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WESTERN WATER BULLETIN 1970

Flow of
The Colorado River
and other
Western Boundary Streams
and
Related Data

COLORADO RIVER

TIJUANA RIVER

SANTA CRUZ RIVER

SAN PEDRO RIVER

WHITEWATER DRAW

1970

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FOREWORD

This bulletin is the eleventh annual compilation of stream discharges and other hydrographic data relating to the international aspects of the Colorado River below Imperial Dam, the Tijuana River and other streams crossing the western land boundary of the United States and Mexico. The compilation was prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission, solely for the purpose of presenting statistical data relating to stream flow and kindred subjects for the Colorado River from Imperial Dam to the Gulf of California, the Tijuana River and its important tributaries in the United States and Mexico, and other streams, including the Alamo and New Rivers which cross the California-Baja California boundary, and the Santa Cruz and San Pedro Rivers and Whitewater Draw which cross the Arizona-Sonora boundary. This volume contains the information for the year 1970.

Stream gaging on the Colorado River below Imperial Dam began in 1902 when the station at Yuma, Arizona was established. Stage records have been obtained at this station since January 1878. Continuous stream gaging on the Tijuana River and its important tributaries in the United States and in Mexico began in 1936. Each government operates the gaging stations located within its own country.

Colorado River below Imperial Dam

Below Imperial Dam, the Colorado River flows southward 10 miles to the mouth of the Gila River, thence westward 11 miles to Pilot Knob Mountain, and south 1 mile to the point where the northerly international land boundary, between California and Baja California, intersects the river. From this point the river continues to flow southward and forms the boundary between the United States and Mexico for a distance of about 22 miles to the point where the southerly international land boundary between Arizona and Sonora intersects the river. From this point the river continues to flow southward about 90 miles to discharge into the Gulf of California.

The ordinary flows of Colorado River below Imperial Dam are largely controlled by releases at Hoover Dam, completed in 1935. The releases are further regulated at Davis Dam, completed in 1950, and by Parker and Imperial Dams, completed in 1938. Small amounts of runoff may occasionally be contributed to the flow in the lower river from the usually dry arroyos draining the 10,900 square miles along the river from Hoover Dam to the mouth of the Gila River, not including 5,500 square miles in the Bill Williams River watershed. In addition, flows ranging from usually minor amounts to infrequent torrential floods may enter the lower Colorado River from the Bill Williams River and from the Gila River, draining about 7,300 square miles below Painted Rock Dam and Reservoir, completed in January 1960.

At Imperial Dam, diversions are made to Gila Gravity Main Canal and All-American Canal for irrigation projects in Arizona, including the Yuma Valley, Gila and Wellton-Mohawk projects, and in California, including the Imperial Valley, Coachella Valley and Reservation Division of Yuma Project. Also, under the provisions of the 1944 Water Treaty, there may be diverted to the All-American Canal at Imperial Dam for delivery to Mexico in the Alamo Canal, or substitute canal, at the northerly boundary, a portion of Mexico's guaranteed annual allotment of waters of the Colorado River. No such diversions were made in 1970.

Below Laguna Dam, measured and unmeasured flows are returned to the river principally as waste and drainage water from the irrigation projects in the United States. Waste and drainage waters from irrigation projects in the United States also cross the boundary into Mexico near San Luis, Arizona without returning to the river in the United States.

In the limitrophe section of the river, 1.1 miles downstream from the northerly boundary, Morelos Dam, the principal diversion structure for Mexico, was completed and placed in operation on November 8, 1950. Since that date all of Mexico's guaranteed treaty allotment of Colorado River water has been delivered in the limitrophe section of the river. The greater portion of such deliveries has been diverted to the Alamo Canal at Morelos Dam.

Tijuana River Basin

The total drainage area of the Tijuana River basin is 1,731 square miles of which 27 percent lies in the United States and 73 percent in Mexico. This river is formed by the principal tributaries, Cottonwood Creek, which rises in the United States and Río de las Palmas, which rises in Mexico. Cottonwood Creek crosses the international land boundary 21 miles from the Pacific Ocean to join the Río de las Palmas in Mexico. From the confluence of these tributaries, the Tijuana River flows northwesterly 5 miles to cross the land boundary into the United States near San Ysidro, California, and Tijuana, Baja California, and then flows westerly 6 miles to discharge into the Pacific Ocean 2 miles north of the boundary. The flow of Cottonwood Creek is partially controlled by Barrett and Morena Reservoirs in the United States and the flow of the Río de las Palmas is partially controlled by Rodríguez Reservoir in Mexico.

Whitewater Draw near Douglas, Arizona

Whitewater Draw rises in the United States and flows south into Mexico crossing the international boundary near Douglas, Arizona, eventually discharging into the Gulf of California through the Yaqui River in Mexico. The total drainage area above the Douglas Gaging Station is 1,023 square miles. A number of mountain streams in the upper reaches of the basin are diverted for irrigation but they would normally sink or go to ground water before reaching the main water course.

San Pedro River at Palominas, Arizona

The San Pedro River rises in Mexico and flows north into the United States crossing the boundary near Palominas, Arizona, and thence northwesterly into the Gila River. The river in the vicinity of the international boundary drains an area of 741 square miles of which 649 square miles are in Mexico.

FOREWORD

Santa Cruz River near Nogales and Lochiel, Arizona

The Santa Cruz River rises in the United States and flows south into Mexico crossing the international boundary near Lochiel, Arizona, and returns to the United States near Nogales, Arizona, eventually discharging into the Gila River southwest of Phoenix, Arizona. The drainage area of the Santa Cruz River above Nogales station is 533 square miles. Of this amount, 348 square miles lie in Mexico. There are a few ground water irrigation diversions above the Lochiel station in Arizona and an unknown amount of water diverted for irrigation in Mexico.

Acknowledgments

Other agencies which have contributed to the data published herein include the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the U. S. Weather Bureau, Department of Commerce; the Yuma County Water Users' Association; the Imperial Irrigation District; the city of San Diego, California; and the Ministry of Hydraulic Resources of Mexico. Specific notation is made of each of the above-named agencies, where the data appear. The courtesy and cooperation of those who have made these contributions are acknowledged with appreciation.

Units of Measure

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

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

GENERAL HYDROLOGIC CONDITIONS FOR 1970

Colorado River

Normally, there is no measurable amount of runoff from the portion of the Colorado River basin in the United States and Mexico below Hoover Dam, not including Bill Williams and Gila Rivers. There was no significant amount in 1970. The average seasonal (October 1969-September 1970) rainfall over the upper basin, as gaged at 13 index stations, was about 13.9 inches compared to a seasonal average of about 13.8 inches for the 48 seasons (1923-1970). In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation (1970) measured at 6 index stations was 1.85 inches compared to an average of 2.08 inches during the last 10 years (1961-1970).

The flow of the Colorado River reaching Imperial Dam was 5,705,700 acre-feet, about 68% of the 36-year average (1935-1970) of 8,411,656 acre-feet. At the northerly international boundary, the total flow of the river during 1970 was 1,312,728 acre-feet, about 33% of the 1935-1970 average of 3,929,459 acre-feet. At the southerly international boundary, the flow during 1970 was only 120,754 acre-feet, or about 4% of the 1935-1970 average of 3,131,439 acre-feet. The total flow of the Colorado River reaching the M. C. Rodríguez gaging station, 24.5 miles downstream from the southerly international boundary, and 4.5 miles upstream from the Sonora-Baja California railroad bridge, was 49,119 acre-feet in 1970, about 4% of the 1951-1970 average of 1,273,673 acre-feet.

The total of all flows of the Colorado River entering Mexico in 1970 amounted to 1,583,186 acre-feet, 35% of the 1935-1970 average of 4,574,846 acre-feet, as measured 1) in the Colorado River at the northerly international boundary, 2) in the Wellton-Mohawk Main Outlet Drain Extension below Morelos Dam, 3) in the wasteways that discharge into the limittrophe section of the river from the United States bank, and 4) in the canal which discharges waste and drainage waters from the Yuma Project across the southerly land boundary into Mexico near San Luis, Arizona, less diversions in the United States by pumps in the limittrophe section.

No flood peaks of importance occurred in streams of the lower Colorado River basin during 1970. A maximum instantaneous flow of 6,560 second-feet occurred in the Colorado River at the northerly boundary station on March 4.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 18,880,300 acre-feet, 66% of the usable capacity of 28,588,400 acre-feet. The greater part (16,811,000 acre-feet) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1970 due to drought or accident to the irrigation system.

The total reported acreage irrigated from waters of the Colorado River below Imperial Dam in 1970 was 1,079,752 acres; 653,162 acres in the United States and 426,590 acres in Mexico. An estimated one-third of acreage in Mexico is served by pumping from ground water.

The suspended sediment load passing the northerly boundary station in 1970 was 76.2 acre-feet, about 25% of the 1956-1970 average of 301.8 acre-feet.

Tijuana River Basin

During 1970, the temperatures at Barrett Dam, California (elevation 1,750 feet) in the upper portion of the basin in the United States averaged 61.2 degrees, 0.1 degree below the 40-year mean. In the extreme upper portion of the basin in Mexico at San Juan de Dios, Baja California (elevation 3,280 feet), the recorded temperatures during the year averaged 55.4 degrees, equal to the long-term average, and at Rodríguez Dam, Baja California (elevation 459 feet), the recorded temperatures averaged 64.4 degrees, 2 degrees above the 25-year normal.

At Barrett Dam in the upper portion of the basin in the United States, the recorded precipitation was 15.07 inches, 86% of normal, and at Chula Vista near the lower end of the basin, 8.36 inches, or 86% of normal. The recorded precipitation at San Juan de Dios in the upper portion of the basin in Mexico, was 14.4 inches, approximately 93% of the normal during the 15-year period, and at Rodríguez Dam in the lower portion of the basin in Mexico, 7.7 inches, 96% of the 33-year average.

Runoff in the basin during 1970 averaged less than 10% of normal. Above Morena Reservoir the runoff was 649 acre-feet, or about 11% of the 34-year 1937-1970 mean of 6,079 acre-feet. At Rodríguez Reservoir, the runoff was 935 acre-feet, or about 7% of the 33-year mean of 14,256 acre-feet.

The flow of the Tijuana River at the international boundary was 688 acre-feet during 1970, and the flow in the Tijuana River near Nestor was 47 acre-feet.

Whitewater Draw

During 1970, the average annual temperature over the watershed was slightly below normal, while the annual precipitation was below normal. Runoff for the year at the gaging station near Douglas, Arizona, of 5,314 acre-feet was 76% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1970

San Pedro River

During 1970, the average annual temperature was below normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 94% of the 1961-1970 mean of 19.98 inches. The stream flow at the international boundary was 15,733 acre-feet, 73% of the 1951-1970 normal.

Santa Cruz River

During 1970, the average annual temperature over the watershed was somewhat below normal and the annual precipitation was about 19% of the 32-year 1939-1970 mean. Runoff measured at the Nogales gaging station where the stream re-enters the United States was 11,339 acre-feet. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States, was 536 acre-feet. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 10,803 acre-feet from the loop of the river lying in Mexico, or approximately 95% of the flow reaching the Nogales station.

Alamo and New Rivers

During 1970, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, and at Mexicali, Baja California, was 71.8 and 71.6 degrees, respectively, 0.5 and 0 degrees below the respective normals.

At El Centro, the precipitation was 1.06 inches, about 42% of the 40-year average, and in Mexicali, the annual precipitation was 1.89 inches, 63% of the 45-year average. The total flow of the New River at the international boundary in 1970 was 99,671 acre-feet, which was about 136% of the 1943-1970 normal.

Salton Sea

During 1970, the average annual temperature around the Salton Sea was about 98% of the long-term average while the annual precipitation recorded at Brawley, California was approximately 84% of the long-term mean of 2.35 inches. The water surface of the Salton Sea remained more or less the same during the year. The maximum stage, 231.7 feet below mean sea level, was recorded on May 22 to June 3, 1970 inclusive. The minimum stage, 232.8 feet below mean sea level, was recorded on October 26 to November 23, 1970 inclusive.

COLORADO RIVER AT YUMA, ARIZONA - STAGES

DESCRIPTION: Water-stage recorder 200 feet upstream from lower highway bridge, 6.9 miles upstream from the northerly international land boundary, 2,100 feet downstream from the upper highway and railroad bridges at Yuma, Arizona, 4.7 miles downstream from the mouth of the Gila River, 19.1 miles downstream from Imperial Dam, and 0.3 mile upstream from the mouth of the Yuma Main Canal Wasteway. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily gage heights are based on continuous water-stage records. Records available: Gage heights, January 1878 through August 10, 1965, furnished by the U. S. Geological Survey. From August 11, 1965 through 1970, records obtained by the United States Section of the Commission.

EXTREMES: Prior to 1935: Maximum gage height 136.79 feet on January 22, 1916; minimum gage height 115.49 feet on September 17, 1917. Since 1935: Maximum gage height 127.36 feet on September 7, 1939; minimum gage height 111.22 feet on July 16, 1947.

