2		74.9		32.8	52.3		52.3		52.3
Sum	3,655	3,010.9	2,035.4	1,867.1	2,773.6	1,818.6	1,422.2	1,429.3	1,333.7	1,916.9	1,553.8	1,664.9

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period October 1932-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	3.08	2.99	#	143	#	100	118	7,250	7,756	36,430	2,910	5,766
Feb.	3.12	2.92	12	159	#	74.9	108	5,970	6,186	25,760	1,970	5,271
Mar.	2.95	2.85	#	87.2	#	52.3	65.7	4,040	5,967	27,040	2,140	5,163
Apr.	3.81	2.85	30	611	#	52.3	62.2	3,700	5,983	21,650	1,110	5,003
May	4.46	2.89	17	1,120	#	63.2	89.5	5,500	*14,889	* 120,200	1,290	9,148
June	3.05	2.82	20	129	#	42.0	60.6	3,610	11,039	62,240	1,420	8,012
July	2.92	2.79	#	74.9	#	32.8	45.9	2,820	10,257	34,430	1,210	10,650
Aug.	2.89	2.79	#	63.2	#	32.8	46.1	2,840	8,756	32,180	2,030	8,258
Sept.	2.92	2.76	#	74.9	#	24.0	44.5	2,650	*16,289	* 84,620	2,120	*15,053
Oct.	2.92	2.82	#	74.9	#	42.0	61.8	3,800	20,940	146,640	1,950	15,212
Nov.	2.89	2.82	#	63.2	#	42.0	51.8	3,080	13,043	68,290	1,960	10,461
Dec.	2.89	2.85	#	63.2	#	52.3	53.7	3,300	8,562	45,160	2,060	6,307
Yearly	4.46	2.76		1,120		24.0	67.1	48,560	129,667	* 381,720	* 27,460	104,304

* Partly estimated # Various days of the month ⊕ Period October 1932-1950

RIO SAN RODRIGO NEAR EL MORAL, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car. Reinforced concrete control weir for measuring the flow up to 177 second-feet. This station is located 10.6 miles west of the town of El Moral, Coahuila, 19.3 miles northwest from Piedras Negras, Coahuila and 11.2 river miles above the confluence with the Rio Grande. Zero of the gage is 879.95 feet above mean sea level, U.S.C. & G.S. datum. This stream enters the Rio Grande 735.4 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on the weir discharge table and a continuous record of gage heights. No current meter measurements were made in 1950. Records available: 1922 through December 1950. The records from 1922 to 1931 are considered doubtful.

REMARKS: The flow of this spring-fed stream is modified by irrigation diversions above this station.

COMPARATIVE FLOWS FROM RECORDS ⊕: Momentary Peak: Max. 81,200 second-feet on September 7, 1932 with a gage height of 16.08 feet. Min. Frequently dry. Zero flow occurs at a gage height of 0.0 feet.

Average Flow in Second-Feet

Daily:	Max.	27,900	Sept. 7, 1932	Min.	frequently dry
Monthly:	Max.	4,270	Sept. 1932	Min.	dry during July 1939
Yearly:	Max.	571	1932	Min.	10.3 1939

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	57.2	43.8	37.4	21.2	12.0	43.8	21.2	16.2	26.1	21.2	31.4	26.2
2	57.2	43.8	31.4	21.2	12.0	37.4	21.2	16.2	26.1	21.2	31.4	21.2
3	57.2	37.4	31.4	21.2	12.0	31.4	21.2	16.2	16.2	21.2	26.1	21.2
4	57.2	37.4	31.4	21.2	12.0	57.2	21.2	16.2	12.0	21.2	26.1	21.2
5	57.2	37.4	31.4	21.2	12.0	57.2	21.2	12.0	12.0	21.2	26.1	21.2
6	57.2	37.4	31.4	16.3	12.0	43.8	21.2	12.0	26.1	21.2	26.1	16.3
7	57.2	37.4	26.1	16.2	12.0	37.4	21.2	12.0	16.2	21.2	26.1	21.2
8	57.2	37.4	26.1	16.2	12.0	31.4	21.2	12.0	16.2	16.2	26.1	16.3
9	57.2	37.4	31.4	16.2	8.1	31.4	21.2	12.0	16.2	21.2	26.1	21.2
10	50.1	37.4	26.1	21.2	8.1	31.4	21.2	12.0	12.0	21.2	26.1	16.3
11	50.1	37.4	26.1	21.2	79.5	26.1	21.2	16.2	16.2	16.2	26.1	16.2
12	50.1	37.4	26.1	21.2	57.2	21.2	21.2	21.2	16.2	16.2	26.1	16.2
13	50.1	43.8	26.1	21.2	26.1	21.2	21.2	21.2	16.2	16.2	21.2	16.2
14	50.1	43.8	26.1	16.2	31.4	21.2	26.1	21.2	16.2	16.2	21.2	16.2
15	50.1	37.4	26.1	21.2	21.2	21.2	21.2	21.2	16.2	21.2	21.2	16.2
16	50.1	43.8	26.1	16.2	21.2	21.2	21.2	21.2	16.2	21.2	21.2	16.2
17	43.8	37.4	26.1	16.2	16.2	21.2	21.2	21.2	16.2	26.1	21.2	21.2
18	43.8	37.4	26.1	16.2	12.0	21.2	21.2	26.1	16.2	26.1	26.1	16.2
19	43.8	37.4	26.1	16.2	12.0	16.2	21.2	26.1	21.2	26.1	26.1	16.2
20	43.8	37.4	26.1	16.2	12.0	16.2	21.2	26.1	16.2	26.1	21.2	16.2
21	43.8	37.4	26.1	16.2	12.0	16.2	21.2	26.1	16.2	26.1	21.2	16.2
22	43.8	43.8	26.1	16.2	12.0	31.4	21.2	26.1	16.2	26.1	26.1	21.2
23	43.8	43.8	26.1	16.2	12.0	43.8	16.2	21.2	16.2	26.1	26.1	21.2
24	43.8	43.8	26.1	12.0	12.0	31.4	16.2	21.2	16.2	26.1	26.1	21.2
25	43.8	43.8	26.1	12.0	12.0	26.1	16.2	26.1	21.2	26.1	26.1	21.2
26	43.8	43.8	26.1	12.0	50.1	21.2	16.2	26.1	21.2	26.1	26.1	21.2
27	37.4	43.8	21.2	12.0	50.1	21.2	12.0	26.1	16.2	26.1	21.2	21.2
28	37.4	43.8	26.1	12.0	31.4	21.2	16.2	26.1	21.2	26.1	21.2	21.2
29	37.4		21.2	12.0	26.1	21.2	12.0	26.1	21.2	26.1	21.2	21.2
30	43.8		21.2	12.0	21.2	21.2	12.0	26.1	21.2	26.1	26.1	21.2
31	43.8		26.1		21.2		12.0	26.1		26.1		21.2
Sum	1,503.3	1,124.0	837.5	506.7	661.1	864.2	600.3	635.8	533.1	705.7	744.6	597.5

Month	Current Year 1950								Period 1932-1950			Acre-Feet
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Normal 1938-1950
	High	Low	High	Day	Low	Day			Normal	Maximum	Minimum	
Jan.	.39	.30	#	57.2	#	37.4	48.5	2,980	3,630	14,850	171	2,820
Feb.	.33	.26	#	43.8	#	31.4	40.1	2,230	2,976	11,580	555	2,611
Mar.	.30	.20	1	37.4	#	21.2	27.0	1,660	2,702	9,900	576	2,236
Apr.	.23	.13	1	26.1	#	12.0	16.9	1,010	3,106	21,160	382	3,078
May	1.44	.10	11	424	#	8.1	21.3	1,310	5,459	42,330	57.6	3,372
June	.52	.16	4	87.6	#	16.2	28.8	1,710	6,561	41,660	30.0	5,646
July	.30	.13	14	37.4	#	12.0	19.4	1,190	3,838	12,170	0	3,793
Aug.	.26	.13	18	31.4	#	12.0	20.5	1,260	4,907	23,580	38.9	5,718
Sept.	.30	.13	6	37.4	#	12.0	17.8	1,060	*21,060	* 253,960	383	8,935
Oct.	.26	.16	#	31.4	#	16.2	22.8	1,400	10,553	81,360	815	7,394
Nov.	.26	.20	#	31.4	#	21.2	24.8	1,480	5,202	24,450	535	4,305
Dec.	.23	.16	1	26.2	#	16.2	19.3	1,190	4,313	19,060	131	3,604
Yearly	1.44	.10		424		8.1	25.5	18,480	*74,307	* 414,310	7,436	53,512

* Partly estimated # Various days of the month ⊕ Period 1932-1950

RETURN FLOW TO THE RIO GRANDE AT MAVERICK POWER PLANT

Near Eagle Pass, Texas

DESCRIPTION: A part of the water diverted from the river into the Maverick Canal is returned to the Rio Grande through the hydroelectric power plant near Eagle Pass, Texas, at a point about 32.2 canal miles below the point of diversion and about 744.9 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on records furnished by the Maverick County Water Control and Improvement District No. 1, showing hourly manometer readings of discharge, in cubic feet per second, through each turbine at the Central Power and Light Company hydroelectric power plant. The mean daily discharges computed from the manometer readings have been multiplied by an average factor of 1.034 to make them agree with periodic check measurements of flow made by current meter by hydrographers of this Commission under stable flow conditions. Records available: January 1949 through December 1950.

REMARKS: This power plant began operating April 16, 1932. 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, however, it has operated continuously. This plant contains 3 vertical turbine generators of 4,000 kw. capacity each, operating under a normal head of about 84 feet.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,140	995	1,050	963	968	1,220	1,000	1,090	1,130	1,220	933	823
2	1,140	1,030	1,020	976	958	1,240	984	1,090	1,190	1,180	949	805
3	1,150	1,030	1,000	971	914	1,220	999	1,120	1,170	1,190	863	852
4	1,130	1,040	1,020	968	880	1,240	963	1,160	1,100	1,160	899	848
5	1,130	1,080	1,010	953	885	1,220	898	1,170	1,060	1,130	883	834
6	1,100	1,060	968	* 956	875	1,220	818	1,210	1,070	1,120	906	832
7	1,130	1,050	960	904	# 868	1,260	791	1,160	1,090	1,090	889	877
8	1,130	1,020	956	928	782	1,280	778	1,170	1,090	1,100	885	829
9	1,100	1,070	960	891	856	1,110	797	1,180	1,040	1,070	894	900
10	1,080	1,050	973	* 852	849	1,270	782	1,160	1,020	1,050	886	915
11	1,040	1,010	943	953	# 1,170	1,270	771	1,130	953	1,070	873	894
12	1,000	1,060	963	934	1,220	1,270	924	1,150	906	1,060	866	899
13	1,010	1,050	* 937	950	1,190	1,260	1,030	1,140	944	1,050	904	806
14	1,020	1,060	* 942	987	1,140	1,200	1,090	1,140	912	1,030	896	907
15	1,040	1,060	# 949	996	1,170	1,180	1,140	1,140	924	1,010	887	999
16	995	1,010	918	1,030	1,180	1,170	1,160	1,100	947	1,030	903	990
17	1,030	999	932	1,090	1,170	1,140	1,190	1,100	970	1,010	886	943
18	1,030	1,000	952	1,080	1,160	1,110	1,180	1,080	1,040	1,000	849	923
19	984	1,010	950	1,070	1,140	1,080	1,200	1,080	1,030	993	908	931
20	997	1,000	946	1,030	1,110	1,010	1,200	1,100	993	1,000	877	948
21	991	1,020	932	1,050	1,130	1,020	1,190	1,080	999	981	880	993
22	1,060	# 995	943	1,050	1,110	1,090	1,160	1,050	1,020	960	864	956
23	1,080	994	935	1,040	1,090	1,140	1,100	1,030	1,020	974	852	982
24	1,050	988	938	1,050	1,090	1,120	1,100	1,040	1,120	968	868	1,040
25	1,000	1,010	903	1,020	1,100	1,110	1,100	979	1,240	982	859	1,050
26	1,030	1,030	941	1,020	1,080	1,090	1,050	927	1,220	993	831	1,020
27	998	1,050	884	992	1,110	1,070	1,070	946	1,260	968	893	1,000
28	1,000	1,040	882	959	1,130	1,060	1,060	# 956	1,250	951	889	996
29	1,010		831	946	1,140	1,050	1,080	1,010	1,240	964	852	985
30	1,010		870	930	1,100	1,040	1,080	1,120	1,240	951	831	986
31	1,020		938		1,140		1,070	1,200		888		988
Sum	32,625	28,811	29,346	29,539	32,705	34,760	31,755	34,008	32,188	32,143	26,455	28,751

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1949-1950: Acre-Feet Average	Maximum	Minimum
Jan.			3	1,150	19	984	1,050	64,700	* 57,600	64,700	¤ 50,500
Feb.			5	1,080	24	988	1,030	57,100	* 52,900	57,100	* 48,700
Mar.			1	1,050	29	831	947	58,200	59,250	60,300	58,200
Apr.			17	1,090	10	* 852	985	58,600	* 56,500	58,600	* 54,400
May			12	1,220	8	782	1,060	64,900	63,300	64,900	61,700
June			8	1,280	20	1,010	1,160	68,900	62,400	68,900	55,900
July			‡19	1,200	11	771	1,020	63,000	* 58,150	63,000	* 53,300
Aug			6	1,210	26	927	1,100	67,500	68,200	68,900	67,500
Sept.			27	1,260	12	906	1,070	63,800	65,650	67,500	63,800
Oct.			1	1,220	31	888	1,040	63,800	66,400	69,000	63,800
Nov.			2	949	‡26	831	882	52,500	58,000	63,500	52,500
Dec.			25	1,050	2	805	927	57,000	61,250	65,500	57,000
Yearly				1,280		771	1,020	740,000	* 729,600	740,000	* 719,200

¤ Estimated * Partly estimated ϕ Mean daily ‡ And other days # Includes gate spill

RETURN FLOW TO THE RIO GRANDE AT MAVERICK POWER PLANT

Near Eagle Pass, Texas

1949

RECORDS: Mean daily discharges for 1949 were taken from Consulting Engineer John J. Ledbetter's "Report of Investigation, Main Canal, Maverick County Water Control and Improvement District, above C. P. & L. Hydro Plant, Maverick and Kinney Counties, Texas," furnished by W. H. Brown, Manager, Maverick County Water Control and Improvement District No. 1.

Mean Daily Discharge in Second-Feet 1949 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	‡ 848	‡ 785	1,010	893	1,030	880	868	952	1,100	1,110	1,140	992
2	‡ 845	‡ 877	990	929	1,070	858	‡ 910	993	1,090	1,090	1,130	985
3	‡ 845	‡ 910	#1,000	901	1,060	868	‡ 960	986	1,090	1,100	1,110	1,040
4	‡ 826	‡ 917	1,020	931	1,070	851	956	991	1,090	1,110	1,110	#1,040
5	‡ 813	‡ 938	1,020	932	1,030	804	915	998	1,070	1,120	1,120	1,040
6	‡ 818	‡ 804	1,010	938	1,000	828	911	‡ 1,040	1,080	1,080	1,110	1,040
7	‡ 812	‡ 937	#1,030	798	1,020	816	819	‡ 1,030	1,070	1,100	1,050	1,050
8	‡ 821	‡ 931	# 992	803	1,020	# 816	804	‡ 1,110	1,070	1,080	1,050	1,040
9	‡ 823	‡ 534	‡1,060	912	1,060	734	817	‡ 1,130	1,020	1,080	1,050	1,070
10	‡ 822	‡ 820	‡1,030	889	1,050	1,130	849	‡ 1,180	1,010	1,070	1,070	1,040
11	‡ 824	‡ 887	1,030	890	1,020	1,170	822	‡ 1,220	1,030	1,070	1,090	1,070
12	‡ 832	‡ 904	1,040	884	1,020	1,160	‡ 792	1,250	1,020	1,070	1,080	1,070
13	‡ 842	‡ 889	984	856	1,010	1,060	‡ 790	1,240	1,060	1,040	1,070	1,070
14	‡ 871	‡ 860	978	843	1,010	453	‡ 810	1,210	1,080	1,050	1,070	1,070
15	‡ 877	‡ 863	991	834	982	492	‡ 827	1,220	1,120	1,050	1,070	1,090
16	‡ 874	‡ 856	968	838	1,000	1,170	‡ 833	1,230	‡ 1,170	1,030	1,030	1,090
17	‡ 891	‡ 851	929	830	1,010	1,220	‡ 853	1,100	1,210	1,030	1,040	1,090
18	‡ 888	‡ 857	954	810	1,010	1,200	‡ 810	1,140	1,230	1,050	1,040	1,100
19	‡ 902	‡ 845	924	‡ 861	998	1,150	‡ 817	1,200	‡ 1,260	1,030	1,030	1,070
20	‡ 901	857	921	‡ 891	1,000	1,100	‡ 790	1,120	1,240	1,040	1,180	1,080
21	‡ 774	896	965	907	996	1,010	‡ 817	1,120	1,270	‡ 1,040	1,140	1,090
22	‡ 746	916	1,010	‡ 908	1,000	979	‡ 819	1,170	1,280	‡ 1,060	1,020	1,080
23	‡ 743	998	990	‡ 935	1,020	934	‡ 815	1,140	1,260	1,080	1,040	1,090
24	‡ 851	982	971	‡ 984	981	859	‡ 850	1,120	1,220	1,200	1,020	1,090
25	‡ 855	# 984	965	‡1,000	955	‡ 877	‡ 877	1,130	1,180	1,370	1,030	1,100
26	‡ 858	780	950	‡1,000	942	‡ 953	‡ 912	1,130	1,160	1,350	1,020	1,080
27	‡ 859	914	957	‡1,070	937	‡ 995	‡ 874	1,120	1,140	1,300	1,020	1,070
28	‡ 859	964	948	‡1,060	984	1,020	‡ 1,000	1,140	1,150	1,320	1,050	1,050
29	‡ 852		931	1,070	957	941	‡ 994	1,120	1,150	1,300	1,030	1,040
30	‡ 800		909	1,050	952	855	980	1,110	1,120	1,230	985	1,080
31	‡ 308		926		906		964	1,110		1,150		1,140
Sum	‡25,480	*24,556	30,403	*27,447	31,100	28,183	*26,855	34,750	34,040	34,800	31,995	33,047

Month	Current Year 1949								Period		
	Extreme Gage Feet		ϕ Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Normal	Maximum	Minimum
Jan.			19	‡ 902	31	‡ 308	‡ 822	‡ 50,500			
Feb.			23	998	9	‡ 534	* 877	* 48,700			
Mar.			9	‡ 1,060	30	909	981	60,300			
Apr.			‡27	‡ 1,070	7	798	* 915	* 54,400			
May			‡ 2	1,070	31	906	1,000	61,700			
June			17	1,220	14	453	939	55,900			
July			28	‡ 1,000	‡13	‡ 790	* 866	* 53,300			
Aug			12	1,250	1	952	1,120	68,900			
Sept.			22	1,280	10	1,010	1,130	67,500			
Oct.			25	1,370	‡16	1,030	1,120	69,000			
Nov.			20	1,180	30	985	1,070	63,500			
Dec.			31	1,140	2	985	1,070	65,500			
Yearly				1,370		308	* 993	* 719,200			

‡ Estimated * Partly estimated ϕ Mean daily ‡ And other days # Includes gate spill

RIO GRANDE AT EAGLE PASS, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch located .5 mile above the international highway bridge between Eagle Pass, Texas, and Piedras Negras, Coahuila and 754.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 682.91 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 164 meter measurements during the year, 153 by the Mexican and 11 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to March 1914; August 1914 to 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; January 1924 through December 1950.

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

EXTREME FLOWS: The greatest recorded flow was on September 2, 1932, when the extreme gage height was 49.00 feet and the discharge was 569,000 second-feet. The lowest flow ever recorded was on June 22, 1948, when the extreme gage height was 1.08 feet and the extreme flow 551 second-feet.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,380	2,440	2,430	1,500	2,090	2,410	1,590	‡ 3,710	4,630	‡4,660	1,870	1,570
2	3,330	2,520	2,340	1,420	1,530	2,090	1,520	‡ 3,640	3,280	‡4,030	1,870	1,580
3	3,100	2,560	2,100	1,430	1,410	1,760	1,490	‡ 6,890	2,710	‡3,810	1,790	1,530
4	2,790	2,550	2,300	1,420	1,290	2,010	1,320	‡ 8,830	2,300	‡6,920	1,780	1,480
5	2,700	2,560	2,230	1,410	1,170	2,510	1,200	‡ 7,590	1,950	‡7,420	1,680	1,560
6	2,690	2,570	2,000	1,320	1,150	3,990	1,130	‡ 4,590	1,760	‡7,100	1,670	1,580
7	2,740	2,630	1,970	1,310	1,120	2,950	1,070	‡ 3,880	2,830	‡5,300	1,890	1,820
8	2,750	2,510	2,050	1,270	1,120	2,440	1,020	‡ 3,710	3,110	‡4,340	1,680	1,760
9	2,670	2,560	2,000	1,230	1,090	2,120	1,050	‡ 3,640	2,040	‡4,170	1,560	1,880
10	2,590	2,610	2,220	1,150	1,020	1,870	1,050	‡ 3,280	1,820	‡3,850	1,510	1,750
11	2,500	2,480	1,950	1,290	2,090	4,480	1,040	2,910	1,780	‡3,390	1,450	1,680
12	2,420	2,480	2,000	1,380	2,090	3,530	1,650	‡ 2,680	1,630	3,240	1,490	1,690
13	2,370	2,640	1,950	1,300	2,370	2,780	1,830	‡ 2,580	1,620	3,010	1,500	1,640
14	2,460	2,590	1,960	1,350	3,100	2,500	‡21,890	2,860	1,650	2,830	1,810	1,650
15	2,520	2,430	2,010	1,350	2,260	2,160	‡ 9,220	2,570	1,500	2,700	1,750	1,750
16	2,660	2,210	1,950	1,380	1,850	1,760	11,120	2,350	1,640	2,520	1,770	1,980
17	2,680	2,280	1,840	1,510	1,640	1,780	8,260	2,220	1,790	2,390	1,730	1,710
18	2,750	2,270	2,010	1,600	2,310	2,670	6,710	2,300	2,950	2,260	1,680	1,570
19	2,870	2,380	2,030	1,710	2,320	2,300	‡ 4,660	2,110	2,180	2,350	1,900	1,550
20	2,850	2,370	2,060	2,010	1,770	2,010	7,770	2,130	2,010	2,240	1,850	1,580
21	2,910	2,490	2,090	1,820	1,540	1,810	7,350	2,380	2,300	2,100	1,730	1,520
22	2,920	2,330	2,120	1,640	1,610	1,720	‡ 5,970	2,070	2,210	2,080	1,550	1,520
23	2,930	2,260	2,170	1,550	1,510	1,980	‡ 5,190	1,830	2,460	2,050	1,420	1,580
24	2,800	2,130	2,160	1,500	1,490	2,000	‡ 4,940	1,890	4,980	2,190	1,490	1,640
25	2,620	2,200	2,110	1,490	1,440	2,260	‡ 4,200	1,710	18,290	2,270	1,500	1,600
26	2,700	2,340	1,960	1,490	1,430	3,780	‡ 3,880	1,620	19,490	2,250	1,530	1,720
27	2,650	2,410	1,770	1,360	1,450	2,960	‡ 3,110	1,550	18,790	2,080	1,850	1,600
28	2,590	2,450	1,700	1,410	2,170	2,180	‡ 2,650	3,470	‡11,800	1,960	1,900	1,610
29	2,610		1,570	1,380	1,780	1,800	‡ 2,750	1,790	‡ 7,060	1,890	1,790	1,610
30	2,550		1,430	1,380	1,620	1,660	‡ 2,970	2,980	‡ 5,540	1,960	1,610	1,560
31	2,580		1,450		1,660		‡ 4,130	5,580		1,940		1,560
Sum	84,680	68,250	61,930	43,360	52,490	72,270	*133,730	*101,340	138,100	*101,300	50,600	50,830

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	3.28	2.76	1	3,430	13	2,290	2,730	168,000	176,503	365,000	96,060	152,450
Feb.	3.05	2.56	9	2,930	24	2,020	2,440	135,400	157,469	398,200	97,510	153,199
Mar.	2.95	2.20	4	2,510	30	1,390	2,000	122,800	147,096	247,440	93,510	130,967
Apr.	2.53	1.87	20	2,150	10	1,110	1,450	86,000	137,151	270,700	60,250	122,929
May	3.67	1.74	13	4,030	9	989	1,690	104,100	231,519	* 918,000	70,210	185,852
June	4.59	2.07	11	6,070	30	1,570	2,410	143,300	267,775	1,005,000	48,710	257,199
July	11.84	1.64	14	‡36,730	10	1,010	*4,310	*265,300	273,486	*1,225,000	89,040	344,494
Aug.	5.97	1.84	4	‡ 9,890	27	1,470	*3,270	*201,000	282,959	* 947,000	86,400	275,448
Sept.	8.92	1.84	25	21,510	16	1,420	4,600	273,900	560,317	3,079,000	69,920	454,386
Oct.	6.40	2.07	4	‡10,950	29	1,740	*3,270	*200,900	425,293	1,680,300	108,100	409,589
Nov.	2.46	1.94	19	2,210	25	1,310	1,690	100,400	203,246	512,800	100,400	189,817
Dec.	2.33	1.80	9	2,240	21	1,370	1,640	100,800	175,424	369,760	100,800	151,625
Yearly	11.84	1.64		‡36,730		989	2,630	1,901,900	3,038,238	6,946,510	1,773,520	2,827,955

‡ Estimated * Partly estimated

RIO ESCONDIDO AT VILLA DE FUENTE, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, located 3.1 miles southwest of Piedras Negras, Coahuila, on the outskirts of Villa de Fuente, 5 miles above the confluence with the Rio Grande. This stream enters the Rio Grande 758.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 717.78 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 53 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1922 through December 1950. The records from 1922 to September 1932 are considered doubtful.

REMARKS: Diversions and drainage returns modify the flow of this spring-fed stream at this station. When the flow of the Rio Grande at Eagle Pass reaches approximately 380,000 second-feet, Rio Grande backwater reaches this station.

COMPARATIVE FLOWS FROM RECORDS: ⊕ Momentary Peak: Max. 24,000 second-feet on June 29, 1936 with a gage height of 19.13 feet. Min. .35 second-foot on November 4, 1934 with a gage height of .75 foot.

Average Flow in Second-Feet

Daily:	Max.	6,710	June 29, 1936	Min.	.7	1934, 1945, and 1946 ♂
Monthly:	Max.	647	Oct. 1932	Min.	1.0	Sept. 1945
Yearly:	Max.	83.2	1935	Min.	11.0	1943

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	52.3	43.4	30.7	14.8	11.7	292	15.2	11.3	18.4	39.9	23.0	11.0
2	52.3	43.8	31.1	8.5	11.7	88.6	10.2	11.3	18.4	39.6	23.0	11.0
3	52.3	37.8	31.8	8.5	15.5	44.8	10.2	11.3	15.5	39.2	23.0	9.5
4	52.3	42.7	33.5	8.5	13.4	113	10.6	11.3	21.9	39.2	23.0	9.9
5	52.3	44.5	35.3	8.5	11.7	82.6	10.2	11.3	45.6	38.8	23.3	9.9
6	52.3	44.5	36.0	9.9	11.7	41.3	8.8	9.9	58.3	37.4	23.3	11.7
7	52.3	43.4	36.4	10.9	11.7	34.3	8.5	9.9	76.6	36.4	20.1	16.2
8	53.7	32.8	36.0	10.9	11.7	35.3	8.1	9.9	62.2	35.0	12.4	13.4
9	57.6	31.1	35.7	12.4	11.7	30.7	7.8	9.9	57.6	33.5	12.7	11.0
10	57.6	30.4	35.3	10.6	11.7	31.8	7.4	9.9	54.0	32.5	12.7	10.9
11	57.9	31.1	35.3	9.5	191	30.4	7.1	8.8	55.4	25.4	12.7	10.6
12	61.4	30.4	35.0	9.5	57.6	28.6	7.4	8.8	55.1	29.7	12.7	10.6
13	59.7	30.0	34.6	9.5	40.3	29.3	8.1	8.8	51.9	27.2	14.8	10.2
14	56.5	29.3	34.3	10.2	34.6	26.8	8.1	8.8	51.6	24.4	24.0	9.9
15	56.5	29.3	34.3	12.0	40.6	13.8	10.6	9.5	45.9	21.9	42.0	9.5
16	58.3	29.7	34.3	13.4	35.0	19.8	10.9	9.5	42.7	19.4	42.0	9.2
17	58.6	29.7	34.3	11.7	35.0	14.8	11.3	9.5	45.2	16.6	37.8	8.5
18	58.3	31.1	34.3	11.7	38.1	14.5	11.8	9.5	57.6	14.1	32.1	8.1
19	58.3	31.4	34.3	11.7	35.3	14.1	11.3	9.5	60.4	13.8	14.8	7.8
20	57.9	32.8	34.3	11.3	35.3	13.8	11.3	9.5	25.8	13.8	13.1	8.1
21	57.9	32.8	22.2	11.3	38.5	13.8	11.0	9.5	18.7	13.4	11.3	8.5
22	57.6	32.8	29.0	12.7	65.7	21.6	11.0	9.5	18.7	19.4	11.7	8.5
23	57.6	31.4	33.5	12.7	35.7	29.7	10.6	9.5	19.1	27.5	9.9	8.8
24	57.2	31.1	34.6	12.7	35.3	25.4	10.6	9.5	36.4	13.1	10.2	9.2
25	55.4	31.1	25.4	13.1	32.5	21.6	10.6	9.5	338	13.4	10.6	9.2
26	55.8	31.1	29.3	11.7	88.3	19.4	10.9	9.5	95.7	15.5	10.6	9.5
27	53.7	30.7	47.3	12.0	75.9	18.0	10.9	11.7	60.0	18.0	10.2	9.9
28	51.9	30.7	43.8	12.4	144	18.4	10.9	220	52.6	18.0	10.2	10.2
29	50.1		31.1	10.9	56.9	17.0	10.9	198	46.6	18.4	10.6	10.6
30	43.4		24.7	11.3	36.4	17.3	11.3	37.1	39.9	18.7	10.6	9.2
31	43.4		19.1		56.1		11.3	17.7		26.8		11.3
Sum	1,702.4	950.9	1,026.8	334.8	1,330.6	1,202.5	314.9	739.7	1,645.8	780.0	548.4	311.9

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period Oct. 1932-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	2.66	1.90	12	89.7	#	43.4	54.9	3,380	2,515	15,990	375	1,488
Feb.	1.90	1.54	7	44.8	3	27.9	34.0	1,890	1,719	9,990	179	1,168
Mar.	2.00	1.67	28	53.7	31	17.0	33.1	2,040	1,464	6,910	206	1,161
Apr.	1.74	1.51	1	21.5	#	8.5	11.2	664	1,754	7,510	195	1,371
May	6.04	1.54	31	1,070	5	10.6	42.9	2,640	3,641	23,850	494	2,217
June	6.50	1.77	1	1,290	16	13.4	40.1	2,390	3,106	19,730	270	1,520
July	1.84	1.61	1	16.6	11	7.1	10.2	625	2,117	9,740	106	1,547
Aug.	4.00	1.64	28	385	#	8.8	23.9	1,470	* 2,603	* 20,830	77.8	* 3,258
Sept.	¤4.99	1.74	25	¤ 717	#	15.5	54.9	3,260	2,720	16,000	57.5	2,588
Oct.	2.30	1.87	22	53.7	24	13.1	25.2	1,550	3,782	39,790	117	1,560
Nov.	2.33	1.97	18	46.3	23	9.9	18.3	1,090	2,363	25,590	101	939
Dec.	2.03	1.94	7	16.2	18	7.1	10.1	619	2,413	20,720	260	1,072
Yearly	6.50	1.51		1,290		7.1	29.8	21,618	30,179	60,241	7,969	19,889

¤ Estimated * Partly estimated # Various days of the month ♂ Various days of the year
⊕ Period October 1932-1950

RIO GRANDE AT LAREDO, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car. The recorder is located on the downstream side of the first pier from the Mexican end of the railroad bridge between Laredo, Texas, and Nuevo Laredo, Tamaulipas, 884.3 river miles below the American Dam at El Paso, Texas. The cable is located 1.4 miles upstream from the railroad bridge. The zeros of the gages at the recorder and at the cable are 351.51 feet and 352.89 feet respectively above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 168 meter measurements during the year, 158 by the Mexican and 10 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 through December 1913; May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June, November, and December 1922; January 1923 through December 1950. Gage-height records are available for January, February, and March 1914.

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

EXTREME FLOWS: The greatest recorded flow at this station was on September 3, 1932, when the gage height was 52.20 feet, and the discharge 335,000 second-feet. Minimum flow occurred on June 23, 1948 with a flow of 533 second-feet and a gage height of 3.38 feet.

CORRECTIONS: See page 108 for corrections pertaining to Water Bulletin No. 19.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	¤3,000	2,450	2,270	1,490	1,300	2,360	1,820	3,220	4,060	5,900	1,830	1,690
2	¤3,250	2,470	2,260	1,560	1,310	11,190	1,690	4,170	4,520	4,660	1,850	1,680
3	¤3,250	2,440	2,190	1,540	1,860	6,960	1,520	3,600	3,370	4,240	1,780	1,620
4	¤3,160	2,530	2,260	1,520	1,440	3,290	1,470	5,260	2,690	3,710	1,700	1,610
5	¤2,930	2,520	2,160	1,460	1,240	2,060	1,350	8,720	2,280	4,940	1,650	1,660
6	¤2,770	2,480	2,350	1,400	1,100	2,200	1,280	8,860	2,000	7,950	1,650	1,660
7	¤2,690	2,670	2,340	1,340	1,100	3,060	1,200	5,510	1,830	7,240	1,670	1,530
8	¤2,770	2,460	2,240	1,320	1,090	3,210	1,090	4,410	1,780	5,900	1,600	1,490
9	¤2,770	2,490	2,030	1,280	1,030	2,720	999	4,060	2,900	4,340	1,710	1,680
10	¤2,720	2,370	2,100	1,280	975	2,250	961	3,640	2,500	3,990	1,650	1,700
11	¤2,630	2,540	2,130	1,270	1,180	1,970	939	3,350	1,910	3,880	1,620	1,850
12	¤2,520	2,530	2,170	1,220	1,430	1,970	1,010	2,960	1,590	3,500	1,640	1,820
13	2,460	2,510	1,980	1,200	3,340	3,520	1,000	2,710	1,510	3,140	1,610	1,770
14	2,430	2,510	1,990	1,400	2,170	2,740	1,450	2,610	1,450	2,930	1,640	1,670
15	2,440	2,610	1,940	1,410	2,450	2,430	16,240	2,620	1,500	2,660	1,610	1,570
16	2,490	2,460	1,950	1,450	2,860	2,210	10,520	2,690	1,530	2,520	1,760	1,560
17	2,510	2,240	2,020	1,410	2,080	2,030	10,840	2,340	1,500	2,430	1,880	1,670
18	2,640	2,200	1,970	1,410	2,300	1,900	8,160	2,180	1,590	2,330	1,780	1,780
19	2,650	2,200	1,920	1,460	3,880	1,990	6,250	2,160	1,940	2,310	1,840	1,680
20	2,670	2,200	1,980	1,680	3,670	2,580	4,660	2,140	2,510	2,230	1,850	1,620
21	2,690	2,220	2,040	1,680	2,480	2,420	6,320	1,910	2,100	2,240	1,980	1,590
22	2,710	2,290	2,040	1,880	2,510	2,830	6,750	1,950	1,980	2,140	1,910	1,600
23	2,730	2,320	2,000	1,700	2,000	2,870	6,430	2,090	2,300	1,990	1,890	1,600
24	2,790	2,190	2,070	1,550	1,880	2,540	5,300	1,800	2,970	1,960	1,740	1,600
25	2,790	2,180	2,030	1,450	1,570	2,210	4,940	1,680	5,370	1,990	1,660	1,600
26	2,570	2,120	2,010	1,440	1,370	2,090	4,310	1,800	19,210	2,050	1,710	1,590
27	2,460	2,100	1,920	1,430	1,440	2,390	4,100	1,650	19,180	2,160	1,760	1,720
28	2,460	2,220	1,880	1,430	7,310	3,600	3,420	1,790	18,260	2,160	1,730	1,720
29	2,420		1,780	1,440	2,770	2,700	2,990	2,860	11,650	2,070	1,780	1,630
30	2,430		1,640	1,370	2,560	2,170	2,690	2,510	7,560	1,970	1,840	1,590
31	2,440		1,560		2,120		2,870	1,860		1,940		1,640
Sum	*83,240	66,520	63,220	43,470	65,815	88,460	124,569	99,110	135,540	103,470	52,320	51,190

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	5.61	5.25	2	¤ 3,330	14	2,380	*2,690	* 165,100	177,685	351,700	102,000	164,477
Feb.	5.38	5.12	7	2,670	26	2,080	2,380	131,900	158,864	423,700	99,400	163,177
Mar.	5.28	4.82	7	2,420	31	1,470	2,040	125,400	147,490	223,400	95,700	138,415
Apr.	5.05	4.63	22	1,990	13	1,200	1,450	86,220	145,669	316,300	59,530	140,663
May	8.46	4.40	28	12,890	10	943	2,120	130,500	262,374	856,000	68,300	240,164
June	8.66	4.76	2	14,340	19	1,820	2,950	175,500	304,802	1,357,000	46,850	287,303
July	11.81	4.27	15	27,690	11	939	4,020	247,100	285,686	1,250,000	83,570	356,180
Aug.	7.64	4.66	6	10,060	29	1,510	3,200	196,600	291,699	883,000	93,740	310,196
Sept.	10.04	4.59	26	20,800	‡14	1,450	4,520	268,800	578,368	2,943,000	65,840	468,673
Oct.	7.81	4.86	5	9,920	30	1,790	3,340	205,200	460,773	1,951,000	125,400	441,438
Nov.	5.25	4.76	17	2,390	15	1,560	1,740	103,800	209,754	570,800	103,800	198,046
Dec.	5.02	4.72	18	1,950	24	1,510	1,650	101,500	179,592	352,700	101,500	162,762
Yearly	11.81	4.27		27,690		939	2,680	1,937,620	3,202,756	7,017,110	1,862,800	3,071,494

¤ Estimated * Partly estimated ‡ And other days

RIO SALADO AT CD. GUERRERO, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and two reinforced concrete Cipoletti weirs, with a combined capacity of 636 second-feet, located at a place called "El Cable" about 6.2 miles above the confluence of the Río Salado with the Rio Grande and 2 miles southwest of Ciudad Guerrero, Tamaulipas. This stream enters the Rio Grande 946.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 265.75 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 83 meter measurements during the year, the weir discharge curve, and a continuous record of gage heights. Computations by shifting channel methods for flows greater than 636 second-feet. Records available: 1900-1913 and 1923 through December 1950.

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

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: 43,800 second-feet on September 7, 1933 with a gage height of 18.86 feet. Min. sometimes dry.

		Average Flow in Second-Feet				
Daily:	Max.	35,070	Sept. 7, 1933	Min.		sometimes dry
Monthly:	Max.	10,950	Oct. 1932	Min.	dry January and February 1940	
Yearly:	Max.	1,850	1932	Min.	138	1950

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	28.6	12.7	11.3	5.3	14.5	485	35.7	18.4	235	113	11.3	5.3
2	28.6	11.3	24.4	5.3	12.7	382	28.6	88.3	149	79.8	11.3	5.3
3	28.6	11.3	26.5	5.3	11.3	3,390	26.5	97.8	113	66.0	9.9	5.3
4	31.1	11.3	26.5	5.3	9.9	3,640	24.4	66.0	84.0	51.6	9.9	5.3
5	31.1	9.9	24.4	5.3	8.5	925	24.4	48.7	62.9	45.9	8.5	5.3
6	31.1	9.9	22.2	5.3	6.7	3,810	26.5	38.1	59.7	38.1	8.5	5.3
7	28.6	9.9	22.2	5.3	6.7	1,710	26.5	31.1	593	33.2	6.7	5.3
8	28.6	11.3	20.5	6.7	5.3	400	24.4	26.5	130	31.1	6.7	5.3
9	31.1	12.7	20.5	8.5	3.9	220	22.2	26.5	60.0	28.6	6.7	5.3
10	31.1	11.3	20.5	9.9	3.9	143	26.5	24.4	40.3	24.4	6.7	5.3
11	31.1	9.9	18.4	9.9	155	103	33.2	22.2	31.1	20.5	6.7	5.3
12	28.6	8.5	18.4	9.9	69.2	79.8	33.2	22.2	24.4	18.4	6.7	5.3
13	26.5	8.5	51.5	8.5	24.4	66.0	33.2	26.5	20.5	16.2	6.7	5.3
14	26.5	6.7	38.1	8.5	14.5	60.0	682	38.1	18.4	16.2	6.7	6.7
15	24.4	6.7	20.5	6.7	14.5	51.6	484	26.5	16.2	16.2	6.7	8.5
16	22.2	6.7	14.4	6.7	14.5	43.1	227	22.2	14.5	16.2	6.7	11.3
17	22.2	5.3	12.7	14.5	94.6	35.7	103	22.2	14.5	14.5	8.5	11.3
18	20.5	3.9	11.3	62.9	92.9	31.1	66.0	22.2	14.5	14.5	8.5	11.3
19	20.5	3.9	11.3	317	60.0	28.6	62.9	24.4	12.7	12.7	8.5	11.3
20	22.2	2.8	8.5	509	93.6	26.5	72.0	24.4	14.5	11.3	8.5	9.9
21	20.5	2.8	6.7	75.6	639	33.2	66.0	22.2	18.4	9.9	8.5	9.9
22	18.4	2.8	6.7	35.7	331	519	54.4	20.5	18.4	8.5	8.5	8.5
23	16.6	1.8	6.7	26.5	812	360	48.7	20.5	18.4	6.7	6.7	8.5
24	16.6	1.8	8.5	22.2	953	331	43.1	18.4	38.1	6.7	6.7	8.5
25	14.5	1.8	8.5	20.5	324	205	38.1	18.4	143	6.7	6.7	8.5
26	16.6	.7	6.7	18.4	190	197	33.2	16.2	137	6.7	6.7	8.5
27	16.6	.7	5.3	18.4	149	131	31.1	14.5	1,560	6.7	6.7	6.7
28	14.5	.7	5.3	16.2	3,570	88.3	28.6	14.5	840	6.7	6.7	6.7
29	14.5		3.9	16.2	5,440	62.9	26.5	202	304	6.7	6.7	6.7
30	12.7		3.9	14.5	5,330	45.9	22.2	244	169	8.5	6.7	6.7
31	12.7		3.9		1,290		20.5	413		9.9		8.5
Sum	717.4	187.6	490.2	1,280.0	19,744.6	17,603.7	2,474.6	1,720.9	4,954.5	752.1	231.0	226.9

Month	Current Year 1950 Extreme Gage Feet High	Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950 Acre-Feet Normal	Maximum	Minimum	Acre-Feet Normal 1938-1950
Jan.	1.94	1.64	#	31.1	#	12.7	23.1	1,420	13,976	144,110	0	2,463
Feb.	1.64	1.35	#	12.7	#	.7	6.7	372	9,810	98,520	0	1,584
Mar.	2.30	1.35	13	60.0	1	.7	15.8	972	10,202	95,740	52.0	9,603
Apr.	6.36	1.48	20	2,040	#	5.3	42.7	2,540	14,103	82,660	56.4	11,556
May	9.45	1.41	30	6,390	11	2.8	637	39,160	42,454	* 253,000	3,200	33,103
June	8.23	1.77	6	4,480	20	20.5	587	34,920	36,764	192,000	1,620	28,121
July	5.61	1.77	14	1,290	31	20.5	79.8	4,910	18,951	100,000	228	12,752
Aug.	4.43	1.67	31	576	#	14.5	55.5	3,410	30,751	260,180	81.0	47,283
Sept.	6.17	1.64	27	1,760	#	12.7	165	9,830	87,841	600,000	3,310	57,758
Oct.	2.82	1.48	1	130	#	5.3	24.3	1,490	63,929	673,070	1,490	24,812
Nov.	1.61	1.51	#	11.3	#	6.7	7.7	458	21,829	248,590	246	3,400
Dec.	1.61	1.48	#	11.3	#	5.3	7.3	450	15,464	198,160	46.0	2,441
Yearly	9.45	1.35		6,390		.7	138	99,932	366,074	1,350,300	99,932	234,876

* Partly estimated # Various days of the month

RIO GRANDE NEAR ZAPATA, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located about 3 miles below the town of Zapata, Texas, 7.5 miles northeast of Guerrero, Tamaulipas, 1.4 river miles below the confluence of the Río Salado with the Rio Grande, and 947.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 59 meter measurements during the year, 54 by the United States Section and 5 by the Mexican Section of this Commission and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1932 through December 1950.