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	* 112.67	112.79	‡ 113.17	113.72	113.71	113.31	113.04	112.98	113.70	112.85	112.93	112.97
2	112.62	112.80	* 116.05	113.69	113.73	113.26	113.06	113.06	113.47	112.87	112.92	113.00
3	112.62	112.78	117.72	113.65	113.84	113.28	113.11	113.18	113.40	112.87	112.92	113.05
4	112.63	112.79	117.10	113.29	113.78	113.04	113.33	113.07	113.17	112.86	112.94	113.06
5	112.62	112.80	114.53	113.23	113.71	113.06	113.12	113.06	113.14	112.90	112.95	113.04
6	112.61	112.80	113.60	113.17	113.66	113.03	113.06	113.10	113.14	112.89	112.97	113.03
7	112.59	112.73	113.85	113.22	113.61	113.03	113.08	112.97	113.17	112.88	112.99	113.04
8	112.60	112.72	113.94	113.50	113.55	113.02	113.06	112.97	113.15	112.92	112.97	113.25
9	112.69	112.72	113.74	113.20	113.34	113.04	113.05	112.99	113.18	112.93	112.97	113.45
10	112.71	112.77	113.39	113.20	113.23	113.06	113.03	113.59	113.16	112.95	112.98	112.95
11	112.69	113.87	* 113.36	113.20	113.37	113.33	113.09	113.38	113.08	112.92	112.98	112.95
12	112.60	114.31	113.39	113.42	113.34	112.77	113.32	113.06	113.09	112.95	112.97	113.00
13	112.55	113.51	114.03	113.15	113.24	112.79	113.13	112.93	113.09	112.91	113.17	112.98
14	112.37	113.00	* 113.92	113.12	113.25	112.74	113.04	112.85	113.13	113.07	113.18	112.94
15	112.42	113.12	‡ 113.53	113.11	113.24	112.75	113.00	112.92	113.14	113.17	113.17	112.93
16	112.38	113.52	‡ 113.42	113.09	113.22	112.80	113.01	112.94	112.81	113.17	113.17	112.93
17	112.31	113.12	‡ 113.39	113.09	113.23	112.82	113.03	112.93	112.78	113.10	113.14	112.92
18	112.34	113.56	* 113.35	113.62	113.19	112.91	113.05	112.93	112.81	113.08	113.08	112.93
19	112.64	113.70	113.27	113.80	113.19	113.38	113.01	112.93	112.82	113.00	113.01	112.95
20	112.97	* 113.25	113.29	113.34	113.21	113.27	113.01	112.90	112.84	112.95	112.95	112.95
21	112.79	‡ 113.14	113.28	113.23	113.21	113.03	112.99	112.92	112.82	112.90	112.93	112.96
22	112.71	‡ 113.16	113.27	113.22	113.22	112.99	112.98	112.82	112.79	112.90	112.94	112.95
23	112.70	‡ 113.15	113.25	113.24	113.17	112.99	112.96	112.87	112.77	112.89	112.93	112.92
24	112.69	‡ 113.12	113.11	113.53	113.21	112.99	112.95	112.90	112.78	112.88	112.97	112.94
25	112.69	‡ 113.15	113.09	113.46	113.15	112.98	112.97	112.90	112.78	112.89	112.95	112.96
26	112.75	‡ 113.14	113.20	113.23	113.17	112.97	113.02	112.94	112.77	112.88	113.11	112.94
27	112.80	‡ 113.13	113.65	113.23	113.17	112.99	113.50	113.60	112.77	112.89	113.28	112.94
28	112.81	‡ 113.12	113.60	113.15	113.14	112.98	113.30	113.10	112.76	112.85	113.06	112.95
29	112.81		113.86	113.14	113.17	112.99	113.11	112.94	112.76	112.94	113.01	112.96
30	112.81		113.74	113.80	113.16	113.00	113.05	112.99	112.78	112.95	113.02	112.95
31	112.82		113.73		113.19		113.00	113.61		112.93		112.91
Avg.	112.65	113.13	113.87	113.33	113.34	113.02	113.08	113.04	113.00	112.94	113.02	112.99

* Partly estimated

‡ Estimated

RESERVATION MAIN DRAIN NO. 4 (CALIFORNIA DRAIN)

DESCRIPTION: Water-stage recorder (digital) located 500 feet upstream from the U. S. Highway No. 80 crossing and one mile northwest of Yuma, Arizona. Discharge measurements are made from a footbridge immediately below the gage. The drainage canal discharges into the outfall channel of the Yuma Main Canal Wasteway 200 feet downstream from the spillway structure, and thence into the Colorado River on the right bank, 1,000 feet upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles upstream from the northerly international boundary. Prior to October 1955, published as "California Drainage Canal near Yuma, Arizona."

RECORDS: Based on 24 current meter measurements during the year and a continuous record of gage heights. Records are computed and furnished by the U. S. Geological Survey. Records available: Monthly discharge, January 1913 to April 1920, October 1921 to March 1925, and January 1934 to September 1947; daily and monthly discharge, October 1947 through 1970.

REMARKS: Reservation Main Drain No. 4 collects drainage and wastewater from the area east of the Yuma Main Canal on the Reservation Division of the Yuma Project, located in California. Since 1939, collection of seepage from the All-American Canal has caused large increases in drainage flows. Average annual flow prior to 1937 was 12,800 acre-feet. Monthly and annual averages since 1937 are shown on the table below.

EXTREMES: Prior to 1937: Maximum annual flow 20,190 acre-feet, 1916; minimum annual flow 8,920 acre-feet, 1913.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	47	38	52	49	51	56	57	66	54	43	50	42
2	39	38	50	49	51	60	56	68	47	41	48	45
3	42	38	42	50	56	57	58	57	47	43	55	48
4	41	40	54	51	51	53	53	61	44	45	51	45
5	42	39	52	49	51	52	63	65	45	52	48	45
6	41	40	42	55	54	55	53	58	44	63	58	44
7	42	40	45	51	55	66	57	58	45	53	48	50
8	43	41	45	58	56	52	56	57	47	51	49	49
9	41	40	44	54	56	52	57	58	43	58	46	52
10	42	48	38	53	61	56	57	57	45	66	45	55
11	41	47	40	47	62	51	52	63	44	50	46	43
12	41	46	39	48	60	71	55	64	44	47	46	42
13	43	45	50	50	63	60	61	67	46	47	47	43
14	40	40	45	50	56	58	56	69	42	48	49	41
15	40	43	40	53	56	50	54	70	47	50	50	42
16	38	47	43	54	52	57	57	69	55	49	46	44
17	44	43	42	47	63	47	58	63	51	50	49	41
18	39	41	43	50	52	51	58	58	55	52	46	41
19	38	42	46	51	51	44	53	62	48	52	44	46
20	38	39	50	53	51	46	54	56	45	50	47	41
21	36	41	55	48	58	44	57	59	57	47	45	45
22	35	41	48	47	50	45	58	57	48	50	47	47
23	35	47	50	48	51	48	59	58	44	49	45	43
24	36	42	49	48	56	46	66	57	52	53	45	38
25	35	43	64	50	53	48	59	58	44	53	51	39
26	35	43	60	54	58	51	57	58	49	49	46	38
27	35	41	50	55	52	50	60	62	46	49	45	40
28	36	43	48	52	52	49	59	59	42	57	50	40
29	37		52	48	52	54	60	55	43	49	44	39
30	38		48	51	60	53	62	59	50	47	42	38
31	38		49		56		64	59		48		38
Sum	1,218	1,176	1,475	1,523	1,706	1,582	1,786	1,887	1,413	1,561	1,428	1,344

Current Year 1970							Period 1937-1970				
Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.			1	47	† 22	35	39.3	2,416	3,246	4,780	877
Feb.			10	48	† 1	38	42.0	2,333	3,092	4,320	563
Mar.			25	64	10	38	47.6	2,926	3,773	5,240	1,240
Apr.			8	58	† 17	47	50.8	3,021	3,801	5,250	1,160
May			† 13	63	22	50	55.0	3,384	3,914	5,590	992
June			12	71	19	44	52.7	3,138	3,802	5,580	885
July			24	66	11	52	57.6	3,542	4,103	6,550	816
Aug.			15	70	29	55	60.9	3,743	4,062	6,810	861
Sept.			21	57	† 14	42	47.1	2,803	3,814	6,220	889
Oct.			10	66	2	41	50.4	3,096	3,815	5,740	1,040
Nov.			6	58	30	42	47.6	2,832	3,553	5,490	994
Dec.			10	55	† 24	38	43.4	2,666	3,447	4,960	966
Yearly				71		35	49.6	35,900	44,422	63,700	12,840

Ø Mean daily † And other days

YUMA MAIN CANAL WASTEWAY TO COLORADO RIVER AT YUMA, ARIZONA

DESCRIPTION: The wasteway receives water from the Yuma Main Canal at the check structure on the canal, 1,645 feet upstream from the intake of the Colorado River siphon, and 3.2 miles downstream from the Siphon Drop Power Plant. This wasteway discharges into the Colorado River on the California side, 1,000 feet upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles upstream from the northerly international land boundary.

RECORDS: Discharge is computed as the difference between the measured discharge of the Yuma Main Canal at the Siphon Drop Power Plant upstream and that of the same canal below the Colorado River siphon, with deductions for small irrigation diversions from the canal between the two gaging stations. 1970 records good, except those below 125 second-feet, which are fair. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through 1970.

REMARKS: The wasteway discharges to the river the flow in excess of irrigation water in the Yuma Main Canal. This excess flow, in addition to the irrigation water, was diverted from the All-American Canal into the Yuma Main Canal and utilized for power purposes at the Siphon Drop Power Plant.

EXTREMES: Prior to 1935, when storage began in Lake Mead: Average annual flow, 297,800 acre-feet; maximum annual flow, 913,700 acre-feet, 1932; minimum annual flow, 114,900 acre-feet, 1917. Since 1935: Maximum mean daily discharge, 2,020 second-feet, December 24-25, 1948; minimum mean daily discharge, no flow on numerous occasions.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.5	386	14	9.1	805	337	7.2	7.2	978	204	211	178
2	5.5	383	7.4	9.1	806	238	7.8	7.2	907	200	215	201
3	5.5	420	5.5	9.1	518	286	7.2	7.2	915	199	190	126
4	5.5	404	6.1	9.1	575	500	7.2	6.7	681	201	190	139
5	5.5	397	6.1	9.0	740	515	7.2	6.7	669	200	209	150
6	5.5	410	6.1	9.6	867	494	7.2	6.7	668	205	227	135
7	5.5	390	6.7	9.1	866	495	7.2	6.7	696	206	227	209
8	5.5	409	6.7	9.2	892	528	8.3	6.9	651	193	216	544
9	5.5	422	6.7	10	773	553	7.2	6.9	591	194	245	648
10	5.7	296	7.2	11	627	576	7.2	6.7	567	196	247	7.2
11	6.0	9.5	7.2	13	396	692	7.2	7.2	606	209	241	6.9
12	5.5	9.7	7.2	14	466	9.5	8.4	7.2	619	220	222	6.7
13	5.5	44	7.8	16	609	9.5	7.2	7.2	613	204	36	6.7
14	5.5	404	7.2	13	609	9.5	7.2	7.2	663	148	45	6.7
15	5.5	646	7.2	13	618	15	7.2	7.1	550	53	90	6.5
16	5.5	744	7.2	15	642	15	7.2	6.7	173	50	31	6.1
17	5.5	10	7.2	16	623	15	7.2	6.7	152	50	28	6.1
18	6.4	9.2	7.8	16	628	15	7.8	6.7	123	70	8.8	6.1
19	371	8.7	7.8	16	634	19	7.4	6.7	123	155	120	6.1
20	633	8.4	7.9	13	664	16	7.2	6.7	140	202	184	6.1
21	505	9.4	7.2	13	662	14	7.2	6.7	129	206	223	6.1
22	445	23	9.5	13	692	10	8.2	6.7	165	233	251	6.2
23	389	9.5	8.5	15	667	9.3	7.2	6.7	126	240	252	6.8
24	415	9.9	9.6	15	650	8.4	7.2	7.3	111	277	229	6.2
25	391	18	9.8	12	632	9.7	7.2	7.6	122	252	217	7.0
26	413	11	9.9	9.1	667	7.8	7.2	7.7	117	248	164	6.7
27	416	11	8.0	14	670	7.8	7.2	7.2	107	254	12	6.7
28	407	11	8.1	12	672	7.8	7.2	7.2	101	258	82	6.5
29	432		12	124	690	7.6	7.2	7.2	125	165	148	6.1
30	436		8.9	838	684	7.2	7.2	153	162	172	189	6.1
31	419		9.3		704		7.2	823		184		6.1
Sum	5,773	5,913	248	1,304	20,748	5,427	228	1,179	12,350	5,848	4,950	2,472

Month	Extreme Gage Feet		Current Year 1970				Average Second Feet	Total Acre Feet	Period 1935-1970		
	High	Low	Extreme Second Feet		Average	Maximum			Minimum		
			Day	High			Day	Low			
Jan.			20	633	† 1	5.5	186	11,451	63,110	110,700	3,230
Feb.			16	744	† 0	8.4	211	11,728	55,069	89,140	2,856
Mar.			1	14	3	5.5	492	57,944	90,190	90,190	492
Apr.			30	838	5	9.0	43.5	2,586	58,338	86,580	2,500
May			8	892	11	396	669	41,153	65,073	88,280	5,480
June			11	692	30	7.2	181	10,764	57,730	86,960	3,330
July			12	8.4	† 1	7.2	7.35	452	57,339	91,220	452
Aug.			31	823	† 4	6.7	38.0	2,339	57,709	89,890	456
Sept.			1	978	† 28	101	412	24,496	57,925	83,660	12,419
Oct.			24	277	† 18	50	189	11,599	55,619	90,050	2,176
Nov.			23	252	† 18	8.8	165	9,818	55,936	101,500	3,850
Dec.			9	648	† 16	6.1	79.7	4,903	62,859	108,800	918
Yearly				978		5.5	182	131,781	704,651	1,042,850	75,950

† And other days

‡ Mean daily

**COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY
AT YUMA, ARIZONA - DISCHARGES**

DESCRIPTION: Water-stage recorder located in California on the right bank of the river, 1,000 feet downstream from the mouth of the Yuma Main Canal Wasteway, 0.6 mile downstream from the abandoned gaging station on the Colorado River at Yuma, 5.2 miles downstream from the mouth of the Gila River, 19.6 miles downstream from Imperial Dam and 6.4 miles upstream from the northerly international boundary. Zero of gage is 101.99 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 27 current meter measurements during the year, 15 by the U. S. Geological Survey, 12 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by U. S. Geological Survey. Records available: October 1963 through 1970. Records from January 1951 through September 1963, deduced from "Colorado River at Yuma" plus flows from "Reservation Main Drain No. 4", and "Yuma Main Canal Wasteway."

REMARKS: Reservoirs on the Colorado River, including Lake Mead where storage began in 1935, transmountain diversions, reservoirs on the Gila River, irrigation diversions and return flows modify the river flow at this station.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	383	664	593	963	1,410	948	547	487	1,570	599	614	671
2	371	670	3,190	923	1,410	841	551	535	1,370	578	617	674
3	371	668	4,630	902	1,340	865	572	614	1,320	581	625	649
4	375	671	4,090	629	1,290	837	685	550	1,060	577	625	639
5	371	668	1,450	606	1,310	882	570	554	1,030	591	648	633
6	367	684	696	595	1,320	877	531	578	1,020	604	680	625
7	359	652	865	611	1,280	887	545	514	1,050	599	689	655
8	363	653	994	809	1,230	888	542	522	1,020	628	681	936
9	400	657	883	610	1,050	906	534	525	1,030	616	700	1,180
10	408	613	659	608	915	921	526	898	999	610	717	496
11	400	991	644	602	888	1,230	562	804	977	604	717	485
12	363	1,290	650	759	897	410	709	577	999	619	694	510
13	343	828	1,030	571	911	427	584	514	995	593	694	503
14	277	725	1,010	575	936	406	535	473	1,020	622	693	489
15	294	930	719	572	933	403	518	506	987	627	729	489
16	284	1,230	687	567	952	432	527	523	579	627	674	495
17	260	545	679	545	972	434	541	521	570	595	671	490
18	273	760	681	903	947	470	554	512	548	608	624	491
19	602	860	615	1,060	953	706	533	522	551	619	661	503
20	860	616	624	698	989	655	530	501	558	631	666	504
21	707	551	630	634	988	519	520	516	549	595	699	500
22	646	571	632	629	1,020	491	505	468	551	616	707	509
23	624	566	634	629	978	492	505	489	521	620	705	497
24	629	546	567	839	1,000	513	510	504	515	615	723	498
25	618	566	577	804	962	514	510	504	518	605	703	514
26	654	554	613	620	985	510	540	532	513	605	742	505
27	675	549	874	640	992	520	818	955	507	631	736	507
28	679	543	885	584	978	508	673	608	492	620	697	514
29	698		1,050	617	1,010	520	560	520	503	601	692	520
30	697		1,030	1,490	1,010	530	512	599	530	598	715	516
31	702		989		1,050		501	1,440		597		505
Sum	15,053	19,821	33,870	21,594	32,906	19,542	17,350	18,365	24,452	18,831	20,538	17,702

Month	Extreme Gage Feet		Current Year 1970				Average Second Feet	Total Acre Feet	Period 1951-1970			
	High	Low	Extreme Second Feet		Low	Average			Acre Feet	Average	Maximum	Minimum
			Day	High								
Jan.			20	860	17	260	486	29,857	254,093	979,890	29,857	
Feb.			12	1,290	28	543	708	39,314	189,015	826,600	33,790	
Mar.			3	4,630	24	567	1,093	67,180	208,744	1,073,270	35,002	
Apr.			30	1,490	17	545	720	42,831	197,257	843,010	42,831	
May			† 1	1,410	11	888	1,061	65,268	184,231	863,860	56,493	
June			11	1,230	15	403	651	38,761	173,771	833,970	38,761	
July			27	818	31	501	560	34,413	189,655	649,820	34,413	
Aug.			31	1,440	22	468	592	36,426	195,543	670,050	36,426	
Sept.			1	1,570	28	492	815	48,500	162,426	775,930	43,182	
Oct.			† 20	631	4	577	607	37,351	134,357	802,210	34,965	
Nov.			26	742	1	614	685	40,737	160,036	911,370	36,924	
Dec.			9	1,180	11	485	571	35,111	206,303	1,114,550	33,023	
Yearly				4,630		260	712	515,749	2,255,431	10,220,870	515,749	

† And other days Ø Mean daily

**COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY
AT YUMA, ARIZONA - STAGES**

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.73	10.27	10.13	10.71	11.29	10.67	9.91	9.89	11.37	10.07	10.13	10.14
2	9.70	10.28	12.97	10.66	11.32	10.47	9.92	9.99	11.14	10.05	10.13	10.17
3	9.70	10.27	14.75	10.62	11.26	10.50	9.96	10.13	11.09	10.06	10.12	10.14
4	9.71	10.28	14.12	10.20	11.22	10.45	10.17	10.01	10.76	10.05	10.11	10.13
5	9.70	10.27	11.35	10.16	11.26	10.51	9.96	10.01	10.72	10.08	10.15	10.12
6	9.69	10.30	10.41	10.14	11.29	10.49	9.88	10.06	10.71	10.11	10.18	10.11
7	9.67	10.24	10.65	10.16	11.26	10.50	9.91	9.92	10.75	10.11	10.19	10.17
8	9.68	10.25	10.84	10.50	11.22	10.49	9.90	9.93	10.71	10.16	10.16	10.61
9	9.77	10.25	10.67	10.16	10.97	10.50	9.89	9.93	10.71	10.14	10.18	10.91
10	9.79	10.16	10.33	10.16	10.79	10.52	9.87	10.55	10.68	10.13	10.20	9.87
11	9.77	10.74	10.30	10.15	10.74	10.92	9.94	10.39	10.65	10.11	10.20	9.84
12	9.68	11.13	10.31	10.40	10.74	9.62	10.21	10.02	10.68	10.14	10.16	9.88
13	9.63	10.49	10.86	10.09	10.75	9.66	9.99	9.88	10.67	10.09	10.16	9.86
14	9.45	10.37	10.83	10.10	10.77	9.61	9.89	9.80	10.71	10.15	10.15	9.83
15	9.50	10.67	10.42	10.09	10.76	9.61	9.86	9.87	10.65	10.16	10.21	9.82
16	9.46	11.05	10.36	10.08	10.78	9.67	9.87	9.91	10.03	10.16	10.12	9.82
17	9.39	10.04	10.33	10.06	10.79	9.68	9.90	9.90	10.01	10.10	10.12	9.80
18	9.42	10.42	10.34	10.60	10.75	9.75	9.93	9.88	9.97	10.12	10.03	9.80
19	10.17	10.57	10.21	10.84	10.75	10.21	9.89	9.90	9.97	10.14	10.10	9.82
20	10.58	10.17	10.22	10.32	10.79	10.12	9.88	9.86	9.99	10.16	10.11	9.81
21	10.35	10.05	10.23	10.25	10.78	9.86	9.86	9.89	9.97	10.10	10.17	9.80
22	10.25	10.09	10.23	10.25	10.82	9.80	9.83	9.79	9.97	10.14	10.18	9.81
23	10.20	10.08	10.22	10.25	10.75	9.80	9.83	9.84	9.91	10.14	10.18	9.77
24	10.21	10.04	10.10	10.54	10.77	9.85	9.84	9.87	9.90	10.14	10.21	9.77
25	10.19	10.08	10.10	10.49	10.71	9.85	9.84	9.87	9.91	10.12	10.17	9.80
26	10.25	10.06	10.17	10.18	10.74	9.84	9.93	9.92	9.90	10.12	10.24	9.77
27	10.29	10.05	10.59	10.22	10.74	9.86	10.43	10.60	9.88	10.16	10.22	9.76
28	10.29	10.04	10.61	10.12	10.71	9.84	10.22	10.07	9.85	10.14	10.16	9.77
29	10.33		10.82	10.15	10.75	9.86	10.04	9.90	9.88	10.11	10.16	9.78
30	10.32		10.80	11.37	10.74	9.88	9.94	10.01	9.93	10.10	10.19	9.76
31	10.33		10.75	10.19	10.79		9.92	11.21		10.10		9.74
Avg.	9.91	10.31	10.81	10.33	10.90	10.08	9.95	10.03	10.37	10.12	10.16	9.94

DRAIN NO. 8-B (ARAZ DRAIN)

DESCRIPTION: This drain discharges into the Colorado River 3.9 miles downstream from Colorado River below Yuma Main Canal Wasteway, and 2.5 miles upstream from the northerly international boundary. Prior to October 1955, published as "Araz Drain."

RECORDS: Records are furnished by U. S. Geological Survey from 13 current meter measurements during the year. Records available: May 1948 through 1970.

REMARKS: Drain 8-B, which was constructed in February 1948, collects seepage water in the westerly section of the Reservation Division of the Yuma Project which lies in California. Flow in the drain between the mouth and the U. S. Highway No. 80 culvert, about 3,200 feet upstream, is affected by backwater from the river during ordinary high stages.

EXTREMES: Mean daily discharge: Maximum, 24 second-feet on September 1, 1953; minimum, 0.1 second-foot several days in February 1966.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.0	1.2	1.5	1.8	2.9	1.8	2.0	2.1	1.9	1.9	2.0	2.0
2	1.9	1.2	1.5	1.8	2.9	1.8	2.0	2.1	1.9	1.9	2.0	1.9
3	1.9	1.2	1.6	1.8	2.8	1.8	2.0	2.1	1.9	1.9	2.0	1.9
4	1.8	1.2	1.6	1.8	2.8	1.8	2.0	2.1	1.9	1.9	2.0	1.9
5	1.8	1.2	1.6	2.0	2.7	1.8	2.0	2.0	1.9	1.9	2.0	1.9
6	1.8	1.2	1.6	2.1	2.7	1.8	2.0	2.0	1.9	1.9	2.0	1.9
7	1.7	1.2	1.6	2.3	2.6	1.8	2.0	2.0	1.9	1.9	2.0	1.9
8	1.7	1.2	1.6	2.4	2.6	1.8	2.0	2.0	1.9	1.9	2.0	1.9
9	1.7	1.2	1.7	2.6	2.5	1.8	2.0	2.0	1.9	1.9	2.0	1.9
10	1.6	1.2	1.7	2.8	2.5	1.9	2.0	2.0	1.9	1.9	2.0	1.9
11	1.6	1.2	1.7	3.0	2.4	1.9	2.0	2.0	1.9	1.9	2.0	1.9
12	1.5	1.2	1.7	3.0	2.4	1.9	2.0	2.0	1.9	1.9	2.0	1.9
13	1.5	1.2	1.7	3.0	2.3	1.9	2.0	2.0	1.9	1.9	2.0	1.9
14	1.5	1.2	1.8	3.0	2.3	1.9	2.0	2.0	1.9	1.9	2.0	1.9
15	1.4	1.2	1.8	3.0	2.3	1.9	2.0	2.0	1.9	1.9	2.0	1.9
16	1.4	1.3	1.8	3.0	2.2	1.9	2.0	2.0	1.9	1.9	2.0	1.9
17	1.4	1.3	1.8	3.0	2.2	1.9	2.0	2.0	1.9	1.9	2.0	1.9
18	1.3	1.3	1.8	3.0	2.2	1.9	2.1	2.0	1.9	1.9	2.0	1.9
19	1.3	1.3	1.8	3.0	2.1	1.9	2.1	2.0	1.9	1.9	2.0	1.9
20	1.2	1.4	1.8	3.0	2.1	1.9	2.1	2.0	1.9	2.0	2.0	1.9
21	1.2	1.4	1.8	3.0	2.0	1.9	2.1	2.0	1.9	2.0	2.0	1.9
22	1.2	1.4	1.8	3.0	2.0	1.9	2.1	2.0	1.9	2.0	2.0	1.9
23	1.2	1.4	1.8	3.0	2.0	1.9	2.1	1.9	1.9	2.0	2.0	1.9
24	1.2	1.4	1.8	3.0	1.9	1.9	2.1	1.9	1.9	2.0	2.0	1.9
25	1.2	1.4	1.8	3.0	1.9	1.9	2.1	1.9	1.9	2.0	2.0	1.9
26	1.2	1.5	1.8	3.0	1.8	2.0	2.1	1.9	1.9	2.0	2.0	1.9
27	1.2	1.5	1.8	3.0	1.8	2.0	2.1	1.9	1.9	2.0	2.0	1.9
28	1.2	1.5	1.8	3.0	1.8	2.0	2.1	1.9	1.9	2.0	2.0	1.9
29	1.2	1.8	3.0	1.8	2.0	2.1	1.9	1.9	2.0	2.0	2.0	1.9
30	1.2	1.8	3.0	1.8	2.0	2.1	1.9	1.9	2.0	2.0	2.0	1.9
31	1.2	1.8	1.8	1.8	1.8	2.1	1.9	1.9	2.0	2.0	2.0	1.9
Sum	45.2	36.1	53.5	81.4	70.1	56.6	63.4	61.5	57.0	60.1	60.0	59.0

Month	Extreme Gage Feet		Current Year 1970				Average Second Feet	Total Acre Feet	Period May 1948-1970		
	High	Low	Extreme Second Feet		Low	Average			Acre Feet		
			Day	Day					Average	Maximum	Minimum
Jan.			† 1	2.0	† 20	1.2	1.5	394	899	39.3	
Feb.			† 26	1.5	† 1	1.2	1.3	71.6	746	40.5	
Mar.			† 14	1.8	† 1	1.5	1.7	106	417	73.8	
Apr.			† 11	3.0	† 1	1.8	2.7	161	853	66.8	
May			† 1	2.9	† 26	1.8	2.3	139	438	61.5	
June			† 26	2.0	† 1	1.8	1.9	112	459	77.4	
July			† 18	2.1	† 1	2.0	2.0	196	524	72.8	
Aug.			† 1	2.1	† 23	1.9	2.0	122	578	73.8	
Sept.			† 1	1.9	† 1	1.9	1.9	113	548	53.6	
Oct.			† 20	2.0	† 1	1.9	1.9	119	556	55.3	
Nov.			† 1	2.0	† 1	2.0	2.0	119	502	57.7	
Dec.			† 1	2.0	† 2	1.9	1.9	117	458	51.0	
Yearly				3.0		1.2		1,395	5,657	12,429	834

† And other days

ø Mean daily

PILOT KNOB POWER PLANT AND WASTEWAY NEAR PILOT KNOB, CALIFORNIA

DESCRIPTION: The Pilot Knob Power Plant and Wasteway is located on the All-American Canal, 20.8 miles downstream from the intake at Imperial Dam, 6 miles west of Yuma, about one mile north of the northerly international boundary and empties into the old Alamo Canal in the United States and thence into the Colorado River through Rockwood gates, about one mile upstream from the northerly international boundary. Water-stage recorder is located in forebay on right bank of the All-American Canal, 550 feet upstream from wasteway gates and 1,800 feet from entrance to the power plant. Datum of gage is 150.00 feet above mean sea level. Tailrace gage is on left bank, 680 feet downstream from power plant with automatic recording equipment in control house. All bypass gates are equipped with calibrated openings which are read on all gate changes. Datum of tailrace gage is at mean sea level; elevation of sill of wasteway gates is 147.88 feet, U. S. C. & G. S. datum. Prior to October 1956, this station was published as "Pilot Knob Wasteway near Pilot Knob, California."

RECORDS: Daily discharge is computed from flowmeter equipment and head and openings on wasteway gates or from head and gate opening on wicket and wasteway gates. Records furnished by the U. S. Geological Survey. Records available: July 1944 through 1970. The wasteway was operated for the purpose of diverting Colorado River water to the Alamo Canal for use in Mexico from July 1944 to November 8, 1950, in accordance with arrangements between the United States and Mexico for emergency use of the All-American Canal facilities. Records since 1950 show water released through Pilot Knob Power Plant and Wasteway from the All-American Canal and returned to the Colorado River through Rockwood gates.

REMARKS: Pilot Knob Wasteway was completed in 1938 and the first flow occurred on February 5, 1939. Pilot Knob Power Plant was completed in January 1957 and the first flow occurred on January 14, 1957.