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

EXTREME FLOWS: The greatest recorded flow was on September 4, 1932, when the gage height was 262.07 feet and the flow was 261,000 second-feet. The lowest flow recorded was on June 23, 1948, when the gage height was 219.12 feet, and the flow was 491 second-feet.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,760	2,520	2,230	1,600	* 1,400	2,710	2,050	2,670	2,140	6,530	1,910	1,950
2	3,060	2,470	2,290	1,500	* 1,320	* 6,400	1,760	3,190	4,700	4,980	1,920	1,800
3	3,350	2,520	2,360	1,520	‡ 1,320	‡ 13,600	1,600	4,130	4,600	4,530	1,900	1,760
4	3,300	2,540	2,330	1,500	‡ 1,870	‡ 13,400	1,410	3,620	3,480	4,020	1,860	1,740
5	3,190	2,700	2,360	1,490	‡ 1,450	* 4,950	1,310	* 6,360	2,880	3,640	1,780	1,740
6	2,930	2,620	2,250	1,440	‡ 1,250	* 5,780	1,260	‡ 8,630	2,440	6,930	1,760	1,720
7	2,700	2,540	2,430	1,400	‡ 1,110	4,830	1,230	* 7,430	2,690	7,290	1,710	1,710
8	2,660	2,600	2,290	1,340	* 1,200	* 4,200	1,170	4,990	2,100	7,190	1,720	1,680
9	2,640	2,570	2,150	* 1,310	1,180	* 3,790	1,090	4,260	1,840	5,620	1,710	1,690
10	2,700	2,520	2,100	* 1,310	‡ 1,100	3,010	1,030	3,980	3,140	4,520	1,790	1,840
11	2,660	2,350	2,140	1,270	‡ 2,160	* 2,520	1,000	3,550	2,670	4,200	1,730	1,850
12	2,570	2,550	2,180	1,240	‡ 1,380	* 2,260	1,000	3,280	1,990	4,020	1,720	1,940
13	2,530	2,520	2,310	1,230	‡ 1,460	2,680	1,020	2,990	1,700	3,640	1,760	1,910
14	2,490	2,350	2,100	1,150	‡ 3,360	* 3,950	1,540	2,790	1,630	3,320	1,790	1,880
15	2,460	2,420	2,050	1,350	* 2,350	* 2,980	2,530	2,740	1,510	3,090	1,720	1,840
16	2,490	2,520	2,020	1,440	3,360	* 2,700	19,500	2,640	1,470	2,800	1,720	1,800
17	2,480	2,450	2,010	1,440	2,970	2,410	10,200	2,730	1,540	2,600	2,400	1,760
18	2,520	2,270	1,980	1,480	* 2,290	2,170	9,500	2,400	1,530	2,540	3,280	1,820
19	2,670	2,160	1,940	2,710	‡ 4,150	2,070	7,300	2,210	1,530	2,470	1,930	1,990
20	2,740	2,190	1,950	4,160	‡ 8,390	2,140	5,570	2,190	1,860	2,370	1,960	1,820
21	2,840	2,190	2,010	2,080	‡ 4,770	5,440	4,720	2,140	2,530	2,260	1,930	1,740
22	2,880	2,270	2,010	1,920	‡ 4,510	5,490	6,630	1,900	2,000	2,310	2,060	1,660
23	2,880	2,340	2,010	2,090	‡ 4,050	5,500	6,860	1,880	1,890	2,330	2,040	1,630
24	2,890	2,390	2,010	1,950	* 3,070	3,690	6,020	2,040	2,170	2,120	2,000	1,650
25	2,900	2,220	2,040	1,840	2,290	2,850	5,180	1,800	3,250	2,020	1,770	1,620
26	2,890	2,200	2,040	1,750	1,820	2,320	4,680	1,690	11,100	2,000	1,680	1,650
27	2,650	2,140	2,050	1,660	1,780	2,130	4,230	1,710	* 20,900	2,140	1,720	1,660
28	2,550	2,150	1,980	1,550	‡30,700	2,400	3,830	1,590	19,800	2,280	1,730	1,700
29	2,600		1,860	1,480	*19,000	3,400	3,330	1,700	16,500	2,380	1,730	1,680
30	2,520		1,790	1,440	11,600	2,540	2,910	3,230	9,850	2,100	1,890	1,610
31	2,500		1,710		4,760		2,580	2,910		2,040		1,590
Sum	85,000	67,280	64,980	49,640	*133,420	*124,310	124,040	99,370	137,430	110,280	56,620	54,430

Month	Current Year: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1932-1950 Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	221.11	220.76	3	3,370	16	2,440	2,740	169,000	188,514	* 484,450	106,000	169,731
Feb.	220.89	220.56	5	2,750	27	2,090	2,400	133,000	170,799	399,000	106,000	164,461
Mar.	220.80	220.24	12	2,530	31	1,600	2,100	129,000	165,899	292,000	106,000	159,385
Apr.	222.75	219.92	20	9,160	14	1,140	1,650	98,500	172,920	662,000	65,200	176,561
May	231.10		28	50,900	11	‡1,070	*4,300	*265,000	303,455	682,000	81,800	310,977
June	‡225.20	220.26	3	‡19,400	20	1,740	*4,140	*247,000	360,182	1,517,000	59,000	321,000
July	226.66	219.67	16	26,000	12	983	4,000	246,000	343,737	1,238,000	92,300	378,177
Aug.	‡222.85	220.17	6	‡ 9,590	29	1,510	3,210	197,000	320,440	* 721,000	108,000	371,077
Sept.	225.75	220.07	27	21,700	15	1,440	4,580	273,000	736,925	2,895,330	76,400	542,262
Oct.	222.78	220.43	6	9,320	25	1,980	3,560	219,000	570,881	2,396,440	135,000	488,538
Nov.	221.90	220.25	18	5,780	6	1,670	1,890	112,000	230,923	748,020	112,000	206,308
Dec.	220.52	220.24	19	2,100	30	1,530	1,760	108,000	194,798	591,380	108,000	168,462
Yearly	231.10			50,900		983	3,030	2,196,500	3,759,473	8,038,070	2,196,500	3,456,939

‡ Estimated * Partly estimated

RIO ALAMO AT CD. MIER, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and reinforced concrete weir for measurement of flows up to 177 second-feet, located about 3.1 miles above the confluence of the Río Alamo with the Rio Grande and .6 mile west of Ciudad Mier, Tamaulipas, at a point called "El Paso del Cántaro." This stream enters the Rio Grande 984.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 187.04 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 5 meter measurements at high flows during the year, the weir discharge table at low flows, and a continuous record of gage heights. High-flow computations by shifting channel methods. Records available July 1, 1923 through December 1950.

REMARKS: Small reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 144,800 second-feet on September 11, 1948, with a gage height of 33.56 feet. Min. dry at times during all years of record except 1934 and 1935.

			Average Flow in Second-Feet			
Daily:	Max.	87,230	Sept. 11, 1948	Min.		frequently dry
Monthly:	Max.	5,170	Sept. 1948	Min.		frequently dry
Yearly:	Max.	505	1944	Min.	16.4	1929

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.9	0	1.1	0	0	121	1.1	0	4.2	15.9	2.5	4.2
2	15.9	0	1.1	0	0	59.0	21.5	0	2.5	10.6	2.5	4.2
3	15.9	0	1.1	0	0	21.5	13.1	0	2.5	8.1	2.5	2.5
4	15.9	0	1.0	0	0	4.2	6.0	0	1.1	8.1	2.5	2.5
5	13.0	0	1.0	0	0	526	2.5	0	1.1	8.1	2.5	2.5
6	10.6	0	1.0	0	0	530	2.5	0	0	6.0	2.5	2.5
7	8.1	0	1.0	0	0	80.5	1.1	0	0	6.0	2.5	2.5
8	8.1	0	0	0	0	33.9	1.1	0	0	13.1	2.5	2.5
9	8.1	0	0	0	0	18.7	1.1	0	0	18.7	2.5	2.5
10	8.1	0	0	0	0	10.6	0	0	0	6.0	2.5	2.5
11	8.1	0	0	0	720	6.0	0	0	0	6.0	2.5	2.5
12	6.0	0	0	0	40.6	6.0	0	0	0	6.0	2.5	2.5
13	8.1	0	0	0	6.0	2.5	0	0	0	6.0	2.5	2.5
14	8.1	0	0	0	2.5	2.5	1,910	360	0	4.2	2.5	2.4
15	8.1	0	0	0	1.1	2.5	593	99.6	0	4.2	2.5	2.4
16	8.1	0	0	0	1.1	1.1	71.3	24.7	0	15.9	2.5	2.4
17	8.1	0	0	0	0	0	27.9	10.6	0	15.9	2.5	0
18	8.1	0	0	0	0	0	13.1	8.1	0	8.1	2.5	2.5
19	8.1	80.6	0	158	0	0	8.1	6.0	0	8.1	2.5	2.5
20	8.1	24.7	0	89.7	0	342	6.0	2.5	0	6.0	2.5	2.5
21	6.0	8.1	0	6.0	0	445	4.2	2.5	0	4.2	1.0	2.5
22	6.0	4.2	0	2.5	328	43.8	2.5	1.1	0	4.2	1.0	2.5
23	6.0	2.5	0	1.1	346	80.5	2.5	0	0	2.5	1.0	2.5
24	4.2	2.5	0	1.0	27.9	37.1	1.1	0	1,760	4.2	1.0	2.5
25	2.5	2.5	0	0	10.6	18.7	1.1	0	4,840	2.5	1.0	2.5
26	2.5	1.1	0	0	8.1	10.6	0	0	519	4.2	0	2.5
27	2.5	1.1	0	0	6.0	6.0	0	0	766	4.2	0	2.5
28	1.1	1.1	0	0	2.5	4.2	0	0	99.6	2.5	0	4.2
29	1.1		0	0	2.5	2.5	0	0	37.1	2.5	2.5	4.2
30	1.1		0	0	1.1	2.5	0	6.0	21.5	2.5	4.2	4.2
31	1.1		0		0		0	8.1		2.5		4.2
Sum	232.6	128.4	7.3	258.3	1,504.0	2,418.9	2,690.8	529.2	8,054.6	217.0	61.7	84.9

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	1.57	1.31	#	15.9	31	0	75.0	461	4,647	34,920	0	1,751
Feb.	3.18		19	317	#	0	4.6	255	3,286	25,550	67.2	899
Mar.	1.35		#	1.1	#	0	.2	14.5	3,319	19,830	14.5	2,542
Apr.	4.95		19	1,500	#	0	8.6	512	6,693	33,990	86.0	5,720
May	10.17		11	6,570	#	0	48.5	2,980	15,633	* 137,000	209	10,953
June	6.30		20	2,580	#	0	80.6	4,800	13,961	83,240	0	10,869
July	7.55		14	3,960	#	0	86.8	5,340	7,960	37,590	229	4,665
Aug.	4.53		14	1,140	#	0	17.1	1,050	16,177	194,200	0	27,404
Sept.	13.71		25	11,760	#	0	268	15,980	38,931	307,900	* 135	46,290
Oct.	2.36	1.38	16	109	#	2.5	7.0	430	14,535	51,620	0	14,501
Nov.	1.41	1.31	#	4.2	#	0	2.1	122	3,859	21,940	0	1,722
Dec.	1.41	1.31	#	4.2	17	0	2.7	168	3,871	15,000	124	1,817
Yearly	13.71			11,760		0	44.4	32,112.5	132,872	366,826	11,908.7	129,133

* Partly estimated # Various days of the month

RIO GRANDE AT ROMA, TEXAS

DESCRIPTION: Water-stage recorder at international bridge between Roma, Texas, and Cd. Miguel Alemán (formerly San Pedro), Tamaulipas, 14.9 river miles above the confluence of the Río San Juan from Mexico, and 992.0 river miles below the American Dam at El Paso, Texas. The zero of the gage is 145.93 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 182 meter measurements during the year from bridge, 170 by the Mexican Section and 12 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 and September 1900 through December 1913; October 1914; September and October 1917; September and October 1919; August and September 1920; June 1922 and November 1922 through December 1950. Gage-height records are available for January, February, and March 1914.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Backwater from the Río San Juan sometimes reaches this station.

EXTREME FLOWS: The greatest recorded flow was on September 5, 1932, when the gage height was 35.4 feet and the flow 203,000 second-feet. The lowest flow recorded was on June 23, 1948 when the flow was 526 second-feet at a stage of -1.21 feet.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,740	2,540	2,090	1,620	1,510	3,740	2,380	2,680	2,510	7,700	1,790	1,980
2	2,910	2,510	2,110	1,530	1,440	3,780	1,980	2,790	2,560	6,360	1,700	1,880
3	3,220	2,500	2,330	1,430	1,340	15,820	1,750	3,990	4,840	5,080	1,720	1,680
4	3,390	2,530	2,270	1,440	1,250	13,810	1,580	3,780	4,100	4,450	1,700	1,660
5	3,270	2,590	2,320	1,450	1,690	7,590	1,390	3,960	3,130	4,060	1,660	1,630
6	3,160	2,730	2,280	1,470	1,410	5,120	1,230	8,050	2,660	4,130	1,610	1,600
7	2,910	2,610	2,260	1,420	1,260	6,250	1,240	8,260	2,390	8,090	1,670	1,610
8	2,780	2,620	2,430	1,370	1,140	3,920	1,220	5,830	2,470	7,060	1,620	1,630
9	2,800	2,670	2,220	1,320	1,100	4,340	1,150	4,660	2,000	6,430	1,620	1,590
10	2,760	2,630	2,070	1,310	1,080	3,400	1,020	4,170	1,890	4,700	1,590	1,600
11	2,780	2,580	2,100	1,300	2,240	2,720	961	3,850	3,020	4,100	1,640	1,720
12	2,670	2,480	2,130	1,270	2,760	2,270	901	3,390	2,290	3,950	1,600	1,690
13	2,630	2,670	2,380	1,240	1,440	2,180	858	3,050	1,840	3,740	1,580	1,770
14	2,490	2,540	2,300	1,190	2,260	3,640	2,040	2,860	1,660	3,350	1,660	1,740
15	2,450	2,500	2,100	1,230	2,710	3,530	2,860	2,790	1,550	3,100	1,630	1,660
16	2,360	2,540	2,050	1,340	2,670	2,720	13,420	2,690	1,480	2,870	1,620	1,650
17	2,410	2,580	1,960	1,450	3,340	2,570	9,680	2,630	1,470	2,650	1,680	1,610
18	2,500	2,480	1,920	1,420	2,680	2,230	10,060	2,530	1,490	2,490	3,100	1,630
19	2,550	2,470	2,060	1,950	2,170	2,000	8,190	2,310	1,450	2,460	2,300	1,700
20	2,700	2,270	1,970	9,460	4,060	2,050	6,320	2,160	1,440	2,470	1,850	1,770
21	2,740	2,260	1,890	3,050	8,300	4,700	5,010	2,290	1,950	2,270	1,860	1,630
22	2,840	2,300	1,970	2,100	5,010	4,030	5,540	2,160	2,320	2,240	1,880	1,570
23	2,830	2,300	1,970	1,850	4,700	6,600	6,430	1,910	1,920	2,240	1,950	1,580
24	2,810	2,360	1,970	2,120	3,990	3,850	6,640	2,050	3,320	2,130	1,910	1,590
25	2,780	2,350	2,000	1,840	3,000	3,640	5,440	2,040	9,750	2,000	1,810	1,610
26	2,860	2,170	2,070	1,620	2,190	2,640	5,230	1,880	5,090	1,940	1,650	1,600
27	2,820	2,160	2,050	1,490	1,820	2,300	4,380	1,660	20,020	1,950	1,600	1,580
28	2,620	2,080	2,070	1,440	29,560	2,050	4,100	1,640	20,090	2,020	1,680	1,620
29	2,570		1,910	1,410	22,180	2,810	3,570	1,630	18,260	2,160	1,650	1,660
30	2,620		1,790	1,370	13,310	2,950	3,120	1,860	11,900	2,140	1,680	1,590
31	2,520		1,710		7,450		2,810	3,130		1,960		1,560
Sum	85,490	69,020	64,750	54,500	141,060	129,250	122,500	98,680	140,860	112,290	53,010	51,390

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	1.12	.49	4	3,450	16	2,360	2,760	169,600	203,218	467,400	103,600	169,046
Feb.	.69	.16	6	2,840	28	2,030	2,460	136,900	178,271	402,000	107,000	163,616
Mar.	.46	-.13	13	2,530	31	1,710	2,090	128,400	173,628	325,500	99,000	162,792
Apr.	5.61	-.59	20	13,350	14	1,190	1,820	108,100	189,482	855,700	64,250	193,382
May	13.94	-.79	28	47,320	11	1,010	4,550	279,800	346,048	706,300	91,320	333,255
June	7.22	0	3	19,140	20	1,800	4,310	256,400	381,701	1,586,000	53,990	337,154
July	8.14	-.92	16	22,780	13	858	3,950	243,000	334,771	1,217,000	94,100	385,500
Aug.	4.40	-.30	7	9,180	27	1,590	3,180	195,700	345,959	[1] 904,000	109,400	394,007
Sept.	8.20	-.46	27	22,780	20	1,380	4,700	279,400	716,035	3,048,000	69,900	599,485
Oct.	4.27	.10	1	9,220	31	1,930	3,620	222,700	560,032	3,372,000	137,700	515,630
Nov.	2.00	-.20	18	4,630	10	1,550	1,770	105,100	240,243	736,000	105,100	208,915
Dec.	.16	-.20	1	2,060	10	1,560	1,660	101,900	204,096	565,100	101,900	168,024
Yearly	13.94	-.92		47,320		858	3,080	2,227,000	3,873,484	8,098,000	2,227,000	3,630,806

[1] Estimated

RIO GRANDE NEAR RIO GRANDE CITY, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located about 4 river miles below Rio Grande City, Texas, 3.7 miles northeast of Camargo, Tamaulipas, 7.9 river miles below the confluence of the Río San Juan with the Rio Grande and 1,015.3 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 148 meter measurements during the year, 136 by the United States Section and 12 by the Mexican Section of this Commission and a continuous record of gage heights. Computations by shifting channel methods. Records available: 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; January 1924 through December 1950.

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

EXTREME FLOWS: The greatest recorded flow was on September 5, 1932, when the peak stage was 157.4 feet and the flow was 198,800 second-feet. The lowest recorded flow was on May 15, 1948, when the extreme gage height was 121.48 feet, and the extreme flow 524 second-feet.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,700	2,590	2,130	1,690	1,490	5,660	2,500	2,620	2,830	7,780	2,020	1,870
2	2,810	2,580	2,210	1,620	1,480	4,860	2,210	2,720	2,090	6,240	1,920	1,930
3	3,020	2,570	2,280	1,580	1,380	10,800	1,910	3,330	4,830	5,290	1,870	1,810
4	3,290	2,630	2,350	1,590	1,280	14,500	1,660	3,930	5,080	4,580	1,860	1,700
5	3,280	2,610	2,380	1,490	1,490	9,620	1,480	3,560	3,740	4,140	1,800	1,690
6	3,240	2,710	2,390	1,510	1,620	5,780	1,390	6,080	2,900	3,800	1,750	1,670
7	3,040	2,670	2,310	1,500	1,330	5,930	1,320	8,300	2,430	7,260	1,610	1,680
8	2,850	2,600	2,380	1,440	1,210	4,950	1,300	6,960	2,480	7,460	1,700	1,680
9	2,750	2,600	2,280	1,410	1,150	4,180	1,190	4,990	2,040	6,800	1,720	1,690
10	2,780	2,600	2,100	1,380	1,110	4,390	1,140	4,250	1,730	5,010	1,740	1,680
11	2,840	2,600	2,080	1,350	1,190	2,940	1,060	3,940	2,660	4,210	1,780	1,770
12	2,800	2,500	2,120	1,300	3,570	2,470	998	3,490	2,570	3,890	1,770	1,770
13	2,690	2,560	2,120	1,280	2.050	2,120	951	3,190	2,020	3,720	1,720	1,870
14	2,610	2,570	2,300	1,290	1,840	2,210	981	2,890	1,680	3,410	1,800	1,890
15	2,580	2,470	2,180	1,280	3,100	3,480	2,790	2,940	1,580	3,100	1,870	1,870
16	2,530	2,480	2,090	1,340	2,460	2,730	6,900	2,680	1,480	2,880	1,780	1,840
17	2,560	2,510	2,070	1,490	3,280	2,420	12,500	2,570	1,460	2,780	1,740	1,790
18	2,570	2,480	2,060	1,460	3,050	2,310	9,090	2,610	1,500	2,650	2,160	1,720
19	2,590	2,440	2,030	1,460	2,460	2,080	8,310	2,560	1,470	2,550	2,970	1,780
20	2,700	2,340	2,050	6,430	3,080	1,920	7,020	2,280	1,430	2,490	1,990	1,970
21	2,760	2,270	1,990	4,310	5,910	3,100	5,520	2,190	1,640	2,380	1,940	1,860
22	2,840	2,210	2,010	2,490	6,560	4,800	4,820	2,200	2,390	2,280	1,940	1,770
23	2,890	2,250	2,030	2,130	5,040	5,230	6,290	2,060	2,070	2,270	1,980	1,730
24	2,920	2,270	2,020	2,110	4,130	5,410	6,680	1,930	1,940	2,220	2,000	1,700
25	2,930	2,340	2,010	2,000	3,410	3,520	5,650	2,020	10,900	2,100	1,940	1,700
26	2,920	2,240	2,020	1,740	2,590	2,870	5,030	1,890	6,200	1,990	1,820	1,680
27	2,900	2,200	2,020	1,620	2,110	2,350	4,480	1,770	13,900	1,940	1,740	1,680
28	2,750	2,160	1,980	1,520	18,000	2,130	4,140	1,680	19,700	2,050	1,750	1,720
29	2,670		1,910	1,500	25,200	2,210	3,800	1,660	18,400	2,190	1,780	1,760
30	2,650		1,840	1,500	14,400	3,060	3,180	1,600	12,800	2,290	1,810	1,760
31	2,610		1,750		9,330		2,830	2,800		2,150		1,730
Sum	87,070	69,050	65,490	54,810	136,300	130,030	119,120	97,690	137,940	113,900	56,270	54,760

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	126.12	125.21	4	3,340	16	2,530	2,810	173,000	238,632	521,000	105,000	197,077
Feb.	125.45	124.70	6	2,740	28	2,100	2,470	137,000	201,148	410,000	112,000	178,693
Mar.	125.06	124.20	6	2,420	31	1,710	2,110	130,000	194,028	401,000	108,000	180,769
Apr.	129.68	123.52	20	9,890	15	1,250	1,830	109,000	206,445	* 850,000	61,500	209,562
May	137.16	123.37	28	38,000	10	1,090	4,400	270,000	399,074	833,000	98,900	376,608
June	132.41	124.85	3	16,100	21	1,870	4,330	258,000	483,048	1,737,000	74,500	417,293
July	132.10	123.32	17	16,700	14	923	3,840	236,000	409,389	1,240,000	105,000	426,461
Aug.	130.16	124.15	7	8,700	30	1,560	3,150	194,000	411,702	1,280,000	121,000	483,539
Sept.	133.20	123.89	28	20,000	17	1,400	4,600	274,000	941,395	3,723,800	79,400	773,184
Oct.	130.17	124.79	1	9,480	27	1,940	3,670	226,000	717,933	2,852,270	142,000	634,231
Nov.	126.73	124.35	19	3,630	7	1,580	1,880	112,000	291,130	829,260	112,000	239,308
Dec.	124.72	124.25	20	1,990	‡ 6	1,660	1,770	109,000	242,039	625,260	109,000	193,692
Yearly	137.16	123.32		38,000		923	3,080	2,228,000	4,735,963	9,554,530	2,228,000	4310,417

* Partly estimated ‡ And other days

CONTRIBUTIONS FROM RIO SAN JUAN

DESCRIPTION: The discharges reported below entered the Rio Grande between the gaging stations at Roma and Hidalgo via various irrigation canals and the Río San Juan channel. The confluence of the Río San Juan and the Rio Grande is 1,007.4 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on meter measurements and weir discharges. Records furnished by the Department of Agriculture and Livestock of Mexico. Records available: March 10, 1943 through December 1950.

REMARKS: The second tabulation below includes 19,689 acre-feet of water used to supplement irrigation of United States lands in the Lower Rio Grande Valley. This water was released on April 4-21 and May 6-12 from Marte Gómez Reservoir on the Río San Juan 12.4 river miles above its confluence with the Rio Grande. The zero of the reservoir gage is 7.64 feet above mean sea level, U.S.C. & G.S. datum. No water passed over the reservoir spillway in 1950. Under this reservoir in the Lower San Juan Irrigation District in Mexico 163,100 acres of land were irrigated in 1950, on a small part of which two crops per year were grown, but the water for this irrigation is not included in these tables, nor is the water which reached the Rio Grande from drains.

Above Rio Grande City Station

These amounts of water consist of small seepage through the bank near the reservoir dam and waste from canals of the first unit of the Irrigation District.

Month	Current Year 1950								Period 1946-1950 ##		
	Extreme Gage Feet ●		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	242.26	240.58					5.3	328	7,117	33,680	328
Feb.	240.48	236.42					6.7	381	4,638	20,920	381
Mar.	236.29	234.87					4.6	276	1,763	7,390	276
Apr.	234.87	230.71					5.7	344	2,026	6,320	344
May	230.54	224.74					6.7	410	22,979	112,700	410
June	225.46	218.83					6.7	400	630	859	400
July	218.50	216.63					3.5	226	547	722	226
Aug	217.52	216.34					3.5	226	17,740	86,850	226
Sept.	221.10	215.12					3.5	219	45,620	203,800	219
Oct.	224.74	220.87					3.5	226	38,859	192,600	226
Nov.	224.18	223.26					3.5	219	14,639	71,940	219
Dec.	223.23	222.70					3.5	226	1,428	5,910	226
Yearly	242.26	215.12					4.8	3,481	157,986	478,965	3,481

Below Rio Grande City Station

These amounts of water consist of flow through canals and include releases from Marte Gómez Reservoir for use in the United States.

Month	Current Year 1950								Period 1946-1950		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.							26.8	1,640	5,218	15,960	1,410
Feb.							38.5	2,130	1,314	2,130	0
Mar.							25.1	1,540	1,706	2,560	888
Apr.							264	15,690	15,702	37,140	7,100
May							118	7,280	8,202	18,500	0
June							13.4	807	5,585	11,870	0
July							17.0	1,050	5,352	18,050	0
Aug							10.2	624	6,194	15,470	624
Sept.							10.2	616	1,827	7,620	0
Oct.							12.0	735	1,363	4,090	0
Nov.							0	0	1,340	3,360	0
Dec.							0	0	565	1,950	0
Yearly							44.4	32,112	54,368	85,680	32,112

● Water-surface elevations in Marte Gómez Reservoir. ## Record began March 10, 1943, but the period considered is 1946-1950 to make it comparable to the period of contributions from the San Juan below Rio Grande City.

RIO GRANDE AT HIDALGO, TEXAS

DESCRIPTION: Water-stage recorder on the downstream side of the United States end of the international highway bridge between Hidalgo, Texas, and Reynosa, Tamaulipas, 1,084.8 river miles below the American Dam at El Paso, Texas, and 156.6 river miles from the Gulf of Mexico. Zero of the gage is mean sea level, U.S.C. & G.S. datum.

RECORDS: The peak discharges shown below are based on rating curve supported by 3 meter measurements during the year. Records available: July 1928 to December 1931; September and October 1932; peak flows in September 1933 and in 1934, also January to July and September 1935; peak flows May and October, and full record July and September 1936; full record April 26 to December 31, 1938, and January to November 1939. Mean daily gage-height record and discharges during peaks, 1940 to November 16, 1948. Mean daily gage-heights and peak discharges during periods of high flow since November 16, 1948.

REMARKS: When the river at this station reaches a stage of about 100.5 feet, or a flow of about 60,000 second-feet, water begins to flow into two floodway inlets on the United States side, viz.: Hackney Lake inlet about 4 miles upstream and Mission inlet about 15 miles above this station, but the river may begin to overflow at Granjeño and Jardín de Flores at stages about 3.5 feet lower.

EXTREME FLOWS: In September 1932 the peak stage was 104.88 feet, with a flow of 83,870 second-feet.

Mean Daily Gage Height in Feet — 1950

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1										88.00		
2										* 85.62		
3												
4						88.46						
5						88.83						
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18							86.55					
19												
20												
21												
22												
23												
24												
25												
26									* 85.75			
27									* 85.46			
28									89.55			
29									90.63			
30					91.28				90.05			
31					88.61							
Sum												

Month	Current Year 1950								Period		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
				High		Low					
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.											
Feb.											
Mar.											
Apr.											
May	92.42		29	25,000							
June	89.38		5	16,800							
July	87.60		17	11,800							
Aug											
Sept.	90.72		29	19,100							
Oct.											
Nov.											
Dec.											
Yearly											

* Partly estimated

RIO GRANDE FLOODWAY DISCHARGES IN THE LOWER RIO GRANDE VALLEY

On The United States Side

During floods water is diverted from the Rio Grande to the United States floodway system at Mission Inlet and Hackney Lake Inlet, approximately 15 and 4 miles, respectively, above the Hidalgo gaging station. Water diverted at Mission Inlet flows through the North Floodway branch, and that entering the Hackney Lake Inlet flows through the South Floodway branch. They join about 5 miles northeast of Hidalgo to flow eastward in the Main Floodway to a point approximately 3 miles southwest of Mercedes. Here the floodwaters may divide, part going northeastward through the Arroyo Colorado Floodway to the Gulf of Mexico, the remainder going to the Gulf via the North Floodway, traveling first northward and then eastward. Mission Inlet flows are measured at the North Floodway South of McAllen Station, and Hackney Lake Inlet flows are measured at the South Floodway South of McAllen Station, and North Floodway flows are measured near Sebastian. Arroyo Colorado Floodway flows are measured near La Feria.

In 1950 there was no flow from the Rio Grande through these floodways. For 1950 discharges of North Floodway near Sebastian, Texas, see the following page.

On The Mexican Side

There are several regular floodways on the Mexican side which divert excess Rio Grande floodwater to the Gulf of Mexico. During 1950 no flow was diverted from the Rio Grande in any of the floodways except Retamal Canal. Records of flows through Retamal Canal are shown on page 60.

NORTH FLOODWAY NEAR SEBASTIAN, TEXAS

DESCRIPTION: Water-stage recorder located on the downstream side of the bridge on U. S. Highway 77 about 2.5 miles south of Sebastian, Texas. High-flow measurements are made from the highway bridge, and low-flow measurements are made from a low timber bridge just upstream from the highway bridge. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 54 current meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: October 1940 through December 1950.

REMARKS: The channel of this floodway in the vicinity of Sebastian serves as a drainage channel as well as a floodway.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: 10,500 second-feet on September 4, 1944 with a gage height of 42.95 feet. Min. Sometimes dry.

Average Flow in Second-Feet

Daily:	Max.	10,000	Sept. 4, 1944	Min.		sometimes dry
Monthly:	Max.	2,110	Sept. 1944	Min.	2.2	Oct. 1940
Yearly:	Max.	218	1944	Min.	39.2	1945

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	78.2	82.4	80.6	70.2	78.4	434	63.2	78.2	65.4	75.3	48.7	67.4
2	75.8	68.3	98.3	79.6	64.4	350	81.9	79.0	59.2	77.3	46.6	76.0
3	68.4	70.3	128	71.2	49.9	323	82.4	85.0	61.9	85.9	43.4	89.4
4	64.2	85.3	138	69.5	39.7	282	83.2	83.0	56.4	135	45.6	88.4
5	69.5	103	*107	* 67.3	38.2	202	79.6	72.4	53.5	133	43.5	80.6
6	66.7	85.4	*111	* 66.1	31.8	173	69.3	63.0	58.7	90.8	42.4	88.2
7	63.9	73.2	98.4	* 62.3	* 26.0	161	62.0	63.9	61.7	77.6	44.8	94.7
8	62.2	76.6	86.6	* 62.1	* 25.0	144	61.7	69.4	69.1	72.4	51.1	82.8
9	46.9	85.2	84.7	* 64.5	¶ 11.3	132	52.7	66.0	71.0	65.1	53.0	62.2
10	44.9	85.5	106	* 58.4	¶ 1.4	136	44.5	58.7	65.1	57.1	52.7	60.1
11	48.1	91.7	106	50.4	0	132	38.7	61.0	58.0	68.5	60.1	62.4
12	51.3	114	88.0	44.0	0	121	37.3	62.0	54.7	66.1	64.2	69.6
13	68.5	116	72.4	42.4	¶ 2.7	116	30.0	64.2	49.1	69.7	45.0	61.0
14	69.2	118	64.8	41.8	¶ 47.0	112	26.4	62.5	41.4	69.5	44.2	63.1
15	71.1	93.9	74.4	45.8	* 79.2	103	24.0	50.0	35.9	64.7	58.4	64.8
16	68.6	87.5	72.8	81.1	68.4	91.4	28.3	53.4	33.2	54.0	62.2	63.5
17	66.6	99.6	73.5	86.7	55.8	90.6	30.3	56.3	47.8	61.4	67.7	61.7
18	67.2	103	77.4	73.1	55.2	97.0	27.4	53.6	53.3	61.6	83.1	57.6
19	83.0	98.0	75.7	63.2	183	96.2	38.2	48.9	38.6	70.2	85.8	53.6
20	78.3	96.3	71.1	65.6	314	78.8	43.4	73.0	34.8	68.8	77.0	50.8
21	71.7	85.6	71.5	68.1	499	77.7	49.0	72.7	34.0	71.2	79.4	49.0
22	86.3	85.9	78.4	72.6	* 597	76.8	53.6	68.9	34.0	69.7	82.5	51.6
23	90.1	86.6	75.8	* 76.9	510	61.0	72.8	71.4	29.4	64.3	90.6	55.2
24	80.6	86.6	69.4	* 75.3	380	59.5	74.2	65.3	34.3	68.3	86.2	66.2
25	76.1	85.8	69.9	80.7	237	59.0	70.4	57.8	33.9	64.4	91.4	61.7
26	75.2	89.7	90.0	68.2	140	64.3	79.3	58.0	53.7	68.9	95.2	52.0
27	*156	86.8	95.4	69.0	113	73.3	77.9	64.9	69.5	67.3	67.6	39.9
28	*239	75.9	75.2	70.4	121	71.4	77.6	71.3	69.7	61.7	63.8	37.6
29	193		66.8	79.4	372	63.4	81.9	67.8	66.5	63.5	69.2	34.3
30	124		65.6	81.7	523	56.6	86.3	62.2	73.5	48.0	71.6	33.0
31	91.7		64.2		523		82.0	61.6		39.4		31.8
Sum	2,596.3	2,516.1	2,636.9	* 2,007.6	5,186.4	4,038.0	1,809.5	2,025.4	1,567.3	2,210.7	1,917.0	1,910.2

Month	Current Year 1950								Period Oct. 1940-1950		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	High Day	High	Low Day	Low			* Normal	* Maximum	*Minimum
Jan.	30.95	28.37	28	249	11	44.0	83.8	5,150	3,697	7,450	1,400
Feb.	29.67	28.53	14	128	2	58.8	89.9	4,990	3,530	6,010	1,610
Mar.	29.92	28.54	4	147	14	61.2	85.1	5,230	3,977	6,900	1,880
Apr.	29.21	28.06	16	99.7	15	41.6	* 66.9	* 3,980	4,918	22,000	1,380
May	33.28		21	623	‡10	0	167	10,300	7,070	24,200	2,290
June	32.56	28.01	1	495	23	48.8	135	8,010	4,320	9,090	602
July	28.66	27.38	4	89.0	15	21.0	58.4	3,590	3,616	11,000	865
Aug	28.58	27.86	3	88.5	19	43.4	65.3	4,020	2,647	7,400	605
Sept.	28.50	27.57	30	79.3	23	25.7	52.2	3,110	21,335	125,700	1,400
Oct.	29.41	27.72	‡ 4	143	31	38.4	71.3	4,380	4,035	10,200	136
Nov.	28.84	27.71	26	101	3	36.4	63.9	3,800	3,002	6,200	861
Dec.	28.67	27.74	7	98.2	31	29.7	61.6	3,790	3,635	6,100	1,830
Yearly	33.28			623		0	83.4	60,350	65,782	158,550	28,412

¶ Estimated * Partly estimated ‡ And other days

RIO GRANDE AT MATAMOROS, TAMAULIPAS

DESCRIPTION: Water-stage recorder with sit-down cable car and winch. The recorder is attached to the left pier on the downstream side of the railroad bridge between Matamoros, Tamaulipas and Brownsville, Texas, 57.6 miles upstream from the Gulf of Mexico and 1,183.8 river miles below the American Dam at El Paso, Texas. The cable is located .3 miles upstream from the bridge. This gage was moved May 1, 1950 and its zero was lowered 3.27 feet. According to the adjusted elevation of U.S.C. & G.S. B.M. Y48, the zero of the gage prior to May 1 was 15.38 feet instead of 15.26 feet above mean sea level, as published in previous water bulletins, and the new zero of the gage is 12.11 feet above mean sea level.

RECORDS: Based on 204 meter measurements by the Mexican Section and 12 by the United States Section, and a continuous record of gage heights. The river bottom shifts greatly at this station. Computations by shifting channel methods. Records available: 1901 to 1913; 1923 through December 1950.

REMARKS: Reservoirs, irrigation and flood flow diversions, and drainage returns greatly modify the flow at this station.

EXTREME FLOWS: The greatest recorded flow was on June 22, 1903 when a mean daily discharge of 36,320 second-feet occurred with a gage height of 13.2 feet. The greatest flow since 1923 was on April 30, 1949 when 32,950 second-feet passed this station with a gage height of 24.89 feet on the present gage. In 1930 the river at this station was dry for a few days in March and April.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,500	420	101	31.8	3.5	9,500	12.0	1,040	3.9	13,460	132	148
2	1,810	268	119	21.2	31.1	7,380	7.0	788	4.2	8,830	58.6	43.1
3	1,790	131	184	20.5	5.3	9,610	5.2	541	3.5	5,010	17.0	22.2
4	1,680	176	385	17.0	3.5	12,220	234	276	12.3	4,520	4.9	5.3
5	1,410	593	911	17.3	6.7	7,030	94.5	118	123	4,100	3.5	4.9
6	1,420	833	1,270	10.9	3.9	4,410	57.8	368	99.6	3,640	3.5	6.0
7	1,780	664	1,450	5.3	4.2	5,650	15.5	926	399	3,260	2.8	3.2
8	2,050	343	1,550	8.1	4.2	4,980	6.3	1,060	395	2,950	2.8	194
9	2,080	266	1,480	4.9	3.2	3,920	4.2	2,280	131	3,180	4.9	349
10	1,650	91.1	1,320	4.2	143	3,600	3.5	3,220	56.1	3,780	3.2	260
11	1,210	47.3	1,440	17.0	180	3,010	4.2	2,780	218	3,810	2.1	62.5
12	950	74.9	1,630	125	85.1	2,690	3.5	2,160	262	3,670	2.8	16.2
13	724	271	1,720	47.7	25.4	2,140	2.1	1,920	68.5	3,130	5.3	5.7
14	794	258	1,270	11.7	38.5	1,490	2.4	1,930	3.9	2,580	174	4.2
15	756	73.8	1,180	14.8	51.6	996	2.4	1,150	2.8	2,330	332	3.5
16	1,100	62.9	1,390	43.1	39.2	622	2.4	636	1.4	2,150	85.8	3.9
17	837	33.9	1,460	13.4	13.1	410	2.4	360	1.1	1,360	13.1	51.2
18	360	16.6	1,310	60.0	2.8	399	398	172	.7	738	4.6	196
19	158	36.7	1,300	209	2.8	590	3,780	65.0	2.1	540	3.5	146
20	101	109	1,330	135	229	286	3,740	385	2.1	509	5.3	137
21	59.0	131	1,090	124	336	66.7	3,040	526	23.0	477	4.2	55.8
22	80.2	134	569	155	533	19.4	2,240	352	3.5	434	14.5	31.4
23	257	136	452	1,560	1,010	10.2	2,030	179	2.5	480	321	23.7
24	430	99.2	374	1,770	3,210	5.3	2,150	81.9	7.4	424	195	124
25	347	35.3	212	1,170	3,220	10.2	1,930	30.4	57.6	108	118	221
26	278	46.3	60.7	452	2,640	298	2,150	18.7	586	23.0	198	256
27	104	308	221	174	1,970	540	2,220	21.9	1,620	8.5	254	220
28	208	201	125	73.8	1,630	378	2,110	68.2	3,220	5.7	160	137
29	388		51.6	20.8	1,640	297	1,780	88.6	10,520	6.4	81.2	62.5
30	752		14.1	7.1	12,500	70.6	1,810	14.5	13,840	12.7	205	28.3
31	763		3.2		15,070		1,640	6.7		283		4.9
Sum	27,826.2	5,860.0	25,972.6	6,324.6	44,635.1	82,628.4	31,477.4	23,562.9	31,670.2	75,809.3	2,412.6	2,826.5

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	Extreme Second-Feet High	Extreme Second-Feet Low Day	Extreme Second-Feet Low	Average Second-Feet	Total Acre-Feet	Period 1924-1950: Acre-Feet Normal	Acre-Feet Maximum	Acre-Feet Minimum	Acre-Feet Normal 1938-1950
Jan.	4.72	- .16	9	2,160	21	47.0	898	55,190	194,058	490,800	33,450	141,912
Feb.	2.33	- .79	6	858	25	8.8	209	11,620	139,730	328,300	11,620	105,963
Mar.	3.71	-1.05	13	1,850	31	* .7	838	51,520	116,246	313,600	18,240	102,723
Apr.	4.10	-1.02	24	1,940	18	1.8	211	12,540	113,988	425,800	2,410	96,117
May	ϕ18.27	ϕ 2.23	31	16,100	#	2.8	1,440	88,530	270,110	721,100	34,630	240,967
June	ϕ16.60	ϕ 3.25	1	12,850	24	5.3	2,750	163,900	346,616	1,180,500	2,580	275,866
July	ϕ10.07	ϕ 2.79	19	4,100	#	2.1	1,020	62,430	298,417	756,600	22,940	269,578
Aug.	ϕ 9.22	ϕ 2.59	10	3,460	31	5.3	760	46,740	276,112	833,700	12,290	262,014
Sept.	ϕ16.93	ϕ*1.90	30	14,130	18	* .4	1,060	62,820	576,489	1,363,200	24,740	530,516
Oct.	ϕ16.93	ϕ 2.99	1	14,130	28	4.6	2,450	150,400	544,557	1,408,500	28,150	492,147
Nov.	ϕ 4.63	ϕ 2.79	15	392	#	2.1	80.4	4,790	246,750	827,500	4,790	174,980
Dec.	ϕ 4.63	ϕ 2.66	9	367	8	2.1	91.2	5,610	188,788	594,200	5,610	123,518
Yearly	18.27	*1.90		16,100		* .4	989	716,090	3,311,861	6,579,500	716,090	2,816,301

* Partly estimated ϕ Zero of the gage lowered 3.27 feet # Various days of the month

RIO GRANDE AT LOWER BROWNSVILLE, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located about 1,000 feet below the El Jardin pumping plant, about 6.6 river miles below Brownsville, Texas, and Matamoros, Tamaulipas, 50.4 river miles upstream from the Gulf of Mexico and 1,191.0 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum. An auxiliary water-stage recorder located at the El Jardin pumping plant was used during periods of low flow.

RECORDS: Based on 58 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1934 through December 1950.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. During floods, a portion of the upstream river flow finds outlet to the Gulf of Mexico through flood channels in both countries, which divert from the Rio Grande within 124.6 miles above this station.

EXTREME FLOWS: The greatest recorded flow was on October 8, 1945, when a discharge of 31,700 second-feet occurred with a gage height of 31.48 feet. Zero flow has frequently occurred at this station.

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,500	434	87.4	10.6	8.3	10,100	21.8	1,120	0	13,200	128	107
2	1,740	244	122	18.1	15.5	6,870	7.3	815	0	9,920	18.9	30.7
3	1,780	136	169	7.3	2.5	4,860	2.0	638	0	6,370	8.0	2.9
4	1,740	197	313	1.8	1.2	3,950	57.6	357	5.2	5,160	4.5	0
5	1,470	444	711	2.7	2.2	7,680	87.6	51.2	101	4,540	6.9	0
6	1,310	658	1,180	7.1	2.7	9,860	5.5	182	7.6	3,860	2.2	0
7	1,730	587	1,390	7.1	3.3	7,770	4.2	820	160	3,400	2.0	0
8	2,000	318	1,500	8.9	5.8	5,140	2.0	882	310	2,970	2.2	25.8
9	2,120	218	1,510	8.7	5.1	4,040	1.3	1,750	137	3,100	5.1	252
10	1,780	65.2	1,380	7.1	8.4	3,710	1.4	2,880	41.6	3,820	4.3	201
11	1,340	30.1	1,410	6.3	48.7	3,180	1.3	3,000	150	4,020	4.1	53.0
12	946	32.0	1,510	76.0	1.7	2,800	1.1	2,360	538	3,950	3.6	0.1
13	633	174	1,580	22.0	1.3	2,410	1.2	1,930	50.0	3,330	1.1	.1
14	708	265	1,220	2.7	6.2	1,800	.6	1,850	.8	2,760	82.0	0
15	627	97.2	1,060	5.2	18.9	1,320	.9	1,300	.1	2,440	246	0
16	975	37.7	1,260	2.4	0	922	.8	768	0	2,270	103	0
17	856	44.5	1,380	5.9	0.5	573	.7	318	0	1,580	7.7	.3
18	446	8.1	1,300	23.6	0.8	442	71.2	106	0	898	.2	55.4
19	204	10.4	1,240	105	1.5	716	3,040	43.9	0	642	.1	39.1
20	119	29.7	1,290	35.9	3.5	360	3,540	242	0	631	.9	43.3
21	69.2	67.6	1,100	56.6	61.6	63.9	3,270	514	4.8	601	2.8	.4
22	65.2	58.5	634	49.2	309	5.3	2,510	317	1.0	522	1.4	.2
23	174	92.9	492	1,100	659	1.2	2,130	219	0	565	251	0
24	339	82.7	441	1,760	2,420	1.8	2,190	95.9	1.7	327	186	17.3
25	310	56.8	309	1,260	3,000	2.4	1,940	21.0	17.1	106	75.7	94.1
26	267	48.4	162	536	2,580	120	2,020	12.2	356	8.2	124	154
27	130	149	167	195	1,930	559	2,190	25.7	1,060	4.0	218	149
28	171	180	132	35.9	1,460	356	2,200	32.3	2,680	9.5	150	105
29	322		68.1	2.3	1,340	217	1,870	145	8,110	8.3	48.7	14.6
30	539		9.1	9.7	8,870	105	1,830	2.2	12,500	11.1	124	0
31	667		3.0		14,900		*1,640	.9		133		.2
Sum	27,077.4	4,765.8	25,129.6	5,369.1	37,667.7	79,934.6	30,638.5	22,798.3	26,231.9	81,156.1	1,812.4	1,345.5

Month	Current Year 1950								Period 1934-1950			Acre-Feet
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			Normal 1938-1950
	High	Low	High		Low				Normal	Maximum	Minimum	
			Day		Day							
Jan.	15.43	10.16	9	2,170	22	56.9	873	53,700	156,083	299,000	28,000	135,646
Feb.	12.50		6	693	‡18	0	170	9,450	115,861	237,000	9,450	101,512
Mar.	14.34		13	1,630	31	0	811	49,800	104,747	311,000	18,600	99,000
Apr.	14.51		24	1,810	‡ 1	0	179	10,600	96,737	* 372,000	1,130	88,449
May	26.30		31	15,700	‡ 1	0	1,220	74,700	253,871	717,000	29,900	230,061
June	24.81		1	13,000	‡22	0	2,660	159,000	309,611	*1,161,000	1,380	267,337
July	17.25		19	3,660	‡ 2	0	988	60,800	279,106	759,000	15,500	257,293
Aug.	16.60		10	3,150	‡25	0	735	45,200	229,560	679,000	6,000	248,123
Sept.	25.03		30	13,300	‡ 1	0	874	52,000	519,900	1,337,000	21,300	510,792
Oct.	25.12		1	13,500	‡26	0	2,620	161,000	469,746	*1,427,000	21,700	481,208
Nov.	11.40		23	299	‡ 2	0	60.4	3,590	175,676	614,000	3,590	168,653
Dec.	11.40		9	297	‡ 3	0	43.4	2,670	137,605	341,000	2,670	118,114
Yearly	26.30			15,700		0	943	682,510	2,848,503	6,526,000	682,510	2,706,188

* Partly estimated ‡ And other days

OUTFALLS FROM WELLS AND SEWERS INTO THE RIO GRANDE

EL PASO ELECTRIC COMPANY SANTA FE STREET PLANT COOLING WATER WASTE

This outfall enters the Rio Grande 3.3 miles below the American Dam. From the company's pumping records and records of diversions from this outfall by the City of El Paso, it is calculated that 162 acre-feet flowed into the river in 1950. This corresponds to an average flow of .2 second-foot.