EXTREMES: Maximum mean daily discharge, 8,350 second-feet on January 26, 1958; minimum mean daily discharge, no flow during long periods.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,680	0	1,890	2,900	0	0	1,490	1,780	0	0	0	0
2	1,680	0	1,900	2,900	0	0	1,470	1,710	0	0	0	0
3	1,780	0	1,900	2,920	0	0	1,470	1,610	0	0	0	0
4	1,780	0	1,900	2,950	0	0	1,360	1,670	0	0	0	0
5	1,820	0	1,410	2,900	0	0	1,490	1,710	0	0	0	0
6	1,870	0	1,600	2,900	0	0	1,500	1,690	0	0	0	0
7	1,870	0	1,700	2,930	0	0	1,490	1,720	0	0	0	0
8	1,850	0	1,700	2,610	0	0	1,520	1,740	0	0	0	0
9	1,860	0	1,340	2,800	0	0	1,520	1,760	0	0	0	33
10	1,870	298	1,550	2,830	0	0	1,490	1,470	0	0	0	1,050
11	1,850	1,190	1,600	2,850	0	0	1,490	1,450	0	0	0	1,380
12	1,880	1,380	1,620	2,730	0	1,170	1,310	1,670	0	0	0	1,450
13	1,960	22	1,260	2,850	0	1,390	1,430	1,760	0	0	0	1,460
14	1,990	0	1,270	2,830	0	1,400	1,470	1,820	0	0	0	1,380
15	1,990	0	1,570	2,840	0	1,400	1,720	1,810	0	0	0	1,400
16	1,920	47	1,950	2,880	0	1,360	1,700	1,750	0	0	0	1,440
17	1,600	1,170	2,060	2,880	0	1,380	1,720	1,750	0	0	0	1,440
18	1,200	1,240	2,250	2,600	0	1,340	1,690	1,800	0	0	0	1,430
19	671	1,130	2,550	2,320	0	1,060	1,690	1,860	0	0	0	1,400
20	0	1,320	2,830	2,660	0	1,080	1,710	1,850	0	0	0	1,340
21	0	1,400	2,890	2,770	0	1,210	1,710	1,810	0	0	0	1,400
22	0	1,400	2,850	2,790	0	1,250	1,710	1,860	0	0	0	1,400
23	0	1,400	2,860	2,790	0	1,300	1,760	1,810	0	0	0	1,390
24	0	1,420	2,900	2,290	0	1,270	1,760	1,800	0	0	0	1,400
25	0	1,450	2,930	1,960	0	1,280	1,700	1,800	0	0	0	1,400
26	0	1,480	2,890	1,800	0	1,290	1,660	1,670	0	0	0	1,420
27	0	1,600	2,590	1,480	0	1,280	1,410	1,120	0	0	0	1,410
28	0	1,610	2,620	1,210	0	1,300	1,520	1,160	0	0	0	1,370
29	0		2,760	1,050	0	1,280	1,640	1,340	0	0	0	1,390
30	0		2,850	0	0	1,360	1,690	1,100	0	0	0	1,400
31	0		2,880	0	0		1,990	0	0	0	0	1,410
Sum	33,121	19,557	66,870	74,220	0	24,400	49,280	49,850	0	0	0	30,593
Current Year 1970												
Month	Extreme Gate Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			† 14	1,990	† 20	0	1,068	65,695	44,047	400,200	0	
Feb.			28	1,610	† 1	0	698	38,791	18,293	149,500	0	
Mar.			25	2,930	13	1,260	2,157	132,635	65,631	279,300	0	
Apr.			4	2,950	30	0	2,474	147,213	94,389	260,900	0	
May				0		0	0	0	20,527	165,400	0	
June			† 14	1,400	† 1	0	813	48,397	64,228	204,300	0	
July			31	1,990	12	1,310	1,590	97,745	114,076	260,000	0	
Aug.			† 19	1,860	31	0	1,608	98,876	118,310	270,100	0	
Sept.				0		0	0	0	58,079	173,300	0	
Oct.				0		0	0	0	11,705	51,460	0	
Nov.				0		0	0	0	16,450	182,600	0	
Dec.			13	1,460	† 1	0	987	60,680	36,146	319,700	0	
Yearly				2,950		0	950	690,032	661,881	1,944,700	0	

‡ Mean daily

† And other days

WELLTON-MOHAWK DRAINAGE WATER DISCHARGED TO COLORADO RIVER ABOVE MORELOS DAM

DESCRIPTION: Diversion structure (Main Outlet Drain Extension No. 1) in Wellton-Mohawk Drainage Extension Channel for diverting water to the Gila River, 0.5 mile upstream from the confluence of the Gila and Colorado Rivers. A continuous water-stage recorder immediately upstream from outlet structure (Main Outlet Drain Extension No. 2), 0.4 mile downstream from diversion structure which diverts water from the Extension Channel directly to the Colorado River at a point 0.8 mile upstream from the northerly international boundary, and 1.9 miles upstream from Morelos Dam. The Gila River enters the Colorado River 13 miles upstream from Morelos Dam.

RECORDS: Partial diversions of the Extension Channel flow at M. O. D. E. No. 1 were determined from the gage openings, rated by discharge measurements below the outlet. Diversions of the total Extension Channel flow were determined at an upstream measuring station at channel station 9+00. Flows diverted at M. O. D. E. No. 2 were based on 20 discharge measurements during the year and a continuous record of gage heights. Records furnished by Bureau of Reclamation through September 30, 1969. Beginning October 1, 1969 records furnished by U. S. Geological Survey. The record shown below is the combination of diversions at M. O. D. E. No. 1 and M. O. D. E. No. 2. Records available: February 10, 1961 through 1970.

REMARKS: Pursuant to Minute No. 218 of the Commission, an extension to the Wellton-Mohawk Drainage Conveyance Channel was constructed along the left bank of the Colorado River to a point immediately below Morelos Dam, a distance of about 12 miles, and placed in operation on November 16, 1965. Drainage flows may be discharged to the Gila River and thence to the Colorado River at the diversion structure, M. O. D. E. No. 1, at the upstream end of the extension; and directly to the Colorado River at the structure above Morelos Dam, M. O. D. E. No. 2, and at the structure immediately below Morelos Dam, M. O. D. E. No. 3, the record of which is shown on page 22.

Mean Daily Discharge in Second-Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	82	0	116	294	103	105	224	252	128	0	0	0
2	84	0	9.1	290	101	107	223	255	118	0	0	0
3	97	0	.77	217	102	106	229	251	115	0	0	0
4	97	0	.67	251	97	103	227	258	99	0	0	0
5	96	0	.60	252	101	107	229	260	98	0	0	0
6	96	0	51	258	102	105	229	261	97	0	0	0
7	97	0	136	277	99	103	228	255	98	0	0	0
8	97	0	3.0	281	100	102	227	249	99	0	0	33
9	97	0	92	282	87	102	227	260	99	0	0	66
10	114	0	145	276	85	102	227	249	97	0	0	99
11	112	0	140	280	84	139	233	252	96	0	0	138
12	112	0	140	279	84	172	229	250	96	0	0	139
13	111	0	136	278	85	194	229	245	98	0	0	138
14	111	0	135	285	84	191	230	246	96	0	0	138
15	111	30	135	288	85	191	252	244	97	0	0	141
16	110	64	164	292	85	188	257	249	5.2	0	0	143
17	91	68	187	296	85	185	259	249	.61	0	0	144
18	74	83	195	295	102	188	258	246	.49	0	0	143
19	72	84	200	296	102	191	257	247	.42	0	0	142
20	35	85	234	296	103	187	258	246	.35	0	0	144
21	1.9	84	237	294	103	194	259	250	.27	0	0	144
22	.04	84	241	298	101	193	258	250	.19	0	0	143
23	0	82	242	303	101	193	258	253	.16	0	0	143
24	0	84	236	307	101	188	258	250	.10	0	0	142
25	0	83	236	276	101	196	265	249	.08	0	0	141
26	0	84	236	257	99	196	268	233	0	0	0	141
27	0	101	234	173	101	193	264	205	0	0	0	140
28	0	102	234	152	101	190	259	201	0	0	0	161
29	0		334	121	105	190	254	200	0	0	0	163
30	0		295.12	103	105	200	264	168	0	0	0	165
31	0		295.04		103		255	137				168
Sum	1,897.94	1,118	5,040.30	7,847	2,997	4,801	7,594	7,420	1,538.87	0	0	3,259

Month	Extreme Gage Feet		Current Year 1970				Average Second-Feet	Total Acre-Feet	Period 1961-1970		
	High	Low	Extreme Second-Feet		Total	Average			Maximum	Minimum	
			Day	Low							
Jan.			10	114	† 22	0	61.2	3,765	8,509	19,452	0
Feb.			28	102	† 1	0	39.9	2,218	7,700	16,784	0
Mar.			29	334	5	.60	163	9,997	14,816	18,742	8,434
Apr.			24	307	30	103	262	15,564	15,471	18,573	11,948
May			† 29	105	† 11	84	96.7	5,944	12,737	19,783	5,944
June			30	200	† 8	102	160	9,523	14,273	19,186	9,523
July			26	268	2	223	245	15,062	17,039	19,295	15,062
Aug.			6	261	31	137	239	14,717	16,605	18,887	14,428
Sept.			1	128	† 26	0	51.3	3,052	11,389	18,313	3,052
Oct.				0		0	0	0	7,106	18,625	0
Nov.				0		0	0	0	6,794	17,627	0
Dec.			31	168	† 1	0	105	6,464	7,412	18,988	930
Yearly				334		0	119	86,306	139,851	215,087	86,306

∅ Mean daily

† And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank and cableway at the point where the northerly international land boundary (California-Baja California) intersects the Colorado River, about 6.4 miles downstream from Colorado River below Yuma Main Canal Wasteway, 5 miles west of Yuma, Arizona, 1.1 miles upstream from Morelos Diversion Structure, and about one mile downstream from Rockwood Gate. Zero of gage is at mean sea level, U. S. C. & G. S. datum. Station is operated by the United States Section of the Commission.

RECORDS: Based on 365 current meter measurements during the year, 203 by the United States Section, 152 by the Mexican Section of the Commission, 10 by the U. S. Geological Survey, and a continuous record of gage heights. Computations by shifting control methods. Discharges are computed on the basis of a water-stage recorder located 1,680 feet upstream from the northerly international boundary where the remains of an old weir serve as a partial controlling section. A continuous gage height record is available November 15, 1948 through 1970; daily discharge records available January 1, 1950 through 1970.

REMARKS: Reservoirs on the Colorado River, including Lake Mead above Hoover Dam, where storage began in 1935, reservoirs on the Gila River, and many irrigation diversions and return flows regulate the river flow at this station except for infrequent flood flows. During 1970, the flow at this point represented the total amount of the Colorado River water which crossed the northerly international boundary.

EXTREMES: Prior to January 1935: Maximum instantaneous discharge estimated about 250,000 second-feet, January 22, 1916; minimum discharge, no flow several days during August and September 1934; average annual flow 13,443,000 acre-feet; maximum annual flow 25,480,000 acre-feet, 1907; minimum annual flow 1,174,000 acre-feet, 1934. Since January 1935: Maximum mean daily discharge, about 33,000 second-feet, February 7, 1942; minimum discharge, no flow during April 1935.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,160	700	2,520	3,660	1,400	1,190	2,360	2,650	1,490	697	700	720
2	2,140	710	4,130	3,640	1,400	1,110	2,380	2,620	1,400	690	700	720
3	2,270	680	6,050	3,680	1,430	1,130	2,400	2,600	1,400	690	690	720
4	2,290	721	6,040	3,680	1,380	1,080	2,400	2,600	1,210	690	680	710
5	2,320	690	3,170	3,640	1,400	1,110	2,400	2,600	1,140	700	680	700
6	2,360	710	2,270	3,620	1,420	1,110	2,410	2,650	1,130	700	710	710
7	2,380	700	2,560	3,670	1,420	1,110	2,360	2,640	1,160	700	720	722
8	2,350	690	2,630	3,680	1,400	1,100	2,380	2,640	1,160	700	710	1,030
9	2,390	710	2,340	3,700	1,240	1,120	2,380	2,650	1,170	710	700	1,340
10	2,360	922	2,360	3,720	1,100	1,110	2,380	2,640	1,160	710	710	1,690
11	2,350	2,000	2,400	3,700	1,090	1,440	2,400	2,620	1,120	700	730	2,030
12	2,330	2,470	2,380	3,750	1,110	1,780	2,350	2,620	1,120	720	720	2,170
13	2,390	1,080	2,380	3,700	1,110	2,020	2,360	2,620	1,130	690	720	2,160
14	2,380	754	2,380	3,700	1,120	2,040	2,350	2,620	1,140	710	700	2,060
15	2,390	1,000	2,380	3,680	1,110	2,050	2,610	2,620	1,200	730	761	2,060
16	2,350	1,380	2,730	3,670	1,110	2,040	2,590	2,590	660	710	700	2,110
17	2,000	1,740	2,830	3,680	1,110	2,050	2,620	2,600	611	680	690	2,110
18	1,640	2,010	2,960	3,690	1,110	2,060	2,610	2,590	598	690	640	2,110
19	1,380	2,010	3,260	3,620	1,110	2,040	2,640	2,650	590	690	680	2,080
20	1,020	1,980	3,580	3,640	1,100	2,040	2,640	2,660	600	710	670	2,050
21	782	2,000	3,670	3,680	1,110	2,050	2,620	2,660	604	680	710	2,080
22	700	2,000	3,660	3,720	1,120	2,050	2,620	2,650	600	690	700	2,100
23	703	2,010	3,660	3,700	1,120	2,080	2,620	2,640	620	690	720	2,080
24	690	2,010	3,600	3,440	1,140	2,050	2,600	2,650	610	700	740	2,080
25	680	2,060	3,610	3,100	1,120	2,060	2,620	2,650	600	690	730	2,100
26	690	2,080	3,620	2,760	1,110	2,080	2,640	2,510	590	690	750	2,100
27	710	2,180	3,600	2,330	1,130	2,080	2,620	2,240	580	720	770	2,080
28	710	2,180	3,580	2,000	1,130	2,080	2,640	2,050	574	720	720	2,080
29	721		3,650	1,730	1,140	2,100	2,600	2,160	573	690	720	2,100
30	710		3,670	1,430	1,160	2,200	2,650	1,810	610	690	730	2,110
31	721		3,670	1,200	1,200		2,830	1,410		680		2,120
Sum	51,067	40,177	101,340	101,410	37,150	51,560	78,080	77,910	27,150	21,657	21,301	53,032

Month	Current Year 1970						Period 1955-1970					
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	103.93	102.16	15	2,430	23	640	1,650	101,290	454,149	1,644,000	31,900	
Feb.	104.12	102.15	12	2,730	3	660	1,430	79,690	378,127	1,378,000	60,400	
Mar.	108.04	103.45	4	6,560	6	1,860	3,270	201,005	373,543	1,120,000	19,400	
Apr.	104.90	102.80	12	3,850	30	1,250	3,380	201,144	289,233	823,850	0	
May	103.01	102.49	3	1,500	11	990	1,200	73,686	300,525	1,151,000	72,278	
June	103.58	102.45	30	2,230	2	1,060	1,720	102,268	281,000	1,175,000	8,500	
July	104.16	103.57	31	2,950	1	2,220	2,520	154,869	269,489	763,800	24,400	
Aug.	104.07	102.74	26	2,860	31	1,240	2,510	154,532	287,100	791,600	43,800	
Sept.	103.02	101.88	1	1,550	28	495	905	53,851	262,550	1,029,000	60,000	
Oct.	102.20	101.99	1	772	19	640	699	42,956	266,502	1,186,000	42,956	
Nov.	102.29	102.03	15	866	18	620	710	42,250	336,031	1,422,000	42,250	
Dec.	103.62	102.08	12	2,200	1	680	1,710	105,187	431,210	1,832,000	42,000	
Yearly	108.04	101.88		6,560		495	1,809	1,312,728	3,929,459	10,596,900	722,100	

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103.72	102.21	103.99	104.81	102.91	* 102.60	103.69	103.91	102.96	102.06	102.11	102.12
2	103.70	102.20	105.28	104.80	102.91	* 102.54	103.70	103.89	102.92	102.06	102.12	102.13
3	103.81	102.18	107.56	104.83	102.94	* 102.56	103.72	103.88	102.87	102.06	102.10	102.13
4	103.84	102.23	107.43	104.83	102.88	* 102.46	103.72	103.87	102.74	102.07	102.09	102.12
5	103.85	102.19	104.45	104.81	* 102.91	* 102.53	103.72	103.88	102.63	102.07	* 102.10	102.12
6	103.89	102.22	103.78	104.77	102.92	* 102.53	103.72	103.91	102.62	102.11	* 102.14	102.12
7	103.90	102.21	103.99	104.80	102.92	102.52	103.69	103.91	102.65	102.11	* 102.15	102.13
8	103.89	102.20	104.06	104.72	102.90	102.51	103.70	103.92	102.64	102.11	* 102.13	102.47
9	103.91	102.21	103.82	104.73	102.75	102.53	103.71	103.92	102.64	102.13	* 102.12	102.79
10	103.89	102.41	103.83	104.75	102.61	102.51	103.70	103.90	102.63	102.13	* 102.14	103.17
11	103.87	103.56	103.87	104.74	102.60	102.82	103.72	103.90	102.60	102.12	102.16	103.48
12	103.85	103.73	103.86	104.78	102.60	103.14	103.70	103.89	102.61	102.15	102.13	103.59
13	103.90	102.58	103.87	104.75	102.59	103.37	103.70	103.89	102.61	102.13	102.12	103.60
14	103.89	102.26	103.86	104.73	102.60	103.41	103.69	103.89	102.62	102.16	102.08	103.52
15	103.89	102.51	103.85	104.73	102.59	103.43	103.89	103.89	102.66	102.17	102.18	103.52
16	103.86	102.92	104.11	104.71	102.60	103.44	103.89	103.87	102.11	102.15	102.11	103.56
17	103.58	103.29	104.20	104.72	102.60	103.44	103.91	103.87	102.05	102.11	102.10	103.57
18	103.24	103.54	104.29	104.72	102.58	103.46	103.90	103.87	* 102.03	102.13	102.06	103.58
19	102.96	103.56	104.52	104.66	102.58	103.45	103.91	103.91	102.01	102.13	102.10	103.55
20	102.57	103.56	104.78	104.69	102.57	103.44	103.90	103.92	102.02	102.14	102.09	103.52
21	102.32	103.56	104.85	104.71	102.58	103.45	103.89	103.92	102.03	102.11	102.12	103.55
22	102.23	103.58	104.84	104.74	102.59	103.46	103.89	103.91	102.01	102.12	102.12	103.57
23	102.24	103.58	104.82	104.73	102.59	103.48	103.89	103.90	102.01	102.13	102.13	103.55
24	102.20	103.58	104.78	104.52	102.60	103.46	103.88	103.91	101.99	102.13	102.17	103.56
25	102.20	103.62	104.79	104.27	102.56	103.48	103.89	103.93	101.94	102.12	102.14	103.57
26	102.21	103.63	104.80	104.01	102.55	103.48	103.90	103.82	101.94	102.10	102.18	103.57
27	102.23	103.73	104.77	103.71	102.58	103.48	103.88	103.61	101.94	102.13	102.19	103.56
28	102.20	103.74	104.76	103.46	102.58	103.49	103.90	103.47	101.93	102.13	102.14	103.55
29	102.21		104.82	* 103.23	102.57	103.49	103.88	103.52	101.92	102.12	102.14	103.56
30	102.22		104.82	102.96	102.59	103.56	103.91	103.32	101.97	102.12	102.14	103.57
31	102.24		104.82		102.61		104.06	102.91		102.11		103.58
Avg.	103.18	102.96	104.59	104.51	102.68	103.12	103.81	103.81	102.34	102.12	102.13	103.16

1/2 Estimated * Partly estimated

COLORADO RIVER IMMEDIATELY ABOVE MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico attached to the upstream abutment of the gates of the Intake Canal at Morelos Dam, 1.1 miles downstream from the northerly international boundary, and about 7.5 miles downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969 zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date zero of the gage was 0.16 foot below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage height records November 8, 1950 to June 3, 1951; a continuous record of gage heights June 4, 1951 through 1970.

REMARKS: Prior to June 4, 1951, when a continuous water-stage recorder was installed, mean daily gage height records were determined from hourly readings of a staff gage.

EXTREMES: Since November 8, 1950: Maximum mean daily elevation above mean sea level, 112.70 on January 2, 1958; minimum mean daily elevation above mean sea level, 101.51 on February 17, 1957.

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102.92	101.84	103.15	103.87	102.43	102.23	103.02	103.22	102.46	101.80	101.84	101.87
2	102.92	101.84	104.33	103.87	102.43	102.17	102.99	103.18	102.43	101.80	101.84	101.87
3	102.99	101.84	107.02	103.87	102.43	102.20	103.02	103.18	102.40	101.80	101.84	101.87
4	103.02	101.87	106.92	103.87	102.40	102.13	103.02	103.18	102.26	101.80	101.84	101.87
5	103.02	101.84	103.77	103.87	102.40	102.17	103.02	103.18	102.23	101.80	101.84	101.87
6	103.05	101.87	102.59	103.84	102.43	102.17	103.02	103.22	102.20	101.84	101.87	101.87
7	103.05	101.87	103.15	103.87	102.40	102.17	103.02	103.18	102.23	101.84	101.87	101.87
8	103.02	101.84	103.22	103.81	102.40	102.17	103.02	103.18	102.23	101.84	101.87	102.13
9	103.05	101.84	103.05	103.81	102.26	102.17	103.02	103.22	102.23	101.84	101.87	102.36
10	103.02	102.00	103.05	103.81	102.17	102.17	103.02	103.18	102.23	101.84	101.87	102.62
11	103.02	102.89	103.08	103.81	102.17	102.40	103.02	103.18	102.20	101.84	101.90	102.85
12	103.02	102.72	103.05	103.87	102.20	102.62	103.02	103.18	102.23	101.87	101.87	102.95
13	103.05	102.17	103.05	103.87	102.20	102.85	103.02	103.18	102.23	101.84	101.87	102.95
14	103.05	101.94	103.05	103.90	102.20	102.85	102.99	103.18	102.23	101.87	101.87	102.89
15	103.05	102.10	103.05	103.87	102.17	102.82	103.15	103.18	102.23	101.87	101.90	102.92
16	103.02	102.36	103.25	103.87	102.17	102.82	103.15	103.15	101.84	101.87	101.84	102.92
17	102.82	102.62	103.35	103.84	102.17	102.82	103.15	103.18	101.77	101.84	101.84	102.92
18	102.56	102.85	103.41	103.84	102.13	102.85	103.15	103.18	101.77	101.87	101.80	102.95
19	102.36	102.85	103.58	103.77	102.13	102.85	103.15	103.22	101.74	101.87	101.84	102.92
20	102.10	102.82	103.74	103.77	102.13	102.85	103.15	103.22	101.74	101.87	101.84	102.89
21	101.90	102.82	103.81	103.84	102.17	102.85	103.15	103.22	101.74	101.84	101.87	102.89
22	101.84	102.85	103.84	103.87	102.17	102.85	103.15	103.22	101.74	101.84	101.87	102.89
23	101.84	102.85	103.84	103.84	102.17	102.85	103.18	103.22	101.74	101.84	101.87	102.89
24	101.84	102.85	103.81	103.67	102.20	102.85	103.18	103.22	101.71	101.84	101.90	102.89
25	101.80	102.89	103.84	103.48	102.17	102.85	103.18	103.22	101.71	101.84	101.90	102.89
26	101.80	102.89	103.84	103.28	102.17	102.85	103.18	103.15	101.71	101.84	101.87	102.89
27	101.84	102.95	103.81	103.08	102.17	102.85	103.18	103.02	101.71	101.87	101.94	102.85
28	101.84	102.95	103.81	102.85	102.20	102.85	103.18	102.89	101.67	101.87	101.87	102.89
29	101.84		103.84	102.69	102.20	102.85	103.18	102.95	101.67	101.84	101.87	102.89
30	101.84		103.87	102.46	102.20	102.89	103.22	102.72	101.71	101.84	101.90	102.92
31	101.87		103.87		102.23		103.28	102.46		101.84		102.92
Avg.	102.53	102.40	103.71	103.67	102.23	102.59	103.12	103.12	102.00	101.84	101.87	102.62

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 200 feet downstream from the intake at Morelos Dam, 1,350 feet upstream from the point where it joins the old Alamo Canal, 2.2 miles upstream from Matamoros Check, and about one mile south of the northerly international boundary. Zero of gage is 0.16 foot below mean sea level, U. S. C. & G. S. datum.

RECORDS: The records are deduced from the flows arriving in the limitrophe section of the Colorado River at the northerly international boundary, the flows that pass downstream from the structure, and leakage through the structure. Records available: November 8, 1950 through 1970. Records obtained and furnished by the Mexican Section of the Commission.

REMARKS: The canal is operated with a minimum hydraulic slope to permit the maximum retention of silt above Matamoros Check and the lower velocities in the canal do not permit measuring the flow with a current meter. Records for this station show the amounts of Colorado River water diverted at Morelos Diversion Dam to the Intake Canal and thence to the Alamo Canal for use in Mexico. Water for use in Mexico may also be diverted to the Alamo Canal in the United States directly from the river at Rockwood Head or by means of Imperial Dam, the All-American Canal, and certain facilities of the Imperial Irrigation District under conditions set forth in the 1944 Water Treaty. No diversions of the above nature have been made during the years 1951 through 1970 and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years. Other diversions from the Colorado River are made by Mexico downstream from Morelos Dam by means of pumps.

EXTREMES: Maximum mean daily discharge, 6,540 second-feet, August 3, 1958; maximum mean daily gage height, 107.22 feet on November 8, 1950. Minimum daily discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,150	692	2,500	3,640	1,400	1,190	2,350	2,640	1,490	696	696	713
2	2,140	706	3,030	3,640	1,400	1,110	2,370	2,610	1,400	689	696	717
3	2,260	675	2,780	3,670	1,430	1,130	2,390	2,590	1,390	689	685	717
4	2,280	717	2,800	3,670	1,380	1,080	2,390	2,590	1,210	689	675	706
5	2,320	685	2,320	3,640	1,400	1,110	2,390	2,590	1,130	696	678	696
6	2,350	706	2,250	3,600	1,420	1,110	2,400	2,640	1,130	696	706	706
7	2,370	696	2,540	3,670	1,420	1,110	2,360	2,630	1,150	696	717	720
8	2,340	685	2,630	3,670	1,390	1,100	2,370	2,630	1,160	696	706	1,020
9	2,380	703	2,340	3,670	1,240	1,120	2,370	2,640	1,170	706	696	1,330
10	2,350	918	2,360	3,710	1,100	1,110	2,370	2,630	1,160	706	703	1,680
11	2,340	1,990	2,400	3,670	1,090	1,430	2,390	2,610	1,120	696	727	2,020
12	2,320	1,910	2,380	3,740	1,110	1,770	2,340	2,610	1,120	717	713	2,170
13	2,390	954	2,380	3,670	1,110	2,010	2,360	2,610	1,130	689	710	2,160
14	2,380	752	2,380	3,670	1,120	2,030	2,340	2,610	1,140	706	696	2,060
15	2,390	992	2,380	3,670	1,110	2,040	2,600	2,610	1,190	727	752	2,060
16	2,340	1,370	2,730	3,670	1,110	2,030	2,580	2,580	657	706	692	2,110
17	2,000	1,740	2,830	3,670	1,110	2,040	2,610	2,590	607	678	685	2,110
18	1,640	2,010	2,960	3,670	1,110	2,060	2,600	2,580	597	689	636	2,100
19	1,380	2,010	3,250	3,600	1,110	2,040	2,630	2,640	586	689	678	2,080
20	1,020	1,980	3,570	3,640	1,100	2,040	2,630	2,650	597	706	667	2,050
21	780	2,000	3,670	3,670	1,110	2,040	2,610	2,650	600	678	706	2,080
22	696	2,000	3,640	3,710	1,120	2,040	2,610	2,640	597	689	696	2,100
23	699	2,010	3,640	3,670	1,120	2,080	2,610	2,630	618	685	717	2,080
24	689	2,010	3,600	3,430	1,140	2,040	2,590	2,640	607	696	738	2,080
25	678	2,050	3,600	3,100	1,120	2,050	2,610	2,630	597	685	727	2,100
26	685	2,080	3,600	2,760	1,110	2,080	2,630	2,500	586	685	749	2,100
27	703	2,180	3,600	2,330	1,130	2,080	2,610	2,230	576	713	766	2,080
28	706	2,180	3,570	2,000	1,130	2,080	2,630	2,040	565	713	717	2,070
29	717		3,640	1,730	1,140	2,100	2,600	2,150	569	682	717	2,090
30	703		3,670	1,430	1,160	2,200	2,640	1,810	607	682	727	2,100
31	717		3,670		1,200		2,830	1,410		675		2,120
Sum	50,920	39,365	92,662	101,099	37,066	51,425	77,883	77,604	27,040	21,542	21,175	52,912

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High		Low		Feet	Acre Feet	Average	Maximum	Minimum
			Day	Day	Day	Day					
Jan.	101.35	98.36	† 13	2,390	25	678	1,642	100,998	60,303	116,737	966
Feb.	103.58	98.39	† 27	2,180	3	675	1,406	78,079	54,974	101,685	9,232
Mar.	103.22	101.57	† 21	3,670	6	2,250	2,988	183,792	166,641	216,994	97,902
Apr.	103.38	100.10	† 12	3,740	30	1,430	3,369	200,526	197,129	264,127	158,162
May	100.30	99.34	† 6	1,420	11	1,090	1,197	73,519	96,652	159,010	66,207
June	101.38	99.31	† 30	2,200	4	1,080	1,713	102,000	167,606	269,632	102,000
July	102.36	101.31	† 31	2,830	† 12	2,340	2,511	154,478	237,695	304,263	154,478
Aug.	102.36	100.23	† 20	2,650	31	1,410	2,504	153,925	237,365	341,044	153,925
Sept.	100.79	98.65	† 1	1,490	28	565	901	53,633	135,899	198,095	53,633
Oct.	100.82	98.75	† 15	727	31	675	696	42,728	48,925	90,639	10,453
Nov.	100.20	98.75	† 27	766	18	636	706	41,999	36,384	103,954	7,516
Dec.	101.94	99.77	† 12	2,170	5	696	1,706	104,949	58,935	131,440	8,825
Yearly	103.58	98.36		3,740		565	1,780	1,290,627	1,501,239	1,961,556	1,290,627