JUAREZ SEWAGE OUTFALL

Water from the Juárez sewer which formerly entered the river 4.7 miles below the American Dam did not enter the river in 1950.

PEYTON PACKING COMPANY WASTE

This outfall enters the river 5.7 miles below the American Dam. From several inspections it was found that the flow from this source was too small to be of account.

EL PASO SEWAGE OUTFALL

This outfall enters the Rio Grande 6.6 river miles below the American Dam. The 1950 record of total outfall consists of flows measured by a Parshall meter and estimates by the Department of Water and Sewerage of the City of El Paso of amounts which by-passed the meter. The breakdown of this total into water from wells, or from the Rio Grande, is made in co-operation with the El Paso Water and Sewerage Department. Water for 110 acres of land was diverted from this outfall between the Sewage Plant and the Rio Grande.

1950							Period 1936-1950
Month	From Wells		From Rio Grande		Estimated Diversions Acre-Feet	To Rio Grande	
	Mean Sec.-Ft.	Acre-Feet	Mean Sec.-Ft.	Acre-Feet		Acre-Feet	Normal Acre-Feet
Jan.	14.8	911.0	0	0	0	911	708
Feb.	14.9	829.0	0	0	0	829	662
Mar.	14.6	894.9	.8	50.1	0	945	716
Apr.	10.7	634.6	5.1	301.4	91	845	704
May	11.3	692.9	5.4	332.1	88	937	761
June	12.1	718.6	5.8	344.4	88	975	808
July	12.6	774.0	6.2	383.0	99	1,058	868
Aug.	12.5	770.7	6.7	411.3	106	1,076	844
Sept.	11.7	697.3	6.6	395.7	78	1,015	791
Oct.	10.9	669.0	6.8	417.0	0	1,086	806
Nov.	9.9	591.0	6.9	409.0	0	1,000	757
Dec.	8.0	493.2	7.7	473.8	0	967	742
Year	12.0	8,676.2	4.9	3,517.8	550	11,644	9,167

EL PASO COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NO. 1 SEWAGE OUTFALLS

This water enters the Rio Grande through the sewer system of the El Paso County Water Control and Improvement District No. 1 between Ascarate and Ysleta, Texas, 9 and 15 miles respectively, below the American Dam. The tabulation includes the outfalls from Disposal Plant No. 1 at Ascarate, Texas and Disposal Plant No. 2 a few miles downstream. Records were furnished by the El Paso County Water Control and Improvement District No. 1.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
Acre-Feet	11.5	11.5	11.5	11.5	11.5	16.6	39.0	51.4	73.2	73.2	73.3	66.4	450.6

LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 885.7 river miles below the American Dam at El Paso, Texas, and 1.4 river miles below the Laredo gaging station. The record is based on estimates by the Texas State Health Department.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
Acre-Feet	143	142	167	164	170	165	171	171	164	169	162	159	1,947

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

Data are presented below for all storage reservoirs in the Rio Grande Basin that exceed 15,000 acre-feet in capacity. The monthly figures represent the water in storage on the last day of each month, in thousands of acre-feet. The capacities indicated are at spillway level. Storage figures greater than the capacity indicate that the water surface was above spillway level.

The reservoirs and the sources of the data are: Rio Grande, Continental, Santa Maria, Terrace, and Mountain Home from Colorado State Engineer; Sanchez and Costilla from San Luis Power and Water Company; and El Vado from Middle Rio Grande Conservancy District. Bluewater data are from the Secretary of the Bluewater-Toltec Irrigation District; Elephant Butte, Caballo, Alamogordo, McMillan, and Avalon from the United States Bureau of Reclamation; Red Bluff from Red Bluff Water Power Control District; Willacy from the Willacy County Water Control and Improvement District No. 1; Boquilla, Colina, and Rosetilla from Río Conchos Agriculture and the Electric Power Company of Mexico; Francisco I. Madero from Ministry of Hydraulic Resources of Mexico; Centenario and San Miguel, Venustiano Carranza, Marte R. Gómez, Culebrón, Villa Cárdenas, and Palito Blanco from the Department of Agriculture and Livestock of Mexico.

CORRECTION: The Superintendent of Operations of the Río Conchos Agriculture and Electric Power Co. of Mexico reported that, based on reservoir sedimentation surveys, the usable storage capacity of Boquilla Reservoir in 1950 was 2,014,600 acre-feet, and the dead storage capacity was 575.9 acre-feet. The capacity of the La Colina Reservoir in 1950 was reported as 19,500 acre-feet.

In The United States

Month	Rio Grande (Capacity 51.1)		Continental (Capacity 26.7)		Santa Maria (Capacity 43.6)		Terrace (Capacity 17.7)		Mountain Home (Capacity 20.1)		Sanchez (Capacity 103.2)	
	1950	#Normal 1927-1950	1950	#Normal 1928-1950	1950	#Normal 1928-1950	1950	#Normal 1925-1950	1950	#Normal 1924-1950	1950	#Normal 1927-1950
Jan.	29.1	14.8	17.3	5.6	22.9	8.5	3.7	2.8	4.0	4.4	12.4	12.0
Feb.	29.8	16.1	18.7	5.8	22.9	9.1	4.1	3.2	4.3	4.8	12.9	12.2
Mar.	30.6	17.5	19.0	5.8	22.5	10.2	4.4	3.6	4.7	5.2	12.9	12.8
Apr.	19.7	17.0	19.0	6.3	22.1	11.9	4.4	4.2	4.8	5.8	12.5	14.6
May	7.9	25.4	19.0	9.0	18.3	17.0	3.8	7.4	3.9	8.2	9.6	20.2
June	0	27.0	13.0	9.6	15.5	19.7	3.9	9.2	2.9	8.2	6.8	19.2
July	0	16.2	1.7	7.3	8.8	13.8	3.2	5.8	1.9	6.0	3.7	13.5
Aug.	0	7.1	1.1	5.1	1.2	6.3	1.5	2.9	.4	3.6	0	10.1
Sept.	0	6.8	1.1	5.2	.9	5.8	1.2	2.3	0	3.2	.5	10.4
Oct.	0	8.2	1.1	4.9	.9	6.2	1.1	2.6	0	3.3	.6	11.2
Nov.	‡ 0.8	11.5	1.6	5.1	‡ 1.3	7.0	1.1	2.2	0	3.6	1.5	11.2
Dec.	2.1	13.0	‡ 2.2	5.4	1.9	7.6	1.3	2.5	.4	3.9	2.3	11.3
Avg.	10.0	15.0	9.6	6.3	11.6	10.3	2.8	4.1	2.3	5.0	6.3	13.2
Max.	30.6	51.8	19.0	26.7	22.9	42.1	4.4	17.7	4.8	16.4	12.9	62.4
Min.	0	0	1.1	0	.9	0	1.1	0	0	0	0	0

Month	Costilla (Capacity 15.7)		El Vado (Capacity 200.3)		Bluewater (Capacity 43.5)		Elephant Butte (Capacity 2,197.6)		Caballo (Capacity 346.0)	
	1950	#Normal 1922-1950	1950	Normal 1935-1950	1950	#Normal 1927-1950	1950	Normal 1915-1950	1950	#Normal 1938-1950
Jan.	‡ 8.4	4.0	164.1	65.0	3.9	5.9	607.5	1,001.3	240.4	199.5
Feb.	‡ 8.5	4.3	93.5	58.9	3.9	7.0	650.6	1,003.2	270.1	206.8
Mar.	8.7	4.9	25.2	54.6	4.4	11.2	655.9	992.0	220.8	185.2
Apr.	9.2	6.1	63.9	113.3	4.6	14.7	616.6	996.7	194.4	151.3
May	8.0	8.7	89.8	172.8	4.0	12.5	541.5	1,129.4	171.3	138.2
June	7.0	7.9	78.7	162.5	3.4	9.9	457.5	1,183.2	146.2	111.2
July	4.8	4.7	66.6	134.9	3.6	8.4	397.9	1,124.1	134.2	78.9
Aug.	2.6	3.0	36.4	101.3	3.4	7.1	354.5	1,049.5	55.5	44.1
Sept.	2.1	2.6	29.6	81.6	3.1	6.9	333.4	1,006.4	43.1	39.5
Oct.	1.9	2.9	24.8	74.5	‡ 3.0	6.4	329.5	996.4	54.6	72.8
Nov.	2.1	3.3	27.0	66.3	‡ 3.0	6.3	323.2	995.5	63.8	109.6
Dec.	2.4	3.6	30.0	63.9	2.9	6.0	335.4	999.3	70.6	147.4
Avg.	5.5	4.7	60.8	95.8	3.6	8.5	467.0	1,039.8	138.8	123.7
Max.	9.2	15.1	164.1	203.5	4.6	47.1	ϕ 667.8	ϕ2,302.8	ϕ 273.1	ϕ 346.6
Min.	1.9	0	24.8	2.3	2.9	0	ϕ 322.7	3.3	ϕ 25.8	ϕ 0.1

‡ Estimated # Some months missing ϕ Daily extreme

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

In Thousands of Acre-Feet

In The United States

Month	Alamogordo (Capacity 132.2)		McMillan and Avalon (Capacity 43.5)		Red Bluff (Capacity 310.0)		Willacy (Capacity 25.0)		Total in United States Reservoirs (Capacity 3,576.2)	
	1950	#Normal 1938-1950	1950	#Normal 1908-1950	1950	#Normal 1936-1950	1950	#Normal 1939-1950	1950	Estimated Normal
Jan.	103.7	62.7	25.4	30.4	109.4	131.6	18.0	15.8	1,370.2	1,564.3
Feb.	103.5	66.8	19.9	30.6	115.0	135.7	16.2	15.1	1,373.9	1,579.6
Mar.	102.0	58.0	13.3	28.6	104.6	132.7	16.7	14.3	1,245.7	1,536.6
Apr.	87.5	46.6	4.9	20.1	80.4	110.6	4.9	12.9	1,148.9	1,532.1
May	73.5	60.2	3.5	23.5	65.9	124.1	10.4	13.5	1,030.4	1,770.1
June	60.2	56.0	4.6	22.6	52.6	135.8	9.7	13.7	862.0	1,795.7
July	99.9	59.6	38.1	19.4	55.2	120.3	9.0	14.3	828.6	1,627.2
Aug.	95.9	59.2	28.9	17.4	30.3	103.3	12.1	13.6	623.8	1,433.6
Sept.	95.2	57.1	31.2	19.9	46.8	105.3	7.0	14.6	595.2	1,367.6
Oct.	95.2	60.1	24.0	22.5	72.0	111.2	13.3	14.7	622.0	1,397.9
Nov.	97.0	57.7	16.2	24.0	72.9	116.1	5.0	13.6	616.5	1,433.0
Dec.	99.2	61.7	15.5	27.9	94.2	123.0	4.8	15.2	665.2	1,491.7
Avg.	92.7	58.8	18.8	23.9	74.9	120.8	10.6	14.3	915.4	1,544.1
Max.	103.7	156.3	38.1	85.5	115.0	327.5	18.0	22.0	1,373.9	
Min.	60.2	1.7	3.5	0	30.3	10.0	4.8	3.9	595.2	

In Mexico

Month	Boquilla (Capacity 2,014.6)		La Colina (Capacity 19.5)		Rosetilla (Capacity 15.4)		Madero (Capacity 344.6)		Centenario and San Miguel (Capacity 19.9)	
	1950	#Normal 1914-1950	1950	#Normal 1940-1950	1950	Normal 1940-1950	1950	#Average 1948-1950	1950	Normal 1934-1950
Jan.	1,227.4	1,503.8	18.8	17.8	13.1	13.3	268.1	145.1	18.8	13.6
Feb.	1,181.8	1,472.0	17.7	18.0	15.7	14.6	267.0	145.9	19.1	13.4
Mar.	1,097.9	1,420.4	17.6	17.7	14.6	14.0	256.1	140.8	10.7	10.1
Apr.	1,005.4	1,355.3	18.9	18.5	13.6	13.2	235.0	129.2	6.5	8.3
May	907.8	1,290.3	18.9	18.6	14.8	11.5	215.7	119.1	7.5	9.7
June	821.0	1,201.8	18.6	18.1	12.4	13.4	202.1	112.6	8.1	8.6
July	871.8	1,242.7	18.5	18.5	12.7	12.9	219.2	96.7	5.1	8.4
Aug.	888.1	1,413.0	18.4	17.9	13.5	13.3	214.9	107.7	5.0	9.3
Sept.	916.0	1,571.5	18.6	18.1	13.5	15.1	240.1	165.6	6.4	11.8
Oct.	887.3	1,563.3	13.5	17.7	14.4	14.3	245.4	174.8	8.5	13.4
Nov.	828.8	1,523.7	17.9	17.9	14.9	13.0	242.8	175.4	6.6	12.3
Dec.	784.4	1,505.3	18.6	17.5	13.6	14.0	238.2	174.5	4.0	12.3
Avg.	951.5	1,421.9	18.0	18.0	13.9	13.6	237.1	140.6	8.9	10.9
Max.	1,227.4	2,224.5	18.9	20.4	15.7	19.4	268.1	268.5	19.1	20.7
Min.	784.4	37.6	13.5	13.5	12.4	0.4	202.1	1.4	4.0	0.6

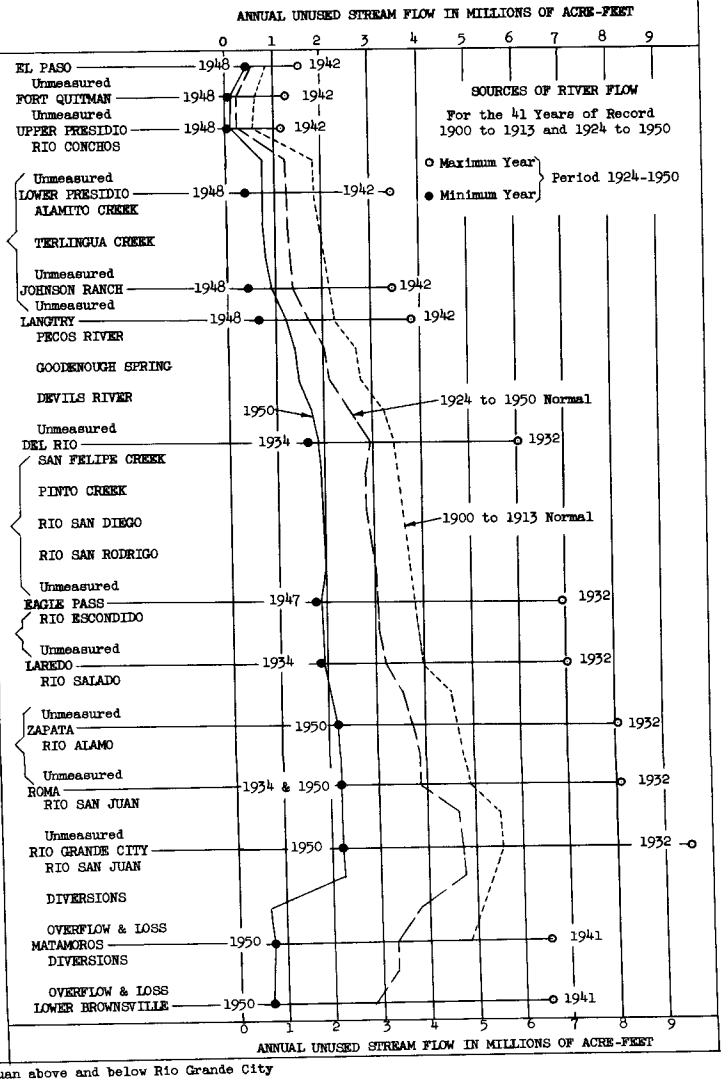
Month	Venustiano Carranza (Capacity 1,123.0)		Marte Gómez (Capacity 876.4)		e Culebrón (Capacity 73.0)		Palito Blanco (Capacity 178.4)		Total in Mexican Reservoirs (Capacity 4,664.8)	
	1950	Normal 1930-1950	1950	#Average 1943-1950	1950	#Normal 1939-1950	1950	Average 1942-1950	1950	Estimated Normal
Jan.	434.1	426.7	547.2	517.0	21.6	54.5	79.4	47.7	2,628.5	2,739.5
Feb.	382.4	411.2	431.3	483.3	14.7	48.9	21.5	36.7	2,351.2	2,644.0
Mar.	374.4	388.2	394.0	406.1	14.8	38.9	26.1	37.5	2,206.2	2,473.7
Apr.	362.5	376.2	304.0	398.3	14.4	36.7	15.7	25.3	1,976.0	2,361.0
May	318.6	364.1	194.2	395.8	12.2	40.6	0	21.0	1,689.7	2,270.7
June	340.8	358.8	121.8	367.1	38.3	53.3	0	24.4	1,563.1	2,158.1
July	316.5	350.7	104.2	345.5	32.4	47.9	0	32.5	1,580.4	2,155.8
Aug.	289.7	352.2	98.2	395.2	23.8	49.6	0	36.2	1,551.6	2,394.4
Sept.	313.1	406.1	146.1	457.8	19.1	61.0	0	42.8	1,672.9	2,749.8
Oct.	309.0	429.7	186.5	494.4	29.3	67.4	19.5	62.1	1,713.4	2,837.1
Nov.	300.0	441.0	172.7	487.0	17.6	57.8	19.1	60.5	1,620.4	2,788.6
Dec.	289.7	442.4	165.5	492.0	12.3	56.9	5.8	55.2	1,532.1	2,770.1
Avg.	335.9	395.6	238.8	436.6	20.9	51.1	15.6	40.2	1,840.4	2,528.6
Max.	434.1	1,163.4	547.2	914.5	38.3	116.8	79.4	140.1		
Min.	289.7	0.7	98.2	ϕ 2.1	12.2	12.2	0	0		

Some months missing ϕ Daily extreme e Includes Villa Cárdenas

SOURCES OF RIVER FLOW

The graph and the column of figures on this page each represents data on the annual yield of drainage areas tributary to various stream gaging stations in the Rio Grande Watershed. The graphic values are for the entire tributary area, while the column figures are reduced to the yield from one average square mile of the tributary area. Because there were no reservoirs of consequence on the area from 1900 to 1913 the figures in the first column are the same as those in the graph for that period except that the column figures have been reduced to a per-square-mile basis. Because some large reservoirs began storing water between 1913 and 1924 large volumes of unused run-off were not permitted to pass on downstream as unused stream flow until later years when the impounded water was released and added to the stream flow. Elephant Butte and La Boquilla reservoirs illustrate this. Reservoirs which began storing water after January 1, 1924 were on December 31, 1950 retaining large volumes of run-off water which had not yet passed downstream as stream flow. Caballo and Marte Gómez reservoirs illustrate this. The column figures below for the period 1924 to 1950 differ from the corresponding graphic values because of such adjustments between unused run-off and unused stream flow incident to changes of reservoir storage.

AVERAGE ANNUAL UNUSED RUN-OFF A.F. per Sq.Mi.		
1900-1913	1924-1950	
29.7	18.7	EL PASO
		Unmeasured
19.6	6.4	FORT QUITMAN
		Unmeasured
16.4	5.5	UPPER PRESIDIO
51.0	40.1	RIO CONCHOS
		Unmeasured
		LOWER PRESIDIO
		ALAMITO CREEK
20.7	21.3	TERLINGUA CREEK
		Unmeasured
		JOHNSON RANCH
		Unmeasured
28.2	20.2	LANGTRY
12.4	9.8	PECOS RIVER
		GOODENOUGH SPRING
106.1	104.0	DEVILS RIVER
55.7	68.2	Unmeasured
28.0	22.1	DEL RIO
		SAN FELIPE CREEK
		PINTO CREEK
112.6	76.9	RIO SAN DIEGO
		RIO SAN RODRIGO
		Unmeasured
30.4	23.7	EAGLE PASS
32.7	30.7	RIO ESCONDIDO
		Unmeasured
30.5	23.9	LAREDO
27.2	17.5	RIO SALADO
		Unmeasured
		ZAPATA
65.1	59.9	RIO ALAMO
		Unmeasured
31.1	24.2	ROMA
52.8	66.2 *	RIO SAN JUAN
		Unmeasured
		RIO GRANDE CITY
		RIO SAN JUAN
		DIVERSIONS
		OVERFLOW & LOSS
		MATAMOROS
		DIVERSIONS
		OVERFLOW & LOSS
		LOWER BROWNSVILLE



* Includes Río San Juan above and below Rio Grande City

DIVERSIONS FROM THE RIO GRANDE

INTO THE AMERICAN CANAL AT EL PASO, TEXAS

DESCRIPTION: An open channel rating station in a concrete-lined canal with two water-stage recorders located 396 and 2,350 feet, respectively, below the head gates at the American Dam near El Paso, Texas. The zero of the gages at both recorders is 3,712.09 feet above mean sea level, U.S.C. & G.S. datum. Measurements are made at the downstream end of the first covered section of this canal, 835 feet below lower recorder.

RECORDS: Based on 43 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 2, 1938, through December 1950.

REMARKS: This canal diverts water from the Rio Grande at the American Dam near El Paso, Texas, 2.1 river miles above the International Dam near Juárez, Chihuahua. Operation began June 2, 1938. Water from this canal discharges into the Franklin Canal from which water is frequently returned to the Rio Grande at spillways 2.2, 2.7, and 3.6 river miles below the American Dam.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 1,840 second-feet on March 27, 1944. Min. sometimes dry.

Average Flow in Second-Feet

Daily:	Max.	1,510	Aug. 13, 1945	Min.		sometimes dry	
Monthly:	Max.	1,210	Aug. 1943	Min.	.1	Jan.	1946
Yearly:	Max.	748	1943	Min.	477		1948

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	172	0	686	1,230	750	530	730	1,010	859	170	199	169
2	174	0	627	1,180	808	555	747	909	884	301	195	167
3	56.3	0	517	1,170	624	516	1,010	798	928	324	184	164
4	0	0	571	1,200	563	539	960	866	1,130	316	135	167
5	0	0	430	1,130	639	598	957	731	1,020	693	¤ 0.5	155
6	0	0	493	997	666	643	976	649	1,010	595	¤ 0.5	154
7	0	0	450	951	728	573	1,200	905	904	464	¤ 0.5	157
8	0	0	467	996	956	566	1,190	874	850	349	¤ 0.5	157
9	0	0	524	900	918	681	896	786	855	310	¤ 0.5	155
10	0	0	452	1,010	888	778	1,340	880	832	310	¤ 0.5	154
11	0	0	404	1,030	897	784	1,220	969	918	280	¤ 0.5	156
12	0	0	487	995	884	892	1,200	920	719	264	¤ 0.5	153
13	0	84.1	625	911	872	813	1,080	1,060	569	259	¤ 0.5	151
14	0	135	758	779	857	836	954	1,110	538	256	¤ 0.5	149
15	0	137	700	743	935	814	913	1,010	407	256	¤ 0.5	149
16	0	137	598	820	855	856	671	978	321	249	¤ 0.5	145
17	0	133	575	878	817	898	772	876	303	238	87.7	142
18	0	133	600	763	778	1,050	753	812	345	234	150	145
19	0	134	643	735	600	1,160	753	880	306	234	150	143
20	0	138	1,020	671	581	1,100	826	930	276	226	144	144
21	0	136	769	679	567	1,060	881	866	350	226	162	142
22	0	133	899	749	640	1,030	944	649	293	228	173	143
23	0	134	991	773	577	1,180	1,160	645	349	220	171	144
24	0	131	869	778	544	1,020	1,350	970	471	211	167	146
25	0	223	866	619	507	883	1,170	828	361	208	169	147
26	0	436	1,260	595	722	942	800	780	305	206	170	145
27	0	437	998	591	576	1,020	793	825	450	202	170	145
28	0	645	998	603	583	920	994	1,190	302	204	168	147
29	0		1,060	592	598	845	966	1,020	245	203	169	146
30	0		1,210	689	589	784	816	949	179	206	170	145
31	0		1,170		529		1,080	861		203		146
Sum	402.3	3,306.1	22,717	25,757	22,048	24,866	30,102	27,536	17,279	8,645	2,939.7	4,672

Month	Current Year 1950: # Extreme Gage Feet High	Low	Extreme Second-Feet High: Day	High	Low: Day	Low	Average Second-Feet	Total Acre-Feet	Period June 1938-1950: Acre-Feet Normal	Maximum	Minimum
Jan.	4.79		2	179	‡ 3	0	13.0	798	2,161	8,110	8.5
Feb.	8.51		28	812	‡ 1	0	118	6,560	10,632	19,500	2,620
Mar.	10.67	6.23	26	1,540	11	370	733	45,100	37,321	50,100	20,300
Apr.	10.60	7.15	3	1,520	27	548	859	51,100	55,567	70,900	41,800
May	9.24	6.66	15	1,020	26	468	711	43,700	48,416	69,000	38,000
June	9.72	6.80	19	1,230	3	481	829	49,300	53,184	65,700	44,200
July	10.56	6.40	25	1,530	13	440	971	59,700	60,600	70,700	42,600
Aug	10.35	7.30	4	1,430	23	581	888	54,600	60,900	74,600	44,000
Sept.	9.71	4.70	4	1,190	30	169	576	34,300	42,707	63,100	30,400
Oct.	8.59	4.59	5	869	1	160	279	17,100	22,623	39,100	12,800
Nov.	5.00		1	203	‡ 4	¤ .5	98.0	5,830	13,031	21,000	5,630
Dec.	4.70	4.28	4	176	‡26	132	151	9,270	13,597	25,500	8,440
Yearly	10.67			1,540		0	521	377,358	420,739	541,610	346,190

¤ Estimated ‡ And other days # Downstream gage

DIVERSIONS FROM THE RIO GRANDE INTO THE ACEQUIA MADRE

Near Juárez, Chihuahua

DESCRIPTION: Water-stage recorder and bridge for meter measurements located about 260 feet below the canal intake at the International Dam at Juárez, Chihuahua, which is 2.1 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on 102 meter measurements during the year, 76 by the Mexican and 26 by the United States Section of this Commission and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1938 through December 1950.

REMARKS: In 1950, 58,730 acre-feet were distributed to lands irrigated in the first unit under the canal. The remainder of the water from this canal was used, together with drainage water (which entered the canal at the lower end of the first unit), to irrigate lands farther down the canal.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 480 second-feet on July 21, 1944 with a gage height of 6.00 feet. Min. dry through winter months.

Average Flow in Second-Feet

Daily:	Max.	339	May 10, 1942	Min.	dry several months each year	
Monthly:	Max.	283	May 1938	Min.	dry several months each year	
Yearly:	Max.	116	1942	Min.	76.4	1941

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				54.7	141	176	167	177	183	61.4		
2				109	189	167	171	195	167			
3				108	179	162	159	190	168			
4				108	226	170	153	216	179			
5				108	205	170	156	189	179			
6				110	187	176	163	188	161			
7				110	195	165	160	205	154			
8				113	207	163	167	200	153			
9				105	207	164	261	204	155			
10				109	190	156	181	206	158			
11				110	193	155	154	204	164			
12				109	184	158	161	197	160			
13				107	180	162	168	200	166			
14				113	177	168	132	196	170			
15				120	187	165	153	191	139			
16				119	198	170	142	192	152			
17				115	197	171	160	185	153			
18				107	194	172	165	186	157			
19				103	209	167	156	191	153			
20				103	220	172	171	182	167			
21				113	209	164	158	184	170			
22				115	202	164	162	182	165			
23				115	197	163	154	201	165			
24				114	202	163	189	206	167			
25				111	214	163	200	213	167			
26				115	209	163	176	211	158			
27				113	217	161	140	214	161			
28				117	208	155	149	216	162			
29				113	202	156	147	216	154			
30				113	195	176	142	219	164			
31					204		147	242				
Sum				3,279.7	6,124	4,957	5,064	6,198	4,871	61.4		

Month	1938-50 Average Rainfall Inches	Current Year 1950 Rainfall Inches **	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1938-1950 Acre-Feet Normal	Maximum	Minimum
Jan.	.52	.42				0	0	0	0	0	0
Feb.	.26	.16				0	0	0	0	0	0
Mar.	.26	0				0	0	0	1,821	5,540	0
Apr.	.18	.02	15	132	1	0	109	6,510	7,266	11,720	5,240
May	.43	.11	11	267	1	107	198	12,150	13,474	17,380	11,200
June	.81	.77	30	* 279	1	136	165	9,830	10,626	15,700	9,650
July	1.41	3.16	25	276	18	6.7	163	10,040	10,205	15,170	7,910
Aug.	1.21	.29	31	261	1	140	200	12,290	9,803	12,410	5,200
Sept.	1.21	1.29	1	221	15	132	162	9,660	8,398	12,380	2,240
Oct.	.92	.21	1	176	#	0	2.0	122	119	328	0
Nov.	.30	0				0	0	0	0	0	0
Dec.	.61	0				0	0	0	0	0	0
Yearly	8.12	6.43		* 279		0	83.7	60,602	61,712	83,930	55,320

* Partly estimated ** Average for Valley floor from El Paso to Island Station # Various days of the month

INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
RIO GRANDE DRAINAGE BASIN
SAN MARCIAL, NEW MEXICO
TO THE GULF OF MEXICO
LEGEND
Stream Gaging Station
Non-recording Rainfall Station
Recording Rainfall Station
Watershed Boundary
Note: Evaporation Stations located at, or near, underlined names.
MILES
KILOMETERS
INDEX MAP
NEW MEXICO
UNITED STATES
TEXAS
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMPS.
DURANGO
MEXICO
Gulf of Mexico
Rio Grande
Pecos River
Devils River
Rio Conchos
Rio San Diego
Rio San Rodrigo
Rio Escondido
Rio Salado
Rio Alamo
Rio San Pedro
Alamito Cr.
Terlingua Cr.
San Marcial
Elephant Butte Dam
Caballo Dam
Roswell
Jornada
Las Cruces
State College
Lake McMillan
Lake Avalon
Carlsbad
Red Bluff Reservoir
Big Spring
Abilene
American Dam
El Paso
Ysleta
Island Station
Juarez
Fabens-Guadalupe Br.
County Line
Ft. Hancock Br.
West Small
Madden Arroyo
Guayuco Arroyo
Fort Quitman
Neely Rch.
Grandfalls
San Angelo
Balmorhea
Girvin
Fort Stockton
Sheffield
Junction
Closed Basin
Dryden
Agua Verde
Pumpville
Lanstry
Pecos River
Devils Lake
San Felipe Cr.
Del Rio
Comstock
Goodenough Spring Rch.
Villa Acuña
Arr. Las Vacas
Pinto Creek
Maverick County Canal Headgate
Palestina
Jimenez
Quemado
El Moral
Piedras Negras
Eagle Pass
Villa de Fuente
El Indio
Tortuga Ranch
Presidio
Ojinaga
Cuchillo Parado
Maclovio Herrera (Falomir)
Maravillas
Ranchos Los Angeles
Terlingua
Johnson Rch.
San Antonio
Guerrero
La Junta
Chihuahua
Las Virgenes
Rosetilla
Delicias
F. I. Madero Res.
Villalba
La Boquilla Dam
La Boquilla
Hormiguero
Parral
Balleza
San Antonio
Nueva Rosita
Sabinas
Allende
Ft. Mc Intosh
Laredo International Bridge
Corpus Christi
Villa Juarez
Prosteso
Venustiano Carranza Reservoir
Don Martin
Laguna de Salinillas
Nuevo Laredo
Laredo
Anahuac
San Buenaventura
Monclova
Zapata
Guerrero
Falcon Dam
Roma
Rio Grande City
Sebastian
Weslaco
San Benito Pump
Brownsville
McAllen
Gonzales Hidalgo
Marte Gomez Res.
Cerralvo
Higueras
Cienegas de Flores
Reynosa
Rebamal
Culebron Lake Control (CI-K-9)
Matamoros
18 de Marzo
Rinconada
Topo Chico
Monterrey
Santa Catarina
Ramos Arizpe
Saltillo
Las Comitas
Los Ramones
Las Herreras
Gral. Bravo
El Cuchillo
Cadereyta
Las Enramadas
Villa de Santiago
Villa Aldende
Montemorelos
Laguna de Sanchez
Rayones
Gral. Cepeda
Closed Basins
Linares
Villagran

DIVERSIONS FROM THE RIO GRANDE INTO THE MAVERICK CANAL AT LAS MORAS CREEK

Near Quemado, Texas

DESCRIPTION: For power generation and irrigation use water is diverted into the Maverick Canal from the Rio Grande at a point 17.4 river miles below the international bridge between Del Rio, Texas and Villa Acuña, Coahuila, and 711.0 river miles below the American Dam at El Paso, Texas. The water-stage recorder is located about 400 feet above the Las Moras Creek siphon. Meter measurements are made from a gate structure about 550 feet above the siphon, and 15.4 canal miles below the diversion point. The zero of the gage is 796.82 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 24 meter measurements and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 21, 1949 through December 1950.

REMARKS: Water to irrigate about 1,030 acres of land was diverted from this canal above this gaging station and 8,065 acres of land were irrigated from this canal between this station and the power plant, 16.4 canal miles downstream, where a part of the water returns to the Rio Grande.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 1.540 second-feet on ‡ June 8, 1950. Min., 1,060 second-feet on August 7, 1949.

Average Flow in Second-Feet

Daily:	Max.	* 1,530	Aug. 31, 1950	Min.	1,140	Aug. 7, 1949
Monthly:	Max.	1,450	June 1950	Min.	* 1,260	July 1949

Mean Daily Discharge in Second-Feet 1950 —— Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,350	1,390	1,410	1,400	1,310	1,420	1,420	1,500	* 1,510	¤ 1,480	1,360	*1,280
2	1,360	1,400	1,390	1,410	1,270	1,410	1,420	1,500	1,480	¤ 1,460	1,350	1,280
3	1,350	1,400	1,380	1,390	1,250	1,410	1,410	1,500	1,450	¤ 1,510	1,340	1,280
4	1,360	1,390	1,420	1,390	1,230	1,400	* 1,400	1,490	1,410	1,470	1,340	1,280
5	1,360	1,390	1,390	1,380	1,240	1,400	* 1,350	1,480	1,390	¤ 1,460	1,330	1,280
6	1,270	1,400	1,360	1,360	1,230	1,380	1,300	1,480	1,370	¤ 1,460	1,340	1,300
7	1,370	1,390	1,370	1,350	1,210	1,460	1,270	1,480	1,440	¤ 1,430	1,330	1,310
8	1,370	1,370	1,350	1,340	1,200	1,500	1,260	1,480	1,420	¤ 1,440	1,320	1,320
9	1,380	1,420	1,400	1,310	1,240	1,470	1,280	1,480	1,360	¤ 1,410	1,320	1,340
10	1,360	1,400	1,360	1,280	1,240	1,460	1,260	1,490	1,350	¤ 1,410	1,320	1,350
11	1,340	1,380	1,330	1,390	1,300	1,480	1,250	1,480	1,340	¤ 1,420	1,310	1,350
12	1,340	1,420	1,350	1,340	1,390	1,460	1,380	1,480	1,330	¤ 1,420	1,300	1,350
13	1,340	1,430	1,340	1,340	1,370	1,480	1,450	1,480	1,340	¤ 1,410	1,320	1,370
14	1,330	1,410	1,360	1,320	1,380	1,470	1,400	1,460	1,320	¤ 1,390	1,320	1,370
15	1,340	1,360	1,360	1,320	1,440	1,460	1,460	1,440	1,320	¤ 1,410	1,310	1,420
16	1,280	1,360	1,330	1,370	1,440	1,430	1,490	1,410	1,350	¤ 1,420	1,320	1,420
17	1,310	1,340	1,350	1,450	1,420	1,440	1,510	1,400	1,400	1,410	1,320	1,410
18	1,340	1,360	1,370	1,420	1,420	1,430	1,510	1,400	1,430	1,410	1,330	1,410
19	1,290	1,370	1,370	1,420	1,380	1,420	1,520	1,390	1,400	1,420	1,350	1,430
20	1,290	1,390	1,360	1,360	1,350	1,420	1,520	1,440	1,410	1,400	1,340	1,440
21	1,310	1,370	1,340	1,400	1,400	1,430	1,510	1,420	1,400	1,390	1,300	1,460
22	1,390	1,360	1,350	1,390	1,380	1,450	1,490	1,380	1,440	1,380	1,280	1,460
23	1,390	1,340	1,350	1,380	1,340	1,460	1,480	1,390	1,410	1,390	1,290	1,460
24	1,370	1,340	1,350	1,380	1,340	1,470	1,480	1,370	1,480	1,410	1,290	1,470
25	1,380	1,360	1,330	1,370	1,360	1,480	1,480	1,350	¤ 1,520	1,430	1,290	1,480
26	1,400	1,370	1,310	1,380	1,350	1,480	1,480	1,350	¤ 1,480	1,420	¤1,310	1,470
27	1,370	1,400	1,300	1,340	1,390	1,470	1,480	1,340	¤ 1,520	1,390	¤1,290	1,480
28	1,380	1,410	1,290	1,300	1,420	1,470	1,490	1,360	¤ 1,510	1,370	¤1,290	1,470
29	1,370		1,260	1,290	1,390	1,470	1,490	1,360	¤ 1,500	1,370	¤1,280	1,470
30	1,390		1,310	1,280	1,360	1,450	1,500	1,500	¤ 1,500	1,390	¤1,280	1,480
31	1,380		1,420		1,420		1,500	* 1,530		1,370		1,490
Sum	41,860	38,720	41,960	40,850	41,460	43,430	44,240	44,610	* 42,580	*43,950	39,470	43,180

Month	Current Year 1950: Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period July 1949-1950: Acre-Feet Normal	Maximum	Minimum
Jan.	9.92	9.35	26	1,400	6	1,250	1,350	83,000			
Feb.	10.02	9.63	12	1,440	24	1,330	1,380	76,800			
Mar.	9.92	9.19	‡ 4	1,430	29	1,240	1,350	83,200			
Apr.	10.12	8.97	19	1,480	10	1,170	1,360	81,000			
May	10.00	8.82	‡15	1,450	‡ 8	1,150	1,340	82,200			
June	10.19	9.68	8	1,540	6	1,370	1,450	86,100			
July	10.09	8.55	20	1,540	11	1,230	1,430	87,800	* 82,750	87,800	* 77,700
Aug	9.97	8.93	‡30	1,530	27	1,330	1,440	88,500	* 85,950	88,500	* 83,400
Sept.		8.94	‡25	ϕ¤1,520	15	1,300	*1,420	* 84,500	* 83,500	* 84,500	82,500
Oct.			3	ϕ¤1,510	‡28	ϕ 1,370	*1,420	* 87,200	* 86,650	* 87,200	86,100
Nov.	9.58		1	1,360	‡22	ϕ 1,280	1,320	78,300	80,550	82,800	78,300
Dec.	10.00	9.06	31	1,500	4	1,260	1,390	85,600	85,250	85,600	84,900
Yearly				1,540		1,150	1,390	1,004,200			

¤ Estimated * Partly estimated ‡ And other days . ϕ Mean daily

DIVERSIONS FROM THE RIO GRANDE INTO THE MAVERICK CANAL AT LAS MORAS CREEK

Near Quemado, Texas

1949

RECORDS: Based on 14 meter measurements and a continuous record of gage heights. Computations by shifting channel methods. Record began June 21, 1949.

Mean Daily Discharge in Second-Feet 1949 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1							* 1,220	¤ 1,340	1,400	1,390	1,410	1,370
2							* 1,330	¤ 1,340	1,380	1,390	1,420	1,370
3							* 1,350	* 1,360	1,380	1,400	1,420	1,420
4							* 1,320	1,370	1,380	1,400	1,410	1,430
5							* 1,300	1,370	1,370	1,400	1,400	1,430
6							* 1,270	1,370	1,350	1,390	1,410	1,430
7							* 1,240	1,140	1,340	1,410	1,400	1,410
8							* 1,240	1,280	1,360	1,400	1,400	1,400
9							* 1,240	1,340	1,340	1,400	1,390	1,400
10							¤ 1,220	* 1,310	1,320	1,390	1,380	1,360
11							¤ 1,220	* 1,360	1,350	1,400	1,390	1,390
12							* 1,180	1,390	1,350	1,420	1,390	1,410
13							* 1,180	1,350	1,410	1,410	1,400	1,390
14							* 1,180	* 1,330	1,420	1,400	1,390	1,400
15							* 1,210	¤ 1,330	1,420	1,400	1,390	1,380
16							* 1,210	* 1,370	1,380	1,400	1,390	1,380
17							* 1,220	1,350	1,400	1,400	1,380	1,370
18							* 1,210	¤ 1,380	1,400	1,400	1,400	1,380
19							* 1,220	* 1,370	1,400	1,390	1,380	1,370
20							* 1,200	1,380	1,390	1,400	1,390	1,370
21						* 1,320	* 1,220	1,390	1,430	1,400	1,390	1,360
22						* 1,290	1,240	1,390	1,420	1,400	1,380	1,360
23						* 1,260	1,230	1,390	1,420	1,410	1,380	1,360
24						* 1,250	1,270	1,380	1,400	1,430	1,390	1,360
25						* 1,280	1,310	* 1,380	1,400	* 1,450	1,380	1,360
26						* 1,320	1,380	* 1,390	1,400	* 1,420	1,380	1,360
27						* 1,310	1,290	1,400	1,400	1,390	1,380	1,360
28						* 1,230	1,360	1,390	1,400	1,370	1,380	1,360
29						* 1,230	1,410	1,390	1,380	1,390	1,370	1,370
30						* 1,230	1,350	1,370	1,380	1,380	1,370	1,350
31							* 1,340	1,370		1,390		1,360
Sum							*39,160	*42,070	41,570	43,420	41,740	42,820

Month	Current Year 1949								Period		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Normal	Maximum	Minimum
Jan.											
Feb.											
Mar.											
Apr.											
May											
June											
July	9.98	8.87	29	1,450	13	* 1,160	* 1,260	* 77,700			
Aug	9.88	8.55	‡13	1,400	7	1,060	* 1,360	* 83,400			
Sept.	9.97	9.47	‡15	1,450	10	1,320	1,390	82,500			
Oct.	10.02	9.64	25	1,460	28	1,360	1,400	86,100			
Nov.	9.90	9.61	3	1,430	19	1,360	1,390	82,800			
Dec.	9.96	9.62	5	1,440	30	1,330	1,380	84,900			
Yearly											

¤ Estimated * Partly estimated ‡ And other days

DIVERSIONS FROM THE RIO GRANDE INTO THE MAVERICK CANAL EXTENSION BELOW THE POWER PLANT

Near Eagle Pass, Texas

DESCRIPTION: The main Maverick Canal divides into two branches at a point about 31.8 canal miles below the point at which water from the Rio Grande is diverted. One branch leads to the power plant and back to the Rio Grande. The other branch forms the Maverick Canal Extension which is used to transmit irrigation water. The water-stage recorder is located at a wood pile bridge about 1 mile below the heading of this canal extension. Meter measurements are made from the bridge.

RECORDS: Based on 26 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1, 1939 through December 1950.

REMARKS: Irrigation from this canal extension began in June 1938, and in 1950, 23,773 acres of land were irrigated north and south of Eagle Pass. Some water from this canal extension returns to the river below the power plant.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 394 second-feet on December 15, 1950. Min., sometimes dry.