‡ Mean daily † And other days

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100.69	98.43	102.17	103.15	100.16	99.74	101.54	102.03	100.49	100.26	98.82	99.90
2	100.66	98.43	102.30	103.12	100.13	99.57	101.57	102.00	100.39	100.43	98.82	99.90
3	100.79	98.43	102.49	103.15	100.20	99.41	101.57	102.03	100.30	100.49	98.82	99.87
4	100.82	98.49	102.69	103.15	100.10	99.41	101.57	102.07	99.90	100.69	98.79	99.87
5	100.85	98.43	102.20	103.15	100.07	99.41	101.61	102.03	99.74	100.66	98.79	99.90
6	100.98	98.46	102.46	103.12	100.13	99.41	101.57	102.03	99.70	100.16	98.85	99.87
7	101.02	98.43	102.66	103.15	100.10	99.41	101.54	102.03	99.80	99.21	98.85	99.90
8	100.98	98.39	102.69	103.08	100.07	99.41	101.54	102.03	99.80	99.18	98.85	100.13
9	101.31	98.43	102.49	103.08	99.77	99.44	101.57	102.03	99.80	99.21	98.85	100.46
10	101.28	98.69	102.46	103.12	99.51	99.41	101.57	102.00	99.77	99.21	98.88	101.35
11	101.25	101.31	102.40	103.15	99.54	100.10	101.61	102.00	99.74	99.15	98.92	101.80
12	101.21	101.38	102.43	103.22	99.57	100.56	101.54	102.00	99.77	99.25	99.08	101.87
13	101.28	101.08	102.46	103.25	99.57	100.95	101.57	102.00	99.74	99.15	99.70	101.87
14	101.25	100.00	102.43	103.28	99.57	101.05	101.54	102.03	99.77	99.18	99.80	101.77
15	101.28	100.69	102.40	103.28	99.51	101.05	101.77	102.07	99.87	99.25	100.07	101.80
16	101.25	101.18	102.62	103.28	99.44	101.05	101.77	102.03	99.08	99.21	99.87	101.84
17	101.15	101.38	102.76	103.25	99.48	101.05	101.84	102.07	98.79	99.08	99.77	101.84
18	100.98	101.61	102.82	103.28	99.44	101.08	101.94	102.07	98.69	99.15	99.64	101.84
19	100.10	101.54	102.92	103.18	99.44	101.05	102.00	102.13	98.65	99.41	99.70	101.84
20	98.85	101.54	103.05	103.22	99.48	101.02	102.07	102.17	98.69	99.77	99.74	101.77
21	99.05	101.44	103.08	103.31	99.57	101.08	102.07	102.13	98.75	99.51	99.84	101.84
22	98.56	101.48	103.05	103.28	99.61	101.12	102.03	102.13	98.69	99.61	99.84	101.87
23	98.43	101.51	103.05	103.22	99.57	101.12	102.00	102.17	98.72	100.07	99.87	101.84
24	98.39	101.44	103.02	102.95	99.54	101.08	102.03	102.17	98.75	100.13	99.93	101.84
25	98.39	101.48	103.05	102.66	99.48	101.05	102.03	102.23	98.79	100.13	99.93	101.84
26	98.56	101.44	103.12	102.33	99.48	101.08	102.03	102.10	99.18	100.03	99.97	101.84
27	98.52	101.71	103.05	102.03	99.57	101.08	102.00	101.77	99.80	99.93	99.93	101.80
28	98.56	101.84	103.05	101.61	99.64	101.08	102.03	101.57	100.16	100.00	99.90	101.84
29	98.52		103.12	100.69	99.67	101.12	102.00	101.64	100.23	99.31	99.90	101.84
30	98.52		103.15	100.26	99.70	101.28	102.07	101.31	99.93	98.79	99.90	101.87
31	98.49		103.15		99.77		102.20	100.72		98.79		101.87
Avg.	100.13	100.30	102.72	102.85	99.70	100.49	101.80	101.97	99.51	99.64	99.44	101.28

COLORADO RIVER IMMEDIATELY BELOW MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico immediately downstream from Morelos Dam, 1.1 miles downstream from the northerly international boundary, and about 7.5 miles downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969 zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date zero of the gage was 0.16 foot below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; continuous record of gage heights June 7, 1966 through 1970.

REMARKS: On June 7, 1966 a continuous water-stage recorder was installed; prior to this date mean daily gage heights were determined from hourly readings of a staff gage.

EXTREMES: Maximum mean daily gage height, 112.63 feet on January 2, 1958; minimum mean gage height, 98.13 feet several days during March and April 1967.

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100.13	100.39	99.84	98.56	99.38	99.38	98.79	98.62	99.28	100.20	100.23	100.20
2	100.13	100.36	103.31	98.59	99.38	99.38	98.79	98.62	99.38	100.20	100.23	100.23
3	100.10	100.36	106.86	98.56	99.41	99.38	98.79	98.62	99.34	100.16	100.20	100.20
4	100.10	100.39	106.76	98.56	99.44	99.38	98.79	98.56	99.38	100.16	100.20	100.20
5	100.10	100.36	102.72	98.56	99.41	99.34	98.79	98.56	99.34	100.20	100.23	100.20
6	100.10	100.36	99.97	98.56	99.44	99.41	98.82	98.56	99.38	100.23	100.23	100.20
7	100.10	100.39	99.44	98.56	99.41	99.41	98.85	98.56	99.41	100.23	100.23	100.20
8	100.10	100.36	99.90	98.56	99.38	99.41	98.85	98.56	99.44	100.23	100.23	100.10
9	100.10	100.39	99.67	98.56	99.44	99.44	98.85	98.52	99.44	100.26	100.23	100.00
10	100.00	100.39	99.38	98.56	99.44	99.41	98.82	98.56	99.44	100.23	100.23	99.80
11	99.97	100.20	99.38	98.56	99.44	99.28	98.79	98.56	99.44	100.23	100.23	99.61
12	99.97	102.13	99.38	98.56	99.44	99.15	98.85	98.62	99.41	100.23	100.23	99.61
13	100.00	100.49	99.41	98.56	99.44	99.02	98.85	98.65	99.44	100.23	100.20	99.61
14	100.00	100.07	99.41	98.56	99.41	99.02	98.85	98.65	99.51	100.26	100.20	99.61
15	100.00	99.93	99.41	98.56	99.41	98.98	98.69	98.65	99.54	100.23	100.23	99.57
16	99.97	99.77	99.25	98.56	99.41	98.98	98.62	98.62	99.93	100.23	100.20	99.61
17	100.03	99.80	99.11	98.56	99.44	98.95	98.62	98.65	100.03	100.20	100.20	99.61
18	100.13	99.80	98.98	98.56	99.34	98.92	98.62	98.65	100.03	100.23	100.20	99.61
19	100.13	99.77	98.98	98.56	99.34	98.98	98.62	98.65	100.07	100.23	100.20	99.57
20	100.23	99.80	98.79	98.52	99.38	99.02	98.62	98.65	100.07	100.23	100.20	99.61
21	100.39	99.84	98.72	98.52	99.41	98.98	98.62	98.65	100.10	100.23	100.23	99.61
22	100.39	99.80	98.65	98.52	99.41	98.98	98.62	98.69	100.10	100.26	100.23	99.61
23	100.39	99.80	98.69	98.52	99.41	99.02	98.62	98.69	100.13	100.26	100.20	99.61
24	100.43	99.77	98.69	98.52	99.41	99.05	98.62	98.72	100.13	100.23	100.16	99.57
25	100.39	99.77	98.69	98.56	99.41	98.98	98.56	98.75	100.13	100.23	100.16	99.57
26	100.39	99.80	98.69	98.59	99.41	99.02	98.56	98.82	100.13	100.23	100.20	99.57
27	100.39	99.80	98.65	99.05	99.38	99.05	98.59	98.92	100.16	100.20	100.20	99.57
28	100.33	99.77	98.65	99.21	99.34	99.05	98.62	98.92	100.16	100.20	100.16	99.48
29	100.36		98.59	99.34	99.34	99.05	98.59	98.95	100.16	100.23	100.20	99.44
30	100.39		98.56	99.38	99.38	98.95	98.56	99.08	100.20	100.20	100.20	99.44
31	100.39		98.56		99.38		98.62	99.21		100.20		99.44
Avg.	100.20	100.13	99.84	98.65	99.41	99.15	98.72	98.69	99.77	100.23	100.20	99.74

WELLTON-MOHAWK DRAINAGE WATER DISCHARGED TO COLORADO RIVER BELOW MORELOS DAM

DESCRIPTION: Water-stage recorder located on downstream end of the Wellton-Mohawk Drainage Extension Channel on the Arizona bank of the Colorado River at the east end of the weir section of Morelos Dam, 1.1 miles downstream from the northerly international boundary. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 30 discharge measurements and a continuous record of gage heights. Station is operated by the United States Section of the Commission. Records available: November 16, 1965 through 1970.

REMARKS: Pursuant to Minute 218 of the Commission, an extension to the Wellton-Mohawk Drainage Conveyance Channel was constructed along the left bank of the Colorado River to a point immediately below Morelos Dam, a distance of about 12 miles, and placed in operation on November 16, 1965. Drainage flows may be discharged to the Gila River and thence to the Colorado River at the diversion structure, Main Outlet Drain Extension No. 1, at the upstream end of the extension; directly to the Colorado River at Main Outlet Drain Extension No. 2, 1.9 miles upstream from Morelos Dam; and immediately below Morelos Dam at this station, Main Outlet Drain Extension No. 3. The combined 1970 record of discharges to the river above Morelos Dam through M. O. D. E. No. 1 and No. 2 is shown on page 15.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	222	304	184	0.3	192	176	67.3	44.3	149	306	303	304
2	220	306	286	.3	189	178	69.2	44.3	159	306	303	306
3	210	304	296	5.2	196	178	70.1	42.8	150	300	300	308
4	211	306	292	23.2	196	173	69.2	34.4	155	298	303	306
5	213	303	294	26.1	189	170	68.4	32.4	153	300	309	306
6	209	300	242	17.9	189	179	71.9	32.4	158	303	306	308
7	209	306	155	0	180	179	77.2	33.8	159	308	308	306
8	209	309	277	0	171	176	76.3	27.4	167	308	306	276
9	209	309	204	0	185	176	76.3	18.8	164	309	306	246
10	193	306	152	0	188	176	73.6	35.9	162	303	306	212
11	192	261	156	0	188	145	70.1	36.5	165	298	306	172
12	194	233	158	0	188	119	76.3	44.6	160	300	308	173
13	197	240	168	0	189	95.8	77.2	45.0	150	303	303	173
14	197	244	170	0	186	97.9	76.3	44.3	162	306	306	173
15	198	211	169	0	186	96.2	50.4	39.0	167	309	303	168
16	194	182	140	0	191	94.3	42.5	38.5	278	309	306	169
17	212	191	112	0	191	91.4	42.1	33.8	289	308	308	171
18	226	198	101	0	170	87.5	45.0	33.8	292	306	308	170
19	226	194	86.6	0	170	95.3	45.8	28.6	294	306	306	169
20	258	197	50.5	0	174	101	45.0	29.2	292	309	309	173
21	292	198	44.3	0	178	94.3	46.6	27.4	296	309	312	173
22	295	200	41.4	0	179	95.3	46.6	28.6	300	308	309	173
23	295	196	42.8	0	180	102	46.6	30.5	298	306	308	173
24	304	196	47.3	0	180	106	41.8	36.5	300	304	306	171
25	306	193	47.3	30.2	183	93.0	37.1	37.8	306	303	308	171
26	304	206	46.6	43.7	179	104	36.3	51.7	303	303	308	171
27	300	198	45.8	130	174	109	40.7	74.7	304	303	306	171
28	295	196	45.8	154	168	108	42.1	74.5	304	301	304	149
29	300		18.2	177	170	108	41.4	83.7	300	301	309	148
30	306		2.0	187	175	92.0	33.1	107	303	300	308	144
31	309		.8		176		42.3	141				143
Sum	7,505	6,787	4,075.4	794.9	5,650	3,796	1,744.8	1,413.2	6,839	9,433	9,191	6,376
Current Year 1970										Period 1966-1970		
Month	Extreme Gage Feet		Current Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum	
Jan.	3.17	2.35	31	309	11	192	242	14,886	14,296	17,740	11,029	
Feb.	3.17	2.25	† 8	309	16	182	242	13,462	11,885	15,154	9,992	
Mar.	3.09	.06	3	296	31	.8	131	8,083	4,202	8,083	1,943	
Apr.	2.30	0	30	187	† 7	0	26.5	1,577	1,884	3,977	1,053	
May	2.36	2.20	† 3	196	28	168	182	11,207	7,162	11,207	3,160	
June	2.29	1.46	† 6	179	18	87.5	127	7,529	4,158	7,529	2,098	
July	1.35	.81	† 7	77.2	30	33.1	56.3	3,461	1,627	3,461	0	
Aug.	1.99	.57	31	141	9	18.8	45.6	2,803	1,430	2,803	34.9	
Sept.	3.20	2.06	25	306	1	149	228	13,565	9,236	13,565	3,575	
Oct.	3.22	3.15	† 9	309	† 4	298	304	18,710	18,057	18,710	17,599	
Nov.	3.23	3.16	21	312	3	300	306	18,230	17,883	18,478	17,234	
Dec.	3.20	1.98	† 3	308	31	143	206	12,647	15,182	16,374	12,647	
Yearly	3.23	0		312		0	175	126,160	107,002	126,160	100,028	

† And other days

‡ Mean daily

COOPER WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging regulatory waste water from the Cooper Canal to the Colorado River. This wasteway is located 1.5 miles downstream from the northerly international boundary and 0.4 mile downstream from Morelos Diversion Dam. This is one of three wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, March 1950 through 1970, obtained by the United States Section; monthly discharge, January 1934 through March 1950, by the Bureau of Reclamation.

EXTREMES: Prior to March 1950, maximum monthly discharge, 914 acre-feet in January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 79.3 second-feet on June 19, 1965, at a maximum gage height of 114.13 feet; minimum instantaneous discharge, zero during parts of each month.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	4.0	1.4	0.6	1.3	0.5	0.4	1.1	1.7	9.1	5.3	0.6
2	.7	1.2	1.3	1.7	.7	1.5	0	1.0	3.1	2.4	3.6	6.0
3	.6	1.2	.6	1.0	.7	3.1	0	.7	1.1	1.2	.6	1.0
4	.6	2.7	5.4	.6	.7	2.6	0	.6	.9	1.6	.4	.7
5	1.5	3.0	5.2	.7	2.9	.5	0	.6	.2	1.1	1.8	.2
6	1.1	1.1	1.2	1.5	1.9	.4	0	4.3	0	2.3	.4	.2
7	1.6	6.3	.5	3.1	1.4	1.1	2.6	.8	3.0	.7	.4	.2
8	3.7	.4	.5	2.6	1.0	1.1	2.3	.5	.8	.5	1.3	2.8
9	3.5	1.2	2.0	3.3	.6	4.6	.2	3.1	1.1	.5	1.1	3.5
10	1.9	4.8	.8	.8	1.2	.5	.6	1.1	4.6	.7	.2	.4
11	2.4	1.8	.5	3.2	1.1	3.3	.6	1.3	1.8	5.0	4.4	.1
12	.4	.8	1.2	1.6	1.1	1.1	.7	1.7	.5	1.0	.6	.2
13	.3	.6	.9	5.5	1.0	3.2	.9	.1	1.9	1.5	.2	.5
14	.3	1.5	.5	2.7	.6	.2	4.0	0	5.6	1.2	0	.5
15	.3	1.3	1.2	1.2	.3	0	3.5	.7	3.7	1.8	1.7	1.3
16	.3	1.2	1.5	.7	.8	0	.6	.7	.6	4.5	.4	5.8
17	.4	.5	.4	.1	4.2	.2	.6	.6	2.3	2.6	.1	* 6.5
18	1.3	.4	.7	1.5	2.2	.4	.5	.2	1.2	5.2	0	.8
19	.6	.2	.3	1.0	1.7	2.3	.7	0	1.0	2.3	.4	2.3
20	.1	1.0	.4	1.4	.8	.1	.4	1.4	.5	3.3	4.4	.7
21	0	8.0	.4	.4	3.1	0	.4	2.2	.5	2.8	4.2	.5
22	0	4.0	.3	.3	3.4	0	.4	1.6	.6	3.2	4.0	.4
23	.7	1.6	2.3	.3	2.9	0	.4	.6	.6	4.2	2.4	.4
24	2.6	1.7	.3	.3	2.7	3.9	1.4	.6	.6	2.9	.7	.4
25	1.8	.7	1.6	2.9	2.0	1.2	2.6	.6	.7	1.7	.4	4.9
26	.6	.7	.6	2.9	.4	.5	2.6	.6	.7	5.3	1.3	1.7
27	.6	3.2	.5	1.9	.5	1.2	1.8	2.9	1.4	3.6	3.0	.5
28	.4	.5	.5	.7	3.2	1.1	1.8	1.2	.6	1.1	1.0	.5
29	.3		1.0	1.6	2.0	.6	1.2	1.1	.5	4.7	4.5	1.2
30	.2		.7	1.5	4.4	1.4	.6	1.2	8.3	1.1	.5	3.2
31	.8		.7		2.4		1.1	1.6		.7		1.0
Sum	31.1	55.6	35.4	47.6	53.2	36.6	32.9	34.7	50.1	79.8	49.3	49.0
Current Year 1970									Period 1935-1970			
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	111.74	111.00	5	9.2	† 20	0	1.0	61.7	189	914	0	
Feb.	112.54	111.00	7	26.6	19	0	2.0	110	167	400	6	
Mar.	112.09	111.01	25	15.9	19	0.1	1.1	70.2	178	517	0	
Apr.	112.40	111.00	9	23.1	18	0	1.6	94.4	193	425	40	
May	112.38	111.00	17	22.6	16	0	1.7	106	185	440	76	
June	112.30	111.00	2	20.6	15	0	1.2	72.6	173	595	47	
July	112.20	111.00	14	18.1	† 2	0	1.1	65.3	158	516	0	
Aug.	112.39	111.00	21	22.8	† 13	0	1.1	68.8	123	617	0	
Sept.	112.85	111.00	30	34.6	† 5	0	1.7	99.4	124	462	0	
Oct.	112.32	111.00	1	21.1	† 21	0	2.6	158	152	490	0	
Nov.	112.34	111.00	20	21.6	† 4	0	1.6	97.8	173	462	9	
Dec.	112.31	111.00	2	20.8	† 11	0	1.6	97.2	203	592	63.3	
Yearly	112.85	111.00		34.6		0	1.5	1,101.4	2,018	4,500	1,024	

* Partially estimated

† And other days

COLORADO RIVER AT MORELOS GAGING STATION - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, and cableway 1.8 miles downstream from the northerly international boundary, 0.7 mile downstream from Morelos Diversion Dam, and about 9 miles downstream from Yuma, Arizona, along the river levee. The cableway and recorder are 1,260 feet and 1,300 feet, respectively, below the mouth of Cooper Wasteway. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 158 current meter measurements during the year, 111 by the United States Section, 47 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: Daily discharges, January 1, 1954 through 1970; continuous record of gage heights, July 20, 1952 through 1970.

REMARKS: Reservoirs, diversions in United States and Mexico, drainage returns, and waste flows modify the river flow at this station. The record at this station, less that of Cooper Wasteway and Main Outlet Drain Extension No. 3, represents the river flow passing Morelos Diversion Dam.

EXTREMES: Maximum instantaneous discharge, 22,240 second-feet on January 4, 1955; maximum gage height, 112.18 feet on January 28, 1958. Minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	230	316	208	12.6	177	177	77.3	53.9	148	310	312	310
2	225	310	1,390	12.6	180	179	77.4	53.9	158	306	312	312
3	220	312	3,570	13.9	188	180	77.4	53.9	155	301	306	308
4	219	314	3,540	34.5	193	177	74.8	46.2	160	301	308	308
5	219	312	1,150	37.0	190	172	73.5	44.0	159	304	312	306
6	218	305	266	34.0	190	180	77.4	45.1	162	306	310	306
7	218	316	174	13.6	187	184	83.9	44.0	166	310	310	304
8	219	314	256	13.6	179	182	85.2	40.0	171	310	312	284
9	219	316	207	13.5	188	184	83.9	32.4	168	312	312	259
10	206	316	159	11.8	192	180	81.3	46.2	168	308	312	219
11	201	274	159	12.6	190	155	76.1	47.3	170	306	314	178
12	200	795	160	11.8	188	131	81.3	52.8	164	303	314	176
13	202	368	166	16.4	190	107	83.9	53.9	156	304	312	176
14	202	243	171	14.2	185	105	85.2	53.9	171	306	310	177
15	202	219	170	11.8	184	102	64.6	48.4	176	308	314	172
16	200	192	143	10.8	190	101	52.8	47.3	268	310	314	176
17	215	194	119	10.8	192	96.9	50.6	46.2	289	308	312	179
18	229	204	106	11.3	174	91.7	51.7	46.2	287	308	312	176
19	231	198	95.6	11.3	176	98.2	50.6	42.0	291	310	310	174
20	256	201	65.8	9.5	177	103	52.8	44.0	291	312	314	174
21	293	206	56.2	9.2	182	98.2	55.0	43.0	295	312	316	177
22	300	204	52.8	9.2	184	99.5	53.9	43.0	299	314	316	177
23	300	201	53.9	9.0	185	107	53.9	44.0	301	314	310	176
24	305	201	56.2	9.0	185	114	51.7	50.6	303	312	308	174
25	309	201	55.0	32.5	187	101	47.3	52.8	304	310	310	176
26	309	207	53.9	46.5	182	109	46.2	64.6	306	312	310	176
27	307	207	50.6	115	177	112	49.5	85.2	310	312	314	176
28	294	202	50.6	147	174	112	50.6	86.5	312	310	308	158
29	300	30.2	165	171	111	111	48.4	93.0	304	314	310	156
30	312	14.6	174	176	99.8	99.8	43.0	110	310	308	312	153
31	314	13.1	177	177	177	177	49.5	136	308	308	312	148
Sum	7,674	7,648	12,762.5	1,034.0	5,690	3,949.3	1,990.7	1,750.3	6,922	9,569	9,346	6,521
Current Year 1970									Period 1954-1970			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	99.96	99.40	31	319	11	198	248	15,221	181,919	969,540	949	
Feb.	102.01	99.16	12	906	16	186	273	15,170	92,564	414,310	977	
Mar.	106.75	97.78	4	3,980	31	13.1	412	25,314	59,635	630,230	780	
Apr.	99.04	97.62	30	176	20	8.8	34.5	2,051	45,635	532,320	899	
May	99.11	98.90	17	200	28	168	184	11,286	54,702	375,970	460	
June	99.06	98.38	9	195	18	90.4	132	7,833	13,141	119,980	834	
July	98.40	97.91	10	93.0	30	40.0	64.2	3,948	12,210	89,430	654	
Aug.	98.64	97.77	31	141	9	28.4	56.5	3,472	20,634	125,590	702	
Sept.	99.73	98.70	30	320	1	148	231	13,730	18,311	87,830	113	
Oct.	99.83	99.64	14	326	3	297	309	18,980	49,856	172,940	9,750	
Nov.	99.84	99.71	13	328	3	304	312	18,538	91,348	356,390	4,869	
Dec.	99.82	98.95	2	320	31	146	210	12,934	125,114	643,850	1,111	
Yearly	102.01	97.62		3,980		8.8	206	148,477	765,069	3,957,730	101,758	

COLORADO RIVER AT MORELOS GAGING STATION - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	99.64	99.94	99.26	97.77	99.03	98.95	98.28	98.03	98.70	99.69	99.75	99.76
2	99.61	99.90	102.58	97.77	99.03	98.96	98.28	98.03	98.82	99.68	99.75	99.78
3	99.58	99.91	106.23	97.77	99.06	98.97	98.28	98.03	98.80	99.66	99.72	99.77
4	99.57	99.92	106.19	97.98	99.08	98.95	98.26	97.96	98.84	99.67	99.73	99.78
5	99.56	99.90	102.28	98.00	99.05	98.92	98.25	97.94	98.83	99.69	99.75	99.77
6	99.55	99.86	99.73	97.97	99.05	98.97	98.28	97.95	98.85	99.71	99.74	99.77
7	99.54	99.91	99.20	97.77	99.03	98.99	98.33	97.94	98.88	99.73	99.74	99.76
8	99.55	99.90	99.69	97.77	98.98	98.98	98.34	97.90	98.91	99.74	99.75	99.67
9	99.55	99.90	99.39	97.76	99.04	98.99	98.33	97.82	98.90	99.75	99.75	99.55
10	99.46	99.90	99.10	97.72	99.06	98.97	98.31	97.95	98.91	99.73	99.75	99.36
11	99.43	99.71	99.09	97.74	99.05	98.84	98.27	97.96	98.93	99.72	99.76	99.14
12	99.42	101.65	99.09	97.72	99.04	98.68	98.31	98.01	98.90	99.71	99.76	99.13
13	99.43	100.06	99.12	97.77	99.05	98.53	98.33	98.02	98.86	99.72	99.76	99.13
14	99.43	99.55	99.14	97.74	99.02	98.51	98.34	98.02	98.96	99.73	99.75	99.14
15	99.42	99.39	99.12	97.69	99.01	98.50	98.18	97.97	98.99	99.74	99.77	99.11
16	99.40	99.21	98.97	97.67	99.05	98.50	98.08	97.96	99.45	99.75	99.77	99.13
17	99.48	99.20	98.80	97.67	99.06	98.47	98.06	97.95	99.56	99.74	99.76	99.15
18	99.57	99.23	98.70	97.68	98.95	98.43	98.07	97.94	99.55	99.74	99.76	99.13
19	99.57	99.19	98.62	97.68	98.96	98.48	98.06	97.90	99.57	99.75	99.75	99.12
20	99.69	99.21	98.39	97.65	98.97	98.52	98.07	97.91	99.57	99.76	99.77	99.12
21	99.86	99.24	98.31	97.64	99.00	98.48	98.08	97.89	99.59	99.75	99.78	99.14
22	99.90	99.23	98.28	97.65	99.01	98.48	98.06	97.89	99.61	99.76	99.78	99.14
23	99.90	99.21	98.29	97.64	99.01	98.52	98.06	97.90	99.62	99.76	99.76	99.13
24	99.93	99.21	98.31	97.64	99.01	98.56	98.03	97.96	99.63	99.75	99.75	99.12
25	99.94	99.20	98.30	97.96	99.02	98.46	97.99	97.98	99.64	99.74	99.76	99.13
26	99.94	99.23	98.29	98.11	98.99	98.52	97.98	98.07	99.65	99.75	99.76	99.13
27	99.92	99.23	98.26	98.64	98.96	98.55	98.01	98.22	99.67	99.75	99.78	99.13
28	99.85	99.20	98.26	98.86	98.94	98.55	98.02	98.23	99.68	99.74	99.75	99.01
29	99.88		98.02	98.97	98.92	98.54	98.00	98.28	99.65	99.76	99.76	99.01
30	99.94		97.81	99.03	98.95	98.45	97.94	98.40	99.68	99.73	99.77	99.00
31	99.93		97.78		98.96		98.00	98.60		99.73		98.96
Avg.	99.66	99.61	99.44	97.91	99.01	98.67	98.16	98.02	99.24	99.73	99.76	99.30

ELEVEN MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging water from the West Main Canal to the Colorado River. This wasteway is located in Arizona 4.3 miles downstream from the northerly international boundary and 3.2 miles downstream from Morelos Diversion Dam. It is the largest of the three wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1970, obtained by the United States Section; monthly discharge, January 1924 through 1950, by Bureau of Reclamation.

EXTREMES: Prior to January 1951, maximum monthly discharge, 9,740 acre-feet in August 1940; minimum monthly discharge, zero in April 1941. Since January 1, 1951, maximum instantaneous discharge, 800 second-feet on December 3, 1961, at a maximum gage height of 117.60 feet; minimum instantaneous discharge, zero during parts of most years.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.1	1.0	24.7	1.2	1.2	3.6	1.0	4.7	1.1	1.2	9.9	5.9
2	1.0	3.2	5.8	1.2	1.6	1.0	1.3	2.8	.9	5.9	3.3	1.3
3	1.0	.9	1.3	1.2	9.6	1.0	1.2	3.9	1.9	10.0	1.4	3.6
4	1.0	1.2	1.3	1.2	1.6	* 1.1	4.6	1.5	1.1	8.1	3.9	11.6
5	1.1	1.0	1.0	1.3	2.1	* 1.2	3.4	1.0	.9	1.9	1.1	4.1
6	1.1	13.5	2.5	3.7	1.3	1.2	9.6	1.5	.9	1.7	1.1	2.0
7	1.1	5.3	* 9.8	1.5	5.4	1.4	1.1	10.5	1.0	1.5	6.2	1.1
8	2.3	1.1	± 1.2	1.6	1.2	3.9	2.5	2.2	1.1	4.0	1.1	4.8
9	2.7	1.1	* 1.2	1.6	1.2	1.8	2.4	1.2	1.1	5.6	1.1	2.2
10	1.0	2.0	1.2	3.8	6.5	1.1	1.9	1.1	1.5	11.2	1.0	1.2
11	1.0	1.6	3.3	2.3	1.3	1.1	16.7	2.3	2.2	6.0	1.0	1.9
12	9.0	3.1	1.3	13.6	1.1	3.2	6.8	2.0	1.2	14.5	1.1	1.3
13	2.1	1.3	1.1	1.5	1.1	1.1	2.8	1.1	1.1	4.1	1.4	1.1
14	1.0	1.1	1.2	1.1	1.0	11.0	1.1	1.2	1.1	2.7	23.7	1.0
15	2.9	54.8	30.9	1.1	1.1	10.3	1.1	4.3	5.2	1.0	75.9	2.5
16	* 4.6	18.8	22.7	1.1	1.2	1.4	1.1	31.8	3.8	1.6	11.3	12.9
17	± 6.4	5.0	4.3	1.1	1.9	2.0	1.0	41.9	4.5	6.1	1.2	1.8
18	* 80.4	2.1	2.7	1.2	5.9	1.3	1.5	3.9	1.1	1.2	.5	2.0
19	* 24.4	.7	.9	29.0	2.1	* 3.4	6.2	1.6	2.5	2.2	1.1	1.0
20	7.4	.9	.4	30.7	1.4	± 1.3	7.8	.9	1.4	1.6	5.1	82.2
21	4.2	.9	.7	3.3	1.4	± 1.3	1.3	.9	2.7	2.4	12.0	44.2
22	1.2	1.0	1.5	2.0	1.3	* 3.0	1.2	1.6	1.4	1.7	19.1	6.7
23	.9	.9	1.2	1.2	1.3	4.6	3.5	11.0	1.1	7.7	1.4	2.4
24	2.4	.9	1.2	1.3	5.0	1.9	6.7	8.4	1.1	14.4	1.3	1.1
25	1.9	.8	1.3	1.3	9.3	1.7	4.3	1.6	1.1	1.5	1.4	14.0
26	2.7	.9	2.3	4.7	1.4	1.5	1.1	3.5	1.1	9.0	5.5	1.3
27	1.2	1.6	1.7	4.6	1.2	1.4	3.4	19.6	* 5.9	6.3	9.6	1.3
28	3.1	6.8	1.9	1.3	1.2	1.9	1.3	1.6	* 1.9	1.1	1.3	3.1
29	1.9	1.9	1.9	3.3	1.1	5.0	2.4	8.5	4.5	8.6	4.6	1.2
30	1.0		3.3	6.4	1.2	1.1	4.3	5.9	2.5	13.1	14.8	1.8
31	6.0		1.4		6.7		1.1	2.2		15.1		7.6
Sum	186.1	133.5	137.2	130.4	80.9	76.8	105.7	186.2	58.9	173.0	223.4	230.2
Current Year 1970								Period 1935-1970				
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	115.26	111.80	18	216	† 21	0.5	6.0	369	3,707	9,570	215	
Feb.	115.94	111.80	15	301	18	0.5	4.8	265	2,973	8,430	193	
Mar.	114.32	111.78	15	147	20	0.4	4.4	272	2,800	6,230	171	
Apr.	114.97	111.82	19	191	22	0.7	4.3	259	2,587	6,300	0	
May	113.35	111.85	3	90.5	† 12	1.0	2.6	160	3,117	9,320	101	
June	112.90	111.85	29	65.0	† 1	1.0	2.6	152	2,945	7,440	130	
July	112.50	111.84	† 6	31.5	† 1	0.9	3.4	210	2,987	8,320	133	
Aug.	115.79	111.79	16	278	19	0.5	6.0	369	2,538	9,740	289	
Sept.	112.43	111.84	15	26.8	† 1	0.9	2.0	117	1,861	6,140	117	
Oct.	112.80	111.84	24	51.4	† 15	0.9	5.6	343	2,531	5,680	343	
Nov.	114.84	111.79	15	182	† 17	0.5	7.4	443	3,010	8,220	344	
Dec.	115.37	111.81	20	227	23	0.6	7.4	457	3,985	9,430	164	
Yearly	115.94	111.78		301		0.4	4.7	3,416	35,041	82,900	2,944	