			Average Flow in Second-Feet				
Daily:	Max.	355	Dec. 19, 1950	Min.		sometimes dry	
Monthly:	Max.	329	Dec. 1950	Min.	# 18.7	March	1939
Yearly:	Max.	244	1950	Min.	62.1		1939

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	141	244	237	300	270	124	263	244	173	178	292	307
2	142	245	248	307	267	120	273	242	172	198	283	309
3	138	243	256	301	266	121	274	234	172	234	297	313
4	145	234	265	296	264	120	281	215	191	229	306	314
5	169	208	261	293	270	122	296	216	203	244	298	312
6	158	218	261	302	267	120	306	211	203	251	286	340
7	164	220	272	306	264	125	305	214	204	247	288	337
8	171	226	267	300	265	123	305	214	205	248	301	337
9	180	222	267	303	265	126	300	212	202	252	295	332
10	178	226	260	305	263	126	292	210	204	260	295	342
11	190	225	263	306	* 168	127	288	212	212	260	297	352
12	197	226	264	311	* 80.9	126	288	215	227	259	295	332
13	198	232	261	311	* 109	173	272	215	239	262	287	352
14	198	227	261	285	165	211	226	204	251	277	298	344
15	198	228	256	257	169	198	172	197	253	307	299	336
16	197	230	260	235	168	185	202	192	260	296	286	301
17	201	227	265	245	167	201	209	187	258	290	297	344
18	198	236	265	236	163	226	211	195	260	292	311	349
19	200	242	268	246	167	245	212	197	256	302	318	355
20	201	243	268	246	166	275	212	206	261	301	319	333
21	202	233	257	255	167	276	212	199	262	299	308	326
22	204	224	262	251	164	249	210	197	262	301	261	338
23	205	219	266	256	164	209	223	201	262	310	320	320
24	207	233	263	255	165	222	222	195	242	306	313	297
25	228	231	268	253	166	237	218	198	197	308	313	293
26	231	221	272	251	168	256	222	221	172	305	314	307
27	242	229	283	252	166	271	230	232	177	295	318	328
28	248	233	283	257	168	271	239	216	177	290	301	334
29	244		291	264	167	274	239	193	177	293	298	343
30	246		301	261	166	268	238	188	181	299	307	334
31	243		308		184		240	178		321		345
Sum	6,064	6,425	8,279	8,246	6,028.9	5,727	7,680	6,450	6,515	8,514	9,001	10,206

Month	1924-50 Average Rainfall Inches **	Current Year 1950 Average Rainfall Inches **	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1939-1950 Acre-Feet Normal	Maximum	Minimum
Jan.	.96	.22	28	258	6	133	196	12,000	8,508	12,000	# 2,140
Feb.	.92	.65	4	258	4	167	229	12,700	7,733	12,700	# 2,120
Mar.	.82	.09	31	313	2	194	267	16,400	8,668	16,400	# 1,150
Apr.	1.59	.58	13	326	29	182	275	16,400	8,544	16,400	3,430
May	3.22	4.34	11	309	‡11	* 80.9	194	12,000	7,078	12,000	2,840
June	2.40	1.95	22	293	‡ 2	117	191	11,400	7,641	11,400	3,750
July	1.77	1.30	9	326	15	164	248	15,200	9,313	15,200	4,510
Aug.	1.86	2.80	3	251	17	157	208	12,800	8,512	13,100	3,480
Sept.	2.86	2.24	24	284	25	142	217	12,900	8,120	12,900	4,600
Oct.	1.65	.03	31	337	1	160	275	16,900	9,443	16,900	5,130
Nov.	.70	.02	30	359	‡ 5	165	300	17,900	9,996	17,900	4,170
Dec.	1.10	0	15	394	5	182	329	20,200	10,558	20,200	4,280
Yearly	19.85	14.22		394		* 80.9	244	176,800	104,114	176,800	44,950

Estimated * Partly estimated ‡ And other days ** On the U.S. side from Quemado to El Indio, Texas.

DIVERSIONS FROM THE RIO GRANDE ON THE UNITED STATES SIDE BELOW RIO GRANDE CITY, TEXAS

The total diversion of 1,489,800 acre-feet to this area was made almost entirely by pumping from the river to irrigate 602,380 acres. Diversions were actually measured for 92% of the acreage. Diversions to the remainder were estimated. Measurements in general were made by Venturi Meters, by open channel rating stations, and Deflection Meters developed by this Commission, although a small part was measured by plant efficiency and power input. There is some re-use of drainage water within the area. Drainage water which escapes from the area does not return to the Rio Grande. In addition to the irrigated area, there were 43,948 acres of dry-farmed land within the area. More than one crop per year is often grown on some of the land.

Average Flow in Second-Feet

Daily ⊕:	Max.	4,510	July 19, 1950	Min.	0	Sept. 25, 1949
Monthly:	Max.	3,660	June 1949	Min.	25.2	June 1930
Yearly:	Max.	2,060	1950	Min.	653	1941

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	287	2,740	2,360	1,650	1,680	2,130	2,450	3,090	1,740	1,730	2,700	2,140
2	709	2,680	1,800	1,680	1,730	1,180	2,420	2,790	1,810	2,770	2,490	1,910
3	1,260	1,830	1,580	2,550	1,700	624	2,760	2,750	1,960	1,900	2,240	1,600
4	1,430	1,080	1,110	2,130	1,640	244	2,490	2,940	2,730	849	1,720	2,080
5	782	1,240	547	1,650	1,530	623	2,800	2,380	3,280	1,020	1,470	1,900
6	873	2,680	622	1,330	1,470	305	2,160	2,130	3,420	1,180	2,350	936
7	910	2,900	1,180	1,460	1,400	920	1,690	3,150	3,270	1,040	2,320	818
8	422	2,840	1,150	1,480	1,390	919	1,870	3,020	3,120	883	2,160	1,740
9	1,630	2,720	933	1,480	1,130	1,230	1,670	3,120	2,240	1,670	2,070	2,190
10	2,260	2,630	714	1,760	1,390	1,390	1,660	2,910	1,690	1,890	1,680	1,920
11	2,200	2,050	546	1,890	1,910	1,240	1,380	2,640	2,880	1,870	575	1,840
12	2,100	1,600	370	2,030	1,830	1,770	1,340	2,000	2,700	1,770	1,160	1,930
13	1,940	2,660	1,020	1,980	2,280	1,950	1,380	1,400	2,480	1,640	2,060	1,800
14	1,770	2,940	1,020	1,840	2,730	2,150	1,410	2,990	2,500	1,260	2,110	1,700
15	1,250	2,860	1,130	1,680	2,820	2,570	1,210	3,270	2,250	1,060	2,300	1,600
16	2,420	2,700	1,340	1,300	2,400	2,830	1,200	3,420	1,880	2,700	2,240	1,440
17	2,640	2,520	1,140	1,580	2,020	2,700	2,860	3,200	1,400	2,980	2,060	1,290
18	2,700	2,130	634	1,700	2,230	2,560	4,230	2,730	2,130	2,600	1,830	1,890
19	2,600	2,030	597	1,740	2,470	3,450	4,510	2,020	1,300	2,270	1,770	1,850
20	2,510	3,040	1,960	1,800	2,330	3,500	4,440	2,080	1,870	2,400	1,930	1,880
21	2,070	2,600	2,000	2,270	1,340	2,940	4,400	2,910	1,760	2,140	1,950	1,780
22	1,650	2,510	1,850	1,990	1,570	2,580	3,730	2,720	1,680	1,760	1,860	1,480
23	2,850	2,530	2,000	2,010	1,630	2,760	2,680	2,610	458	3,180	1,830	1,200
24	2,810	2,530	2,170	2,530	1,640	4,010	3,290	2,520	782	3,020	1,950	1,100
25	2,780	1,920	1,740	2,640	1,760	4,160	3,420	2,290	1,880	2,660	1,730	1,180
26	2,820	1,490	1,430	2,870	1,790	4,390	3,020	1,560	2,730	2,570	1,480	2,040
27	2,260	2,840	2,570	2,700	1,670	4,100	3,080	1,600	2,960	2,320	1,930	1,910
28	1,900	2,610	2,800	2,550	1,160	3,800	3,220	2,590	2,880	1,350	2,150	1,750
29	1,790		2,500	1,970	1,520	3,550	2,620	2,590	2,930	1,310	1,970	1,700
30	2,720		2,280	1,460	1,540	2,960	2,140	2,070	2,270	2,510	2,020	1,610
31	2,640		2,170		1,770		2,960	1,720		2,580		1,270
Sum	58,983	66,900	45,263	57,700	55,470	69,535	80,490	79,210	66,980	60,882	58,105	51,474

Month	1922-1950 Average Rainfall Inches	**	Current Year 1950 ϕ Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period 1922-1950 Acre-Feet Normal	Maximum	Minimum	Acre-Feet Normal 1938-1950
Jan.	1.50	.50	23	2,850	1	287	1,900	117,000	44,338	117,000	7,700	51,829
Feb.	1.06	.35	20	3,040	4	1,080	2,390	133,000	63,842	134,000	6,960	67,051
Mar.	1.18	1.43	28	2,800	12	370	1,460	89,800	85,797	156,000	14,100	89,571
Apr.	1.33	1.11	26	2,870	16	1,300	1,920	114,000	75,953	125,000	29,300	87,910
May	3.39	3.23	15	2,820	9	1,130	1,790	110,000	70,304	135,000	4,510	84,946
June	2.68	2.51	26	4,390	4	244	2,320	138,000	70,611	218,000	1,500	92,237
July	1.85	.24	19	4,510	16	1,200	2,600	160,000	75,992	161,000	10,000	114,362
Aug.	2.15	.43	16	3,420	13	1,400	2,560	157,000	81,212	157,000	19,100	104,258
Sept.	4.58	1.62	6	3,420	23	458	2,230	133,000	59,493	133,000	8,020	79,804
Oct.	2.19	2.13	23	3,180	4	849	1,960	121,000	62,262	131,000	21,400	78,130
Nov.	1.22	.61	1	2,700	11	575	1,940	115,000	63,153	128,000	11,500	88,782
Dec.	1.68	0	9	2,190	7	818	1,660	102,000	49,017	124,000	10,400	74,282
Yearly	24.81	14.16		4,510		244	2,060	1,489,800	801,974	1,489,800	472,500	1,013,162

** Lower Rio Grande area on U. S. Side from Rio Grande City to the Gulf of Mexico. ϕ Mean daily
⊕ Period 1938-1950

DIVERSIONS FROM THE RIO GRANDE INTO THE RETAMAL CANAL

Near Río Bravo, Tamaulipas

DESCRIPTION: Water-stage recorder and cable with car located .87 mile below head gate. The head gate is about 1,000 feet from the Rio Grande. This canal diverts from the Rio Grande at a point about 24 river miles below the Hidalgo-Reynosa Bridge near Hidalgo, Texas, and 1,108.8 river miles below the American Dam at El Paso, Texas. The zero of the gage is .85 foot above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 157 meter measurements during the year. Computations by shifting channel methods. Records available: September 1939 through December 1950.

REMARKS: Retamal Canal has a capacity of about 7,000 second-feet. It empties into Culebrón Reservoir, which in turn discharges into Villa Cárdenas Reservoir from which a canal leads to Palito Blanco Reservoir. These reservoirs are used for irrigation purposes. During Rio Grande floods, floodwater may escape from Villa Cárdenas via Floodway No. 1 to the Gulf of Mexico. No use was made of this floodway in 1950 due to lack of floodwater. In 1950, 123,552 acres with irrigation facilities were cultivated under Retamal Canal, of which 93,652 acres were irrigated with 91,980 acre-feet of water.

COMPARATIVE FLOWS FROM RECORDS: Momentary Peak: Max. 6,990 second-feet on September 12, 1944, with a gage height of 76.31 feet. Min. Sometimes dry.

Average Flow in Second-Feet

Daily:	Max.	6,920	Sept. 12, 1944	Min.		sometimes dry
Monthly:	Max.	3,280	Sept. 1944	Min.		sometimes dry
Yearly:	Max.	769	1949	Min.	212	1950

Mean Daily Discharge in Second-Feet 1950 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	239	84.8	80.9	13.4	15.9	1,170	9.2	150	0	1,550	15.2	5.3
2	239	84.4	83.0	16.6	19.8	731	76.6	94.3	31.8	918	8.1	4.2
3	213	92.5	98.2	20.5	15.2	646	81.2	74.9	106	699	2.8	4.2
4	223	136	157	16.6	9.2	1,490	43.1	78.4	106	674	3.2	10.9
5	313	193	213	15.9	6.0	1,820	15.2	158	253	611	9.5	9.9
6	385	173	234	14.8	7.1	1,330	7.8	307	271	536	28.3	7.4
7	374	101	220	14.8	9.5	897	0	364	174	452	10.9	46.6
8	357	76.6	166	19.8	29.3	749	0	752	85.1	582	6.7	65.7
9	323	71.3	136	39.6	42.7	766	0	869	35.3	830	4.2	23.3
10	212	75.2	121	37.8	47.3	572	0	671	61.4	830	2.5	7.8
11	147	78.4	132	35.3	23.3	477	0	470	36.4	695	3.2	7.1
12	164	121	140	26.8	6.4	374	0	374	18.4	526	38.8	7.1
13	176	177	143	15.2	4.2	249	0	349	33.2	417	34.3	5.7
14	176	132	142	11.3	23.3	127	0	292	50.1	364	12.4	6.4
15	164	93.2	155	7.4	6.4	79.8	0	172	20.0	345	8.5	10.9
16	164	76.3	149	14.1	12.7	92.2	0	135	12.4	290	6.4	24.0
17	110	66.4	106	35.0	77.7	207	509	97.8	7.0	205	5.3	41.7
18	90.8	75.2	95.3	20.8	357	167	1,290	85.5	4.9	160	5.3	47.7
19	84.8	129	125	24.4	151	120	1,040	* 83.3	3.2	146	5.3	17.0
20	121	148	110	31.8	157	57.2	872	‡ 140	2.8	115	14.1	11.7
21	143	102	66.4	353	164	13.8	742	* 146	1.8	85.5	95.0	13.1
22	192	85.5	52.3	639	494	8.1	600	59.0	1.4	96.4	22.6	41.7
23	218	79.5	37.8	448	862	207	494	11.3	2.1	85.8	21.9	75.6
24	141	81.6	29.7	253	699	319	547	5.7	77.3	27.5	36.4	85.1
25	108	88.6	26.8	142	561	452	668	2.5	113	12.7	32.5	96.8
26	117	132	34.6	103	470	385	671	1.4	885	7.1	37.8	75.9
27	134	156	46.6	68.5	392	217	561	11.3	688	3.9	46.3	49.4
28	160	101	33.2	31.1	274	95.0	459	5.7	1,600	3.9	28.3	32.1
29	197		22.6	10.9	1,830	23.7	351	.7	2,150	19.8	10.9	40.6
30	167		18.7	9.9	2,810	9.9	301	0	2,140	32.8	6.7	37.8
31	108		16.6		1,950		234	0		15.5		34.6
Sum	5,960.6	3,010.5	3,191.7	2,490.3	11,527	13,851.7	9,572.1	5,960.8	8,970.6	11,335.9	563.4	947.3

Month	1940-50 Average Rainfall Inches	Current Year 1950 Rainfall Inches **	Extreme Second-Feet High Day	High	Low Day	Low	Average Second-Feet	Total Acre-Feet	Period Sept. 1939-1950 Acre-Feet Normal	Maximum	Minimum
Jan.	1.65	.38	6	403	19	84.8	192	11,820	14,515	25,790	2,090
Feb.	1.07	.34	6	211	9	63.6	108	5,970	11,533	38,200	85.1
Mar.	1.30	1.14	6	420	31	14.1	103	6,330	12,258	54,110	0
Apr.	1.38	1.10	22	685	#	1.4	83.0	4,940	16,351	98,580	0
May	3.38	1.44	30	3,070	13	3.2	372	22,860	27,549	82,980	4,490
June	2.66	2.80	5	1,890	22	6.7	462	27,470	31,391	82,400	1,590
July	1.29	1.18	18	1,450	#	0	309	18,990	27,594	110,700	360
Aug.	2.82	.93	9	886	#	0	192	11,820	33,411	96,180	138
Sept.	3.57	1.92	29	2,210	1	0	299	17,790	63,187	195,100	0
Oct.	2.46	3.17	1	1,880	28	3.5	366	22,480	58,828	124,600	14,160
Nov.	.91	.64	21	107	10	2.1	18.8	1,120	16,808	32,300	1,120
Dec.	1.42	.01	25	100	2	3.2	30.6	1,880	12,940	21,080	1,880
Yearly	23.91	15.05		3,070		0	212	153,470	326,365	556,590	153,470

‡ Estimated * Partly Estimated ** Mean Rainfall from Reynosa to Matamoros # Various days of the month

MUNICIPAL WATER USES

In Acre-Feet

Tabulated below are yearly and monthly amounts of water pumped from the Rio Grande or tributaries into the municipal distribution systems of several towns along the border. The municipal and industrial water supply for the El Paso area in Texas and Juárez in Chihuahua came from wells prior to November 7, 1943, when the City of El Paso began diverting some water from the Rio Grande for municipal use as shown in the table below. The Del Rio water comes from San Felipe Springs, the Eagle Pass water comes from infiltration wells in or adjacent to the bed of the Rio Grande, the Guerrero water comes from the Río Salado, and the others from the Rio Grande. Because of changing conditions, the period records are limited here to the past ten years.

The population figures shown below are the 1950 census figures (of both nations).

In The United States

Month	El Paso (Pop. 130,003)				Del Rio (Pop. 14,191)			
	1950	Period Nov. 1943-1950			1950	Period 1941-1950		
		Average	Maximum	Minimum		Normal	Maximum	Minimum
Jan.	0	41.7	150.3	0	148.9	105.3	148.9	72.0
Feb.	0	199.1	651.6	0	156.5	108.3	156.5	64.5
Mar.	116.3	399.5	812.8	63.4	185.2	155.0	211.9	89.7
Apr.	854.8	585.1	854.8	363.6	246.6	170.0	246.8	118.4
May	959.2	641.7	959.2	430.3	251.3	194.4	259.1	130.8
June	1,093.6	757.1	1,093.6	536.3	268.5	226.4	305.0	163.6
July	871.2	755.6	977.0	538.1	331.2	256.6	358.6	172.3
Aug.	1,128.5	751.1	1,128.5	514.4	356.9	252.2	356.9	180.3
Sept.	939.5	617.2	939.5	207.7	255.8	194.1	255.8	116.5
Oct.	915.0	548.4	915.0	193.4	229.6	146.5	232.9	84.8
Nov.	789.9	381.1	789.9	0	190.9	134.3	214.8	85.4
Dec.	952.8	428.9	952.8	0	184.2	117.7	184.2	78.5
Yearly	8,620.8	6,106.5	8,620.8	4,049.5	2,805.6	2,060.8	2,805.6	1,407.3

Month	Eagle Pass (Pop. 7,247)				Laredo (Pop. 51,694)			
	1950	Period 1941-1950			1950	Period 1941-1950		
		Normal	Maximum	Minimum		Normal	Maximum	Minimum
Jan.	61.3	55.1	63.5	44.9	369.2	301.4	370.1	148.2
Feb.	52.1	54.9	62.7	46.5	352.0	300.7	366.4	188.0
Mar.	75.1	71.8	90.5	54.5	449.9	393.6	473.8	162.4
Apr.	75.7	72.8	92.6	62.4	502.3	420.0	544.3	145.5
May	70.2	72.8	90.0	55.0	526.4	470.3	607.0	194.6
June	86.8	84.3	108.0	40.0	587.8	511.2	660.7	199.7
July	103.7	104.1	120.5	92.8	685.0	553.9	685.0	209.1
Aug.	91.4	98.8	131.3	75.4	705.7	561.6	705.7	285.3
Sept.	74.9	78.2	90.7	49.6	590.8	452.0	601.1	274.6
Oct.	81.1	65.2	92.1	41.0	582.9	415.4	582.9	207.6
Nov.	66.8	61.1	99.9	47.8	427.1	363.8	427.1	213.8
Dec.	59.9	57.9	70.4	46.2	405.1	326.6	405.1	197.7
Yearly	899.0	877.0	1,023.7	771.5	6,184.2	5,070.5	6,184.2	2,450.6

Month	Roma (Pop. 1,575)*				Rio Grande City (Pop. 3,900)				Brownsville (Pop. 36,176)			
	1950	Period 1941-1950			1950	Period 1941-1950			1950	Period 1941-1950		
		Normal	Maximum	Minimum		Normal	Maximum	Minimum		Normal	Maximum	Minimum
Jan.	9.4	6.0	14.3	2.4	40.8	24.7	40.8	14.7	489.7	238.3	489.7	112.1
Feb.	9.9	6.2	12.9	2.4	33.2	22.5	33.2	14.8	294.7	229.2	494.7	99.4
Mar.	13.0	7.0	13.0	2.0	35.0	28.2	35.4	19.9	510.3	255.2	510.3	111.4
Apr.	10.4	7.2	10.7	2.9	38.7	31.0	38.7	18.8	549.7	277.5	549.7	123.2
May	16.1	8.5	16.1	2.2	40.6	33.7	40.6	21.1	568.9	305.0	568.9	120.7
June	16.6	8.9	16.6	2.2	41.6	31.9	41.6	19.4	545.3	312.8	561.0	113.8
July	17.9	9.6	17.9	3.0	58.0	37.4	58.0	17.1	676.0	365.6	676.0	147.5
Aug.	17.4	9.0	17.4	3.5	70.4	40.8	70.4	18.5	664.6	350.4	664.6	162.3
Sept.	15.3	7.8	15.3	2.5	69.6	35.8	69.6	17.1	645.8	305.5	645.8	115.6
Oct.	13.7	7.2	13.7	3.0	58.3	33.1	58.3	19.0	569.2	289.8	569.2	118.6
Nov.	12.8	6.4	12.8	2.6	51.7	29.6	51.7	15.9	490.3	274.0	491.0	114.2
Dec.	12.5	5.8	12.5	2.3	67.9	28.9	67.9	13.9	509.9	266.0	509.9	108.2
Yearly	165.0	89.6	165.0	44.3	605.8	377.6	605.8	218.0	6,714.4	3,469.3	6,714.4	1,503.9

In Mexico

Month	Nuevo Laredo (Pop. 59,274)				Guerrero (Pop. 1,995)				Matamoros (Pop. 42,897)			
	1950	Period 1941-1950			1950	Period 1943-1950			1950	Period 1942-1950		
		Normal	Maximum	Minimum		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	269.2	169.8	269.2	101.0	4.8	4.9	5.5	4.3	121.8	85.8	121.8	‡ 68.4
Feb.	252.8	165.3	252.8	97.5	4.5	4.6	5.2	4.3	112.0	79.9	112.0	64.0
Mar.	339.9	215.0	339.9	108.6	5.3	5.5	6.3	5.0	122.3	90.3	122.3	‡ 68.5
Apr.	362.0	230.4	362.0	132.7	5.3	6.3	7.3	5.3	118.0	89.0	118.0	‡ 68.4
May	386.3	254.0	386.3	122.8	5.8	7.3	8.0	5.8	126.6	94.7	126.6	‡ 68.4
June	395.5	260.4	395.5	134.2	6.8	7.9	8.5	6.8	123.6	93.8	123.6	‡ 68.5
July	425.5	285.9	425.5	115.2	7.8	9.0	10.1	7.8	124.8	97.4	124.8	‡ 68.4
Aug.	440.5	293.9	440.5	157.2	9.6	10.2	11.3	9.6	125.7	98.8	128.5	‡ 68.4
Sept.	408.0	247.5	408.0	123.1	9.2	8.5	9.2	7.3	131.5	93.5	131.5	‡ 68.5
Oct.	375.0	237.8	375.0	133.7	8.9	8.2	8.9	6.5	139.0	98.5	139.0	‡ 68.4
Nov.	355.6	210.8	355.6	121.5	7.0	6.6	7.3	4.9	136.9	90.7	136.9	66.8
Dec.	339.1	194.1	339.1	99.7	5.5	5.5	6.3	5.0	138.6	90.1	138.6	70.0
Yearly	4,349.4	2,764.9	4,349.4	1,504.7	80.5	84.5	87.5	80.5	1,520.8	1,102.5	1,520.8	‡ 821.1

‡ Estimated * Population figure includes Los Saenz. In addition to Roma and Los Saenz, Escobares (250 population) and Cd. Miguel Alemán in Mexico (formerly San Pedro de Roma, 2,032 population) are served by this system.

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES AND DIVERSIONS

At each station several water samples were taken each month by one of four methods:

A. By lowering an open small-necked bottle in one or more verticals in the stream cross section, being careful to approach but not to strike bottom, thus securing an integrated sample at all depths. A monthly composite sample was later made by using from each sample a quantity proportional to the river flow volume represented by each sample. The gravimetric percentage of silt in this composite represented that in the monthly river flow.

B. By obtaining one depth integrated sample, with an U.S.-D43 sampler, at each of three verticals spaced at 1/6, 1/2 and 5/6 of the stream width. The gravimetric percentage of silt for each measurement was computed by weighting the percentage of silt represented by each of the three samples by the partial flow in its section of the stream. These measurements were plotted on the station gage-height hydrograph from which a silt concentration graph was then drawn between plotted points. From this graph mean daily silt concentrations were then determined.

C. By sampling at the stream surface, with a separate bottle at each of three points spaced 1/6, 1/2 and 5/6 of the stream width. A coefficient of 1.10 was then applied to the average gravimetric percentage of silt in the three bottles, and this product was then applied to the volume of stream flow represented by that set of samples.

D. By dipping near the surface with a small-necked bottle in turbulent water at the head gate of the Maverick Canal. The gravimetric percentage of silt in each weekly sample was then applied to the volume of canal flow represented by that sample. The flows represented by each sample were determined on the basis of Rio Grande stages at Del Rio.

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

CORRECTION: See page 108.

Rio Grande at El Paso, Texas

Period September 1947-1950

Month	1950 Tons Water	1950 Tons Silt	1950 Number of Samples	1950 Gravimetric Percentages Average	1950 Gravimetric Percentages Maximum Sample	1950 Gravimetric Percentages Minimum Sample	1950 Acre-Feet at 1,452 Tons Per Acre-Foot	Period of Record Acre-Feet at 1,452 Tons Per Acre-Foot Average	Period of Record Maximum	Period of Record Minimum
Jan.	13,360,000	784	31	.005865			.54	.73	1.4	.25
Feb.	13,826,000	3,210	28	.02325			2.2	1.13	2.2	.33
Mar.	65,297,000	49,000	31	.07504			33.7	17.4	33.7	4.9
Apr.	78,401,000	39,300	29	.05016			27.1	29.2	33.5	26.9
May	77,010,000	29,300	31	.03811			20.2	32.3	63.3	13.3
June	80,957,000	221,000	30	.2727			152	71.4	152	14.2
July	106,555,000	180,000	31	.1689			124	70.0	124	38.5
Aug.	93,505,000	75,100	31	.08037			51.7	42.6	56.8	19.4
Sept.	60,507,000	19,100	30	.03159			13.2	38.0	92.3	13.2
Oct.	24,897,000	17,100	28	.06877			11.8	4.4	11.8	1.0
Nov.	14,867,000	457	30	.003071			.31	.98	1.5	.31
Dec.	13,187,000	179	31	.001357			.12	.87	2.1	.12
Yearly	642,369,000	634,530	361	.09876			436.87	309.01	436.87	225.57

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

Río Conchos at Cuchillo Parado, Chihuahua

Period 1945-1950

Jan.	65,562,000	0	14	0	0	0	0	0	0	0
Feb.	64,458,000	0	12	0	0	0	0	.67	4.0	0
Mar.	66,334,000	0	14	0	0	0	0	0	0	0
Apr.	27,497,000	0	12	0	0	0	0	0	0	0
May	30,561,000	0	13	0	0	0	0	8.5	28.2	0
June	59,844,000	75,000	13	.1253	.5736	0	51.7	30.6	126	0
July	133,796,000	1,069,000	17	.7993	1.8879	0	736	442	890	0
Aug.	84,245,000	514,000	14	.6101	2.0513	0	354	327	948	4.8
Sept.	111,789,000	828,000	14	.7410	1.4692	.0099	570	502	1,190	.32
Oct.	86,772,000	510,000	13	.5877	2.6341	0	351	301	997	0
Nov.	58,336,000	233	14	.0004	.0028	0	.16	.63	3.6	0
Dec.	52,139,000	1,200	4	.0023	.0039	0	.83	.14	0	0
Yearly	841,333,000	2,997,433	154	.3564	2.6341	0	2,063.69	1,612.54	2,590.4	229.8

Samples and Analyses by Mexican Section, Method C.

Rio Grande at Lower Presidio Station –1949

Jan.										
Feb.										
Mar.										
Apr.										
May										
June										
July										
Aug.										
Sept.										
Oct.	127,091,000	147,000	17	.1158	.2214	.00715	101			
Nov.	103,099,000	16,400	12	.0159	.0386	.00294	11.3			
Dec.	76,180,000	6,410	13	.00842	.0113	.00416	4.4			
Yearly										

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

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES AND DIVERSIONS

Month	1950							Period of Record		
	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre-Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Rio Grande at Lower Presidio Station										Period October 1949-1950
Jan.	83,755,000	15,000	13	.0179	.0280	.00443	10.3			
Feb.	70,902,000	13,600	9	.0192	.0346	.0109	9.4			
Mar.	67,060,000	21,200	5	.0316	.0776	.00190	14.6			
Apr.	23,970,000	1,760	5	.00736	.0139	.00556	1.2			
May	26,097,000	2,440	4	.00935	.00886	.00542	1.7			
June	62,165,000	171,000	11	.2746	.7729	.00995	118			
July	170,704,000	1,673,000	10	.9799	1.4805	.00908	1,150			
Aug.	107,242,000	735,000	10	.6851	1.6534	.0134	506			
Sept.	153,503,000	2,084,000	13	1.3579	1.9005	.0211	1,440			
Oct.	127,050,000	739,000	13	.5813	1.1540	.0256	509	305	509	101
Nov.	63,475,000	19,000	4	.0290	.0362	.0239	13.1	12.2	13.1	11.3
Dec.	59,073,000	11,100	5	.0188	.0273	.0127	7.6	7.6	7.6	4.4
Yearly	1,016,996,000	5,486,100	102	.5394			3,780.9			

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

Rio Grade at Langtry, Texas										Period April 1944-1950
Jan.	107,854,000	14,600	5	.01358			10.1	8.6	11.4	2.9
Feb.	95,023,000	8,450	8	.008889			5.8	11.0	36.9	3.3
Mar.	100,293,000	14,300	9	.01429			9.8	9.4	27.0	2.7
Apr.	53,075,000	7,370	9	.01388			5.1	21.2	66.4	1.1
May	62,850,000	66,900	9	.1064			46.1	128	448	3.7
June	131,530,000	1,773,000	9	1.3478			1,220	460	1,220	2.8
July	248,698,000	3,498,000	10	1.4066			2,410	1,409	4,483	60.9
Aug.	210,384,000	1,944,000	9	.9238			1,340	1,114	3,130	4.7
Sept.	275,628,000	2,422,000	10	.8789			1,670	1,797	3,280	82.6
Oct.	183,953,000	806,000	7	.4380			555	1,118	3,261	48.3
Nov.	93,335,000	11,100	8	.01191			7.6	27.5	58.6	7.6
Dec.	89,612,000	5,840	9	.006515			4.0	13.5	46.8	4.0
Yearly	1,652,235,000	10,571,560	102	.6398			7,283.5	6,117.2	8,747.7	1,347.2

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

Pecos River near Comstock, Texas										Period June 1943-1950
Jan.	18,021,000	1,390	15	.007725			.96	.52	.96	.15
Feb.	15,330,000	1,340	14	.008744			.92	.81	2.1	.13
Mar.	15,813,000	783	16	.004952			.54	.70	1.4	.29
Apr.	16,436,000	1,300	15	.007931			.90	6.4	41.7	.19
May	19,759,000	1,900	15	.009631			1.3	5.3	21.7	.54
June	17,201,000	2,170	15	.01262			1.5	4.2	15.7	.62
July	47,967,000	22,500	16	.04695			15.5	21.4	67.1	.19
Aug.	16,589,000	429	15	.002589			.30	2.9	20.0	.18
Sept.	29,313,000	1,580	13	.005393			1.1	2.8	9.4	.15
Oct.	19,921,000	1,260	16	.006330			.87	30.1	176	.22
Nov.	16,430,000	99.8	15	.0006075			.07	.35	1.2	.05
Dec.	18,967,000	10.0	15	.0000529			.01	.54	1.3	.01
Yearly	251,747,000	34,761.8	180	.01382			23.97	76.02	199.36	17.09

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

Maverick Canal at Headgate										
Jan.										
Feb.										
Mar.	113,111,000	7,920	5	.007	.011	.004	5.5			
Apr.	110,119,000	5,510	5	.005	.011	.002	3.8			
May	111,763,000	53,600	4	.048	.089	.008	36.9			
June	117,073,000	588,900	3	.870	.015	.015	406			
July	119,257,000	803,800	5	.674	1.779	.037	554			
Aug.	120,254,000	871,800	4	.725	1.697	.034	600			
Sept.	114,782,000	511,900	5	.446	.967	.008	353			
Oct.	118,475,000	447,800	4	.378	.817	.035	308			
Nov.	106,398,000	20,000	4	.019	.029	.015	13.9			
Dec.	116,399,000	15,100	5	.013	.015	.011	10.4			
Yearly							2,301.5			

Samples and Analyses by Division of Irrigation, Soil Conservation Service, Method D.

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES AND DIVERSIONS

Month	1950							Period of Record		
	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre-Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum

Rio Grande at Eagle Pass, Texas

Period 1934-1950

Jan.	228,270,000	32,700	26	.01433			22.5	23.2	124	.07
Feb.	183,980,000	29,300	23	.01595			20.2	59.8	768	2.6
Mar.	166,943,000	30,400	27	.01822			20.9	28.0	188	3.8
Apr.	116,885,000	29,200	25	.02502			20.1	74.0	466	3.0
May	141,496,000	118,000	27	.08333			81.3	564	4,220	17.7
June	194,817,000	1,208,000	26	.6203			832	1,078	4,340	4.3
July	360,493,000	2,976,000	26	.8256			2,050	1,352	7,840	12.0
Aug.	273,180,000	2,019,000	27	.7389			1,390	1,180	5,310	14.8
Sept.	372,273,000	2,975,000	25	.7992			2,050	2,833	10,800	13.0
Oct.	273,072,000	1,115,000	26	.4084			768	1,139	5,820	24.0
Nov.	136,401,000	20,700	10	.01514			14.3	115	562	12.3
Dec.	137,021,000	23,100	22	.01689			15.9	24.2	84.1	1.1
Yearly	2,584,831,000	10,576,400	290	.4092			7,285.2	8,470.2	20,842.8	1,768.3

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

Río Alamo at Cd. Mier, Tamaulipas

Period 1934-1950

Jan.	627,000	0	5	0	0	0	0	2.8	21.8	0
Feb.	346,000	0	7	0	0	0	0	.42	6.6	0
Mar.	20,000	0	6	0	0	0	0	9.7	91.6	0
Apr.	695,000	386	7	.0556	.0580	0	.27	25.0	227	0
May	4,054,000	20,000	7	.4938	.5200	0	13.8	47.6	230	2.2
June	6,520,000	26,000	6	.3985	.6037	0	17.9	60.8	471	0
July	7,255,000	44,700	8	.6159	.7270	0	30.8	21.2	92.8	0
Aug.	1,427,000	0	7	0	0	0	0	179	1,610	0
Sept.	21,724,000	230,000	9	1.0575	1.3873	0	158	279	2,920	1.5
Oct.	585,000	0	7	0	0	0	0	89.3	558	0
Nov.	166,000	0	8	0	0	0	0	.92	5.2	0
Dec.	228,000	0	7	0	0	0	0	1.3	16.1	0
Yearly	43,647,000	321,086	84	.7350	1.3873	0	220.77	717.04	3,156.57	154.5

Samples and Analyses by Mexican Section, Method C.

Rio Grande at Roma, Texas

Period March 1929-1950

Jan.	230,454,000	21,000	31	.009120			14.5	38.0	169	.41
Feb.	186,056,000	29,300	27	.01573			20.2	71.3	1,010	.83
Mar.	174,545,000	16,400	31	.009396			11.3	126	1,830	1.3
Apr.	146,915,000	166,000	29	.1127			114	356	2,780	.76
May	380,253,000	1,478,000	31	.3888			1,020	1,205	5,230	15.4
June	348,417,000	691,000	30	.1983			476	1,303	7,220	10.6
July	330,221,000	1,876,000	30	.5681			1,290	1,354	9,070	11.1
Aug.	266,010,000	1,245,000	31	.4680			857	1,423	3,720	34.7
Sept.	379,713,000	1,971,000	30	.5190			1,360	3,613	18,000	13.4
Oct.	302,698,000	1,719,000	31	.5678			1,180	2,053	9,240	89.2
Nov.	142,898,000	27,500	30	.01926			18.9	149	660	4.8
Dec.	138,531,000	21,400	31	.01546			14.7	52.9	319	1.0
Yearly	3,026,711,000	9,261,600	362	.3060			6,376.6	11,744.2	30,839	2,314.0

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

Retamal Canal Near Río Bravo, Tamaulipas

Period 1943-1950

Jan.	16,064,000	1,800	11	.0112	.0165	.0083	1.2	4.1	10.1	1.2
Feb.	8,114,000	795	12	.0098	.0145	.0050	.55	26.1	198	.21
Mar.	8,606,000	1,240	5	.0144			.85	22.4	167	.14
Apr.	6,716,000	11,100	10	.1659			7.6	162	1,140	0
May	31,064,000		0					133	396	1.1
June	37,328,000		0					181	400	.25
July	25,807,000	193,000	11	.7495	.8346	.0560	133	168	661	12.1
Aug.	16,067,000	85,000	13	.5288	.8529	.0160	58.5	218	615	2.6
Sept.	24,177,000	203,000	14	.8377	1.1941	.0200	140	324	946	0
Oct.	30,557,000	141,000	14	.4620	.6232	.0180	97.1	337	1,530	6.5
Nov.	1,518,000	337	9	.0222	.0360	.0175	.23	12.1	40.8	3.6
Dec.	2,553,000		0					3.6	8.4	.60
Yearly	208,571,000		99					1,591.3	3,122.8	326.54

Samples and Analyses by Mexican Section, Method C. # No Samples during May, June, and December, 1950

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES —1950

The following chemical analyses are from composites made up periodically from independent water samples composed by taking from each sample an amount of water proportional to the volume of river flow represented by that sample. This compositing and the determination of the electrical conductivity of the individual water samples was done by the United States Section of the International Boundary and Water Commission. The chemical analyses were made by the Rubidoux Laboratory of the United States Department of Agriculture at Riverside, California.

To convert "Milligram Equivalents" to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are (HCO_3 plus CO_3), 30.5; Cl, 35.5; SO_4, 48; Ca, 20; Mg, 12.16; Na, 23; NO_3, 62. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5.

Electrical conductivity, reported in the following tables as $ECx10^6$ at 25°C, is a relative measure of the total salt concentration in the water samples.

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	Mean $ECx10^6$ @25°C	Boron p. p. m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Rio Grande at Caballo Dam, New Mexico															
Sampling by Bureau of Reclamation															
Jan.	31	.67	364	766	.16	8.0	46	19	2.99	1.16	3.61	3.62	2.79	1.47	T
Feb.	28	.64	9,150	732	.11	7.9	47	18	2.77	1.24	3.56	3.63	2.62	1.36	T
Mar.	31	.60	72,000	661	.06	8.1	39	17	3.07	.96	2.56	2.87	2.74	1.18	T
Apr.	30	.60	56,600	673	.10	8.0	38	17	3.18	1.04	2.64	3.00	2.77	1.15	.01
May	31	.60	59,300	673	.11	8.1	42	17	2.93	.97	2.80	2.92	2.79	1.20	.03
June	30	.60	64,200	684	.09	7.9	40	17	3.14	1.04	2.73	2.99	2.82	1.20	.01
July	31	.58	56,700	654	.11	7.9	39	18	2.97	.95	2.63	2.92	2.65	1.20	T
Aug.	31	.64	89,000	701	.09	8.0	41	18	3.13	1.05	2.95	3.20	2.75	1.34	.01
Sept.	30	.78	36,500	892	.13	8.0	49	22	3.35	1.25	4.36	4.01	3.08	2.04	.02
Oct.	31	1.00	72.2	1,180	.19	8.0	65	26	2.40	1.80	7.90	5.48	3.42	3.09	.01
Nov.	30	1.14	96.6	1,320	.20	8.1	60	23	3.65	2.04	8.45	7.47	3.52	3.26	0
Dec.	31	1.12	80.0	1,300	.21	8.1	59	23	3.54	2.02	8.12	7.11	3.39	3.20	T
Mean ⊕	ϕ365	.618	ϕ444,062.8	691	.095	8.0	41	18	3.09	1.02	2.85	3.07	2.77	1.28	.010
Period Average		.705	581,000	777			44	18	3.31	1.16	3.47	2.79	3.77	1.44	
Tons of Constituents,			1950						60,500	12,100	64,100	91,600	130,000	44,400	
Average Tons Period			1931-1950						74,300	15,800	89,500	95,400	203,000	57,400	
Rio Grande at Leasburg Dam, New Mexico															
Sampling by Bureau of Reclamation															
Jan.	5	1.18	2,770	1,270	.19	8.1	45	24	5.00	1.96	5.98	3.50	6.42	3.18	.01
Feb.	28	.75	7,480	800	.12	8.2	44	21	3.29	1.19	3.58	2.77	3.57	1.70	.01
Mar.	31	.66	68,600	708	.09	8.2	40	17	3.23	1.01	2.83	2.97	2.93	1.25	.01
Apr.	30	.66	60,000	729	.10	8.1	43	20	3.02	1.10	3.17	2.73	3.23	1.46	.02
May	31	.64	58,600	694	.10	8.0	50	22	2.22	1.10	3.33	1.95	3.34	1.50	.03
June	30	.66	64,800	722	.12	8.0	46	20	2.71	1.09	3.25	2.48	3.31	1.50	.04
July	31	.63	68,000	684	.12	8.2	42	18	3.00	.87	2.94	2.61	2.99	1.25	.04
Aug.	31	.68	88,400	737	.08	7.8	42	19	3.26	1.02	3.08	3.08	3.03	1.44	.04
Sept.	30	.76	44,500	820	.08	7.3	41	20	3.74	1.24	3.47	4.00	2.83	1.72	T
Oct.	4	1.08	6,490	1,170	.19	8.2	49	26	4.20	1.80	5.86	2.67	6.16	3.05	.02
Nov.	4	1.27	2,960	1,370	.21	7.5	45	24	5.75	2.01	6.36	4.13	6.79	3.54	T
Dec.	4	1.26	2,490	1,360	.19	7.8	47	25	5.29	1.99	6.44	3.63	6.88	3.58	.04
Mean ⊕	ϕ259	.674	ϕ472,090	732	.10	8.0	44	20	3.04	1.06	3.18	2.78	3.17	1.46	.028
Period Average		.763	603,000	832			44	20	3.54	1.24	3.80	2.88	4.03	1.73	
Tons of Constituents,			1950						58,000	12,300	69,600	80,700	145,000	49,300	
Average Tons Period			1931-1950						76,200	16,200	94,000	94,400	208,000	65,900	
Rio Grande at El Paso, Texas															
Sampling by U. S. Section															
Jan.	31	1.62	15,900	1,840	.29	7.8	66	38	3.80	2.15	12.09	2.75	8.57	6.92	.03
Feb.	28	1.48	15,100	1,650	.26	7.9	64	36	3.78	2.00	10.44	2.87	7.59	6.00	.02
Mar.	31	.91	43,700	994	.12	7.8	48	25	3.88	1.28	4.81	3.45	4.16	2.48	.01
Apr.	29	.91	52,500	1,040	.17	8.0	53	28	3.52	1.37	5.41	3.01	4.48	2.90	.02
May	31	1.05	59,500	1,150	.16	7.9	50	26	4.31	1.50	5.90	3.82	4.85	3.12	.01
June	30	.95	56,600	1,080	.15	7.9	52	27	3.76	1.38	5.53	3.32	4.62	3.00	.02
July	31	.95	74,500	1,060	.17	7.8	49	27	3.95	1.31	5.18	3.41	4.43	2.90	T
Aug.	31	.92	63,300	1,050	.17	7.7	53	28	3.49	1.35	5.38	2.98	4.58	2.94	.01
Sept.	30	1.13	50,300	1,280	.21	7.9	57	32	3.80	1.64	7.11	3.20	5.53	4.10	T
Oct.	28	1.56	28,500	1,680	.26	7.8	61	35	4.49	2.01	10.28	3.50	7.58	6.06	T
Nov.	30	1.70	18,500	1,880	.30	7.8	64	36	4.56	2.20	12.12	3.53	8.63	6.80	T
Dec.	31	1.76	17,100	1,960	.31	7.8	64	36	4.66	2.28	12.45	3.68	8.86	7.15	.03
Mean ⊕	ϕ361	1.05	ϕ495,500	1,170	.18	7.8	54	29	3.87	1.48	6.28	3.31	5.07	3.47	.010
Period Average		1.10	627,000	1,220			53	30	4.38	1.61	6.64	3.48	5.44	3.76	
Tons of Constituents,			1950						49,800	11,600	92,800	64,900	157,000	79,100	
Average Tons Period			1930-1950						67,800	15,100	118,000	82,000	202,000	103,000	

ϕ Total ⊕ Weighted mean ** Percent of total cations *** Percent of total anions T Trace

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES —1950

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Rio Grande at Fort Quitman, Texas															
Sampling Jointly by Both Sections															
Jan.	6	3.20	34,600	3,640	.36	7.9	63	56	9.40	4.07	23.46	4.10	12.04	20.95	.04
Feb.	2	3.50	20,900	4,030	.45	7.8	67	62	8.55	4.83	26.83	2.04	13.26	25.15	.04
Mar.	7	5.03	21,600	5,550	.55	7.8	65	64	13.09	6.77	37.38	3.90	16.90	36.90	.03
Apr.	7	5.91	25,500	6,250	.59	7.8	65	66	15.58	8.16	44.92	4.20	19.58	45.50	.03
May	6	5.52	36,800	6,120	.61	8.0	66	66	14.16	7.46	42.06	3.27	18.52	42.24	.03
June	5	5.60	39,800	6,130	.58	8.0	66	66	14.25	7.44	42.00	3.52	18.36	42.10	.02
July	7	2.24	73,500	2,550	.23	7.9	61	54	7.06	2.81	15.50	3.31	8.34	13.95	.05
Aug.	7	4.72	49,600	5,300	.47	7.9	64	64	13.22	6.38	35.02	4.12	15.97	35.24	.01
Sept.	5	4.03	46,700	4,570	.44	7.9	65	62	11.09	5.35	30.24	3.61	14.30	29.26	.01
Oct.	6	3.82	38,200	4,280	.47	7.9	65	60	10.16	4.94	28.18	3.40	14.04	26.45	.03
Nov.	5	3.87	41,800	4,370	.44	7.8	65	59	10.74	5.04	28.69	3.77	14.46	26.76	.01
Dec.	5	3.69	32,000	4,260	.47	7.8	65	61	10.14	4.82	28.30	3.32	13.88	26.40	.03
Mean ●	ϕ 68	3.73	ϕ461,000	4,190	.41	7.9	64	61	10.33	4.91	27.61	3.52	13.31	26.40	.031
Period Average		2.35	540,000	2,670			61	55	7.53	3.08	16.54	3.54	8.65	15.06	
Tons of Constituents,			1950						34,800	10,000	107,000	18,000	107,000	157,000	
Average Tons Period			1930-1950						47,200	11,700	119,000	33,800	130,000	167,000	
Rio Grande at Upper Presidio Station															
Sampling by U. S. Section															
Jan.	5	3.15	29,800	3,610	.40	7.9	65	58	8.24	4.03	23.59	2.75	12.37	21.10	.02
Feb.	5	3.74	13,600	4,280	.48	7.8	65	60	10.33	5.16	28.16	2.78	14.57	26.15	.01
Mar.	3	4.89	2,260	5,260	.54	7.8	60	61	15.50	6.72	32.68	2.54	18.84	34.04	.01
Apr. ‡	0	5.73	398	6,160			60	61	18.17	7.88	38.30	2.98	22.08	39.89	.01
May ♂	0	0	0	0			0	0	0	0	0	0	0	0	0
June	5	1.79	8,430	2,070	.20	7.9	59	54	6.44	1.81	11.87	2.57	6.83	11.00	.05
July	3	1.55	38,900	1,780	.21	8.0	60	47	5.24	1.73	10.56	3.13	6.20	8.30	.04
Aug.	5	1.31	15,900	1,480	.15	8.0	63	47	4.00	1.34	9.15	3.19	4.38	6.82	.06
Sept.	5	1.36	19,200	1,530	.14	7.7	51	42	6.09	1.23	7.76	1.95	6.83	6.40	.04
Oct.	5	1.71	33,700	1,990	.24	7.8	56	49	6.68	1.90	10.93	2.05	8.11	9.72	.06
Nov.	5	3.98	25,400	4,460	.51	7.8	67	61	9.83	5.17	29.98	2.77	15.15	27.66	T
Dec.	5	3.97	21,900	4,520	.52	8.0	65	61	10.47	5.39	29.90	2.61	15.24	28.36	0
Mean ●	ϕ 46	2.07	ϕ209,488	2,360			61	53	6.64	2.43	14.37	2.63	8.47	12.55	.039
Period Average		1.96	443,000	2,210			59	51	6.61	2.47	13.23	3.10	7.86	11.38	
Tons of Constituents,			1950						18,300	4,070	45,500	11,000	56,000	61,300	
Average Tons Period			1935-1950						40,700	9,220	93,500	29,100	116,000	124,000	
Río Conchos at Cuchillo Parado, Chihuahua															
Sampling by Mexican Section															
Jan.	14	.74	35,700	779	.18	8.0	45	13	3.21	1.01	3.54	2.42	4.35	1.00	.10
Feb.	12	.65	30,800	712	.13	8.0	44	13	3.01	1.02	3.19	2.29	3.89	.95	.04
Mar.	11	.61	29,800	670	.15	8.1	41	13	3.07	.91	2.78	2.59	3.29	.86	.04
Apr.	12	.83	16,800	903	.15	8.0	49	17	3.49	1.14	4.38	2.19	5.19	1.56	.04
May	13	.89	20,000	941	.23	8.1	52	17	3.26	1.23	4.78	2.27	5.48	1.60	.03
June	9	.87	38,300	883	.15	8.1	36	11	4.92	.92	3.22	2.68	5.45	1.05	.07
July	12	.60	59,100	602	.08	8.1	31	9	3.56	.65	1.99	2.45	3.11	.58	.05
Aug.	13	.96	59,500	946	.10	7.9	29	8	6.18	.85	2.87	.2.12	6.98	.85	.07
Sept.	14	.66	54,300	690	.16	8.0	38	11	3.60	.70	2.61	2.41	3.89	.75	.03
Oct.	12	.76	48,500	768	.15	8.0	43	13	3.52	.94	3.42	2.87	4.06	1.00	.04
Nov.	14	.78	33,500	802	.16	7.8	43	13	3.62	1.00	3.45	2.70	4.34	1.10	.04
Dec.	12	.79	30,300	822	.22	7.8	45	13	3.47	1.11	3.71	2.57	4.51	1.10	.03
Mean ●	ϕ148	.738	ϕ456,600	762	.15	8.0	39	12	3.80	.893	3.06	2.48	4.36	.927	.049
Period Average		.738	442,000	767			40	12	3.79	.889	3.08	2.55	4.34	.928	
Tons of Constituents,			1950						64,100	9,140	59,200	63,700	176,000	27,700	
Average Tons Period			1946-1950						61,800	8,810	57,700	63,300	170,000	26,800	
Río Conchos at Ojinaga, Chihuahua															
Sampling by U. S. Section															
Jan.	3	.78	40,700	816	.13	8.1	41	13	3.83	1.04	3.47	2.91	4.36	1.12	.04
Feb.	5	.78	37,800	799	.16	8.0	41	13	3.80	1.03	3.34	3.07	4.13	1.10	.03
Mar.	4	.60	29,300	668	.11	8.1	41	14	3.03	.85	2.75	2.55	3.24	.95	.04
Apr.	4	.90	16,200	970	.05	7.8	48	20	3.79	1.26	4.69	2.51	5.32	1.92	.03
May	4	.93	18,100	1,000	.22	8.0	51	18	3.64	1.24	5.05	2.49	5.77	1.84	.01
June	4	.96	39,600	967	.19	8.2	40	13	4.85	1.12	3.99	2.97	5.82	1.30	.05
July	5	.71	71,700	713	.12	7.8	30	8	4.28	.73	2.18	2.60	4.08	.60	.03
Aug.	6	.97	65,200	982	.14	7.7	28	10	6.56	.88	2.93	2.31	7.08	1.05	.06
Sept.	5	.66	68,200	681		7.9	39	11	3.50	.64	2.66	2.45	3.59	.78	.05
Oct.	5	.89	65,600	890	.18	8.0	46	16	3.99	.97	4.23	3.07	4.62	1.52	.04
Nov.	5	.81	33,900	841	.13	7.9	44	14	3.73	1.06	3.73	2.73	4.55	1.20	.03
Dec.	5	.85	32,300	887	.18	8.0	42	14	4.19	1.14	3.89	3.17	4.76	1.28	.03
Mean ●	ϕ 55	.795	ϕ515,600	818		7.9	39	13	4.16	.919	3.27	2.72	4.61	1.08	.040
Period Average		.604	580,000	645			38	14	3.32	.793	2.52	2.56	3.14	.908	
Tons of Constituents,			1950						73,600	9,860	66,400	73,200	195,000	33,800	
Average Tons Period			1935-1950						87,000	12,600	75,700	102,000	197,000	42,100	
Rio Grande at Johnson Ranch, Texas															
Sampling by U. S. Section															
Jan.	5	1.16	73,400	1,300	.19	8.0	54	34	4.26	1.56	6.98	2.51	5.92	4.38	.04
Feb.	4	.93	51,100	1,040	.17	8.0	49	27	3.93	1.37	5.12	2.65	4.98	2.80	.03
Mar.	5	.75	39,200	824	.17	8.1	44	19	3.59	1.04	3.61	2.71	4.04	1.55	.04
Apr.	4	1.08	19,000	1,130		8.0	50	20	4.60	1.13	5.69	2.51	6.64	2.25	.04
May	7	1.02	20,400	1,070	.19	7.8	48	18	4.50	1.10	5.24	2.60	6.34	2.00	.04
June	5	1.05	73,900	1,040	.15	8.0	44	8	5.19	.84	4.75	2.77	7.38	.90	.06
July	7	.83	123,000	869	.16	7.7	39	12	4.46	.82	3.48	2.67	4.91	1.08	.04
Aug.	6	.71	81,600	765	.11	7.8	43	18	3.60	.74	3.35	2.70	3.62	1.44	.04
Sept.	2	.75	123,000	761		7.7	31	8	4.65	.70	2.44	2.10	5.09	.63	.05
Oct.	6	1.03	125,000	1,090	.16	7.8	48	28	4.55	.99	5.20	2.63	5.18	3.08	.04
Nov.	5	1.32	67,700	1,450	.20	7.7	53	36	5.16	1.73	7.80	2.93	6.44	5.18	.02
Dec.	4	1.37	64,900	1,530	.27	8.0	53	36	5.45	1.76	8.16	3.16	6.81	5.54	.03
Mean ●	ϕ 60	.932	ϕ862,200	991		7.8	45	21	4.45	1.02	4.50	2.60	5.27	2.15	.041
Period Average		.956	717,000	1,030			46	22	4.48	1.06	4.73	2.63	5.41	2.33	
Tons of Constituents,			1950						112,000	15,600	130,000	99,800	318,000	95,500	
Average Tons Period			1948-1950						91,600	13,200	111,000	81,700	265,000	84,300	

ϕ Total ● Weighted mean ** Percent of total cations *** Percent of total anions ‡ Estimated T Trace
♂ No flow during the month of May

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES — 1950

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Rio Grade at Langtry, Texas (Sampling by U. S. Section)															
Jan.	5	1.03	81,800	1,170	.20	8.0	51	33	3.80	1.64	5.93	2.47	5.26	3.80	.04
Feb.	8	.91	63,600	1,010	.15	7.7	47	26	3.78	1.62	4.72	2.75	4.63	2.65	.06
Mar.	9	.73	53,900	805	.16	7.9	44	20	3.18	1.30	3.56	2.57	3.80	1.64	.04
Apr.	9	.75	29,300	857	.18	8.0	43	20	3.28	1.49	3.63	2.71	4.04	1.70	.05
May	9	.70	32,300	757	.15	8.0	40	17	3.30	1.23	3.06	2.71	3.62	1.34	.06
June	9	.72	69,700	780	.13	7.8	44	16	3.54	.85	3.40	2.57	3.96	1.25	.09
July	10	.62	113,000	671	.08	7.9	40	15	3.29	.68	2.69	2.56	3.14	1.00	.11
Aug.	9	.90	140,000	977	.13	7.9	43	24	4.61	1.00	4.22	2.77	4.78	2.40	.04
Sept.	10	.48	97,400	526	.09	7.8	35	11	2.87	.52	1.79	2.17	2.48	.60	.09
Oct.	7	.80	108,000	908	.19	7.8	46	25	4.01	.91	4.11	2.62	4.19	2.32	.05
Nov.	8	1.06	72,800	1,170	.20	7.8	51	32	4.10	1.62	6.00	2.57	5.31	3.80	.03
Dec.	9	1.03	67,900	1,150	.27	7.9	51	32	3.90	1.70	5.80	2.59	5.27	3.68	.03
Mean ⊕	ϕ102	.765	ϕ929,700	844	.144	7.9	44	23	3.62	1.04	3.73	2.55	3.97	1.93	.065
Period Average		.798	898,000	802			45	24	3.65	1.13	3.95	2.53	4.19	2.08	
Tons of Constituents, Average Tons Period			1950 / 1945-1950						120,000 / 112,000	20,900 / 21,000	142,000 / 139,000	129,000 / 118,000	315,000 / 308,000	113,000 / 113,000	
Pecos River near Comstock, Texas (Sampling by U. S. Section)															
Jan.	15	3.60	47,900	4,060	.26	7.9	61	63	8.32	7.65	24.95	2.03	13.32	25.94	.06
Feb.	14	3.64	41,100	4,160	.25	7.7	61	63	8.42	7.92	26.08	1.75	13.58	26.75	.05
Mar.	16	3.77	43,700	4,260	.27	7.7	61	63	8.80	8.08	26.52	2.18	13.67	27.50	.06
Apr.	15	3.87	46,800	4,410	.27	7.8	61	64	9.19	8.19	27.52	2.11	14.09	28.75	.06
May	15	3.56	51,600	3,990	.24	7.9	60	62	8.76	7.41	24.28	2.65	12.57	25.42	.06
June	15	2.31	29,300	2,590	.19	8.0	57	57	6.52	4.60	14.57	2.53	8.48	14.95	.06
July	16	.95	33,500	1,140	.08	7.8	49	51	3.65	1.82	5.48	2.21	2.96	5.50	.11
Aug.	15	3.06	37,300	3,510	.24	7.7	60	61	7.52	6.54	21.16	2.43	11.22	21.86	.04
Sept.	13	2.00	43,200	2,320		7.8	57	59	5.67	4.17	12.98	2.24	7.08	13.65	.05
Oct.	16	3.80	55,900	4,240	.28	7.9	60	62	9.66	7.97	26.14	2.65	14.06	27.31	.04
Nov.	15	2.99	36,200	3,420	.22	7.9	58	61	8.06	6.47	20.16	2.40	11.13	21.20	.04
Dec.	15	3.78	52,900	4,310	.27	7.8	59	62	9.90	8.30	26.32	2.70	14.30	27.56	.03
Mean ⊕	ϕ180	2.80	ϕ519,400	3,190		7.8	59	61	7.28	5.91	19.06	2.32	10.17	19.81	.061
Period Average		3.97	1,402,000	4,200			55	55	12.37	7.86	24.55	2.49	17.52	24.79	
Tons of Constituents, Average Tons Period			1950 / 1935-1950						36,800 / 119,000	18,100 / 45,900	111,000 / 271,000	17,800 / 36,400	123,000 / 404,000	177,000 / 422,000	
Río San Diego at Jiménez, Coahuila (Sampling by Mexican Section)															
Jan.‡	0	.45	3,260	504		8.0	20	18	3.27	.86	1.04	2.69	1.43	.94	.06
Feb.	3	.43	2,570	482		8.0	20	18	3.12	.82	.99	2.57	1.37	.90	.06
Mar.	4	.51	2,060	580	.13	8.0	23	22	3.38	.92	1.32	2.53	1.96	1.28	.08
Apr.	4	.48	1,780	538	.08	8.1	21	19	3.39	.95	1.13	2.69	1.65	1.06	.06
May	5	.50	2,750	547	.11	8.1	21	19	3.58	.78	1.13	2.97	1.48	1.05	.09
June	3	.38	1,370	431	.11	8.2	22	20	2.61	.75	.97	2.23	1.23	.90	.05
July	4	.40	1,130	453	.09	8.0	17	17	2.99	.81	.77	2.65	1.15	.80	.03
Aug.	5	.42	1,190	478	.11	7.9	17	15	3.34	.76	.85	3.10	1.11	.72	.03
Sept.	4	.42	1,110	474	.09	8.0	16	15	3.36	.71	.79	3.07	1.08	.71	.03
Oct.	4	.39	1,480	420	.07	8.1	20	17	2.64	.73	.86	2.35	1.15	.70	.04
Nov.	4	.35	1,080	388	.11	8.1	33	18	1.71	.84	1.27	1.95	1.07	.68	.04
Dec.	4	.41	1,350	447	.12	8.0	17	14	3.13	.75	.79	2.85	1.09	.64	.05
Mean ⊕	ϕ 44	.435	ϕ 21,130	486		8.0	21	18	3.09	.81	1.01	2.64	1.35	.89	.056
Period Average															
Tons of Constituents, Average Tons Period			1950						4,090	650	1,530	5,320	4,280	2,080	
Río San Rodrigo near El Moral, Coahuila (Sampling by Mexican Section)															
Jan.‡	0	.30	894	336		8.0	17	15	2.14	.71	.59	2.07	.78	.52	.09
Feb.	4	.29	647	325	.06	8.0	17	15	2.07	.69	.57	2.00	.75	.50	.09
Mar.	4	.32	531	365	.03	8.0	11	13	2.52	.68	.40	2.55	.68	.48	.11
Apr.	4	.45	454	481	.10	8.0	18	14	2.96	1.28	.92	3.20	1.02	.68	.07
May	4	.40	524	451	.10	7.9	17	15	‡ 3.09	‡ .81	.81	‡ 2.87	‡ 1.02	‡ .70	‡ .06
June	4	.27	462	312	.03	7.8	14	11	2.25	.51	.46	2.38	.50	.35	.05
July	4	.42	500	478	.11	8.0	14	13	3.44	.85	.72	3.35	.94	.65	.09
Aug.	4	.42	529	464	.18	8.0	17	15	3.18	.83	.81	2.95	1.05	.72	.06
Sept.	4	.45	477	503	.05	8.0	17	13	3.34	.81	.88	3.17	1.30	.68	.06
Oct.	4	.33	462	353	.05	7.9	18	15	2.21	.70	.63	2.17	.79	.52	.06
Nov.	4	.37	548	407	.07	7.9	15	12	2.85	.70	.63	2.77	.79	.50	.04
Dec.	4	.45	536	494	.14	7.9	19	15	3.26	.88	.98	2.91	1.34	.76	.09
Mean ⊕	ϕ 44	.355	ϕ 6,564	396		8.0	16	14	2.65	.757	.663	2.58	.868	.565	.073
Period Average															
Tons of Constituents, Average Tons Period			1950						1,330	231	383	1,980	1,050	503	
Rio Grande at Eagle Pass, Texas (Sampling by Mexican Section)															
Jan.	26	.95	160,000	1,110	.18	7.9	49	39	3.52	1.93	5.30	2.40	4.07	4.25	.09
Feb.	23	.91	123,000	1,070	.15	7.9	51	40	3.22	1.93	5.29	2.20	3.92	4.22	.08
Mar.	27	.86	106,000	1,020	.15	7.8	49	38	3.16	1.85	4.83	2.23	3.79	3.80	.10
Apr.	25	.92	79,100	1,090	.13	7.9	50	44	3.12	2.15	5.21	2.08	3.75	4.60	.14
May	28	.83	86,400	976	.16	7.9	46	37	3.38	1.73	4.37	2.55	3.39	3.60	.09
June	26	.84	120,000	963	.10	8.1	47	33	3.56	1.39	4.44	2.38	3.88	3.20	.12
July	26	.70	186,000	771		7.7	37	22	3.92	.87	2.95	2.77	3.23	1.74	.11
Aug.	28	.83	167,000	948	.16	8.1	45	31	3.91	1.16	4.10	2.49	3.87	2.90	.12
Sept.	25	.67	184,000	771	.14	8.0	43	23	3.49	.85	3.32	2.57	3.38	1.80	.10
Oct.	26	.90	181,000	986	.15	8.0	45	33	4.21	1.21	4.44	2.51	4.03	3.26	.08
Nov.	10	1.06	106,000	1,170	.17	7.7	48	37	4.16	1.91	5.61	2.91	4.37	4.26	.04
Dec.	22	1.08	109,000	1,260	.18	8.0	50	40	4.10	2.17	6.20	2.77	4.57	5.02	.04
Mean ⊕	ϕ292	.845	ϕ1,607,500	967		7.9	46	31	3.68	1.43	4.38	2.51	3.78	3.21	.955
Period Average		1.03	2,900,000	1,160			47	39	4.33	1.80	5.40	2.40	4.59	4.49	
Tons of Constituents, Average Tons Period			1950 / 1938-1950						191,000 / 334,000	45,000 / 84,400	261,000 / 478,000	198,000 / 282,000	470,000 / 848,000	294,000 / 612,000	

ϕ Total ⊕ Weighted mean ** Percent of total cations *** Percent of total anions ‡ Estimated

CHEMICAL ANALYSES OF WATER SAMPLES FROM RIO GRANDE AND TRIBUTARIES —1950

Month	No. of Samples	Dissolved Solids: Tons Per Acre Foot	Dissolved Solids: Total Tons	Mean ECx10⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Río Salado at Cd. Guerrero, Tamaulipas (Sampling by Mexican Section)															
Jan.	15	3.77	5,350	3,470	.96	7.8	44	28	13.04	9.58	17.64	1.93	27.02	11.25	.09
Feb.	13	4.83	1,800	4,380	1.30	7.7	43	27	17.33	12.72	22.91	2.23	36.27	14.50	.10
Mar.	8	5.18	5,030	4,670	1.54	7.7	44	28	18.69	13.53	24.90	2.18	38.74	15.85	.06
Apr.	12	4.14	10,500	3,820	1.20	7.6	44	29	14.72	10.33	19.66	1.67	30.11	12.98	.04
May	14	1.33	52,100	1,390	.50	7.7	42	26	5.59	2.72	6.02	1.87	8.66	3.82	.11
June	15	.66	23,000	727	.19	7.8	35	21	3.56	1.07	2.48	2.03	3.61	1.50	.11
July	14	1.10	5,400	1,150	.26	7.8	39	25	4.85	2.26	4.59	1.83	6.94	3.00	.03
Aug.	15	4.15	14,200	3,790	1.30	7.6	44	28	14.38	10.23	19.50	1.67	30.43	12.25	.10
Sept.	14	1.66	16,300	1,710	.50	7.6	42	27	6.74	3.69	7.64	1.81	11.52	4.90	.05
Oct.	11	.62	924	737	.26	7.8	36	22	3.35	1.26	2.63	2.15	3.55	1.60	.12
Nov.	14	.58	266	572	.19	8.4	46	19	1.65	1.46	2.67	2.09	2.45	1.10	.03
Dec.	14	.63	284	628	.24	7.8	34	18	2.81	1.31	2.13	2.45	2.80	1.18	.03
Mean ●	ϕ159	1.35	ϕ135,154	1,380	.438	7.7	41	26	5.70	2.87	6.01	1.92	8.91	3.80	.097
Period Average		.919	228,000	966			40	27	4.32	1.74	4.00	1.92	5.43	2.72	
Tons of Constituents,			1950						15,500	4,740	18,800	7,960	58,200	18,300	
Average Tons Period			1935-1950						29,200	7,150	31,000	19,800	88,000	32,500	
Rio Grande at Roma, Texas (Sampling by Mexican Section)															
Jan.	31	.95	161,000	1,110	.16	7.9	49	40	3.43	1.99	5.32	2.23	4.20	4.38	.09
Feb.	27	.99	136,000	1,120	.15	7.9	50	40	3.46	1.97	5.47	2.20	4.26	4.35	.09
Mar.	31	.96	123,000	1,130	.17	7.7	50	39	3.49	2.05	5.48	2.25	4.36	4.35	.09
Apr.	29	.93	101,000	1,090	.16	8.0	48	39	3.65	1.89	5.12	2.33	4.16	4.22	.09
May	30	.73	204,000	860	.17	8.0	43	33	3.51	1.31	3.64	2.17	3.39	2.76	.04
June	30	.70	179,000	800	.14	7.8	42	31	3.46	1.02	3.28	2.51	2.84	2.42	.08
July	30	.70	170,000	795	.13	7.7	39	26	3.65	1.00	3.12	2.50	3.25	2.06	.09
Aug.	31	.86	168,000	972	.07	7.8	43	28	4.40	1.09	4.09	2.71	4.29	2.80	.06
Sept.	30	.75	210,000	854	.15	7.8	40	27	3.85	1.26	3.40	2.65	3.64	2.30	.05
Oct.	31	.75	167,000	868	.12	7.9	38	24	4.40	.97	3.25	2.76	3.96	2.10	.04
Nov.	30	1.01	106,000	1,210	.19	7.8	51	41	3.95	1.92	6.03	2.39	4.70	4.88	.03
Dec.	31	1.01	103,000	1,180	.22	7.8	51	40	3.59	2.07	5.82	2.27	4.56	4.64	.06
Mean ●	ϕ361	.821	ϕ1,828,000	949	.147	7.8	45	33	3.75	1.41	4.14	2.45	3.80	3.09	.066
Period Average		♯.788	♯2,437,000	861			46	35	3.23	1.28	3.87	2.21	3.23	2.99	
Tons of Constituents,			1950						228,000	51,900	288,000	226,000	553,000	332,000	
Average Tons Period			1944-1950						277,000	66,600	381,000	288,000	663,000	454,000	
North Floodway near Sebastian, Texas (Sampling by U. S. Section)															
Jan.	5	2.80	14,400	3,130	1.74	7.9	61	56	6.86	5.28	19.22	2.50	11.37	17.80	.09
Feb.	4	3.24	16,200	3,640	2.05	8.2	59	56	9.30	6.13	21.98	3.60	12.96	20.98	.09
Mar.	4	3.66	19,100	4,080	2.30	7.8	62	59	8.85	6.99	26.00	2.54	14.68	24.80	.09
Apr.	4	3.91	15,600	4,290	2.56	7.9	61	58	10.25	7.28	26.91	2.88	15.61	26.15	.11
May	5	1.40	14,400	1,690	.88	7.7	56	56	4.66	2.37	9.08	2.00	5.14	9.14	.06
June	5	3.38	27,100	3,810	2.29	7.8	59	60	9.78	6.08	22.75	3.18	12.44	23.15	.06
July	5	3.90	14,000	4,260	2.66	8.0	61	58	10.12	6.86	26.98	3.10	15.29	25.56	.09
Aug.	4	2.93	11,800	3,200	1.91	8.1	62	55	7.30	4.98	20.15	2.20	12.48	17.85	.11
Sept.	4	3.12	9,700	3,470	2.01	7.9	62	55	8.14	5.44	22.12	2.81	13.14	19.80	.05
Oct.	6	3.19	14,000	3,460	2.03	8.0	59	54	9.20	5.57	21.41	3.51	13.13	19.68	.09
Nov.	4	3.85	14,600	4,290	2.48	8.0	59	57	11.15	7.19	26.87	4.10	15.47	25.60	.08
Dec.	4	3.87	14,700	4,330	2.58	8.0	61	58	10.10	7.30	27.22	2.86	15.97	26.10	.07
Mean ●	ϕ 54	3.08	ϕ185,600	3,440	1.99	7.9	60	57	8.40	5.59	21.10	2.85	12.22	20.17	.080
Period Average		2.12	140,300	2,370			57	55	6.31	3.86	13.69	2.58	8.17	13.26	
Tons of Constituents,			1950						13,800	5,580	39,800	7,130	48,200	58,700	
Average Tons Period			1941-1950						11,400	4,230	28,400	7,110	35,400	42,400	

ϕ Total ● Weighted mean ** Percent of total cations *** Percent of total anions ♯ Period 1943-1950

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1950

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

Rio Grande at El Paso, Texas

January		February		March		April		May		July		August		September		October		December	
1	1,830	7	1,890	16	1,020	22	1,130	30	1,210	5	1,120	11	990	17	1,600	26	1,830	2	1,980
2	1,750	8	1,890	17	1,090	23	1,070	31	1,220	6	1,060	12	1,030	18	1,600	27	1,870	3	2,050
3	1,740	9	1,910	18	1,080	25	1,220	June		7	929	13	975	19	1,610	28	1,940	4	1,880
4	1,850	10	1,880	19	1,110	26	1,260	1	1,250	8	998	14	932	20	1,740	29	1,920	5	1,930
5	1,850	11	1,920	20	968	27	1,170	2	1,260	9	1,000	15	967	21	1,620	30	1,890	6	2,060
6	1,880	12	1,980	21	1,010	28	1,210	3	1,270	10	940	16	967	22	1,590	November		7	1,880
7	1,830	13	1,880	22	926	29	1,190	4	1,200	11	1,010	17	1,100	23	1,600	1	1,810	8	1,960
8	1,840	14	1,890	23	945	30	1,190	5	1,170	12	951	18	1,130	24	1,590	2	1,810	9	1,910
9	1,830	15	1,890	24	947	May		6	1,150	13	1,000	19	1,080	25	1,440	3	1,840	10	2,030
10	1,790	16	1,950	25	1,010	1	1,140	7	1,170	14	918	20	1,120	26	1,600	4	1,790	11	1,890
11	1,800	17	1,950	26	914	2	1,070	8	1,180	15	1,090	21	1,050	27	1,540	5	1,800	12	2,030
12	1,900	18	1,930	27	888	3	1,130	9	1,140	16	1,200	22	1,300	28	1,440	6	1,840	13	2,010
13	1,800	19	1,920	28	959	4	1,190	10	1,070	17	1,330	23	1,330	29	1,540	7	1,810	14	1,890
14	1,870	20	1,950	29	952	5	1,200	11	1,030	18	1,190	24	1,100	30	1,750	8	1,770	15	1,840
15	1,880	21	1,920	30	926	6	1,100	12	1,010	19	1,220	25	1,140	October		9	1,860	16	1,930
16	1,940	22	1,970	31	883	7	1,160	13	1,100	20	1,100	26	1,210	1	1,620	10	1,860	17	2,020
17	1,900	23	1,980	April		8	1,020	14	1,080	21	1,100	27	1,170	2	1,740	11	1,800	18	2,000
18	1,960	24	2,020	1	933	9	988	15	1,090	22	1,120	28	1,050	3	1,690	12	1,790	19	2,010
19	1,970	25	2,040	2	927	10	1,050	16	1,040	23	1,000	29	1,090	5	1,370	13	1,820	20	2,030
20	1,960	26	1,230	3	929	11	985	17	1,100	24	866	30	1,110	6	1,190	14	1,900	21	1,900
21	1,990	27	1,080	4	957	12	1,040	18	1,040	25	888	31	1,140	7	1,310	15	1,930	22	1,970
22	2,020	28	1,040	5	912	13	1,060	19	1,010	26	1,030	September		8	1,600	16	1,940	23	2,050
23	1,980	March		6	1,040	14	1,070	20	1,010	27	1,190	1	1,130	9	1,750	17	1,950	24	2,010
24	1,990	1	972	7	1,010	15	1,080	21	1,010	28	1,170	2	1,040	10	1,570	18	1,850	25	1,920
25	2,000	2	959	8	1,070	16	1,130	22	1,030	29	1,060	3	1,190	11	1,810	19	1,870	26	2,030
26	1,990	3	1,000	9	916	17	1,130	23	977	30	1,160	4	1,120	12	1,740	20	2,020	27	1,960
27	2,040	4	1,010	10	987	18	1,120	24	994	31	1,140	5	1,120	13	1,790	21	1,990	28	1,910
28	2,000	5	1,090	11	1,020	19	1,200	25	1,060	August		6	1,020	14	1,890	22	1,950	29	1,910
29	1,990	66	1,060	12	968	20	1,240	26	1,130	1	1,060	7	1,140	15	1,730	23	2,020	30	2,000
30	2,000	7	1,150	13	1,040	21	1,270	27	1,010	2	1,060	8	1,160	16	1,770	24	1,940	31	2,010
31	1,990	8	1,190	14	1,090	22	1,260	28	1,040	3	1,160	9	1,170	17	1,890	25	2,030		
February		9	1,080	15	1,060	23	1,250	29	1,070	4	889	10	1,180	18	1,930	26	2,030		
1	1,870	10	1,130	16	1,000	24	1,270	30	1,150	5	1,070	11	1,190	19	1,850	27	2,010		
2	1,980	11	1,200	17	1,080	25	1,240	July		6	1,120	12	1,100	20	1,950	28	2,020		
3	1,910	12	1,130	18	1,110	26	1,270	1	1,120	7	1,160	13	1,250	22	1,850	29	2,010		
4	1,990	13	1,110	19	1,120	27	1,220	2	1,140	8	1,070	14	1,320	23	1,800	30	2,020		
5	1,990	14	980	20	1,110	28	1,210	3	1,110	9	1,010	15	1,370	24	1,920	December			
6	1,900	15	939	21	1,120	29	1,230	4	1,090	10	988	16	1,650	25	1,840	1	1,860		

Rio Grande at Fort Quitman, Texas

January		March		April		May		June		July		August		September		October		November	
4	3,540	1	5,050	4	6,730	6	6,850	14	6,450	15	1,410	12	6,930	14	4,130	21	4,590	29	4,250
11	3,590	4	4,000	5	6,780	19	6,620	17	7,520	15	1,410	16	7,080	23	4,740	25	4,280	December	
14	3,470	8	4,980	12	6,200	20	5,540	21	7,140	19	5,540	23	6,790	27	4,440	November		2	3,950
18	3,620	15	5,350	15	6,270	24	5,200	July		26	1,610	26	7,340	October		1,	4,440	6	4,170
25	3,930	18	5,920	19	6,920	31	6,620	4	6,860	27	1,170	30	7,620	4	4,510	4	4,860	13	4,320
28	4,060	22	6,410	26	6,600	June		5	6,810	August		September		7	3,460	8	4,500	20	4,540
February		31	6,160	May		3	5,120	12	2,480	2	3,740	6	4,500	11	4,230	18	4,210	27	4,520
1	4,400	April		3	6,990	7	4,730	14	2,030	9	6,010	9	4,980	18	5,180	29	4,270		
23	4,340	1	6,230																

Rio Grande at Upper Presidio Station

January		January		February		March		June		August		September		October		October		December	
2	3,400	29	3,980	19	4,360	12	6,050	17	1,040	5	1,330	8	4,180	1	961	28	5,020	2	4,240
2	3,340	29	3,980	26	4,540	19	6,200	24	3,450	5	1,360	15	1,790	1	978	November		9	4,410
8	3,550	February		26	4,540	June		July		13	2,700	21	714	8	1,770	4	4,610	16	4,410
8	3,550	5	4,140	28	4,650	8	1,730	15	2,600	17	3,050	21	705	14	3,740	11	4,910	23	4,630
15	3,620	5	4,140	28	4,650	8	1,730	15	2,610	19	1,960	23	1,640	14	3,740	18	4,500	30	4,900
15	3,620	12	4,210	March		10	1,970	22	956	25	2,870	23	1,690	21	4,700	25	4,290		
22	3,630	12	4,230	3	4,880	12	2,250	29	1,500	September		23	1,680	21	4,700	29	4,110		
22	3,630	19	4,360	3	4,760	12	2,260	29	1,500	1	1,390			28	5,020				

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1950

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

Río Conchos at Cuchillo Parado, Chihuahua

January		February		March		April		June		July		August		September		October		November	
1	854	6	837	13	686	26	980	2	912	14	550	14	796	15	864	16	809	24	778
2	809	8	750	15	669	28	962	5	751	14	823	16	977	18	760	18	848	27	881
4	766	10	730	17	620	May		5	762	14	805	18	620	19	781	20	749	29	896
6	913	13	823	20	581	3	899	7	1,320	17	338	21	1,020	19	805	23	722	30	839
9	906	15	788	24	694	3	934	9	914	17	334	23	922	20	720	25	871	December	
11	778	17	707	29	818	5	963	14	873	17	334	25	961	22	499	30	868	2	737
13	803	20	727	April		8	886	16	760	21	560	27	591	22	503	November		4	792
16	778	22	733	3	855	10	905	19	787	24	619	27	589	25	543	1	910	6	836
18	873	24	736	5	962	12	866	21	932	26	702	28	1,020	27	914	3	805	8	759
20	822	27	631	7	959	15	932	28	835	28	720	30	927	29	859	6	848	11	750
23	773	March		10	923	17	925	30	906	31	605	September		October		8	798	13	802
25	737	1	703	12	908	19	977	July		31	591	1	947	2	558	10	859	15	911
27	850	3	820	14	898	22	966	5	973	August		4	889	4	672	13	755	18	929
30	785	6	621	17	946	24	949	7	799	2	1,570	6	948	6	703	15	773	22	836
February		8	686	19	873	26	937	10	724	4	612	8	906	9	820	17	790	25	838
1	759	8	633	21	969	29	920	12	449	9	670	11	759	11	869	20	772	27	818
3	817	10	637	24	898	31	915	13	722	11	720	13	626	13	886	22	716	29	906

Río Conchos at Ojinaga, Chihuahua

January		February		March		May		June		July		August		October		November		December	
2	901	8	866	25	722	6	979	10	939	29	768	30	1,040	4	754	10	823	16	947
9	906	16	750	31	896	13	985	24	927	August		September		11	922	17	818	22	960
16	778	25	724	April		20	1,010	July		3	1,170	2	878	16	908	24	818	28	913
23	795	28	776	1	907	27	996	1	925	5	642	9	987	23	890	29	925		
31	728	March		15	987	June		8	824	11	759	16	908	30	892	December			
February		6	629	22	961	3	979	14	751	18	1,040	26	574	November		1	790		
2	827	18	653	29	1,040	5	975	22	533	26	996	29	701	2	902	9	861		

Rio Grande at Johnson Ranch, Texas

January		February		March		May		June		July		August		September		October		November	
2	1,390	11	1,240	21	712	2	1,240	2	994	9	1,140	2	564	3	1,070	19	1,500	28	1,560
9	1,560	27	875	28	854	10	1,170	8	1,680	13	768	9	1,050	24	592	23	1,180	December	
15	1,240	28	858	April		16	1,120	16	733	15	658	16	1,080	October		November		10	1,570
23	1,220	March		4	1,040	19	1,270	22	815	17	1,250	22	1,150	1	938	2	1,520	17	1,570
29	1,230	2	919	11	1,170	22	722	26	879	25	768	26	951	3	866	8	1,410	26	1,440
February		6	932	12	1,390	23	1,130	July		31	901	28	585	7	773	14	1,280		
6	1,070	14	746	18	1,020	27	785	3	1,010					13	1,460	25	1,540		

Rio Grande at Langtry, Texas

January		February		April		May		June		July		August		September		November		December	
9	1,150	27	1,000	3	694	15	770	23	755	24	636	28	763	25	433	1	1,130	16	1,230
16	1,300	March		6	802	19	1,000	26	637	28	658	September		26	430	3	1,050	18	1,180
19	1,220	3	899	7	815	22	735	July		August		1	678	29	875	8	1,220	22	1,180
24	1,060	6	840	10	752	26	548	1	627	3	1,150	6	388	October		10	1,100	26	1,240
30	1,060	10	912	15	863	29	997	4	741	4	897	6	380	2	793	15	1,200	29	1,230
February		13	864	18	956	June		9	740	4	888	8	389	6	756	17	1,140		
4	978	17	751	23	923	2	777	10	770	8	891	13	916	10	926	24	1,310		
6	982	20	785	29	867	4	1,040	13	876	8	892	15	888	10	918	27	1,240		
11	1,080	24	719	May		5	1,010	13	878	11	1,020	20	563	13	794	December			
14	1,070	28	718	3	850	9	494	14	517	14	1,100	23	450	16	894	2	1,100		
17	939	31	740	6	864	13	951	17	644	18	1,100	24	415	25	1,290	4	1,120		
20	1,060	April		9	856	17	959	17	647	21	983	24	429	27	1,040	8	1,160		
24	969	1	750	14	573	19	553	21	696	25	910	25	431			13	1,130		

Pecos River near Comstock, Texas

January		February		March		April		June		July		August		September		October		December	
2	3,810	9	4,180	19	4,210	24	3,700	2	2,330	8	2,670	9	7,290	16	3,600	27	4,390	2	3,840
4	3,880	11	4,200	21	4,210	26	3,490	2	2,290	10	2,520	11	7,680	18	4,250	29	4,260	4	3,930
6	4,000	13	4,180	23	4,090	28	3,510	4	4,040	12	2,620	13	5,220	20	4,220	31	3,950	6	3,930
8	4,100	15	4,160	25	4,230	30	3,510	6	2,060	13	278	15	3,800	22	4,150	November		8	4,010
10	4,150	17	4,320	27	4,280	May		8	2,360	13	309	17	3,140	24	2,440	2	3,620	10	3,980
12	4,040	19	4,210	29	4,430	4	3,200	10	2,580	13	412	19	3,100	28	1,170	4	3,320	12	4,000
14	3,990	21	4,210	31	4,720	6	3,510	12	2,460	13	423	21	2,960	October		6	3,380	14	4,000
16	4,050	23	4,210	April		8	3,250	14	2,490	14	398	23	2,730	1	2,990	8	3,180	16	3,960
18	4,190	25	4,230	2	4,570	10	3,130	16	2,590	16	1,500	25	2,660	3	3,260	10	3,300	18	4,270
20	4,210	27	4,360	4	4,770	12	3,210	18	2,600	18	5,240	27	2,780	5	3,260	12	3,300	20	4,330
22	4,150	March		6	4,490	14	3,260	20	2,480	20	2,750	29	2,820	7	3,340	14	3,210	22	4,490
24	4,120	1	4,300	8	4,420	16	3,540	22	2,610	22	2,240	31	2,660	9	3,750	16	3,230	24	4,630
26	4,150	3	4,040	10	4,380	18	3,250	24	2,360	24	2,110	September		11	3,340	18	3,390	26	4,770
28	4,170	5	4,300	12	4,210	20	4,550	26	2,610	26	2,160	2	2,510	13	4,500	20	3,500	28	4,840
30	4,220	7	4,300	14	4,270	22	4,630	28	2,630	28	2,320	4	2,390	15	4,480	22	3,580	30	5,060
February		9	4,280	16	4,200	24	4,410	30	2,330	30	2,330	6	2,190	17	5,260	24	3,590		
1	4,130	11	4,330	18	4,810	26	3,950	July		August		8	2,470	19	5,650	26	3,490		
3	4,230	13	4,280	18	4,930	28	3,450	2	2,390	1	2,180	10	2,430	21	5,290	28	3,580		
5	4,090	15	4,240	20	6,000	29	2,690	4	2,430	5	2,280	12	2,350	23	5,150	30	3,640		
7	4,090	17	4,140	22	3,860	31	6,600	6	2,570	7	2,840	14	3,490	25	4,650				

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1950

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

Río San Diego at Jimenéz, Coahuila

February		March		April		May		July		August		September		October		November		December					
1	486	15	498	15	501	22	455	1	458	1	483	1	436	1	477	1	376	1	405				
8	527	22	537	20	508	30	507	8	468	8	485	8	473	8	365	8	413	8	510				
16	514	April		May		June		17	454	15	482	15	483	16	442	17	423	15	515				
March		2	546	1	541	2	414	24	491	21	477	22	475	23	474	24	504	22	499				
1	686	8	578	8	648	14	482			27	451												
8	544			15	625	21	445																

Río San Rodrigo near El Moral, Coahuila

February		March		April		May		June		August		September		October		November		December					
2	325	10	220	14	300	17	581	23	282	2	482	3	270	2	287	2	306	2	328				
10	287	17	288	22	681	24	504	July		9	479	9	571	9	287	9	581	9	592				
17	326	24	647	May		June		3	276	16	272	18	667	17	531	18	318	16	612				
25	647	April		2	286	1	255	10	658	23	599	23	558	24	426	25	554	23	686				
March		1	310	9	287	9	293	15	269														
1	296	10	687			17	476	22	678														

Rio Grande at Eagle Pass, Texas

January		February		March		April		May		June		July		September		October		November					
2	978	6	1,120	13	964	18	1,050	23	956	27	874	31	856	1	984	7	775	25	1,130				
3	1,050	7	1,030	15	1,030	19	1,110	24	1,050	28	896	August		2	848	9	853	29	1,120				
4	1,170	8	1,120	16	1,060	20	1,020	25	1,080	29	883	1	734	4	756	10	860	30	1,140				
5	1,030	9	1,030	17	988	21	1,310	26	1,150	30	818	2	869	5	745	11	1,040	December					
6	1,120	10	1,020	18	1,010	22	1,430	27	1,190	July		3	1,040	6	758	12	1,060	1	1,130				
7	1,130	13	1,120	20	969	24	1,340	29	1,060	1	744	4	993	7	805	13	1,110	2	1,180				
9	1,020	14	1,110	21	1,020	25	1,140	30	956	3	794	5	734	8	612	14	972	4	1,150				
10	1,010	15	1,040	22	942	26	1,150	31	968	4	779	7	879	9	597	16	959	5	1,190				
11	1,030	16	1,090	23	1,020	27	1,170	June		5	694	8	751	11	658	17	1,090	6	1,180				
12	1,060	17	1,060	24	988	28	1,140	1	855	6	753	9	787	12	643	18	1,150	7	1,160				
13	1,060	18	1,070	25	919	29	1,030	2	983	7	743	10	881	13	737	19	1,170	8	1,220				
14	1,180	20	1,170	27	984	May		3	1,230	8	837	11	885	14	814	20	1,170	9	1,190				
16	1,120	21	1,080	28	959	1	1,040	5	1,890	10	805	12	993	15	876	21	1,120	11	1,290				
17	1,160	22	1,070	29	1,030	2	833	6	1,890	11	768	14	1,190	16	926	23	1,400	12	1,320				
18	1,170	23	1,100	30	1,040	3	914	7	1,070	12	807	15	1,240	18	927	24	1,400	13	1,300				
19	1,210	24	1,090	31	989	4	907	8	1,150	13	643	16	1,310	19	974	25	1,530	14	1,310				
20	1,170	25	1,140	April		5	863	9	1,090	14	525	17	1,230	20	883	26	1,470	15	1,280				
21	1,150	27	1,140	1	960	6	943	10	1,060	14	385	18	1,020	21	867	27	1,340	16	1,270				
23	1,130	28	1,130	3	1,050	8	879	12	736	15	342	19	1,010	22	1,020	28	1,340	18	1,150				
24	1,120	March		4	987	9	869	13	684	17	778	21	1,150	23	1,100	30	1,290	19	1,190				
25	1,150	1	1,120	5	1,080	10	882	14	709	18	543	22	1,080	25	518	31	1,220	20	1,250				
26	1,040	2	1,050	6	994	11	1,070	15	651	19	721	23	1,010	26	796	November		21	1,220				
27	1,150	3	1,150	7	1,090	12	822	16	737	20	833	24	938	27	746	1	1,160	22	1,220				
28	1,120	4	1,020	8	1,030	13	932	17	826	21	872	25	993	29	664	2	1,180	28	1,380				
30	1,110	6	1,050	10	1,100	15	879	19	862	22	1,210	26	915	30	696	7	1,200	29	1,380				
31	1,150	7	1,070	11	1,070	16	801	20	986	24	964	28	521	October		12	1,190	30	1,430				
February		8	1,110	12	966	17	1,060	21	982	25	815	29	918	2	763	15	1,180						
1	1,160	9	981	13	969	18	912	22	881	26	801	30	887	3	785	19	1,170						
2	1,140	10	1,080	14	1,010	19	952	23	754	27	729	30	928	4	827	22	1,160						
3	1,130	11	997	15	999	20	954	24	773	28	784	31	962	5	868	23	1,150						
4	1,060	12	1,060	17	970	22	1,200	26	737	29	776			6	691	25	1,130						

Río Salado at Cd. Guerrero, Tamaulipas

January		February		April		May		June		July		August		September		November		December					
1	2,490	8	4,410	1	4,510	10	4,290	6	560	10	486	16	2,330	20	1,180	1	596	11	615				
2	2,560	10	4,410	7	4,630	12	3,400	7	300	12	491	18	2,110	22	951	3	583	13	612				
4	2,730	13	4,410	12	4,740	12	3,400	9	270	14	960	21	1,910	25	807	6	587	15	606				
6	2,930	15	4,430	14	4,740	15	4,300	12	306	14	974	23	1,960	27	881	8	595	18	623				
9	3,520	17	4,450	18	4,760	17	4,080	14	334	17	529	25	1,820	27	878	10	588	20	621				
11	3,140	20	4,450	18	4,760	19	4,210	16	336	19	482	28	1,880	29	1,130	13	579	22	624				
13	3,990	22	4,450	19	4,930	22	5,100	19	345	21	685	30	4,300	30	936	15	592	25	647				
16	4,020	24	4,470	20	3,130	24	2,910	21	345	24	1,980	31	4,550	October		17	575	27	659				
18	3.850	27	4,470	20	3,100	26	943	22	533	26	3,310	31	4,510	4	777	20	585	29	658				
20	3,840	28	4,470	21	2,520	29	1,210	22	541	28	3,700	September		6	788	22	579	31	665				
23	3,960	March		24	3,220	29	1,030	23	544	31	3,800	1	2,290	11	653	24	593						
25	3,930	1	4,460	26	3,650	29	493	26	455	August		4	2,680	16	601	27	582						
27	3,990	3	4,500	28	3,840	30	612	28	463	1	3,780	6	2,810	18	604	29	593						
30	4,140	6	4,930	30	3,990	June		30	364	2	3,750	7	4,130	20	591	30	593						
31	4,180	8	4,830	May		3	1,060	July		4	3,880	7	4,080	23	580	December							
February		10	4,930	1	4,030	3	1,070	1	381	7	4,020	8	4,350	25	590	1	591						
1	4,250	17	4,610	3	4,100	5	289	3	379	9	3,860	11	1,690	27	595	4	598						
3	4,330	24	4,420	5	4,080	6	419	5	428	11	3,410	13	1,400	30	612	6	614						
6	4,350	31	4,500	8	4,200	6	405	7	411	14	2,470	15	1,300	31	607	8	606						

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

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Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
Rio Grande at Roma, Texas																			
January		February		March		April		May		July		August		September		October		December	
1	1,040	7	1,110	17	1,140	24	1,130	30	829	5	928	12	718	18	829	25	996	1	1,170
2	1,030	8	1,090	18	1,130	25	1,090	31	563	6	994	13	831	19	872	26	1,030	2	1,150
3	1,040	9	1,120	19	1,120	26	1,110	June		7	913	14	982	20	802	27	1,120	3	1,130
4	1,070	10	1,150	20	1,090	27	1,140	1	441	8	972	15	842	21	707	28	1,160	4	1,140
5	1,090	11	1,110	21	1,110	28	1,140	2	440	9	937	16	842	22	710	29	1,150	5	1,140
6	1,080	12	1,150	22	1,090	29	1,110	3	728	10	949	17	861	23	766	30	1,150	6	1,140
7	1,100	13	1,150	23	1,060	30	1,140	4	657	11	950	18	867	24	838	31	1,200	7	1,140
8	1,120	14	1,160	24	1,090	May		5	588	12	936	19	924	25	481	November		8	1,120
9	1,070	15	1,150	25	1,100	1	1,160	6	655	13	907	20	992	26	835	1	1,280	9	1,130
10	1,060	16	1,130	26	1,110	2	1,170	7	446	14	880	21	1,120	27	772	2	1,360	10	1,140
11	1,110	17	1,110	27	1,100	3	1,250	8	512	15	604	22	1,390	28	995	3	1,450	11	1,160
12	1,160	18	1,120	28	1,090	4	1,450	9	479	16	785	23	1,460	29	683	4	1,520	12	1,170
13	1,140	20	1,100	29	1,080	5	1,520	10	734	17	798	24	1,400	30	781	5	1,490	13	1,200
14	1,100	21	1,120	30	1,100	6	1,560	11	1,150	18	502	25	1,330	October		6	1,400	14	1,220
15	1,130	22	1,130	31	1,080	7	1,500	12	1,240	19	444	26	1,270	1	805	7	1,350	15	1,210
16	1,120	23	1,120	April		8	1,460	13	1,670	20	369	27	1,220	2	834	8	1,350	16	1,190
17	1,110	24	1,120	1	1,060	9	1,350	14	1,830	21	662	28	1,190	3	747	9	1,350	17	1,190
18	1,090	25	1,120	2	1,040	10	1,310	15	1,760	22	670	29	1,140	4	663	10	1,320	18	1,140
19	1,110	26	1,140	3	1,030	11	1,290	16	1,160	23	790	30	1,130	5	650	11	1,280	19	1,180
20	1,110	27	1,130	4	1,030	12	886	17	1,180	25	1,080	31	1,270	6	734	12	1,250	20	1,220
21	1,150	28	1,130	5	1,030	13	961	18	1,100	26	863	September		7	854	13	1,210	21	1,210
22	1,170	March		6	1,030	14	1,390	19	1,020	27	974	1	1,170	8	776	14	1,180	22	1,240
23	1,150	1	1,140	7	1,030	15	969	20	953	28	1,180	2	1,550	9	856	15	1,160	23	1,300
24	1,120	2	1,160	8	1,040	16	920	21	715	29	1,080	3	954	10	837	16	1,160	24	1,300
25	1,100	3	1,130	9	1,050	17	1,010	22	683	30	1,080	4	744	11	1,090	17	1,160	25	1,310
26	1,140	4	1,130	10	1,070	18	927	23	712	31	999	5	957	12	787	18	1,160	26	1,250
27	1,170	5	1,120	11	1,080	19	824	24	479	August		6	937	13	704	19	1,140	27	1,250
28	1,210	6	1,140	13	1,090	20	826	25	637	1	946	7	966	14	713	20	1,090	28	1,230
29	1,240	7	1,160	14	1,110	21	803	26	821	2	827	8	904	15	804	21	751	29	1,220
30	1,230	8	1,170	15	1,090	22	1,060	27	811	3	861	9	1,530	16	917	22	992	30	1,200
31	1,230	9	1,140	16	1,120	23	1,210	28	950	4	801	10	1,250	17	867	23	1,160	31	1,220
February		10	1,140	17	1,120	24	786	29	649	5	877	11	1,040	18	874	24	1,150		
1	1,200	11	1,160	18	1,120	25	1,820	30	831	6	754	12	760	19	861	25	1,180		
2	1,190	12	1,150	19	1,140	26	1,680	July		7	843	13	829	20	903	26	1,140		
3	1,150	13	1,180	20	925	27	990	1	872	8	972	14	872	21	977	27	1,130		
4	1,100	14	1,120	21	1,310	28	602	2	765	9	1,010	15	918	22	1,090	28	1,140		
5	1,160	15	1,260	22	1,400	28	633	3	808	10	1,040	16	878	23	1,070	29	1,150		
6	1,100	16	1,220	23	1,150	29	506	4	934	11	809	17	911	24	1,010	30	1,150		

North Floodway near Sebastian, Texas

January		February		April		May		June		July		August		October		November		December	
4	3,330	20	3,440	3	4,170	22	1,080	1	2,080	3	4,020	21	3,050	2	3,410	6	4,310	26	5,130
9	3,370	27	3,850	10	4,920	22	1,070	1	2,080	10	4,540	28	3,150	4	2,590	14	4,760		
16	3,440	March		17	3,620	29	1,430	5	3,880	17	5,640	September		4	2,580	20	4,020		
23	2,960	6	3,900	24	4,820	29	1,440	5	3,880	24	3,470	5	3,370	9	3,950	27	4,180		
30	3,000	13	4,360	May		29	1,440	12	5,640	31	3,470	11	3,490	16	3,800	December			
February		20	4,040	1	4,270	June		19	4,920	August		18	3,430	23	3,400	4	3,950		
6	3,810	27	4,300	8	5,640	1	2,080	26	4,390	7	3,420	25	3,620	30	3,620	11	3,910		
13	3,520			15	3,210	1	2,080			14	3,370					18	4,390		

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

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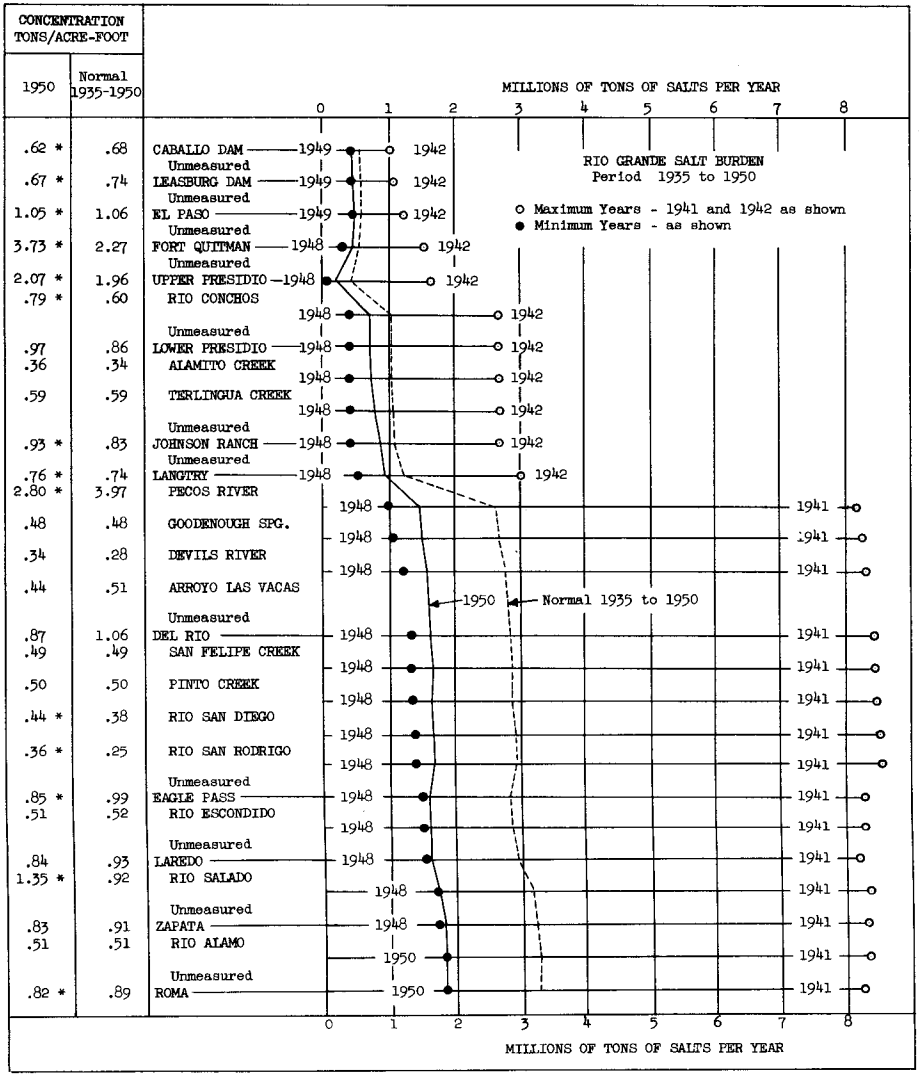
Rio Grande at Mercedes, Texas, Pumps

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		**February**		**March**		**April**		**May**		**July**		**August**		**September**		**October**		**November**	
1	1,250	7	1,320	16	1,490	22	1,440	28	1,110	2	1,270	8	1,030	14	1,480	20	939	25	1,360
2	1,160	8	1,360	17	1,580	23	1,010	29	1,210	3	1,320	9	946	15	1,490	21	1,030	26	1,330
3	1,200	9	1,300	18	1,510	24	1,100	30	690	4	1,000	10	828	16	1,390	22	1,060	27	1,070
4	1,160	10	1,340	19	1,550	25	1,190	31	573	5	1,060	11	1,120	17	1,250	23	1,100	28	1,330
5	1,170	11	1,340	20	1,620	26	1,540	**June**		6	1,270	12	1,110	18	1,160	24	1,070	29	1,360
6	1,220	12	1,370	21	1,670	27	1,470	1	707	7	1,390	13	1,140	19	1,230	25	1,090	30	1,400
7	1,190	13	1,380	22	1,520	28	1,500	2	813	8	1,430	14	1,220	20	1,270	26	1,140	**December**	
8	1,170	14	1,360	23	1,560	29	1,590	3	670	9	1,420	15	1,050	21	1,300	27	1,200	1	1,390
9	1,240	15	1,370	24	1,580	30	1,540	4	585	10	1,400	16	968	22	1,300	28	1,290	2	1,370
10	1,250	16	1,390	25	1,540	**May**		5	591	11	1,560	17	973	23	1,290	29	1,290	3	1,420
11	1,290	17	1,420	26	1,540	1	1,590	6	904	12	1,610	18	1,040	24	1,310	30	1,240	4	1,420
12	1,250	18	1,360	27	1,580	2	1,750	7	740	13	1,650	19	1,160	25	1,210	31	1,250	5	1,430
13	1,300	19	1,450	28	1,530	3	1,740	8	756	14	1,670	20	1,090	26	930	**November**		6	1,390
14	1,300	21	1,360	29	1,520	4	1,640	9	744	15	1,660	21	1,090	27	900	1	1,280	7	1,390
15	1,230	22	1,370	30	1,520	5	1,680	10	725	17	1,740	22	1,160	28	689	2	1,340	8	1,430
16	1,230	23	1,350	31	1,560	6	1,810	11	617	18	847	23	1,090	29	954	3	1,370	9	1,390
18	1,300	24	1,420	**April**		7	1,840	12	688	19	896	24	1,220	30	896	4	1,370	10	1,380
19	1,310	25	1,440	1	1,480	8	1,870	13	662	20	897	25	1,240	**October**		5	1,400	11	1,380
20	1,320	26	1,440	2	1,480	9	1,930	14	813	21	599	26	1,270	1	743	6	1,500	12	1,440
21	1,310	27	1,440	3	1,490	10	1,940	15	980	22	544	27	1,720	2	747	7	1,530	13	1,410
22	1,290	28	1,430	4	1,560	11	2,020	16	1,330	23	526	28	1,720	3	802	8	1,570	14	1,360
23	1,250	**March**		5	1,550	12	1,920	17	1,570	24	530	29	1,750	4	832	9	1,620	15	1,350
24	1,260	1	1,360	6	1,520	13	2,010	18	1,850	25	798	30	1,670	5	790	10	1,710	16	1,360
25	1,300	2	1,400	7	1,530	14	2,120	19	1,970	26	757	31	1,620	6	874	11	1,740	17	1,400
26	1,290	3	1,430	8	1,620	15	1,730	20	2,120	27	750	**September**		7	851	12	1,690	18	1,360
27	1,320	4	1,510	9	1,480	16	1,580	21	1,560	28	828	1	1,570	8	748	13	1,610	20	1,440
28	1,320	5	1,490	10	1,420	17	1,160	22	1,560	29	1,210	2	1,530	9	746	14	1,570	21	1,460
29	1,260	6	1,470	11	1,390	18	1,530	23	1,570	30	1,050	3	1,410	10	757	15	1,570	22	1,440
30	1,260	7	1,430	12	1,330	19	1,530	24	1,520	31	1,070	4	1,320	11	796	16	1,560	23	1,360
31	1,250	8	1,410	13	1,390	20	1,370	25	964	**August**		5	1,540	12	880	17	1,530	25	1,320
February		9	1,480	14	1,420	21	1,360	26	910	1	1,270	6	1,420	13	952	18	1,500	26	1,360
1	1,300	10	1,450	15	1,400	22	1,350	27	901	2	1,480	7	1,250	14	926	19	1,470	27	1,460
2	1,400	11	1,480	17	1,510	23	1,210	28	775	3	1,270	9	913	15	976	20	1,420	28	1,470
3	1,370	12	1,520	18	1,430	24	1,030	29	814	4	1,310	10	1,170	16	981	21	1,420	29	1,490
4	1,410	13	1,560	19	1,520	25	1,130	30	934	5	1,290	11	1,180	17	842	22	1,370	30	1,530
5	1,380	14	1,510	20	1,530	26	1,210	**July**		6	1,120	12	1,250	18	843	23	1,350	31	1,530
6	1,320	15	1,530	21	1,520	27	1,420	1	1,110	7	1,010	13	1,260	19	900	24	1,350		

RIO GRANDE SALT BURDEN

The term "salt" as used herein means total dissolved solids. The concentrations, in tons per acre-foot, for 1950, which are marked by an asterisk (*) are based on the chemical analyses shown on preceding pages of this bulletin. Those not asterisked are based either on chemical analyses reported in previous Water Bulletins, or have been arrived at by deduction. The normal concentrations shown for the period 1935 to 1950 are the weighted means of the values determined for the 16-year period indicated.



SANITARY ASPECTS OF WATER QUALITY

The United States and Mexican sections of this Commission, and the Texas State Department of Health co-operate in the joint sanitary water-sampling program along the Rio Grande. All analyses below have been made under the "Rules of Laboratory Procedure" as approved by the participating agencies, and which conform with the procedures set out in the manual, "Standard Methods for the Examination of Water and Sewage" - Ninth Edition (1946), prepared by the American Public Health Association and the American Water Works Association. These analyses were made in the laboratories of the El Paso Water Plant, the Laredo Water Plant, the Cameron County Health Unit, and the International Boundary and Water Commission. Analyses for Biochemical Oxygen Demand (B.O.D.) and for Dissolved Oxygen (D.O.) were made for only a part of the samples.

The percentages of Dissolved Oxygen (D.O.) shown below are the percent saturation at the elevation of the sampling station. Similar values published in Water Bulletin No. 18 and previous issues are expressed as the percent saturation at sea-level elevation.

Rio Grande at El Paso, Texas, Water Plant

Date 1950	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1950	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Sept. 26	94.1		6,200	30,700	Nov. 14	103	3.09	2,300	5,650
Oct. 3	96.0	1.7	24,000	10,750	Dec. 12	106	1.6	5,500	2,750
17	100	1.9	24,000	22,000					
24		1.0							
31	125	6.4	21,000	1,850	Total	717.0	18.19	86,600	76,400
Nov. 7	92.9	2.5	3,600	2,700	Average	102.4	2.60	12,400	10,900

Franklin Canal at El Paso, Texas, Water Plant

Date 1950	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1950	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Mar. 14	94.8	2.7	2,300		July 25	89.6	1.5	38,000	87,000
21		1.9	3,600	3,800	Aug. 1	91.2	1.6	38,000	30,350
28	90.4	2.5	2,300	2,100	8	89.8	1.47	6,200	19,250
Apr. 4	89.8	1.9	24,000	6,900	15	88.1	1.5	6,200	12,500
11	94.8	1.45	5,500	2,350	22	90.6	1.5	38,000	16,250
18	93.5	1.45	70,000	3,800	29	92.3	2.2	38,000	23,050
25	95.7	1.9	3,600		Sept. 5	95.3	1.2	3,600	15,400
May 2	89.8	1.6	5,500	5,500	12	94.1	1.5	6,200	21,200
9	91.5	1.45	11,000	5,600	19	96.0	.9	24,000	29,500
16	91.2	1.09	24,000	5,100	Oct. 10	91.7	1.3	38,000	29,300
23	97.4	1.8	11,000	6,250	Nov. 21	88.3	1.54	3,400	6,050
29	115	1.6	6,200	8,000	28	101	2.18	2,300	4,050
June 6	93.0	1.55	6,200	6,550	Dec. 5	96.6	2.4	2,300	6,050
13	97.3	1.45	6,200	6,250	19	89.3	1.8	3,600	2,100
20	92.6	1.55	11,000	8,900	26	102	2.1	2,300	1,400
27	94.1	1.55	6,200	12,900					
July 3	95.4	1.7	6,200	12,550					
11	85.5	1.73	24,000	42,500	Total	3,071.1	57.11	502,900	458,550
18	85.3	1.55	24,000	41,500	Average	93.1	1.68	14,800	15,300

Rio Grande at Ysleta, Texas–Zaragosa, Chih. Bridge

Date 1950	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1950	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 3	72.7	5.8	2,400,000	268,000	July 18	71.3	13.2	2,400,000	445,000
10	67.3	7.6	230,000	230,000	25	75.6	9.5	1,600,000	510,000
17	74.3	7.5	360,000	250,000	Aug. 1	65.9	5.1	620,000	395,000
24	69.1	5.0	360,000	310,000	8	72.6	7.24	3,800,000	670,000
31	75.9	7.6	230,000	170,000	15	78.3	5.6	620,000	705,000
Feb. 7	73.9		550,000	210,000	22	59.8	13.4	14,000,000	1,385,000
14	60.5		360,000	455,000	29	78.3	7.1	620,000	505,000
21	18.1	27.5	7,000,000	910,000	Sept. 5	83.6	5.1	230,000	280,000
28	57.8	21.0	2,400,000	91,000	12	75.4	8.9	360,000	315,000
Mar. 7	69.9	6.0	230,000	100,000	19	71.3	4.6	1,600,000	760,000
14	67.3	12.6	230,000	65,000	26	67.4		7,000,000	920,000
21			620,000	440,000	Oct. 3	71.4	6.8	1,100,000	705,000
28	83.9	15.3	620,000	350,000	10	71.2	8.2	3,800,000	1,175,000
Apr. 4	79.1	9.3	3,800,000	300,000	17	37.7	16.3	14,000,000	1,995,000
11	79.6	8.7	1,100,000	255,000	24	72.9	6.4		
18	66.5	9.3	620,000	255,000	31	40.4	22.1	11,000,000	1,385,000
25	73.8	7.5	360,000	215,000	Nov. 7	74.8	5.59	360,000	220,000
May 2	70.1	6.2	1,100,000	230,000	14	70.5	7.78	1,600,000	505,000
9	75.0	4.4	360,000	155,000	21	29.3	19.4	24,000,000	1,215,000
16	75.6	6.96	360,000	230,000	28	28.9	41.5	11,000,000	1,250,000
23	76.8	10.3	2,400,000	325,000	Dec. 5	67.3	12.01	230,000	380,000
29	72.8	6.3	620,000	430,000	12	71.0	8.2	940,000	205,000
June 6	65.8	8.7	1,100,000	350,000	19	41.4	28.0	6,200,000	1,010,000
13	74.1	9.3	1,100,000	340,000	26	61.0	15.3	800,000	405,000
20	71.3	5.6	360,000	310,000					
27	74.1	5.4	2,400,000	485,000					
July 3	79.8	9.6	360,000	490,000	Total	3,426.6	512.08	141,910,000	25,634,000
11	64.2	12.8	2,400,000	1,050,000	Average	67.2	10.7	2,783,000	523,000

SANITARY ASPECTS OF WATER QUALITY

Rio Grande at Laredo, Texas, Water Plant

Date 1950	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1950	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1950	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1950	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
Jan. 3	340		Feb. 21	110		Apr. 14	93		Aug. 14	3,600	25,000
3	360	850	24	36		17	1,600	1,380	21	3,600	5,000
6	230		27	620	1,550	18	620		28	22,000	3,150
9	110	625	28	110		21	620		Sept. 5	3,600	39,500
10	230		Mar. 3	230		24	210	800	11	2,300	43,000
13	340		6	62	1,400	25	2,400		18	600	6,000
16	62	450	7	2,400		28	360		25	38,000	47,700
17	270		10	36		May 1	360	750	Oct. 2	3,600	80,000
20	62		13	360	1,050	8	230	1,150	9	24,000	70,000
23	23	500	14	160		15	3,600	9,500	16	2,300	30,000
24	550		17	620		22	16,000	9,750	23	1,600	4,200
27	360		20	110	1,170	29	23,000	14,500	30	160	700
30	230	580	21	550		June 5	1,600	12,250	Nov. 6	270	2,500
31	93		24	93		12	1,100	5,500	13	62	800
Feb. 3	200		27	160	540	19	2,400	12,000	20	1,100	1,500
6	93	1,080	28	550		26	2,100	25,000	27	1,100	750
7	110		31	620		July 3	1,100	1,500	Dec. 4	360	900
10	62		Apr. 3	130	360	10	1,600	2,000	11	160	780
13	360	1,020	4	940		17	22,000	72,500	18	230	1,250
14	160		7	36		24	5,400	34,000			
17	91		10	620	450	31	11,000	72,500	Total	222,790	756,760
20	230	825	11	36		Aug. 7	3,600	106,500	Average	2,620	14,800

Rio Grande 9.1 Miles Below Laredo, Texas, R. R. Bridge

Jan. 3	36,000	8,600	Apr. 3	3,600	4,000	July 17	93,000	120,000	Oct. 16	23,000	39,000
9	36,000	3,900	10	3,600	5,500	24	36,000	30,000	30	5,400	14,000
16	11,000	2,900	17	16,000	3,750	31	36,000	150,000	Nov. 6	9,300	8,000
23	16,000	5,800	24	21,000	4,500	Aug. 7	36,000	100,000	13	2,300	8,000
Feb. 6	21,000	11,500	May 8	9,300	9,000	14	380,000	32,000	27	36,000	5,500
13	16,000	6,750	15	11,000	15,000	21	55,000	17,500	Dec. 4	34,000	5,000
20	9,300	5,850	22	93,000	38,000	28	16,000	5,000	11	11,000	4,000
27	36,000	12,000	29	16,000	10,000	Sept.11	230,000	17,000	18	5,400	5,000
Mar. 6	11,000	7,000	June 5	240,000	77,500	18	93,000	34,000	26	5,400	2,000
13	11,000	3,800	19	24,000	13,500	25	23,000	36,000			
20	36,000	8,000	July 3	36,000	7,000	Oct. 2	36,000	90,000	Total	2,011,800	1,120,450
27	6,200	4,600	10	17,000	25,000	9	110,000	105,000	Average	44,700	24,900

Rio Grande at Falcón, Texas*

Jan. 4	1,700	1,000	Apr. 10	210	680	July 17	36,000	145,000	Oct. 23	38,000	10,200
9	1,600	1,400	17	1,100	1,100	24		27,200	30	3,600	8,000
16	1,600	1,100	24	14,000	15,900	31	6,200	65,000	Nov. 6	6,200	2,500
23	9,400	2,400	May 1	620	500	Aug. 7	3,600	77,000	13	2,300	2,200
30	6,200	6,450	8	360	600	14	6,200	29,000	27	620	500
Feb. 6	3,600	2,200	15	11,000	16,000	21	6,200	6,300	Dec. 4	3,600	1,800
13	5,500	3,200	22	36,000	45,000	28	3,600	1,100	11	360	1,350
20	2,300	1,350	29	110,000	41,000	Sept. 5	24,000	10,000	18	1,100	1,800
27	2,300	200	June 5	11,000	4,500	11	36,000	42,500	26	6,200	2,050
Mar. 6	6,200	3,150	12	1,100	1,500	18	36,000	19,000			
14	2,300	1,200	19	6,200	9,000	25	11,000	26,000			
20	3,600	1,350	26	16,000	60,000	Oct. 2	36,000	140,000			
27	1,600	650	July 3	3,400	1,800	9	23,000	40,000	Total	559,790	907,730
Apr. 3	620	500	10	1,100	1,600	16	9,400	24,000	Average	11,200	17,800

Rio Grande at Chapeño, Texas**

Jan. 4	620	1,300	Apr. 10	360	340	July 17	36,000	135,000	Oct. 23	6,200	5,500
9	2,300	1,650	17	2,400	590	24	5,500	14,700	30	3,600	3,000
16	620	1,500	24	24,000	19,100	31	5,400	60,000	Nov. 6	2,100	1,800
23	2,300	1,650	May 1	360	800	Aug. 7	6,200	40,000	13	1,100	1,400
30	1,100	400	8	620	850	14	11,000	50,000	27	540	1,000
Feb. 6	2,300	2,300	15	11,000	18,000	21	2,300	4,000	Dec. 4	3,600	1,500
13	1,100	2,000	22	62,000	51,000	28	2,300	1,250	11	2,300	1,400
20	6,200	2,400	29	62,000	40,000	Sept. 5	3,400	7,100	18	3,600	1,500
27	2,300	50	June 5	24,000	6,000	11	23,000	37,000	26	2,300	1,880
Mar. 6	6,200	2,300	12	360	4,000	18	11,000	12,000			
14	2,300	1,500	19	3,600	8,500	25	3,400	25,000			
20	2,300	900	26	3,600	52,500	Oct. 2	36,000	100,000			
27	620	700	July 3	6,200	2,300	9	36,000	39,000	Total	460,090	787,060
Apr. 3	130	300	10	360	600	16	22,000	19,500	Average	9,020	15,400

Rio Grande at Mercedes, Texas, Pumps

Jan. 9	620		Apr. 10	930		July 24	2,300		Nov. 13	1,100	
16	360		17	3,600		31	2,100		20	620	
23	160		24	2,100		Aug. 21	1,600		27	620	
30	360		May 1	38,000		28	620		Dec. 5	16	
Feb. 6	360		8	620		Sept. 5	1,100		11	110	
13	1,100		15	1,200		11	620		18	160	
20	1,100		22	1,100		18	3,600		26	1,300	
27	160		June 5	9,400		25	3,600				
Mar. 6	270		12	1,600		Oct. 2	6,200				
13	350		19	93		16	2,800				
20	340		26	6,200		23	3,600				
27	270		July 10	1,100		30	1,100		Total	107,369	
Apr. 3	110		17	1,600		Nov. 6	1,100		Average	2,330	

* 4.4 miles upstream from Falcón Dam. ** 1.7 miles downstream from Falcón Dam.

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1950

The daily rainfall records tabulated below have not been published elsewhere. For each station there are indicated the source of the record and the type of rain gage in use. The general location of each station is shown on the map of the watershed, pages 54 and 55 of this bulletin.

American Dam Near El Paso

Recording gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.01		.01	.40																				.42	.54
Feb.												.16																				.16	.34
Mar.																																0	.33
Apr.																																0	.25
May											.59																					.59	.35
June																.08	.11					.15								.26		.60	.86
July						.70	.59			.01	.06	.19			.03		.07			1.02	.13	.08		.44	.01		.01		.26	.13		3.73	1.49
Aug.			.02											.01		.08																.11	1.11
Sept.	.02			.02												.12	.02			.01	.44	.07		.18								.88	1.01
Oct.			.06	.24																												.30	.73
Nov.																																0	.24
Dec.																																0	.50

Period 1938-1950 Total 1950 6.79 7.75

Island Station

Recording gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.			T						.12		.05	.45																				.62	.42
Feb.												.14	.03																			.17	.28
Mar.																																0	.28
Apr.																																0	.16
May																																0	.46
June																													.02			.02	.45
July						.02	.75				.22	.17					.13				.21	.18		.08					.04	.09		1.89	1.01
Aug.			.64		.02		.02									T																.68	1.19
Sept.	.03			.25																			.50	.16								.94	1.18
Oct.	.01			.08																												.09	.96
Nov.																																0	.28
Dec.																																0	.49

Period 1939-1950 Total 1950 4.41 7.16

Fabens-Guadalupe Bridge, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.07		.05	.36																				.48	.51
Feb.												.14																				.14	.30
Mar.																																0	.35
Apr.																																0	.26
May																																0	.45
June	.75																					.06								T		.81	.64
July							.48				.06	.28		.03		.02			.29			.32							.11	.10		1.69	.76
Aug.			.01		.01										.09																	.11	1.44
Sept.				.25										.03		.09	.11		.06		.61	.05		T								1.20	1.36
Oct.																																0	1.21
Nov.																																0	.25
Dec.																																0	.27

Period April 1940-1950 Total 1950 4.43 8.10

County Line

Recording gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.								.08		.01	.02	.40		.01																		.52	.33
Feb.												.13																				.13	.21
Mar.																																0	.31
Apr.																																0	.29
May																																0	.30
June	.73		.15																									.03		.03		.94	.66
July						.09	.02				.50	.28						.05	.01		.48	.05	.72	.02						.22		2.44	1.07
Aug.			.07		.03		.01								.01	.06																.18	1.36
Sept.			.01	.19												.06	.02		.10		.25	.10		.20						.02		.95	1.20
Oct.	.01			.01														.07														.09	.99
Nov.																																0	.26
Dec.																																0	.51

Period 1938-1950 Total 1950 5.25 7.69

Fort Hancock Bridge, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.05		.01	.01	.21																			.28	.56
Feb.													.24														T					.24	.50
Mar.																																0	.27
Apr.																																0	.27
May											T			T																		T	.57
June		.33			.03							T														T			.07	T		.43	1.08
July			.01	.04			.10	.06				.47	.19			.01	T	.28	T		.40	.03		.45			.02				.56	2.62	1.08
Aug.			T	.15	.02			.45							T																	.62	1.07
Sept.	.02			.54	.05			.01								.09		T	.28	.01		.32	.07	.17								1.56	1.51
Oct.	.02			T	T																											.02	1.18
Nov.																																0	.21
Dec.																																0	.63

Period April 1940-1950 Total 1950 5.77 8.53

Madden Arroyo Highway (U. S. 80) Bridge, Texas

Recording gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.06		.04	.16																				.26	.45
Feb.												.02	.05																			.07	.13
Mar.																																0	.15
Apr.												.12																				.12	.38
May																																0	.39
June	.50			.05																												.55	.70
July							.13				1.00						.11				.10		.20	.44		.08				.67		2.73	1.04
Aug.			.17						.08			.01																				.26	1.18
Sept.				.62												.06			.05	.02	.12			.07						.42		1.36	1.37
Oct.	.01																															.01	1.43
Nov.																																0	.16
Dec.																																0	.62

Period September 1941-1950 Total 1950 5.36 8.00

West Small, Texas

Standard gage — C. E. Chandler

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.			.10										.30																			.40	.56
Feb.																																NR	.32
Mar.																																0	.19
Apr.																																0	.45
May																																0	.69
June																						2.50										2.50	1.04
July				.85							.11						.12							.10						.25		1.43	1.63
Aug.			.40																													.40	1.68
Sept.				.90																				.16						.60		1.66	1.73
Oct.																																0	1.61
Nov.																																0	.46
Dec.																																0	.77

ϕ Period May 1940-1950 Total 1950 10.91

ϕ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1950

Recording gage — **Guayuco Arroyo Highway (U. S. 80) Bridge, Texas** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.06		.05	.13																				.26	.49
Feb.												.02	.02																			.04	.15
Mar.																																0	.15
Apr.												.05																				.05	.19
May											.10																					.10	.42
June	.24		.13	.12																										.05		.54	.83
July			.02	.02		.02	.20				.25	.10				.04	.05			.04	.29			1.24	.13	.05				.09		2.54	1.56
Aug.			.04	.23		.02								.02		.05												.03				.39	1.34
Sept.	.04			.37																.04	.10		.39	.51						.45		1.90	1.65
Oct.	.01														.04																	.05	1.38
Nov.																																0	.21
Dec.																																0	.60
	♯ Period May 1940-1950 Total 1950																															5.87	8.77

Recording gage — **Fort Quitman** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.05		.04	.16																				.25	.59
Feb.											.01	.02	.05																			.08	.25
Mar.																																0	.26
Apr.												.14																				.14	.31
May																											.03					.03	.51
June	.47		.08	.66																						.48		.25		.05		1.99	.90
July							.53				.34	.02				.03	.08				.25			.76	.10		.28	.02			.02	2.43	1.46
Aug.								.07					.08														.04					.19	1.17
Sept.	.03			.53															.01		.06	.44		.20						.05		1.36	1.28
Oct.		.35													.06																	.41	.84
Nov.																																0	.26
Dec.																																0	.48
	♯ Period 1937-1950 Total 1950																															6.88	8.31

Standard gage — **Neely Ranch, Texas** — Mrs. Tom Neely

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.												.20																				.20	.53
Feb.													.10																			.10	.14
Mar.																																0	.17
Apr.												.22																				.22	.11
May																																0	.50
June	.80			.36																												1.16	.89
July					.14						.19		1.59				.41	.16			.40	.24	.54					.14				3.81	1.69
Aug.																																0	1.26
Sept.				.19																		.50		.20								.89	1.87
Oct.																																0	1.04
Nov.																																0	.14
Dec.																																0	.26
	Period August 1941-1950 Total 1950																															6.38	8.90

Standard gage — **Presidio, Texas 1949** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.															Record began October 16, 1949																		
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																																	
Sept.																																	
Oct.																		.58			.05			.02								0	
Nov.																													.07	.35		.46	
Dec.										.04																							
	Latitude 29° 34' Longitude 104° 23' Elevation 2,600 Feet																																

Standard gage — **Presidio, Texas 1950** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.01				.16																	.01		.18	
Feb.													.22																			.22	
Mar.																																0	
Apr.												.11																				.11	
May																											.05					.15	
June		.40						.70														.14									.10	1.24	
July					T					.04			.09				.13			.14												2.22	
Aug.										T							.11										.10	.06	.03	.07	1.72	.30	
Sept.										.02					.28					.07	.40	1.00	.42	.04	.03			.05				2.26	
Oct.	1.07	.07																														1.14	
Nov.																																0	0
Dec.																																0	.23
	Period November 1949-1950 Total 1950																															7.82	

Standard gage — **Johnson Ranch, Texas** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		T						T				.40	.10																			.50	.58
Feb.													T																			T	.15
Mar.																																0	.11
Apr.													.02																			.02	.51
May											.17	.71														T						.88	.97
June		.33			.06									.37										.92	.19							1.87	1.26
July	T					T							.34	.52			T											T	.51	.19		T	1.56	1.29
Aug.		T																	.02								T	.50	.10			.42	.80
Sept.							.15					.06		T	.04										1.60	.07						1.92	1.64
Oct.																																0	.71
Nov.																																0	.26
Dec.																																0	.40
	♯ Period 1933-1950 Total 1950																															7.17	8.68

Standard gage — **Maravillas 1949** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.															Record began October 1, 1949																		
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																																	
Sept.																																	
Oct.																		.06			.07		.33	.54			.78					1.78	
Nov.																																0	
Dec.																															.47	.02	.49
	Latitude 29° 33' Longitude 102° 47' Elevation 1,810 Feet																																

Standard gage — **Maravillas 1950** — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.												.12	.21																	.01	.01	.35	
Feb.											T		.05																			.05	
Mar.			T		T						T											.56										T	
Apr.									.03	.04	.65	T	.73	.05				T				T				.03	T		T			1.34	
May									1.24			T		.21										T								.75	
June	.02		T	.34	T			.26																								2.07	
July					T	T							1.81	T	.28		.08	.04										.02			.02	2.25	
Aug.		1.69														.29		.19										.05	.73		.03	2.95	
Sept.					.09	.29			T							.31	T	.01		T	.06		.92	.44								2.15	
Oct.																																0	.89
Nov.																																0	0
Dec.																																0	.24
	Period October 1949-1950 Total 1950																															11.91	

♯ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1950

Dryden, Texas

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.												.09	.25																			.34	.72
Feb.	.18		.04																			.05										.27	.45
Mar.																																0	.40
Apr.													.25		.30								.04									.59	.94
May											.81	.01						.06								.02		.02				.92	2.13
June	.01	.27						.04															.15									.47	.99
July											.85		.29	.43													T					.97	1.34
Aug.																											.23		.04			.27	1.52
Sept.						.13				.05						.22		.18	.03			.42	.29	1.64	.23							3.19	1.89
Oct.																																0	1.27
Nov.																																0	.42
Dec.																																0	.64
																															♯ Period 1931-1950	Total 1950	7.02 / 12.71

Pumpville, Texas

Standard gage — C. Cash

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.											.10	.20								.04	.04		.04							T	T	.42	1.12
Feb.																																0	.48
Mar.																																0	.41
Apr.												.32		.27														T				.59	1.04
May										T	.42						T														1.05	1.47	1.57
June	.20																					.16										.36	1.07
July													.50													.40						.90	.43
Aug.																											.12					.12	.95
Sept.			.11	.34	.12										.25		T				.10	T	1.07									1.99	2.31
Oct.			T																													T	2.07
Nov.																																0	.08
Dec.																																0	.84
																															♯ Period 1946-1950	Total 1950	5.85 / 12.37

Pecos River

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.											.12	.04	.02																		.05	.23	1.08
Feb.													.15																			.15	.80
Mar.																																0	.67
Apr.												.06		.36	.03	.13							.19					.20				.97	1.49
May												.49					.39															.88	1.96
June	.09		.12																			.21										.42	1.78
July											.23		2.80																			3.03	1.78
Aug.															.82															.96		1.78	1.97
Sept.										.05												.95		1.35								2.35	2.08
Oct.																																0	1.20
Nov.																																0	.48
Dec.																																0	.86
																															Period March 1938-1950	Total 1950	9.81 / 16.15

Goodenough Spring Ranch

Visual gage — River Riders

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	1.12
Feb.																																0	2.05
Mar.																																0	.80
Apr.																																0	0
May											2.20																					2.20	1.08
June	.50																					.70										1.20	1.40
July											.40		1.10																			1.50	2.28
Aug.														.50							.30											.80	1.65
Sept.					.80																			1.20								2.00	3.28
Oct.																																0	1.02
Nov.																																0	.23
Dec.																																0	.87
																															♯ Period 1946-1950	Total 1950	7.70 / 15.78

Comstock, Texas

Standard gage — George Humphreys

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																															.18	.18	.91
Feb.																				.33												.33	1.04
Mar.																																0	.79
Apr.														.18	.25	.23							.41					.04		.09		1.20	1.74
May										1.17	.24						.08														.64	2.13	1.95
June																						.42										.42	1.69
July									.37		1.02		1.24																	.80		2.26	1.19
Aug.																																1.17	2.92
Sept.																							1.02	.10								1.12	2.02
Oct.																																0	1.62
Nov.																																0	.58
Dec.																																0	1.09
																															Period May 1939-1950	Total 1950	8.81 / 17.48

Devils Lake, Texas

Standard gage — Central Power and Light Co.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.91
Feb.																																0	.86
Mar.																																0	.71
Apr.																.25	.55						.20							.93		1.93	1.77
May																	.10															.10	1.61
June	.45																					.55										1.00	2.02
July												.70	2.00																			2.70	.99
Aug.																																0	1.65
Sept.																								1.68								1.68	1.78
Oct.																																0	1.48
Nov.																																0	.69
Dec.																																0	.92
																															Period May 1939-1950	Total 1950	7.41 / 15.39

Maverick County Canal Headgate

Standard gage — Gate Tender

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.												.08	.20																			0	.76
Feb.			.14			.04																										.46	3.03
Mar.			.17										.17		.30	.07														.49		.17	.18
Apr.																		.40									.02					1.03	1.64
May											1.68																					2.10	1.01
June	.96			.14																		.17	.59									1.46	1.97
July												3.25		.16																		3.41	4.47
Aug.													.70						.13									.03				.86	1.64
Sept.					.49												.05						.15	.10	.25							1.04	3.17
Oct.																																0	1.20
Nov.																	.02															.02	.17
Dec.																																0	.65
																															Period 1948-1950	Total 1950	10.55 / 19.89

Quemado, Texas

Standard gage — Walter F. Cox

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T	.01	T				T	T	T					T		T		T	T	.01	T	.01	T	T	T		.01	T		T	.01	T	.05	1.02
Feb.	T	.02	.05	.03	T	T	T	T	T	T	.45	.08														T	T	T				.65	1.75
Mar.	T	T	.05	T	T	T						.10																	.20	T	T	.15	.56
Apr.	T												.08	.64	.20	.18					T	T	T									1.24	1.80
May											1.05			T								.45									1.69	3.13	2.84
June	.35																					.30	.90									1.15	1.94
July												2.05						.02														2.07	1.41
Aug.														.30				.50														.80	1.70
Sept.				.12												.19							.03									.54	3.18
Oct.						T															.06											.06	1.37
Nov.														T		T	T	.03														.03	.62
Dec.																																0	.71
																															Period November 1941-1950	Total 1950	9.65 / 19.15

♯ Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1950

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average

Tortuga Ranch, Texas

Standard gage — W. H. Brown

Record began May 1, 1950

Jan.																																	
Feb.																																	
Mar.																																	
Apr.																																	
May											1.40	.50		.06			.04	.10			.25	.06				.20	.14	.04			1.40	4.19	
June	1.24	.14																														1.38	
July													.12	.44																			
Aug.	1.28														.30			.35		2.00	.15											.36	
Sept.										.83							.32							2.50								4.08	
Oct.																																3.63	
Nov.																																0	
Dec.																																0	
																																0	

Latitude 28° 39' Longitude 100° 26' Elevation 780 Feet

El Indio, Texas

Standard gage — W. C. Smith

Jan.																																.27	1.02
Feb.			.19	.06		.17						.17							.10		.35											.77	.86
Mar.																																0	.59
Apr.															.14																	.14	1.07
May											2.35							1.25								.05					2.45	6.10	3.72
June																					1.68											1.68	2.12
July	.18											.24		1.13																		1.37	.90
Aug.								1.29										.20														1.74	2.46
Sept.																	.30							1.18	.30			.07				1.78	3.12
Oct.																																0	1.16
Nov.																																0	.52
Dec.																																0	.74

Period June 1941-1950 Total 1950 13.85 18.28

Laredo Water Plant

Standard gage — Laredo Water Plant

Jan.																																0	.98
Feb.			.09	.04	.01						.10										.05											.29	.75
Mar.	.04	.01	.05														.09															.19	.74
Apr.												.12		.04	.10				.07	.13	.05											.51	1.23
May											1.12							.30		.74		.33					.56	1.55				4.60	2.56
June	.31																			.11		.30										.72	2.27
July													.23																		.07	.32	1.41
Aug.																												.79				.79	1.44
Sept.		.35															.21															.56	3.04
Oct.																																0	1.63
Nov.													.06				.67							.04								.77	.77
Dec.																																0	1.14

Period 1930-1950 Total 1950 8.75 17.96

Fort McIntosh, Laredo, Texas

Standard gage — I. B. & W. C.

Record began January 24, 1950

Jan.																															T		
Feb.		.01	.09	.10		.01					.09											.08										.38	
Mar.		.09	.06									.07					.52															.74	
Apr.				.02								.12		.04	.11		.04			.24	.07											.64	
May											.95							.13	.30	1.03		.43					.20	1.71				4.75	
June		1.60																		.22	.25											2.07	
July													.26	.03																	.04	.33	
Aug.																												1.42				1.42	
Sept.		.49															.19								.08							.76	
Oct.																																0	
Nov.													.07				.75										.03					.85	
Dec.																																0	

Latitude 27° 30' Longitude 99° 31' Elevation 410 Feet

Laredo, Texas, International Bridge

Standard gage — U. S. Weather Bureau

Jan.																																0	.78
Feb.			.08	.09							.10											.06										.33	.75
Mar.		.13		.05										.14				.41														.73	.70
Apr.					.02							.09				.05	.02			.03	.14											.35	2.04
May											.60							.14	.42		1.02	.50					.23	1.56				4.47	1.95
June		1.54																			.58	.30										2.22	2.09
July													.29	.05																		.34	1.66
Aug.																													.60		.28	.88	1.48
Sept.			.23															.13								.04						.40	3.02
Oct.																																0	1.34
Nov.																	.36															.36	.49
Dec.																																0	.67

Period 1941-1950 Total 1950 10.08 16.91

Falcón Dam, Texas

Standard gage — I. B. & W. C.

Record began March 16, 1950

Jan.																																	
Feb.																																	
Mar.																																	
Apr.			.01								T						.03			1.44	.27			.01								1.76	
May		.57	.05	.01							.01	.71				.03	T	.06			.72						2.70					3.51	
June																																1.32	
July														.18																		.18	
Aug.														.10																		.10	
Sept.																									.50	.35						.85	
Oct.																																0	
Nov.																																0	
Dec.																																0	

Latitude 26° 34' Longitude 99° 08' Elevation 323 Feet

Roma, Texas

Standard gage — I. B. & W. C.

Jan.																																0	1.00
Feb.		T	.08										T							T												.28	.99
Mar.	.07	.20	.12	.14																												.53	1.01
Apr.														.23					.80	.10												1.13	1.40
May											.66																					.66	1.73
June	.80	.14																		.20												1.14	2.60
July													.20																			.20	1.16
Aug.										.10																						.10	3.17
Sept.																.18								3.00	T							3.18	3.28
Oct.									.28						.25		.05															.58	2.27
Nov.																							.18									.18	.31
Dec.																																0	.45

Period 1941-1950 Total 1950 7.98 18.37

Rio Grande City Gaging Station

Recording gage — I. B. & W. C.

(formerly Rio Grande City, Texas)

Jan.																																0	.84
Feb.			.11									.02	.14																			.27	.77
Mar.			.08	.40			.01					.57		.01		.04																.91	.99
Apr.														.04					.01	.02		.01										.08	1.01
May											.69																					.69	1.40
June		.31	.43			.06														.01												.81	2.55
July										.01	T																		T			0	.66
Aug.																																.01	1.85
Sept.																.03								.08	.45	T						.53	2.62
Oct.		.05																														.08	1.65
Nov.																																0	.49
Dec.											.01																				T	.01	.81

Period July 1939-1950 Total 1950 3.39 15.56

* Some months missing

RAINFALL ON THE UNITED STATES SIDE OF RIO GRANDE WATERSHED

INCHES—1950

San Benito Pump

Standard gage — I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	1.47
Feb.																																0	.72
Mar.		.39	.23	.46	.48													.14														1.70	1.18
Apr.																.86	.17				.25											1.28	1.20
May															.71				.85		.17							.20				1.93	2.76
June		1.24	2.24	.18	.09	.09																										3.84	2.67
July																																0	1.82
Aug.																													.29			.29	1.95
Sept.																											.32					.32	3.77
Oct.				3.40									1.40					.68														3.40	1.79
Nov.																																2.08	.75
Dec.																																0	1.71
Period October 1933-1950 Total 1950																																14.84	21.79

AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED

IN INCHES — 1950

Watershed Subdivision	Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
El Paso to Fort Quitman	1950	.51	.20	0	.02	.13	.94	3.86	.36	1.57	.26	0	0	7.85
	Total	38.14	30.05	27.40	23.50	32.74	65.75	191.45	156.64	116.17	74.69	37.04	51.82	845.39
	Normal	.48	.38	.34	.29	.41	.82	2.39	1.96	1.45	.93	.46	.65	10.56
	Totals and Normals for the 80 Years 1871-1950 Inclusive													
Fort Quitman to Upper Presidio	1950	.35	.14	.01	.31	.23	1.84	3.53	.22	1.93	.83	0	0	9.40
	Total	31.86	20.47	20.94	30.70	49.66	98.37	265.66	201.47	162.67	79.56	32.97	47.47	1,039.80
	Normal	.40	.26	.26	.38	.62	1.23	3.30	2.52	2.03	.99	.41	.59	12.99
	Totals and Normals for the 80 Years 1871-1950 Inclusive													
Pecos River Sheffield to Pecos River Station	1950	.46	.38	.02	1.65	2.32	.80	3.35	1.63	2.78	.33	0	0	13.70
	Total	59.60	72.14	66.91	162.14	141.08	197.48	159.49	171.25	198.84	147.46	79.38	66.48	1,522.25
	Normal	.74	.90	.84	2.03	1.76	2.47	1.99	2.14	2.49	1.84	.99	.83	19.02
	Totals and Normals for the 80 Years 1871-1950 Inclusive													
Devils River	1950	.38	.49	.03	1.64	2.84	1.21	3.49	1.16	4.06	.16	.01	0	15.47
	Total	56.23	51.80	93.32	146.60	210.49	217.29	147.33	174.53	242.43	173.55	137.82	89.83	1,741.22
	Normal	.70	.65	1.17	1.83	2.63	2.72	1.84	2.18	3.03	2.17	1.72	1.12	21.76
	Totals and Normals for the 80 Years 1871-1950 Inclusive													
United States Side Below Rio Grande City	1950	.50	.35	1.43	1.11	3.23	2.51	.24	.43	1.62	2.13	.61	0	14.16
	Total	100.52	83.01	92.58	105.68	233.47	196.09	146.38	183.25	346.91	191.45	112.11	106.49	1,897.94
	Normal	1.26	1.04	1.16	1.32	2.92	2.45	1.83	2.29	4.34	2.39	1.40	1.33	23.73
	Totals and Normals for the 80 Years 1871-1950 Inclusive													

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

IN INCHES—1950

The daily rainfall records tabulated below have not been published elsewhere. For each station there are indicated the source of the record and the type of rain gage in use. The general location of each station is shown on the map of the watershed, pages 54 and 55 of this bulletin.

Chihuahua, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.08																							.08	.32
Feb.																				T	T					T						T	.23
Mar.				T	.08																											.08	.24
Apr.		T																			T											T	.18
May																			T										T			T	.37
June				.04		T		.04	T	T				.08								.28	.04	.03		.08						.59	1.49
July	.08		T	T	T		T		.08	.08	.16	T	.57	T			.14		.57					.23	1.71		.14	.54	.12	.20	.18	.04	4.84	5.37
Aug.	.06	.26												T	T	T	T	T									.78	.12					1.22	3.46
Sept.	T		T	.04		.08						.24		T	.06		1.18	.59	.31	1.34	.08	.28	T	T							.47	4.67	3.33
Oct.	.27		1.34																													1.61	.95
Nov.																																0	.23
Dec.																																0	.42
																																∮ Period 1900-1950 Total 1950 13.09	15.09

La Junta, Chih.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.		.08	.06					.07	.08		.04	.45																	.46	.72		1.96	1.04
Feb.											.11	.16													.10							.37	.46
Mar.			.01								.06	.14																				.21	.27
Apr.																					T		.06									.06	.09
May																					T											.05	.31
June									T	T						T	T		.22	.02	.46	.01	T	.05	.34	.12	.01	T	.01	.01	.05	1.25	1.63
July	.15		.01		1.54	.12	.42	.13	1.47	.26	.42	.08	.13	.02			1.09	.45	.03	.22			.03	.28	.35	T	.01	.11	.63			8.06	5.16
Aug.	.19	.50	T	1.07	.11		.12					.06	.01	T	.01	.68			.01					T	T	.04	.01	T				2.81	5.09
Sept.	.12				T	.03	.20		T					T	T	.09	.46	.33	.85	.30			.02	.20					.03			2.63	2.40
Oct.	T	.26			1.12										.19		T	T														1.37	1.44
Nov.																																0	.38
Dec.																															.09	.09	.86
																																∮ Period 1925-1950 Total 1950 19.06	19.13

Guerrero, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.			T					.01				.12																	.10	.06		.31	.58
Feb.												.20										T			.03							.23	.41
Mar.				.06							.01	.06																				.13	.21
Apr.																					T											T	.17
May																					T								T	.02	.04	.06	.26
June	T					T					.01					.09	.02		T	T	.39		.13	.53	.26	.15						1.58	1.57
July				.01	.35	.10	.35	.57	.01		.42	T	.60				.33	.53	.12	.20		T	1.08	.08	.43	.02	1.37	.02	.61			7.20	4.46
Aug.	.18	.04	.12	.26	.42	.02	T	T				.24		.02			T									.06	.10					1.46	4.88
Sept.					.05	1.39	.14	.62					.21	.06		.03	.56	.60	.90	.13		.14	.10									4.93	3.44
Oct.	.04	.08			.14								T		.09																	.35	1.25
Nov.																																0	.56
Dec.																																0	.76
																																∮ Period 1903-1950 Total 1950 16.25	18.55

Balleza, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T								T		.12	.08				T				T	T							.27	T			.47	.33
Feb.											T	.04									T	T				T						.04	.47
Mar.				T								T																				T	.05
Apr.																	T			T	T	T										T	.23
May																			T										T	.35		.35	.19
June	T			T		T		.18	.14		.47	.16	.35	T	.06	T			T	T	.04	T	.08	T	T				T			1.48	1.26
July				.12	T	.28	.12	.04	T	.08	.12	.91	T	1.18	T	.23	.12	T	.04	T	T	T	T	T	T	.68	.22	.10	.87	.30	.14	5.55	4.59
Aug.	1.96	T	.06												T		.06	T	.06				.12	T	T	.12			.08			2.46	4.61
Sept.				.22	T	.14	T	.12	.08			.39	.38	T	.04	.79	.12	T	T					T								2.98	3.84
Oct.					.04	.04			.06																							.14	.74
Nov.																																0	.64
Dec.																																0	.39
																																∮ Period 1903-1950 Total 1950 12.77	17.34

Parral, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.						T				T																						T	.16
Feb.																																0	.19
Mar.																																0	.12
Apr.																			T													T	.13
May																													T	T	.23	.31	.35
June	T				T		T					.23	T						.08		.16			.12								.32	1.69
July				.08	.08	.12	.02					.39	.43	.90	.02	.86	.05	.85	T					T			.11	.08	.52	T	.12	4.61	4.31
Aug.	1.09	T													.11	.26	.50	.24							.20	.41						2.81	4.03
Sept.					1.20			T	.02							T	.31	T				.43	.06	T					.01			2.03	4.26
Oct.																																0	1.22
Nov.																																0	.64
Dec.																																0	.49
																																∮ Period 1903-1950 Total 1950 10.35	17.55

La Boquilla, Chih.

Standard gage — Río Conchos Hydroelectric Co.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T						T		T		.08									T												.08	.33
Feb.																																T	.16
Mar.				.21	T																T											.21	.18
Apr.		T																														T	.18
May										T									T						T			T		.30	T	.30	.66
June	.06			.01		.05	T	T	T	T		.08	T	T					.03			.25	.05									.53	1.47
July			.25	T	.05		.17	T			T	.78	.75	.02	T	1.55	.03	.02	.15						T	.11		.30		T		4.16	2.98
Aug.	.15	.05												T	T	.08	T	1.40	T						.14	.30	.15			T		2.25	2.99
Sept.			T		.12	.08	T	.55					T			T	.18		.03	1.03		1.55	.12	T					.09	.12		3.87	3.13
Oct.		.26									T																					.26	.99
Nov.																																0	.41
Dec.																																0	.41
																																∮ Period 1910-1950 Total 1950 11.66	13.89

Rosetilla, Chih.

Standard gage — Río Conchos Hydroelectric Co.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.07		.54	.26																				.67	.65
Feb.																																0	.06
Mar.				.12																												.12	.19
Apr.																															.18	0	.14
May															.34																	.18	.20
June				.10		.27			.27										.22			.10	.10	.05								1.45	1.56
July						.33	.08		.07		.24	.05	.18			.20		.13	.65			.57		.13	.10	.22		.09		1.10		4.12	2.37
Aug.	1.12															.43	.12	T							.13	.37						2.17	2.54
Sept.						.44		.80									1.23			.04	.78	.48	.10									3.87	2.37
Oct.	.04																															.04	1.09
Nov.																																0	.25
Dec.																																0	.37
																																Period 1940-1950 Total 1950 12.62	11.79

∮ Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

IN INCHES—1950

Villalba, Chih.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.											.31																					.31	.51
Feb.																																0	.11
Mar.				.06																												.06	.02
Apr.																					.06	T										.06	.06
May														.82																.08	.35	.43	.13
June				.03		T		.14	.02	.10												.03	.20		.01							1.35	.89
July			.10				.17			.41	T	.62	.26	T		.52		T	.26			.22		.06	.15	.26	T	.22	.10	.08		3.43	3.46
Aug.	.39	.02														.06	.10	.22								.06						.85	2.55
Sept.			.22	.23	.02	.02		.55				1.19				.04	.39			.47		.37	.14	.22						.04		3.90	3.17
Oct.		.04																														.04	1.44
Nov.																																0	.23
Dec.																																0	.45

Period 1940-1950 Total 1950 10.43 13.02

Las Vírgenes, Chih.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T					T		.01			.25																					.26	.36
Feb.												T								T												T	.03
Mar.				.27																												.27	.05
Apr.																					.31											.51	.13
May														T																.05	.04	.09	.12
June	T			.06		.64	T	.22	.53					T						.11		.08	.16									1.80	1.03
July							.26	.01		.07	T	T	.21			T		.07	.08						.28	.07		.06	.01			1.12	2.37
Aug.	.38		.07																						.03	.05						.53	2.12
Sept.				T	T	.28		.14				.06		T		.04	.41		.07	.80	.17	.41	.02	T					T	.40		2.80	1.85
Oct.		T																														T	.84
Nov.																																0	.19
Dec.																																0	.54

Period 1943-1950 Total 1950 7.18 9.63

Hormiguero, Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.							.01				.08																					.09	.49
Feb.												T										T										T	.24
Mar.																																0	.11
Apr.											T									T												T	.16
May																												T	T	.37	.10	.47	.46
June	T					T	T		.04			.26	.04							.06	T	1.36	T	.31								2.07	2.00
July	.04				T	.75	.55			T		1.42	.47	.59	T	.98	.22	.94	.02			T	T	.08		.16	.28	.31	.55	.04		7.40	5.57
Aug.	.79	T												T	.06		1.57	.26	.08						.02	1.89						4.63	5.66
Sept.					T	.65	.06	.06	.18	T							.04	.16				.20	T	.39	T					T		1.74	5.62
Oct.		0																														0	1.85
Nov.																																0	.52
Dec.																																0	.70

Period 1923-1950 Total 1950 16.40 23.38

Delicias, Chih.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.								.04	T		.22	T								T												.26	.49
Feb.																																T	.12
Mar.				.20																												.20	.12
Apr.																														.08		0	.20
May														T						T												.08	.21
June				.13		.47	T	.05	.35		T			.55						T		T	.14		.16					T		1.85	1.16
July			.55		.08	T	.14	T		.10	.04		.08			.12		.55	.13			.56		.49	.22	.26		.14	T	.28		3.54	2.38
Aug.	.52	.18														.06	.14	.04							T	T	T			T		.94	2.28
Sept.						.39		.23				.06				.04	.20		.07	.04	.22	1.16	.04						.04			2.49	2.30
Oct.																																0	.96
Nov.																																0	.30
Dec.																																0	.45

Period 1933-1950 Total 1950 9.36 10.97

San Antonio, Durango

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.						T					T														T							T	.50
Feb.			T																													T	.06
Mar.																																0	.03
Apr.																				.69		T										.69	.28
May																		T										T	T	.45	.85	1.30	.37
June	.77			T		.06	T	T				.14	.06		T					.04	.10	.18	.76									2.11	2.29
July					T	.22	T	T		.10	T	.57	T	.06	T	.26	.45	.37	T			.04				.30	.06	.60	T	.14		3.17	4.70
Aug.	1.20												T		T	T	.26	.04	.14	1.94			T		T	.57	.94	.89	T			5.98	3.56
Sept.				T		1.16	T	T	T						T	.18	2.85						.22	T					.14		4.55	4.42
Oct.	T	T		T																												T	1.34
Nov.																																0	.14
Dec.																																0	.30

Period 1943-1950 Total 1950 17.80 17.99

Maclovio Herrera (Falomir), Chih.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.												.16																		.06		.22	.46
Feb.																																0	.13
Mar.																																0	.25
Apr.												.39																				.39	.50
May																																0	.74
June				.22						.31				.11		.43			T						.08							1.15	1.82
July			.26			.28	.20				.71		.33			.50				.14		.18						.04	.12		.39	3.15	3.40
Aug.																											.47					.47	3.96
Sept.														.24		.41		.63		.18	.53	.22	.26	.45								2.72	5.86
Oct.	.83																															.83	.84
Nov.																																0	.12
Dec.																																0	1.39

Period 1924-1950 Total 1950 8.93 18.65

Palestina, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.												T								.23						T		T	T			T	1.23
Feb.		.08										.36																				.67	1.07
Mar.	T	.12																														.12	.76
Apr.	T											.23		.51				T	.08			T						.12	.40			1.14	1.56
May										1.03							.63	T							T	.23						1.89	3.01
June	.65	.04	T																		.47	.85										2.01	2.21
July									T		1.18		.45				.53															1.63	2.27
Aug.														.60			.29						2.46	.14					.35			1.48	2.38
Sept.																													T			2.85	5.31
Oct.															T																	0	1.35
Nov.																																T	.75
Dec.																																0	1.10

Period 1931-1950 Total 1950 11.77 21.00

Piedras Negras, Coah.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T		T	T	T	.24					T					.01	.02				.05	.74	T				.01	T	T				.33	.84
Feb.	.01	.07	.08	.01					T		T		.06	T						T		T										.91	.99
Mar.		T	.02											.06								T	T									.14	.89
Apr.		T									T			.04	.07	.25	T	T		T	.03	T	T	T					T			.37	1.64
May		T									2.69						.24	.22	.02			T	.54				.34	.40			1.70	6.15	3.09
June	2.23	.13				T																					.53	.26	.06			3.21	2.68
July										T		.91	.03	.04																	T	.98	1.30
Aug.	.19													.58	.04			.44										2.62				3.87	1.86
Sept.		.40									.25					.01	.47						.13	.02	2.49	.24	T					4.01	2.95
Oct.	T			.01											T				.04													.05	1.76
Nov.														.02			.04															.06	.97
Dec.																																0	.99

Period 1907-1950 Total 1950 20.08 19.92

Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

IN INCHES — 1950

Allende, Coah.

Standard gage — Hydraulic resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.88
Feb.																							T									T	2.67
Mar.																																0	.36
Apr.													.53	.27	.45	.49			T	.04							T					1.78	1.20
May										.67	.81		T	T		.10	.51	.61			1.39				.24	.22	.18				.20	4.93	2.45
June	1.49		.22		.10																.64	.81										3.26	2.95
July											T	.20	.41																		T	.61	1.74
Aug.														1.58			1.39										.81					3.78	2.22
Sept.		.08	1.12		1.18					.14						.93							1.89	.21		.10	.07					5.72	3.88
Oct.																																0	1.34
Nov.															T	T																T	.33
Dec.																																0	.39
																																# Period 1947-1950 Total 1950 20.08	20.41

Nueva Rosita, Coah.

Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T				.35														T													.55	.80
Feb.		T											T							T												T	.52
Mar.		T						.31				T																				.31	.58
Apr.	T	T									T		T	.28	T				T	T		.31										.59	1.27
May										T	T				T		T	T			T	T			1.42	1.50	T				1.96	4.88	2.87
June	2.99		T		.16																T	.47								T		3.62	2.14
July													T																			T	1.66
Aug.														.59				.39														.98	1.87
Sept.		T	T							T						2.76	T					T	2.83	1.85	T		T	T				7.44	2.46
Oct.	T			T																												T	1.47
Nov.																																0	.54
Dec.																																0	.77
																																# Period 1925-1950 Total 1950 18.17	16.75

Sabinas, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T	T	T	T	.11							T		T	T	T	T	T	.01	T	T	T	T	T								.12	.91
Feb.		.02	T		T	T	T				T	T								T	.04											.06	1.03
Mar.		.04			.08	T				T																						.12	.65
Apr.											.17	T		.08	.17	.03				T		.45								.02		.92	1.39
May										T	.04					.03		.10				T			.20	.94	.25				3.15	4.71	3.26
June	1.66		.22	T																	.10	1.18										3.16	2.52
July												.01	.07																		.85	.93	1.46
Aug.														.37			.04											2.36				2.77	2.70
Sept.																5.90	.08						1.46	1.77	1.50	.06						9.77	4.18
Oct.				.02																												.02	1.87
Nov.												T				T	T															T	.44
Dec.																																0	.63
																																# Period 1922-1950 Total 1950 22.56	21.04

Progreso, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.					.02			T																								.02	.69
Feb.		.17	T																T	T	T											.17	.40
Mar.	T	T			.01																											.01	.14
Apr.											.64	T	.04	.18	.33	T		T	T		T									T		1.21	1.79
May										T	.02	T			T		1.79	.30	T	T	.15	T			.98	.12	.47	T			1.48	5.31	2.78
June	.85		3.96		T																.07	.74										5.60	2.00
July	.01												.08														T				.01	.10	.61
Aug.															T		T								T		T	.03				.03	2.28
Sept.					.05				T	T						.01	.06					T	.11	.53	.01				T			.77	3.22
Oct.				T												T																T	2.39
Nov.																T																T	.25
Dec.				T																												T	.77
																																# Period 1945-1950 Total 1950 13.22	17.32

San Buenaventura, Coah.

Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.							.08																									.08	.72
Feb.		.08	.12																													.20	.46
Mar.	T	T		T								T																				T	.22
Apr.											1.38	T	T	T					.12													1.50	.58
May																	.08		T	T	.26	T		T		.06	.46	T			.53	1.59	1.45
June	.39		.56																		.64	1.06	.71									3.56	1.74
July									.28		1.69		T	T			T											.39	.12			2.48	1.87
Aug.														T									T		.36	T	T	T				.36	1.95
Sept.																								.13	.03							.16	2.14
Oct.																																	1.34
Nov.																																	.55
Dec.																																	.79
																																# Period 1926-1950	13.79

Monclova, Coah.

Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.										No Daily Records for Jan., Feb., Mar., Apr., May, June, July, Aug., and Sept.																						.11	.48
Feb.																																.05	.46
Mar.																																.11	.31
Apr.																																.19	.57
May																																2.77	1.56
June																																1.71	1.22
July																																.81	1.66
Aug.																																.47	1.68
Sept.																																1.11	3.01
Oct.				T																												T	1.22
Nov.																																0	.58
Dec.																																0	.61
																																# Period 1897-1950 Total 1950 7.33	13.56

Gral. Cepeda, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T										T							T		T												T	.59
Feb.		T															T															T	.46
Mar.		10	.21	.55	.08							T				T																.94	.28
Apr.						T					.14			T	T			.10				.16	T									.40	.38
May									T	.89						T	T	.16		T	.08						T	.09			T	1.22	.82
June	.05										T								.19	T	T	T	.09	.05								.58	2.42
July	.09	.91	.05		.33	1.10				.08	.04	.88		.06			.20				.22	.24			T			1.23				5.43	4.00
Aug.	T	1.24													.43	T		T	.12			T		T		T	T	T	2.69			4.48	3.18
Sept.																T	1.00	.14					T	.52	.28	T			T			3.24	3.24
Oct.			.35	.11																												.46	1.34
Nov.												T	T																			T	.53
Dec.																																0	.62
																																# Period 1926-1950 Total 1950 15.25	17.86

Villa Juárez, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.					.06																											.06	.92
Feb.		T																	T													T	.42
Mar.					.06																									.94		.06	.20
Apr.											.35		T	.20	.26																	1.75	1.09
May										.06							.16	.69			.94				.79	1.53	.20				.22	4.59	1.96
June	.78		.18																		.12	.57										1.65	1.42
July											T		1.47																		.20	1.87	.60
Aug.																		.70							T			.26				.96	1.91
Sept.																.30	3.14						1.48	.26	.04							5.22	3.90
Oct.																																0	2.46
Nov.																T																T	.43
Dec.																																0	.40
																																# Period 1945-1950 Total 1950 15.96	15.71

Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

IN INCHES—1950

Don Martín, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T	T								.01		T						T			T	T		T							T	.01	.90
Feb.		.07	T		T														T	T	.02											.09	.69
Mar.		.07			.12																											.19	.58
Apr.											.90		.07	.59	.44	T			.01	T									.41			2.22	1.32
May											T						1.28	.95	T		.67				.71	.03	1.53				1.05	6.22	2.32
June	1.60		.06																		.26											1.94	1.93
July		T									T		1.31																			1.31	1.15
Aug.																		.18							.67			.39				1.24	1.96
Sept.																	.23					.01	.73	5.30	.16	T						6.43	3.02
Oct.																																0	1.68
Nov.																																0	.58
Dec.																	T	T														T	.85
																																# Period 1927-1950 Total 1950 19.65	16.98

Lag. de Salinillas, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																		T														T	.83
Feb.	T	.08	.04																		.34											.46	.77
Mar.		.04															.43															.47	.62
Apr.											.48	.08	.51	T .16				.02	.02													1.27	1.04
May											.10						.51	.23	T	T	2.13					.04	.59				2.15	5.73	2.77
June	.95	.02	.37	T																	.06	.04										1.42	1.64
July																																0	.68
Aug.																												2.46				2.46	3.83
Sept.																					.31	.01	1.70	.02								2.04	2.52
Oct.																																0	1.67
Nov.																.01								.02								.03	.44
Dec.																																0	.56
																																# Period 1940-1950 Total 1950 13.88	17.37

Anahuac, N. L.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.12																															.12	.87
Feb.		.12	.08	.12	.04																.11											.47	.52
Mar.		.02																														.02	.69
Apr.											.43		.10	.37	.12				.04	.06												1.12	1.23
May																	.59	.51			1.78						1.73					4.61	2.80
June	1.19		.37																													1.56	1.67
July													.06																			.06	1.39
Aug.																												.18				.18	1.95
Sept.																	.04							.75	.25							1.04	3.10
Oct.																																0	1.42
Nov.																.20	.04															.24	.48
Dec.																																0	.90
																																# Period 1933-1950 Total 1950 9.42	17.02

Nuevo Laredo, Tamps.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.79
Feb.		.06	.05	.01						.04											.07											.23	.77
Mar.	.03	.02										.75					.38			T												1.18	.85
Apr.			T												.20				.20	.06												.45	1.19
May											.12						.15	.61		.67	.59						1.77					3.91	2.34
June	1.55																			.59	.30											2.24	1.92
July													.14																			.14	1.39
Aug.																												.73		.01		.74	1.11
Sept.		1.00																				T		T								1.00	2.66
Oct.																																0	1.31
Nov.												T				.67						T										.67	.85
Dec.																																0	1.11
																																# Period 1909-1950 Total 1950 10.56	16.25

Nuevo Laredo, Tamps.

Visual gage — Mexican Section I. B. & W. C.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	
Feb.	.02	.04	.07	.01							.08										.07											.29	
Mar.	.15	.04		T								.14					.36															.69	
Apr.				.01							.08		.01	T	.08	.02				.04	.12			T								.36	
May											.54				T		.11	.47			.90	.45				T	.25	1.66			T	4.38	
June	1.59																				.35	.30										2.24	
July												T	.45																		.01	.44	
Aug.																									T			.67		.33		1.00	
Sept.		.30														T	.01						.01	.10	.07							.49	
Oct.																																0	
Nov.												.10	.04			.31	.02															.47	
Dec.												T																			T	T	
	Lat. 27°30' Long. 99°30' Elev. 490																															Total 1950 10.36	

Guerrero, Tamps.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.				T						T			T								T											T	.77
Feb.	T	T	.52	T								.07																				.39	.70
Mar.	.04	.09									.46					T																.59	.98
Apr.														.15					2.84	.16			.07									3.22	1.60
May											1.43				T			T	T	T	.12							.83				2.38	2.99
June	.62	.18																		.16												.96	1.83
July	.08									T																						.08	1.38
Aug.													.35												.08			T	T			.43	2.41
Sept.																								.59	.07							.66	2.90
Oct.		T						.15												T												.15	1.56
Nov.										T		T																			T	T	.52
Dec.																															T	T	1.14
																																# Period 1936-1950 Total 1950 8.86	18.38

Saltillo, Coah.

Standard gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.									.22																							.22	.63
Feb.																		.01									T					.01	.51
Mar.		.03	.17	.32	.43	T						.22																				1.17	.58
Apr.												.06	.06		.37				T													.49	.73
May									.75									1.37	.08	T	.80					T	.07	.02			.06	2.55	1.03
June	.06	.10										T								.16	.10	.08								.04		.54	2.08
July	.04	.01	.92	.06							.02		.35	.12	.35										.06			.02		.35	2.30	2.78
Aug.		.01																	.12			.08				.05	T	.02				.28	2.42
Sept.																.16	.05					.18	.01	.05	.25	.04		.02				.76	2.53
Oct.			1.00																													1.00	1.27
Nov.														.06																		.06	.97
Dec.																															.03	.03	.66
																																# Period 1886-1950 Total 1950 9.41	15.99

Ramós Arizpe, Coah.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.50
Feb.		T																									T					T	.35
Mar.		.10	.35	.64	.08																											1.17	.32
Apr.											.08	.27		T .60	.06		T	.08 .51	T			T			T		T	T				.49	.47
May																				.20 .12	T .14			T								1.31	.75
June	T																															.26	1.16
July				T	T					.12			.18	.49				.22	.04				T	T	T			.76		T	.14	1.95	1.52
Aug.	T												.26	.33									T	T	T	.53			.12			1.24	1.45
Sept.																		.53						.25	.18							.94	1.76
Oct.				.93										.08																		.93	.63
Nov.																															T	.08	.48
Dec.																																T	.59
																																# Period 1907-1950 Total 1950 8.37	9.98

Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

IN INCHES—1950

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Rinconada, N. L. — Standard gage / Hydraulic Resources																																	
Jan.			T														T		.09													.09	.37
Feb.					T														T													T	.57
Mar.	.21																															.21	.17
Apr.											T	T	T						T													T	.53
May										.18	T		T					.05	.12													.35	.41
June	.63	.72																		.24												1.59	1.19
July													.27																	.16		.43	.61
Aug.																						.08										.08	2.34
Sept.																							.31	.16								.47	1.85
Oct.		.45																														.45	.95
Nov.													.08				.04															.12	.23
Dec.																																0	.26
	Period April 1944-1950 Total 1950																															3.77	9.78

Santa Catarina, N. L. — Recording gage / Hydraulic Resources																																	
Jan.	T								.01																							.01	1.30
Feb.		T		.01																						.20						.21	.49
Mar.	.10	.21	.44	.39	.02							.02		T		.02	.06															1.24	.33
Apr.																	T															.02	.78
May																	T	.02	.02	T					T						.24	.28	.61
June																				.02	.17											.19	2.51
July	.31					.16						.16	.51																		.08	1.22	1.60
Aug.																		.21	.08				.08									.57	3.71
Sept.					.06	T																		.15	.18					.08		.47	3.26
Oct.		.07	.15	.17				.15																								.54	1.64
Nov.													.02			T							.10									.12	.42
Dec.																																0	.87
	Period October 1937-1950 Total 1950																															4.67	17.72

Topo Chico, N. L. — Recording gage / Hydraulic Resources																																	
Jan.	.35	.05																	.10	.11												.61	.74
Feb.	T	.05	.09						T										.24	.05						.06	.13					.62	.98
Mar.	.15	.36	.33	.50								.09					.13										.19	.10				1.83	.65
Apr.											.05	.06		.09	T				.83	1.57												2.60	1.46
May										.05	.02							T	T	.21					T							.28	1.00
June	.25		.32		T								.17																	.16		.90	2.65
July												1.49	1.34												T						.16	2.99	1.71
Aug.													.06					.06						.71					.12	.17		1.12	3.30
Sept.					.79												1.57							.59								2.95	4.82
Oct.	1.18							.30				T																				1.48	2.31
Nov.												.05																				.05	.88
Dec.																																0	.85
	♯ Period 1939-1950 Total 1950																															15.43	21.35

Monterrey, N. L. — Standard gage / Hydraulic Resources																																	
Jan.	.12																		.03	.04												.19	.69
Feb.		.10	.10	.09					T	.02									.04	.02							.02					.39	.63
Mar.	.16	.73	.31	.40							.08	.02					.16															1.80	.74
Apr.														.10	.08				.17	.05												.40	1.22
May										.01	.02	.05							.17	.02												.27	1.64
June	.24		.29	.06															.07	.08												.74	2.91
July	.30											.72	.30														.08				.04	1.44	2.60
Aug.													.02					.06				.02			.02							.57	3.18
Sept.					.20	.01																		.86	1.31			.20	T	.26		2.38	5.75
Oct.		.09	.33	.16				.23																								.81	3.30
Nov.													.01			T																.01	1.34
Dec.																																0	.85
	Period 1896-1950 Total 1950																															9.00	24.85

Ciénaga de Flores, N. L. — Recording gage / Hydraulic Resources																																	
Jan.																				.14												.14	1.57
Feb.		T	.13	T						.11								T	T							T	.07					.31	.64
Mar.	.17	.15	.34	.42					T	.09							.22															1.39	.72
Apr.														.15	.14				.54	.20												1.05	1.16
May										.10		.10									T				T							.20	2.11
June	.22		.18	.29																												.69	3.00
July	1.92												1.38																		3.64	6.94	2.33
Aug.	.50																								T							T	3.97
Sept.																							.73		.15				.15			1.53	4.86
Oct.			.09	.14																												.23	1.77
Nov.													.15																			.13	.76
Dec.																															.09	.09	.82
	Period April 1938-1950 Total 1950																															12.68	23.71

Cadereyta, N. L. — Standard gage / Hydraulic Resources																																	
Jan.	.08																			.09	.02					.02						.21	.89
Feb.	T								.03	.01								.04	.04	.02												.14	.97
Mar.	.25	.44	.21	.22	T											.18	.20													.14		.64	1.30
Apr.												.01		.66	.58		.41		.39	.08		.01							.16	.02		2.31	2.12
May																	.18	.01	.95								.01					1.14	2.28
June		.70	.12	.06		.02														.16												1.06	3.84
July	.06						.44					.85	1.03											.02							.76	3.14	2.63
Aug.													.01					.06							.02		.25	.29		.02		.65	3.41
Sept.					.05	.05										T										.65						.75	4.50
Oct.		.79	.09	.07				.41																								1.36	2.88
Nov.																								.08								.08	1.32
Dec.																																0	.84
	♯ Period 1904-1950 Total 1950																															12.48	26.98

Villa de Santiago, N. L. — Standard gage / Hydraulic Resources																																	
Jan.	.14	T															T	T														.14	.94
Feb.		T	.16	.04															.27													.61	1.00
Mar.	.58	.20	.12	.16	.04							.06	.02			.04	.28				T											1.50	1.02
Apr.													T	.26	.39				.37	.14			.14	T						.55		1.87	1.80
May											T	T					T	T		.20				T							T	.20	2.76
June	.26	T	1.62																		.23									.61		2.72	5.28
July	14						.14				T	T	3.00																		1.44	5.67	3.39
Aug.											.23	.14	.04	T				.78						.04								1.57	5.32
Sept.			T	.04	.65	.06											T						T	2.16	.91	.10	.18	.04	.06			3.86	8.92
Oct.	1.42	.47	1.38	.10				.51																		.04			T			3.88	5.09
Nov.											T												T	.08								.08	1.41
Dec.																																0	1.11
	♯ Period 1923-1950 Total 1950																															22.10	38.04

Villa Allende, N. L. — Standard gage / Hydraulic Resources																																	
Jan.				T							T									.08												.08	1.04
Feb.		.16	.12							T	T	T						.10	.45						T	1.12	T					1.95	1.12
Mar.	1.22	.26		.39	T								T	T			.39															2.86	1.12
Apr.		T										T	T		.65		.49		.45	T	.10	T	T					T	T			1.69	2.18
May										T	T	T	T			T	.12	T	T	T					T		.17	T				.29	3.18
June	.41			.70															T	T	.08											1.19	5.48
July		T						T			T	T	T								T	T	T	.22		.13	T	T			.55	.90	2.66
Aug.									T				.20		T			T			T		.10	1.12	1.36		.51	.60				1.41	4.81
Sept.				T												T																2.48	6.92
Oct.		.16	1.77	2.09				.91																.47								4.93	5.58
Nov.										T																						.47	1.17
Dec.																															T	T	1.25
	♯ Period 1938-1950 Total 1950																															17.65	36.43

♯ Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

IN INCHES—1950

Rayones, N. L.

Standard gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.48
Feb.						T	T												T	T					T							T	.46
Mar.	.43	.26		.22													.16															1.07	.35
Apr.														.26																		.26	.71
May											T							.79	.52						T	T				T		1.31	1.39
June	.51	.16		.09																												.76	2.30
July												.28																	.28			.56	1.20
Aug.																		.28												.29		.85	3.37
Sept.																								.25	.36							.61	2.87
Oct.		1.12	1.85	.56																							.28					3.53	1.83
Nov.																							T	.03								.03	.37
Dec.																																0	.30

♯ Period 1926-1950 Total 1950 8.98 15.63

Los Ramones, N. L.

Recording gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																			.16	.17												.33	.82
Feb.		.29	.06															T														.35	.74
Mar.	T	.43	.08	.20								T				.47																1.18	.65
Apr.															T				.24	.04												.28	2.57
May											.39			.23	T				1.01	.02	.54											2.19	1.96
June	.02		.31	2.74																.49												3.56	3.28
July		.26											4.97										T	.49						.04	.18	5.94	2.44
Aug.													T																	.02		.02	3.61
Sept.					T	.37											.43							2.29	.06							3.15	4.07
Oct.			.57	.18																												.73	2.18
Nov.																																0	.31
Dec.																																0	.33

♯ Period 1959-1950 Total 1950 17.75 22.96

Montemorelos, N. L.

Standard gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T																			T	T											T	.90
Feb.		.37	.04	T	T														.51	T												.72	.90
Mar.	.93	.24	.07	.19	T	T						.07	.05			T	.19												.25	T		1.99	1.10
Apr.													T	.39	T		.31		.09	T	T	T								1.28		2.07	2.21
May											.23	T								T								.38				.61	2.71
June	.24		1.11	T															.47													1.82	3.91
July	.39						T					T	T										T	.25	T						T	.64	2.24
Aug.													T		.38										2.06	1.03	.15					.50	3.84
Sept.					.14		T																					.06	.06			3.38	5.12
Oct.	.15		1.83	.65	T			.67	T															.20	.19							3.30	3.28
Nov.													.06																			.45	1.63
Dec.																																0	1.10

♯ Period 1904-1950 Total 1950 15.48 28.94

Las Comitas, N. L.

Standard gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																							.03					.04				0	.44
Feb.																																.07	.34
Mar.	.12	.18	.26	.41								.01				.04																1.02	.37
Apr.														.12	.05								.02									.19	.98
May																		.01	.04	.01						.09	.35	.02				.52	.73
June	.11																			.14	.30	.09							.01	.01		.66	3.06
July	.19						.20					.30	.53						.67				.13	.54				.21	.06	.02			2.05	1.67
Aug.											.04		.06												.03			.17			.39	1.49	4.06
Sept.																								.16	.43							.59	4.72
Oct.	.06	.28	.71	.39				.53																								1.97	2.00
Nov.																								.01								.01	.56
Dec.																																0	.58

Period 1940-1950 Total 1950 8.57 19.31

Las Enramadas, N. L.

Standard gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																			.78	.20												.98	1.11
Feb.		T	.20	T							.08																					.28	.65
Mar.	.23	.35	.20	.39												.60	.20															1.97	.67
Apr.															.39				.99	.20	.39		T			T				T		1.97	1.63
May													T						.65	.20	.71				T							1.54	3.26
June			2.37	.39																T	T											2.76	3.54
July			.20										.19																	T	T	.39	2.43
Aug.													T													T				T		.71	3.10
Sept.					T	.14											.47							.20	2.44							3.25	5.17
Oct.			4.13	.22				.55																T				T				4.90	2.42
Nov.																																T	.65
Dec.																																0	.80

♯ Period 1926-1950 Total 1950 18.75 25.41

El Cuchillo, N. L.

Standard gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	1.05
Feb.		.23	.01															.02	T													.26	.62
Mar.	.04	.08	T	.20	.02							.27				.04	.04			T												.69	.43
Apr.														1.36	.08				1.75	.01												3.20	1.93
May											T								.13	.30												.43	2.07
June	.20			1.24																1.02										T		2.46	2.62
July													.01											2.08								2.09	1.68
Aug.													.16																	.03		.19	2.66
Sept.																								.22	1.35							1.57	3.84
Oct.			1.61	.20				.13																								1.94	2.18
Nov.																								T								T	.30
Dec.																																0	.55

Period June 1938-1950 Total 1950 12.83 19.95

Gral. Bravo, N. L.

Standard gage / Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.						T	T	T												T								T	T			T	.84
Feb.						T														T												T	.44
Mar.	T	T										.39	T	T			T			T												.39	.58
Apr.														5.01					1.90	T												6.91	1.65
May								T			T												T	T	T						T	T	2.75
June															T				T	T										T		T	2.72
July												T	T							T	T	T							T				T	2.63
Aug.								T				T	T	T							T	T	T	.20				T	T			.20	2.24
Sept.							T					T												1.19	1.00			T	T			2.19	3.53
Oct.	.20	T	T							.39	.49																					1.08	1.61
Nov.													T																	T		T	.85
Dec.																																T	.89

♯ Period 1906-1950 Total 1950 10.77 20.73

Laguna de Sánchez, N. L.

Recording gage / Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																			T	T	T			.21				.10				0	.72
Feb.	.80	.49	.37	.45	T										.51	.12	T						T	T								.31	.56
Mar.												.14	T									.10	T			.20	.18	T	.30			2.11	.50
Apr.																			1.17	T	T	T	T								1.07	.65	1.26
May																						.26										2.09	1.72
June	.28			T																												1.61	3.59
July	.78	.10	T			.18		.26	.10				.31	T											.69					T	T	2.42	3.28
Aug.														.69		T			.10	.16		T		T		.84	.55		T		.26	2.60	5.35
Sept.				T		.16		.18															T	T	.28	1.56	.12					2.28	3.80
Oct.		1.06	2.36	.31					.10																							3.84	2.85
Nov.														T																		T	.56
Dec.																															.12	.12	.58

Period April 1941-1950 Total 1950 18.01 26.57

♯ Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

IN INCHES—1950

Higueras, N. L.

Standard gage — Meteor. Serv. of Mex.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.05																		.05	.06	.02										T	.16	.88
Feb.	.05	.11	.02	.07				T	T									.18														.41	.59
Mar.	.57	.36	.33	.26				T	.03			T				.06														T		1.41	.61
Apr.														.07	.06					.05	.14									T		.32	1.25
May											T								.47	T			T		T	T						.47	1.77
June	.08		2.17	.21																	.07											2.53	2.79
July	.68	T									T	T	.63											T					T	.33		1.65	2.27
Aug.																							T		T	T				.02		.02	3.06
Sept.					.37	.20	T															1.21		.33	T							2.11	4.20
Oct.			.02	.02	.08				.09								.50															.71	1.58
Nov.														.09																		.09	.86
Dec.																															T	T	.78
																																∮ Period 1906-1950 Total 1950	9.88	20.62

Cerralvo, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																0	.88
Feb.		T	.15	.01														.32	.08													.56	.63
Mar.	.18	.36	.17	.04				T				.24				.06																1.05	.73
Apr.														.05	.04				.17	.04			1.04									1.34	1.67
May										.16					T		.26		.74		.72											1.88	3.31
June	.04		.25	.72		.01													.05		1.26											2.33	3.20
July		.12	.04										.45																	.17	.18	1.00	1.49
Aug.													.13																			.13	3.26
Sept.					T												.01							.05								.06	5.56
Oct.		.09	T	T				.20								.01																.30	2.22
Nov.													T											.18								.18	.39
Dec.																																0	.47
																																∮ Period 1938-1950 Total 1950	8.83	23.81

Los Herreras, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.			T								T						T	T	T			T	T	T	T				T	T	T		T	.82
Feb.		.38	.07	T	T	T	T	T										.28		.01				T	T							.74	.60
Mar.	.14	.20	.12	.18		T						.35				.21				T												1.20	.72
Apr.													.44	.02					.11	.07												.64	1.73
May														.13	.01		.02		.01		.25											.42	3.05
June	.04			2.28																.49												2.81	3.56
July			.15				.04						.08											.08								.33	1.25
Aug.													.08		.08															T		.16	2.76
Sept.																								1.22	.12							1.34	4.10
Oct.			.20	T	T	T		2.16	T	T	T	T	T	T	T	T							T	T	T							T	2.36	2.21
Nov.	T					T	T	T					T	T	T			T					T	T				T	T	T		T	.58	
Dec.	T											T		T																		T	.58
																																Period September 1939-1950 Total 1950	10.02	21.76

Linares, N. L.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																				.01												.01	1.01
Feb.		.12	.02							.03									.28													.45	.87
Mar.	.58	.12	1.29	.44	.06							104	.04			.01	.38													T	.01	2.97	1.16
Apr.		T												.23	.10		.77	T	.11	.04	.03	.03	.02									1.33	2.50
May											.48	T							T	.04	.28	.05					T					.85	3.41
June	.25		1.98			.14													.26	.42												3.05	3.88
July		1.43						T					T		T	T		T					T	.13	.03							1.58	3.14
Aug.																					.02				.26	T			T	.44		.71	3.16
Sept.					.44	.06					.73						T								1.59	1.18			.02			4.02	6.41
Oct.	.24	.02	3.27	1.93			.33				.02	T				T																5.81	3.33
Nov.													.32											T	T							.32	1.28
Dec.																																0	1.09
																																∮ Period 1900-1950 Total 1950	21.08	31.04

Villagrán, Tamps.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																				.04												.04	.39
Feb.		.10	T							T								.15	.12					T		.04						.41	.89
Mar.	1.27	.04	.45	.98	.04								T			.10	.31														.10	3.29	.98
Apr.														1.16	4.48	T	.20	.04	.10	.04	2.48	.08				T				.04		8.62	2.98
May										.14	.26				T	.02	T	.89		.90	.18					T	.35					2.74	4.98
June	.23		.20			.20				.10										T												.73	4.49
July	3.11	.10											T										.06	.41								3.68	2.04
Aug.								.24					2.44		.43				.06		T			T	.69	T				.63		4.49	6.82
Sept.					.87	T	T														.10			.91	1.49	.69						4.06	6.48
Oct.			2.05	.59				.04			T																					2.68	3.67
Nov.													T											.08								.08	.86
Dec.																																0	.33
																																∮ Period 1939-1950 Total 1950	30.82	35.05

Campamento Comales, Tamps.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	.31												T																			.31	.88
Feb.		.13	.20									T							T	T	T											.33	.72
Mar.	.04	.24	.12	.27								.18		.05																		.90	.82
Apr.											T			T	T				2.22	.22												2.44	1.53
May											.30				.27				T		.06											.63	2.04
June	.14	.79																														.93	2.14
July																																0	1.02
Aug.																											.11	.02		.02		.15	2.80
Sept.																								.79	.02							.81	2.86
Oct.			T					.34								.10																.44	1.77
Nov.																							T									T	4.26
Dec.																															T	T	.89
																																Period March 1938-1950 Total 1950	6.94	21.73

Reynosa, Tamps.

Recording gage — Hydraulic Resources

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.	T									T																.33						.33	1.38
Feb.		T	.06									.31						.03														.40	.46
Mar.											.08	T					T															.08	.56
Apr.														1.51		.33				.31			.20									2.35	.98
May																																	2.91
June																																	1.97
July																																	1.47
Aug.																			T								.34		.02	.31		.67	1.71
Sept.																								.07	.18	.59			.06			.90	2.59
Oct.		T	.79																													.79	1.73
Nov.																							.14									.14	.56
Dec.																																0	.79
																																∮ Period 1941-1950		17.11

Retamal, Tamps. 1949

Standard gage — Hydraulic Resources

Record began Oct. 1, 1949

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Jan.																																	
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June																																	
July																																	
Aug.																																	
Sept.																																	
Oct.			.06				T	T				T						T				.84		.30		T	.04	.14	.25			1.63	
Nov.																																0	
Dec.	T				.12	.04		T	.33			T	.08	.12											T	.12	T	T	.04	T	.04	.89	

Latitude 26° 02' Longitude 98° 02' Elevation 82 Feet

∮ Some months missing

RAINFALL ON THE MEXICAN SIDE OF RIO GRANDE WATERSHED

IN INCHES—1950

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Inches	Normal or Average
Retamal, Tamps. 1950 (Standard gage; Hydraulic Resources)																																	
Jan.	T				T																					.28	T					.28	
Feb.		T	.06									T								T												.06	
Mar.	.57	.14	.30	.58	.22							T		T		T																1.61	
Apr.														T	.08					.10												.18	
May										T	T		.26					.06	T	.70							.06					1.08	
June	.14	.88		.10																												1.12	
July	T	.03											T			T								.43								.46	
Aug.										.39						T				T	.01						.43	T		.20		1.03	
Sept.					T											T	T							.41	.77	.04						1.22	
Oct.										T			T																			T	.82
Nov.									T				T																			T	T
Dec.																															.02	.02	.46
	Period October 1949-1950 Total 1950																															7.06	
"18 de Marzo," Tamps. 1949 (Standard gage; Hydraulic Resources; Record began June 1, 1949)																																	
Jan.																																	
Feb.																																	
Mar.																																	
Apr.																																	
May																																	
June								.20											T		T				T	T		T				.20	
July								T	T						.33									.30								.63	
Aug.					.22	T																		.54		.20						.96	
Sept.	.20								.23										2.57	1.65	T		T	1.06	1.77	.39	.59					9.84	
Oct.				.12																		1.58										.12	
Nov.		.20									.20														.20						.19	.79	
Dec.									.20																							.20	
	Latitude 25° 41' Longitude 97° 48' Elevation 56 Feet																																
"18 de Marzo," Tamps. 1950 (Standard gage; Hydraulic Resources)																																	
Jan.																									.19	.16						.35	
Feb.																																	
Mar.												.08	T				T															.08	
Apr.																																	
May														.16				.17		1.04	.05											1.42	
June		1.58	.80		1.57																											3.95	2.08
July		2.76																														2.76	1.70
Aug.																			1.57													1.57	1.26
Sept.				.26	T		T							T	.16								.71		.29	.16	.16			.80		2.54	6.19
Oct.	.80	.40	4.73	.30																												6.23	5.18
Nov.													1.28																			1.28	1.04
Dec.																															T	T	.10
Control (C I-K-9), Tamps. (Standard gage; Hydraulic Resources)																																	
Jan.	.28							.04																		.51	.04					.87	1.58
Feb.		T	.04																					.43								.47	.70
Mar.	.50	.41	.39	.51	.12							T					T		.08		T											1.81	.71
Apr.															1.18		T			.20												1.38	.81
May														.87				.14		.51							.51					1.85	3.30
June	1.06	1.86	.39																	T												3.31	2.40
July	.31	T																														.31	1.00
Aug.												T						.04	.39					T						T		.43	3.04
Sept.																	.04							1.87	.69	T		.41	T			3.01	4.20
Oct.			2.62					T																								2.62	1.84
Nov.													1.14																			1.14	.96
Dec.																																0	.74
	# Period 1942-1950 Total 1950																															17.18	21.28
Matamoros, Tamps. (Standard gage; Meteor. Serv. of Mex.)																																	
Jan.	.02			T		.03				T				T						.01	.01						T					.07	1.58
Feb.	T		.27	T						T											T	.16	T	T	T							.43	1.00
Mar.	.39	.69	.47	.41													T	.02		T		.11			.02							2.11	1.09
Apr.		T					T		T						.27	.08	.16				T	T	T									.51	1.49
May																																	2.98
June																																	3.42
July																																	2.20
Aug.																																	2.05
Sept.																																	3.19
Oct.																																	2.79
Nov.																																	1.46
Dec.																																	1.89
	# Period 1912-1950																																27.08

Some months missing

EVAPORATION IN THE RIO GRANDE BASIN IN INCHES

In The United States

Evaporation is observed at seven stations operated and maintained by the United States Section of this Commission from Presidio, Texas to Falcón Dam near Roma, Texas. At all stations the exposure to wind is uniform and relatively unimpeded. The sites are kept cleared of all high brush and trees within 150 feet, and all brush and tall weeds within 100 feet of the fenced enclosures. Within the enclosures all vegetation has either been eradicated or is kept trimmed to within 3 inches of the ground surface. No water barrels, tanks, or objects of similar size are stored within 100 feet of the enclosures.

Three types of pans are in use at these stations:

1. U. S. Weather Bureau Standard pan. Circular pan 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, set on wooden platform with rim of pan 16 inches above ground. Water level maintained between 2 to 3 inches below rim of pan. Monthly summations are made of the volumes of water which were required to maintain throughout the month the water level within the above limits and to bring the water level to the point of a fixed gage at the end of the month.. These volumes, together with the measured rainfall, are converted to inches of evaporation. This type of pan is in operation at Dryden and Fort McIntosh (Laredo), Texas. and was used at Agua Verde, Texas.

2. Circular pan 2 feet in diameter and 36 inches deep, made of 22-gage galvanized iron, set in the ground with the rim of the pan 3 inches above the ground surface and the top covered with a circular screen of No. 4 (1/4" mesh) galvanized hardware cloth. Water level maintained between 2.5 to 3.5 inches below rim of pan. Measurements of evaporation are made in the same manner as for the 4-foot diameter pan. This type of pan is in operation at Presidio, Johnson Ranch, Maravillas Creek, Dryden, Fort McIntosh (Laredo), and Falcón Dam, Texas.

3. Circular pan 12 feet in diameter and 36 inches deep, made of 20-gage galvanized iron, set in the ground with the rim of the pan 3 inches above the ground surface. Water level maintained between 2.5 to 3.5 inches below rim of pan. Measurements by micrometer hook gage. This type of pan is in operation at Dryden and Fort McIntosh (Laredo), Texas.

Month	Presidio, Texas		Johnson Ranch, Texas		Maravillas, Texas		Dryden, Texas			
							2-Foot Pan		4-Foot Pan	
	1949	1950	1949	1950	1949	1950	1949	1950	1950	#Average 1944-1950
Jan.		3.56		3.53		3.79		2.03	3.60	3.60
Feb.		4.93		5.47		4.58		3.34	4.89	5.58
Mar.		9.46		9.52		8.01		8.81	11.42	10.34
Apr.		10.91		11.36		9.78		7.27	11.23	12.28
May		12.62		13.17		10.47		10.02	14.39	13.85
June		12.58		14.05		13.02		11.98	15.82	15.93
July		11.20		13.31		11.38		11.67	14.93	15.64
Aug.		13.26		13.77		10.68		10.27	13.50	14.90
Sept.		9.33		10.38		7.99	7.09	7.85	11.49	11.43
Oct.		8.43	8.66	9.36		7.94	3.90	6.99	8.91	7.13
Nov.	5.13	5.79	5.18	6.12	4.92	6.03	4.49	6.33	7.97	5.91
Dec.	4.06	3.46	4.54	4.56	4.22	4.97	3.58	4.89	6.31	4.61
Total		105.53		114.60		98.64		91.45	124.46	121.20

Month	Dryden, Texas 12-Foot Pan		Agua Verde, Texas		Fort McIntosh, Texas			Falcón Dam, Texas
					2-Foot Pan	4-Foot Pan	12-Foot Pan	
	1949	1950	1948	1950	1950	1950	1950	1950
Jan.		2.48	4.02					
Feb.		3.76	4.77	4.51	3.78	5.31	3.62	
Mar.		7.29	10.54	9.80	6.52	8.25	6.58	
Apr.		8.99	15.82	12.54	8.21	9.90	6.94	8.94
May		11.21	16.18	13.10	8.92	13.30	8.89	12.14
June		13.16	18.54		10.90	13.69	9.85	13.41
July		11.66			13.83	17.16	12.30	15.99
Aug.		10.37			13.04	16.48	11.63	14.03
Sept.		8.10			8.97	10.85	* 7.13	10.98
Oct.	4.49	6.67			8.01	9.34	6.99	8.24
Nov.	4.47	5.66			5.66	5.98	4.74	7.83
Dec.	3.23	4.07			4.01	4.45	3.41	5.74
Total		93.42						

Some months missing * Partly estimated

EVAPORATION IN THE RIO GRANDE BASIN IN INCHES

In Mexico

Evaporation records in the Rio Grande Basin in Mexico are furnished by the Meteorological Service of Mexico, the Ministry of Hydraulic Resources, and Cía. Agrícola y de Fuerza Eléctrica del Río Conchos, S. A.

Three types of pans are in use.

1. U. S. Weather Bureau standard pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, set on wooden platform with rim of pan 16 inches above the ground. The water level is maintained between 2 and 3 inches below rim of pan and is measured with micrometer gage. This type pan is used at all stations except Palestina and La Boquilla.

2. Circular pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, set on wooden platform with rim of pan 3 feet above the ground. The water level is maintained between 1 and 6 inches below rim of pan and is measured with micrometer gage. This type pan is used at Palestina.

3. Circular pan 4 feet in diameter and 10 inches deep, made of copper, set on concrete piers with rim of pan 18 inches above the ground. The water level is maintained between 2 and 6 inches below rim of pan and is measured with micrometer gage. This type pan is used at La Boquilla.

Month	San Antonio, Durango		La Junta, Chih.		Villalba, Chih.		La Boquilla Dam, Chih.		* F. I. Madero Dam, Chih.	
	1950	Average 1943-50	1950	#Normal 1936-50	1950	#Average 1940-50	1950	Normal 1938-50	1950	Average 1949-50
Jan.	4.69	4.67	2.89	2.69	6.44	5.31	5.16	4.15	3.57	3.36
Feb.	5.41	6.62	3.61	3.79	6.95	7.28	6.65	6.65	6.03	4.91
Mar.	10.35	10.36	6.86	6.45	12.63	11.74	10.96	9.82	8.76	8.54
Apr.	10.35	10.94	9.18	8.96	13.80	13.45	13.15	11.75	12.48	11.50
May.	10.55	11.90	10.15	10.82	16.02	15.37	14.67	14.01	15.69	14.19
June	9.45	10.72	9.92	10.27	13.12	14.17	14.34	13.78	13.35	13.99
July	7.62	8.25	7.03	7.25	10.56	11.05	10.89	11.13	11.01	10.56
Aug.	8.21	7.93	7.35	6.29	10.85	9.78	10.56	9.69	11.14	10.46
Sept.	5.72	6.11	5.72	5.36	9.34	7.74	8.55	7.58	9.23	8.50
Oct.	5.98	5.66	4.89	4.74	8.66	7.04	8.09	6.56	8.22	7.08
Nov.	4.82	4.96	3.61	3.38	7.45	5.82	5.87	4.92	4.56	3.99
Dec.	4.28	4.17	2.92	2.49	6.43	4.77	4.80	3.75	5.17	4.09
Total	87.43	92.29	74.13	72.49	122.25	113.52	113.69	103.17	108.09	100.52

Month	Delicias, Chih.		Palestina, Coah.		ϕ Piedras Negras, Coah.		Sabinas, Coah.		Progreso, Coah.	
	1950	#Average 1940-50	1950	#Normal 1931-50	1950	#Average 1947-50	1950	#Average 1941-50	1950	
Jan.	4.45	3.61	4.46	5.49	2.07	2.14	3.34	2.96	3.34	
Feb.	4.93	5.26	2.56	4.75	2.47	2.26	4.40	3.67	4.07	
Mar.	8.65	8.66	5.24	7.08	6.88	6.58	8.55	6.89	7.20	
Apr.	10.48	9.97	4.86	8.18	6.87	5.56	8.82	9.85	6.80	
May	12.96	11.89	6.70	9.24	8.01	7.20	10.89	10.50	8.85	
June	11.22	11.86	7.64	10.48	7.59	7.95	9.67	11.82	8.69	
July	9.22	10.27	8.36	11.17	11.26	9.55	11.68	11.83	11.46	
Aug.	9.51	8.82	8.50	11.20	10.01	7.92	11.19	11.77	10.59	
Sept.	9.96	7.64	8.73	9.27	6.96	6.15	7.42	7.81	8.28	
Oct.	6.93	6.04	8.87	8.14	4.91	4.15	5.63	5.99	6.35	
Nov.	4.26	4.32	7.61	6.77	2.97	2.34	4.64	3.91	4.65	
Dec.	3.72	3.42	7.11	5.72	2.17	1.83	4.05	2.55	3.81	
Total	96.29	91.76	80.64	97.49	72.17	63.63	90.28	89.55	84.09	

* Formerly Las Vírgenes, Chih. # Some months missing ϕ 23 Juárez Street

EVAPORATION IN THE RIO GRANDE BASIN IN INCHES

In Mexico

Month	Villa Juárez, Coah.		Don Martín, Coah.		Lag. De Salinillas, N. L.		Cd. Anahuac, N. L.		Rinconada, N. L.	
	1950	Average 1949-50	1950	#Normal 1927-50	1950	#Normal 1936-50	1950	#Normal 1933-50	1950	
Jan.	4.04	3.10	3.13	3.43	3.23	3.68	3.22	2.60		
Feb.	4.41	3.56	3.43	4.16	3.89	4.76	3.51	3.46		
Mar.	8.16	7.16	6.29	7.19	7.24	7.96	6.01	6.20		
Apr.	8.50	7.02	7.07	8.79	7.65	9.58	6.76	7.69		
May	9.51	8.91	9.49	10.19	8.99	10.37	9.28	8.87		
June	10.22	10.70	9.43	11.69	7.65	10.86	9.77	10.16		
July	12.80	11.98	11.60	12.30	9.87	11.74	10.06	10.96		
Aug.	11.85	11.12	10.41	11.85	9.91	10.95	9.85	10.68		
Sept.	8.25	8.52	7.67	8.29	7.63	8.06	8.67	7.28		
Oct.	6.64	6.04	5.76	6.21	5.89	6.24	6.76	5.43		
Nov.	4.61	4.59	5.23	4.26	4.46	4.73	4.63	3.58	5.81	
Dec.	3.65	2.85	3.33	3.20	3.58	3.51	3.45	2.54	4.13	
Total	92.64	85.55	82.84	91.56	79.99	92.44	81.97	79.45		

Month	Monterrey, N. L.		Montemorelos, N. L.		Las Enramados, N. L.		El Cuchillo, N. L.		Saltillo, Coah.	
	1950	#Normal 1921-50	1950	#Average 1941-50	1950		1950	#Normal 1940-50	1950	#Normal 1929-50
Jan.	4.37	3.90	3.23	2.64			5.90	4.21	6.41	4.98
Feb.	3.80	4.81	3.16	3.08			5.89	5.24	4.73	5.33
Mar.	6.25	6.67	4.76	5.44			8.21	8.46	6.63	7.76
Apr.	7.20	7.68	5.39	5.68			9.89	9.67	7.36	9.18
May	8.86	8.54	7.64	6.46			12.50	10.94	9.34	9.37
June	8.96	9.38	8.69	7.69			14.22	12.25	7.79	9.61
July	8.89	10.15	10.66	9.05			17.30	14.31	7.66	8.77
Aug.	9.57	9.38	9.17	8.63			14.90	13.24	8.32	8.41
Sept.	8.33	5.92	7.69	5.80			12.01	9.46	7.21	6.66
Oct.	6.91	4.89	4.74	3.91	5.52		7.46	6.82	6.17	6.00
Nov.	7.14	3.97	4.02	2.94	4.39		6.46	5.15	5.95	5.07
Dec.	6.39	3.62	3.91	2.54	3.72		5.15	4.40	5.07	5.20
Total	86.67	78.91	73.06	63.86			119.89	104.15	82.64	86.34

Month	Las Comitas, N. L.		Los Herreras, N. L.		Ciénaga De Flores, N. L.		Comales, Tamps.		Reynosa, Tamps.	
	1950		1950	#Average 1941-50	1950	#Average 1941-50	1950	#Normal 1938-50	1950	
Jan.			5.27	3.84	3.95	3.84	6.64	4.25		
Feb.			4.96	4.52	3.87	4.36	5.81	5.58		
Mar.			7.42	7.72	6.17	6.93	7.82	8.63		
Apr.			8.09	8.53	7.32	7.82	9.30	10.61	7.28	
May			10.48	9.40	8.29	8.72	13.17	12.12		
June			11.91	10.13	8.30	9.31	14.38	13.83		
July			13.98	11.90	10.18	10.27	17.72	15.48		
Aug.			12.70	11.38	10.23	9.88	14.39	13.95		
Sept.	9.13		11.70	7.96	9.01	7.16	11.49	9.97	8.76	
Oct.	5.79		7.47	6.04	6.28	5.20	8.44	7.93	5.98	
Nov.	4.25		6.15	4.74	5.03	4.52	7.06	5.91	4.94	
Dec.	3.81		5.28	4.21	4.57	3.44	5.16	4.47	3.78	
Total			105.41	90.37	83.20	81.45	121.38	112.73		

#Some months missing

TEMPERATURE, HUMIDITY, AND WIND

The mean monthly temperatures shown for Johnson Ranch, Texas were computed from daily maximum and minimum thermometer observations.

The temperature and relative humidity at the evaporation stations shown below are recorded continuously by a hygrothermographic instrument housed in a louvered shelter set with the sensing elements of the instrument 16 inches above the ground and 9 feet southwest from either the 2 or 4-foot diameter evaporation pan. The total miles of wind movement are indicated by a standard 3-cup anemometer, installed and operated according to specifications for a Class A Weather Bureau evaporation station. The mean temperature and humidity values tabulated below were integrated from the continuous records.

Mean Temperature — Degrees Fahrenheit

Month	Johnson Ranch								
	1945	1946	1947	1948	1949	1950	Period August 1945-1950		
							Average	Maximum	Minimum
January		51.9	51.5	48.7	49.3	59.4	52.2	59.4	48.7
February		61.6	56.5	60.2	60.0	61.8	60.0	61.8	56.5
March		70.8	66.3	65.2	69.0	68.1	67.9	70.8	65.2
April		82.5	* 76.5	76.2	72.2	75.8	76.6	82.5	72.2
May		85.5	86.0	83.4	83.4	81.6	84.0	86.0	81.6
June		89.6	91.8	87.4	88.7	87.5	89.0	91.8	87.4
July		92.0	89.6	86.7	88.4	87.2	88.8	92.0	86.7
August	91.2	92.9	85.4	89.1	85.2	86.6	88.4	92.9	85.2
September	87.0	86.2	80.3	80.6	83.8	81.4	83.2	87.0	80.3
October	74.1	78.5	77.1	70.0	74.4	76.8	75.2	78.5	70.0
November	68.9	* 66.0	59.1	55.6	61.6	62.4	62.3	68.9	55.6
December	55.5	57.3	50.9	58.3	56.2	53.0	55.2	58.3	50.9
Yearly		76.2	72.6	71.8	72.7	73.5	73.6		
Daily Maximum	104.0	104.0	108.0	107.0	107.0	105.5		108.0	
Daily Minimum	39.2	33.8	21.0	16.0	13.0	26.0			13.0

Month	Dryden		Fort McIntosh	Falcón Dam
	1950	Average July 1947-1950	1950	1950
January	52.8	45.1		
February	55.9	# 53.6	63.6	
March	61.3	59.9	67.6	
April	68.4	68.4	75.1	
May	77.4	76.8	82.4	
June	81.3	81.7	84.9	
July	83.6	83.0	88.1	89.4
August	82.8	81.4	* 87.0	89.1
September	77.0	76.6	85.0	87.3
October	71.5	69.4	79.2	80.6
November	56.2	56.1	64.9	67.0
December	49.6	50.2	56.1	60.1

Mean Relative Humidity — Percent

Month	Dryden		Fort McIntosh	Falcón Dam
	1950	Average July 1947-1950	1950	1950
January	69.6	59.2		
February	57.6	# 57.1	62.7	
March	38.5	38.2	50.5	
April	49.0	45.8	57.3	
May	53.7	50.5	57.1	
June	56.1	47.0	55.5	
July	54.0	47.4	51.9	54.5
August	46.5	48.7	* 51.0	54.4
September	59.3	52.2	52.7	56.1
October	51.5	55.5	50.2	54.0
November	39.6	44.8	48.6	51.0
December	43.2	52.4	49.6	51.2

Mean Wind Speed — Miles Per Hour

Month	Dryden		Fort McIntosh	Falcón Dam
	1950	Average July 1947-1950	1950	1950
January	3.0	4.5		
February	3.9	# 4.7	3.4	
March	5.3	5.8	3.6	
April	6.0	6.0	4.5	
May	6.0	6.4	4.6	
June	7.5	6.2	4.5	
July	5.7	5.4	5.0	8.3
August	4.8	4.6	3.9	5.8
September	4.6	4.0	3.3	5.7
October	3.5	3.8	2.9	4.2
November	4.1	4.0	3.0	5.2
December	3.6	3.6	2.3	3.9

* Partly estimated # One month missing

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries — 1950

The total area within the outer rim of the Rio Grande Basin is about 335,500 square miles; however, in many places, particularly along the southwestern boundary of the basin, large areas contribute no surface run-off to the Rio Grande. Such non-contributive areas constitute about 48.8% of the total area, leaving 171,887 square miles of productive watershed. Only the productive part of the watershed is included in the list below.

The irrigated areas shown below are listed according to the downstream sequence of the points of diversion of their irrigation water and consequently, they may or may not be wholly within the indicated main river or tributary reach. They are all within the Rio Grande Basin except in the Lower Rio Grande Valley below the Rio Grande City gaging station where water is diverted at numerous points to irrigate lands which are adjacent to, but do not contribute surface run-off to the Rio Grande. All of the areas listed are equipped with irrigation facilities. In the United States all areas were irrigated in 1950; in Mexico the areas classed as "Secondary" are those for which water is available only after the water requirements of the "Primary" areas have been satisfied.

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin—Square Miles			Irrigated Areas—Acres			
	In		Total	In			Total
	United States	Mexico		United States	Mexico		
					Primary	Secondary	
Above Elephant Butte Dam	25,923	0	25,923	* 726,000	0	0	726,000
Elephant Butte Dam to Caballo Dam	1,295	0	1,295	96	0	0	96
Above Caballo Dam	27,218	0	27,218	726,096	0	0	726,096
Caballo Dam to El Paso Station	2,049	0	2,049	92,316	0	0	92,316
Above El Paso Gaging Station	29,267	0	29,267	818,412	0	0	818,412
El Paso Station to American Dam	4	0	4	0	0	0	0
Above American Dam	29,271	0	29,271	818,412	0	0	818,412
American Dam to Juárez Station	41	47	88				
Above Juárez Gaging Station	29,312	47	29,359				
Juárez Station to Island Station	146	472	618				
Above Island Gaging Station	29,458	519	29,977				
Island Station to County Line Station	485	186	671				
American Dam to County Line - total	672	705	1,377	67,482			
Above County Line Gaging Station	29,943	705	30,648	885,894			
County Line Station to Fort Quitman	663	679	1,342	18,544			
Above Fort Quitman Gaging Station	30,606	1,384	31,990	904,438	44,973	0	949,411
Fort Quitman Station to La Nutria	1,041	886	1,927	2,342	6,425	0	8,767
Above La Nutria Gaging Station (Inactive)	31,647	2,270	33,917	906,780	51,398	0	958,178
La Nutria to Upper Presidio Station	580	503	1,083	1,842	9,142	0	10,984
Above Upper Presidio Gaging Station	32,227	2,773	35,000	908,622	60,540	0	969,162
Río Conchos above Boquilla Dam	0	7,322	7,322	0	2,966	0	2,966
Río Conchos below Boquilla Dam	0	17,419	17,419	0	183,104	12,108	195,212
Río Conchos - total	0	24,741	24,741	0	186,070	12,108	198,178
Upper to Lower Presidio Station - excluding Río Conchos	21	5	26	822	0	0	822
Upper to Lower Presidio Station - total	21	24,746	24,767	822	186,070	12,108	199,000
Above Lower Presidio Gaging Station	32,248	27,519	59,767	909,444	246,610	12,108	1,168,162
Alamito Creek above Gaging Station	1,504	0	1,504	452	0	0	452
Terlingua Creek above Gaging Station	1,070	0	1,070	188	0	0	188
Lower Presidio to Johnson Ranch Station - excluding Alamito and Terlingua Creeks	1,439	2,671	4,110	3,205	3,459	1,977	8,641
Lower Presidio to Johnson Ranch - total	4,013	2,671	6,684	3,845	3,459	1,977	9,281
Above Johnson Ranch Gaging Station	36,261	30,190	66,451	913,289	250,069	14,085	1,177,443
Johnson Ranch Station to Boquillas	471	3,735	4,206	0	0	0	0
Above Boquillas Gaging Station (Inactive)	36,732	33,925	70,657	913,289	250,069	14,085	1,177,443
Boquillas to Langtry Station	6,123	2,595	8,718	23	0	0	23
Above Langtry Gaging Station	42,855	36,520	79,375	913,312	250,069	14,085	1,177,466

* 1950 acreage not known, latest available data from Water Bulletin No. 19.

DRAINAGE BASIN AND IRRIGATED AREAS
Along the Rio Grande and Tributaries—1950

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin—Square Miles			Irrigated Areas—Acres			
	In		Total	In			Total
	United States	Mexico		United States	Mexico		
					Primary	Secondary	
Pecos River above Girvin	29,562	0	29,562	** 228,360	0	0	228,360
Pecos River, Girvin to IBWC Gaging Station	5,731	0	5,731	*** 7,387	0	0	7,387
Pecos River above IBWC Gaging Station	35,293	0	35,293	235,747	0	0	235,747
Goodenough Spring above Gaging Station	1	0	1	0	0	0	0
Devils River above IBWC Gaging Station	4,185	0	4,185	# 309	0	0	309
Las Vacas Arroyo above Gaging Station	0	160	160	0	742	494	1,236
Langtry to Del Rio - excluding above tributaries	416	2,495	2,911	480	0	0	480
Langtry to Del Rio - total	39,895	2,655	42,550	236,536	742	494	237,772
Above Del Rio Gaging Station	82,750	39,175	121,925	1,149,848	250,811	14,579	1,415,238
San Felipe Creek above Gaging Station	46	0	46	850	0	0	850
Pinto Creek above Gaging Station	236	0	236	## 347	0	0	347
Río San Diego above Gaging Station	0	916	916	0	17,544	0	17,544
Río San Diego - total	0	926	926	0	18,780	988	19,768
Río San Rodrigo above Gaging Station	0	591	591	0	3,706	3,212	6,918
Río San Rodrigo - total	0	842	842	0	6,177	3,954	10,131
Del Río to Eagle Pass - excluding above tributaries	1,213	314	1,527	33,603	4,942	0	38,545
Del Río to Eagle Pass - total	1,495	2,082	3,577	34,800	29,899	4,942	69,641
Above Eagle Pass Gaging Station	84,245	41,257	125,502	1,184,648	280,710	19,521	1,484,879
Río Escondido above Gaging Station	0	1,279	1,279	0	6,178	8,649	14,827
Río Escondido - total	0	1,320	1,320	0	6,178	8,649	14,827
Eagle Pass to El Jardín - excluding Río Escondido - total	736	1,485	2,221	161	0	0	161
Eagle Pass to El Jardín - total	736	2,805	3,541	161	6,178	8,649	14,988
Above El Jardín Dam Site	84,981	44,062	129,043	1,184,809	286,888	28,170	1,499,867
El Jardín to Laredo - total	737	1,079	1,816	4,612	5,189	0	9,801
Above Laredo Gaging Station	85,718	45,141	130,859	1,189,421	292,077	28,170	1,509,668
Río Salado above Venustiano Carranza Dam	0	13,819	13,819	0	54,363	8,896	63,259
Río Salado above Gaging Station	0	21,503	21,503	0	106,008	19,027	125,035
Laredo to Zapata - excluding Río Salado	1,097	967	2,064	9,981	2,223	0	12,204
Laredo to Zapata - total	1,097	22,470	23,567	9,981	108,231	19,027	137,239
Above Zapata Gaging Station	86,815	67,611	154,426	1,199,402	400,308	47,197	1,646,907
Zapata to Falcón Dam Site	945	169	1,114	2,313	0	0	2,313
Above Falcón Dam Site	87,760	67,780	155,540	1,201,715	400,308	47,197	1,649,220
Río Alamo above Gaging Station	0	1,663	1,663	0	4,942	5,436	10,378
Falcón Dam Site to Roma - excluding Río Alamo	87	158	245	2,200	494	0	2,694
Falcón Dam Site to Roma - total	87	1,821	1,908	2,200	5,436	5,436	13,072
Above Roma Gaging Station	87,847	69,601	157,448	1,203,915	405,744	52,633	1,662,292
Río San Juan above Marte Gómez Dam	0	12,473	12,473	0	102,548	67,212	169,760
Río San Juan - total	0	12,679	12,679	0	265,637	67,212	332,849
Roma to Río Grande City - excluding Río San Juan	678	181	859	3,205	247	0	3,452
Roma to Río Grande City - total	678	12,860	13,538	3,205	265,884	67,212	336,301
Above Rio Grande City Gaging Station	88,525	82,461	170,986	1,207,120	671,628	119,845	1,998,593
Rio Grande City to Anzaldúas Dam Site	409	415	824	124,111	247	0	124,358
Above Anzaldúas Dam Site	88,934	82,876	171,810	1,331,231	671,875	119,845	2,122,951
Anzaldúas Dam Site to Hidalgo	6	15	21		0	0	
Above Hidalgo Gaging Station	88,940	82,891	171,831		671,875	119,845	
Hidalgo to Matamoros	26	26	52		100,572	0	
Above Matamoros Gaging Station	88,966	82,917	171,883		772,447	119,845	
Matamoros to Lower Brownsville	2	2	4		0	0	
Rio Grande City to Lower Brownsville	443	458	901	598,709	100,819	0	699,528
Above Lower Brownsville Gaging Station	88,968	82,919	171,887	1,805,829	772,447	119,845	2,698,121
Lower Brownsville to the Gulf of Mexico				3,671			
Above Gulf of Mexico				1,809,500			

** Includes 111,500 acres irrigated chiefly from wells, 1949 data. *** Includes 6,837 acres irrigated from wells, 1949 data. # Irrigated from wells. ## Includes 297 acres irrigated from wells.

PUBLISHED DISCHARGES

The tabulation below shows publications in which may be found the discharges at gaging stations on the Rio Grande and on tributaries and outfalls near their confluence with the Rio Grande as well as on floodways and diversions leading from the Rio Grande, from San Marcial, New Mexico to the Gulf of Mexico. The material is tabulated by gaging stations according to their sequence in downstream order.

The publication numbers shown in the table are numbers of Water Bulletins published by this Commission and Water Supply Papers published by the United States Geological Survey. A number in parentheses such as (12) indicates that the pertinent material in Water Bulletin Number 12 has been revised.

All discharges are mean daily unless the following symbols indicate otherwise:

# Indicates monthly discharges
Indicates period discharges
∠ Indicates extreme discharge
⊕ Indicates daily gage heights
ϕ Indicates annual discharges

Period	Publication No.
RIO GRANDE AT SAN MARCIAL, N. M.	
Water Bulletins	
1895-1943, 1895, 1895-1896	13#, 7##, 12#
Jan. Feb. 1895, Apr. 1896	13 (12)
1924 - 1935	6#
1931 - Sept. 30, 1949	1-19
March, April 1932	13, 6, (2)
Seepage 1936 - 1937	7
Water Supply Papers	
Feb. 1 - Aug. 31, 1895	358
Jan. 22, 1896-Sept. 30, 1916	358,388,408,438
Oct. 1, 1916 - Dec. 31, 1921	458,478,508,528
Jan. 1, 1922-Sept. 30, 1930	628,668,688,703
Oct. 1, 1930-Sept. 30, 1934	718,733,748,763
Oct. 1, 1934-Sept. 30, 1938	788,808,828,858
Oct. 1, 1938-Sept. 30, 1942	878,898,928,958
Oct. 1, 1942-Sept. 30, 1945	978,1008,1038
Oct. 1, 1945-Sept. 30, 1948	1058,1088,1118
Oct. 1, 1948-Sept. 30, 1949	1148
Seepage June 1936-Apr. 1937	828#

Period	Publication No.
RIO GRANDE BELOW ELEPHANT BUTTE DAM, N. M.	
Water Bulletins	
March 21, 1915 - 1916	10
1915 - 1943	12#, 13#
June 1915	13 (10)
1938 - 1950	8 - 20
Water Supply Papers	
Oct. 1, 1916-Sept. 30, 1921	458,478,508,528
Oct. 1, 1921-Sept. 30, 1925	548,568,588,608
Oct. 1, 1925-Sept. 30, 1929	628,648,668,688
Oct. 1, 1929-Sept. 30, 1934	703,733,748,763
Oct. 1, 1934-Sept. 30, 1938	788,808,828,858
Oct. 1, 1938-Sept. 30, 1942	878,898,928,958
Oct. 1, 1942-Sept. 30, 1945	978,1008,1038
Oct. 1, 1945-Sept. 30, 1948	1058,1088,1118
Oct. 1, 1948-Sept. 30, 1949	1148

Period	Publication No.
RIO GRANDE BELOW CABALLO DAM, N. M.	
Water Bulletins	
1938 - 1950	8 - 20, 13#
Water Supply Papers	
Jan. 1, 1938-Sept. 30, 1942	878,898,928,958
Oct. 1, 1942-Sept. 30, 1945	978,1008,1038
Oct. 1, 1945-Sept. 30, 1948	1058,1088,1118
Oct. 1, 1948-Sept. 30, 1949	1148

Period	Publication No.
RIO GRANDE AT EL PASO, TEXAS	
Water Bulletins	
1889 - 1943	13#
1889,1893-1896,Jan.1898,1915	7##, 12#, 12
Jan. Feb. 1893	13 (12)
Apr.-Jul.1914, Dec.1915	7, 7#
1924 - 1935	6#
Jan. Aug. 1930	13 (6)
1931 - 1950	1-20
Water Supply Papers	
May 10, 1889-June 30, 1893	358
Jan. 1, 1897-Sept. 30, 1923	358,388,408,568
Oct. 1, 1923-Sept. 30, 1927	588,608,628,648
Oct. 1, 1927-June 30, 1931	668,688,703,718

Period	Publication No.
DIVERSION - AMERICAN CANAL AT EL PASO, TEXAS	
Water Bulletins	
June 1938 - 1950	8 - 20, 13#

Period	Publication No.
RIO GRANDE BELOW AMERICAN DAM	
Water Bulletins	
June 1938 - 1950	8 - 20, 13#

Period	Publication No.
DIVERSION - ACEQUIA MADRE NEAR JUAREZ, CHIH.	
Water Bulletins	
1938 - 1950	8 - 20, 13#

Period	Publication No.
DIVERSIONS IN THE EL PASO VALLEY	
Water Bulletins	
1938 - 1947	8 - 17

Period	Publication No.
OUTFALLS NEAR EL PASO	
Water Bulletins	
1936 - 1950	8 - 20#

Period	Publication No.
RIO GRANDE AT JUAREZ, CHIH.	
Water Bulletins	
April 1938 - 1950	8 - 20

Period	Publication No.
RIO GRANDE AT ISLAND STATION	
Water Bulletins	
Aug. 17, 1938 - 1950	8 - 20

Period	Publication No.
RIO GRANDE AT TORNILLO BRIDGE	
Water Bulletins	
1924 - 1927, 1924 - 1937	5, 13#
1931 - 1937	1 - 7
Water Supply Papers	
Oct. 1, 1927-June 30, 1931	668,688,703,718

Period	Publication No.
RIO GRANDE AT COUNTY LINE	
Water Bulletins	
1938 - 1943, 1938 - 1950	8 - 20, 13#

Period	Publication No.
RIO GRANDE AT FORT HANCOCK, TEXAS	
Water Bulletins	
Apr. 1900 - June 1903	13#
Water Supply Papers	
Mar. 27, 1900-June 30, 1903	358

Period	Publication No.
RIO GRANDE AT FORT QUITMAN, TEXAS	
Water Bulletins	
1889-1923,1889-1943	12#, 13#
1924 - 1935	6#
July 1924, June 1928	13 (6)
1931 - 1950	1 - 20
Water Supply Papers	
Jan. 1, 1923-Sept. 30, 1926	568,588,608,628
Oct. 1, 1926-Sept. 30, 1930	648,668,688,703
Oct. 1, 1931-June 30, 1931	718

Period	Publication No.
RIO GRANDE AT LA NUTRIA	
Water Bulletins	
1935 - 1941, 1935	5-11, 13#, 6#

Period	Publication No.
RIO GRANDE AT UPPER PRESIDIO STATION	
Water Bulletins	
1889 - 1943	13#
1889-1900, 1914-1926	12#
1900 - 1913	7#
September 1919	8
1924-1927, 1932	12 (6)
1924 - 1935	6#
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Sept. 1, 1919-Mar. 31, 1920	508
Aug. 1, 1923-Sept. 30, 1926	568,588,608,628

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May 1, 1900-July 31, 1915	358,388,408
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Aug. 1, 1923-Sept. 30, 1926	568,588,608,628

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May 1, 1900-Oct. 15, 1914	358,388,408
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Oct. 1, 1921-Sept. 30, 1925	548,568,588,608
Oct. 1, 1925-Sept. 30, 1929	628,648,668,688
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1931 - 1950	1 - 20
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May 1, 1900-Apr. 30, 1916	358,388,408,438
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Oct. 1, 1927-June 30, 1931	668,688,703,718

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Nov. 1, 1922-Sept. 30, 1926	568,588,608,628

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Period	Publication No.
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Aug. 1925	15 (14) (6)
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Nov. 1, 1922-Sept. 30, 1925	568,588,608
Mar. 6, 1929-June 30, 1931	688,703,718

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Period	Publication No.
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Period	Publication No.
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Yield of water from watersheds; see Watershed yields
Ysleta-Zaragosa Bridge; see Sanitary assays
Ysleta; see Evaporation

Z

Zapata Station, discharge 2,31 through 20,38; see Sanitary assays, Conductivity

CORRECTIONS TO PREVIOUS WATER BULLETINS

Stream Flow Records

RIO CONCHOS NEAR OJINAGA, CHIHUAHUA: The August, September, and annual discharges for 1932 at this station as previously published are erroneous. The correct values are: 136,000, 505,000, and 1,785,220 acre-feet, respectively.

TERLINGUA CREEK NEAR TERLINGUA, TEXAS: The zero of the gage is 2,195.99 feet above mean sea level, U.S.C. & G.S. datum, determined by levels run in January 1950 and tied to a U.S.C. & G.S. bench mark elevation established in 1943. Previously published elevations are erroneous.

SPECIAL STATIONS IN BIG BEND AREA: The locations of Upper and Lower Lozier Stations shown in Water Bulletin No. 19 are erroneous; those shown on page 20 of this bulletin are correct for both 1949 and 1950.

RIO GRANDE AT LAREDO, TEXAS: The discharge record for the last few days of December 1949 as published in Water Bulletin No. 19 was found to be in error and has been corrected as follows: The mean daily discharges for December 23 through 31, should be 2,540, 2,530, 2,540, 2,540, 2,580, 2,540, 2,610, 2,610, and 2,770 second-feet respectively; the monthly mean 2,790 second-feet; the minimum 2,470 second-feet; and the monthly volume 171,800 acre-feet. The volume for the year 1949 should be 3,469,600 acre-feet. The corrected mean dailies are estimated, and the volume for December is partly estimated.

RIO GRANDE AT MATAMOROS, TAMAULIPAS: This gage was moved May 1, 1950 and its zero was lowered 3.27 feet. According to the adjusted elevation of U.S.C. & G.S. B.M. Y48, the zero of the gage prior to May 1 was 15.38 feet instead of 15.26 feet above mean sea level, as published in previous bulletins. The new zero of the gage is 12.11 feet above mean sea level.

RIO GRANDE AT UPPER PRESIDIO: On the basis of the fuller data referred to in Water Bulletin Number 8, Page 18, the mean daily discharges for August 10 and 11 and August 30 to September 7, 1932, published in Water Bulletin Number 2, have been revised. These revisions are included in the tabulation below.

RIO GRANDE AT UPPER PRESIDIO

MEAN DAILY DISCHARGE IN SECOND-FEET - 1932 REVISED

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	141	1,230	11	1,150	430	21	528	164
2	129	1,010	12	884	362	22	416	140
3	253	740	13	810	320	23	324	157
4	271	809	14	694	315	24	255	260
5	619	1,410	15	578	286	25	209	316
6	579	1,070	16	556	264	26	201	262
7	569	869	17	525	238	27	199	326
8	635	710	18	538	207	28	192	552
9	487	506	19	561	192	29	158	2,070
10	534	455	20	564	214	30	1,520	2,260
						31	2,080	
						SUM	17,159	18,144

REVISED SUMMARY - 1932

Month	Extreme Gage Feet		Extreme Second Feet					Average Second Feet	Total Acre Feet
				High		Low			
	High	Low	Day		Day				
Aug.	10.54	5.40	31	2,080	2	125		554	34,000
Sept.	11.02	5.43	30	2,270	22	125		605	36,000
Yearly	13.20			3,200		0		297	215,310

Suspended Silt

SUSPENDED SILT IN THE RIO GRANDE AND SOME TRIBUTARIES AND DIVERSIONS: Under Method "B" in headings appearing in Water Bulletins Nos. 17, 18, and 19, the coefficient referred to should be 1.10 instead of 0.908 as stated.