* Partly estimated

± Estimated

† And other days

COLORADO RIVER AT ELEVEN MILE GAGE - STAGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, 4.3 miles downstream from northerly international boundary, 3.2 miles downstream from Morelos Diversion Dam, about 50 feet downstream from the mouth of Eleven Mile Wasteway of the Yuma Project, and 11 miles downstream from Yuma, Arizona, along the river levee. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through 1970; once weekly readings obtained by the U. S. Bureau of Reclamation, January 1940 through October 1947.

REMARKS: This station is maintained by the United States Section of the Commission as part of the continuing study of channel conditions in the limnetic section of the river.

EXTREMES: Since November 1947, maximum mean daily gage height, 108.20 feet on January 2, 1958; minimum mean daily gage height, 94.95 feet on June 22, 1968.

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	97.02	97.15	96.69	" 95.28	96.31	96.27	95.65	95.38	95.98	96.98	97.04	97.00
2	96.97	97.16	99.55	* 95.26	96.31	96.26	95.64	95.38	96.06	96.98	97.02	97.00
3	96.92	97.15	103.44	95.27	96.37	96.26	95.64	95.39	96.05	96.99	96.99	97.00
4	96.92	97.16	103.58	95.41	96.37	96.24	95.65	95.31	96.08	96.98	96.99	97.02
5	96.92	97.14	99.95	95.43	96.35	96.22	95.63	95.29	96.08	96.98	97.00	96.99
6	96.91	97.17	97.03	95.45	96.35	96.26	95.69	95.29	96.09	97.01	96.99	96.98
7	96.88	97.17	96.54	* 95.29	96.33	96.26	95.68	95.33	96.13	97.03	97.01	96.98
8	96.89	97.14	96.88	* 95.26	96.28	96.28	95.69	95.30	96.15	97.04	96.99	96.89
9	96.89	97.14	96.72	* 95.24	96.33	96.29	95.68	95.30	96.16	97.05	97.00	96.79
10	* 96.82	97.14	96.41	* 95.21	96.38	96.28	95.66	95.31	96.16	97.05	96.99	96.61
11	" 96.80	97.00	96.41	95.20	96.36	96.17	95.69	95.31	96.17	97.02	97.00	96.41
12	" 96.82	98.72	96.39	95.31	96.35	96.04	95.68	95.34	96.16	97.07	97.00	96.38
13	* 96.78	97.51	96.41	95.27	96.35	95.90	95.67	95.35	96.12	97.03	96.99	96.38
14	96.75	96.85	96.43	95.23	96.34	95.90	95.67	95.33	96.21	97.03	97.05	96.37
15	96.75	96.91	96.51	95.20	96.31	95.92	95.55	95.33	96.24	97.03	97.26	96.36
16	96.74	96.64	96.43	95.20	96.34	95.86	95.44	95.44	96.63	97.04	97.04	96.41
17	96.82	96.55	" 96.24	95.20	96.37	95.84	95.39	95.57	96.78	97.05	96.98	96.39
18	97.16	96.59	" 96.14	95.20	96.32	95.79	95.37	95.35	96.78	97.03	96.97	96.36
19	96.95	96.56	" 96.05	95.35	96.29	95.83	95.38	95.30	96.81	97.05	96.97	96.34
20	96.99	96.58	" 95.82	95.42	96.29	95.86	95.41	95.30	96.82	97.05	97.00	96.69
21	97.13	96.59	" 95.74	95.25	96.33	* 95.83	95.38	95.29	96.87	97.05	97.04	96.57
22	97.15	96.59	" 95.70	95.24	96.33	* 95.84	95.37	95.28	96.88	97.05	97.05	96.41
23	97.15	96.56	* 95.71	95.23	96.33	95.88	95.37	95.32	96.88	97.07	97.00	96.38
24	97.18	96.55	95.72	95.23	96.35	95.89	95.38	95.34	96.88	97.09	96.98	96.36
25	97.18	96.52	95.72	95.37	96.38	95.81	95.32	95.30	96.92	97.02	96.98	96.43
26	97.18	96.55	95.71	95.52	96.32	95.84	95.30	95.38	96.93	97.05	97.00	96.37
27	97.15	96.55	95.70	95.94	96.29	95.88	95.33	95.63	96.95	97.06	97.02	96.36
28	97.11	96.54	95.69	96.13	96.27	95.88	95.34	95.55	96.95	97.02	96.98	96.28
29	97.13		95.55	96.22	96.25	95.90	95.33	95.63	96.95	97.04	97.01	96.25
30	97.15		95.37	96.31	96.27	95.81	95.31	95.75	96.96	97.04	97.05	96.24
31	97.18		* 95.31		96.29		95.33	95.90		97.03		96.23
Avg.	96.98	96.92	96.82	95.40	96.33	96.01	95.50	95.40	96.49	97.03	97.01	96.56

" Estimated * Partly estimated

TWENTY-ONE MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging water from the West Main Canal to the Colorado River. This wasteway is located in Arizona 18.5 miles downstream from the northerly international boundary, 17.4 miles downstream from Morelos Diversion Dam, and 2.2 miles upstream from the southerly international boundary. It is the farthest downstream of the three wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1970, obtained by the United States Section; monthly discharge, March 1939 through 1950, by Bureau of Reclamation.

REMARKS: This wasteway was completed and flow began March 14, 1939. Since May 13, 1944, waste water from the West Main Canal which previously discharged across the southerly land boundary has been returned to the Colorado River through this wasteway.

EXTREMES: Prior to January 1951, maximum monthly discharge, 2,860 acre-feet, January 1946; minimum monthly discharge, 122 acre-feet in September 1950. Since January 1, 1951, maximum instantaneous discharge, 102 second-feet on January 24, 1954, at a maximum gage height of 95.46 feet (present datum); minimum instantaneous discharge, zero during a part of most months.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.3	0	13.3	1.8	1.3	4.8	1.4	1.0	3.6	3.5	13.4	1.4
2	8.4	.4	18.3	.8	.5	5.2	5.6	0	2.2	3.4	5.7	2.1
3	* 2.9	6.1	1.1	3.6	4.0	.7	2.1	0	.1	11.2	4.6	9.7
4	" .3	3.7	.6	5.5	.3	.4	.2	.3	3.2	5.8	1.2	2.1
5	* .1	3.8	.6	6.4	1.8	1.2	3.9	2.6	5.6	.3	.6	.5
6	7.8	.7	.2	3.9	2.0	.2	.7	2.9	0	.7	.4	.5
7	4.9	0	.1	3.3	.2	2.5	0	2.6	0	1.0	2.0	.4
8	.8	.1	.6	3.9	1.3	3.9	.7	0	0	6.3	10.4	.4
9	.4	4.0	.7	.2	7.0	1.8	3.1	0	0	3.8	11.8	.3
10	" .1	7.2	.3	.2	9.8	3.7	4.7	0	.5	9.9	3.5	1.7
11	" .1	4.4	.3	1.6	5.1	.7	3.2	0	0	13.5	6.7	.8
12	0	4.3	6.0	5.2	4.5	.3	3.8	1.6	0	.9	8.5	.3
13	0	3.0	.4	6.8	1.8	.7	5.3	1.8	3.2	1.9	2.2	3.1
14	.3	4.6	2.5	1.7	1.1	.2	.2	2.9	1.2	6.3	15.3	.3
15	9.0	.9	14.6	.5	2.1	1.0	3.0	2.8	0	5.9	29.8	0
16	3.4	18.3	* 13.8	1.4	1.4	.9	0	* 5.4	8.6	1.7	15.7	0
17	6.1	2.8	* 1.5	.1	3.4	.7	1.9	20.2	4.7	.2	1.3	0
18	13.8	1.3	.5	3.4	5.3	.3	9.0	4.8	0	0	.4	0
19	17.1	2.2	2.2	31.3	7.1	3.2	5.2	.3	0	.5	.2	0
20	1.1	15.4	3.2	17.0	.7	1.4	2.5	1.9	7.5	1.8	3.5	0
21	.4	4.7	4.5	2.1	1.6	.1	.4	2.8	4.6	4.2	6.9	.2
22	.2	.1	1.6	* .2	.1	1.0	.9	1.0	7.9	2.6	16.7	.2
23	1.0	0	7.6	* .3	1.9	7.2	3.1	3.5	10.5	9.9	3.2	.2
24	1.6	2.9	1.0	1.6	1.4	.1	8.0	.8	2.2	.9	.3	.3
25	18.8	3.9	2.7	.1	11.5	2.7	.5	1.6	1.0	4.3	1.8	.7
26	2.1	6.9	.2	3.1	5.3	.6	.4	2.4	4.8	8.4	.6	.4
27	1.7	2.3	5.5	5.9	1.5	.2	.4	6.1	1.1	10.1	1.7	1.7
28	1.3	.5	1.2	6.5	1.9	6.8	3.0	0	.2	3.5	1.4	1.1
29	0	1.4	2.0	1.0	4.3	4.0	4.0	11.7	3.5	1.9	1.0	.5
30	0	3.0	5.3	3.6	.2	.6	.6	5.0	.3	7.0	8.2	4.1
31	0	2.9	2.9	7.4	.7	2.4	1.6	1.6	15.2			6.7
Sum	112.1	104.5	112.4	125.7	97.9	57.0	80.2	87.6	76.5	146.6	179.0	39.7
Current Year 1970										Period 1939-1970		
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	94.37	90.92	18	33.4	† 3	0	3.6	222	937	2,860	144	
Feb.	94.62	92.92	20	43.3	† 1	0	3.7	207	805	2,510	138	
Mar.	94.47	92.92	2	37.3	14	0	3.6	223	745	1,660	186	
Apr.	94.76	92.92	15	48.9	15	0	4.2	249	802	1,940	160	
May	94.44	92.92	11	36.1	1	0	3.2	194	977	2,470	59.3	
June	94.70	92.92	10	46.5	11	0	1.9	113	851	2,350	105	
July	94.25	92.92	24	29.2	† 6	0	2.6	159	738	1,950	82.7	
Aug.	94.98	92.92	17	57.7	† 1	0	2.8	174	774	2,530	121	
Sept.	94.75	92.92	23	48.5	† 3	0	2.6	152	695	2,180	120	
Oct.	94.98	92.92	23	57.7	† 1	0	4.7	291	842	2,100	217	
Nov.	94.50	92.92	15	38.5	† 13	0	6.0	355	971	2,380	191	
Dec.	94.68	92.92	3	45.7	† 15	0	1.3	78.7	1,074	2,680	78.7	
Yearly	94.98	90.92		57.7		0	3.4	2,417.7	10,211	24,370	1,928	

* Partly estimated

" Estimated

† And other days

DIVERSIONS BY PUMPS IN THE UNITED STATES - LIMITROPHE SECTION

DESCRIPTION: One privately operated pump located on the left bank of the Colorado River in the limitrophe section pumps water for irrigating land in the river floodway in the United States.

RECORDS: Quantities of water pumped are estimated by the United States Section of the Commission from weekly readings of a running time meter attached to the pump, and pump capacity. Records available: January 1956 through 1970.

REMARKS: These records are used in the computations of water delivered to Mexico.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	2.4	0	1.5	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	4.2	0	0	0	0	4.5	0	0	0	0	0
10	0	3.0	0	0	4.5	0	7.2	0	0	0	0	0
11	0	0	0	0	2.4	0	2.1	0	0	0	0	0
12	0	0	4.5	0	0	0	0	0	0	0	0	0
13	0	0	0	0	3.9	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	4.2	0	0	0	4.2	0	0	0	0	0	0
17	0	5.7	0	0	0	.9	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	3.6	0	0	0	0	0	0
20	0	0	0	0	0	3.0	0	0	0	0	0	0
21	0	2.1	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	3.0	0	0	0	0	0	0	0	0	0
24	0	0	1.8	0	0	0	3.0	0	0	0	0	0
25	0	3.3	0	0	0	0	0	0	0	0	0	0
26	0	5.1	4.2	0	0	0	0	0	0	0	0	0
27	0	0	6.0	3.9	0	0	0	0	0	0	0	0
28	0	0	5.4	6.6	6.3	0	4.2	0	0	0	0	0
29	0	0	0	3.0	3.9	0	6.6	0	0	0	0	0
30	0	0	0	3.6	3.6	0	0	0	0	0	0	0
31	0	0	0	0	3.6	0	0	0	0	0	0	0
Sum	0	27.6	27.3	17.1	29.7	11.7	27.6	0	0	0	0	0
Current Year 1970								Period 1956-1970				
Month	Extreme Gage Feet		Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.				0		0	0	126	280	0		
Feb.			17	5.7	† 1	0	1.0	54.7	500	26.2		
Mar.			27	6.0	† 2	0	.9	54.1	281	11.3		
Apr.			28	6.6	† 1	0	.6	33.9	354	33.9		
May			28	6.3	† 2	0	1.0	58.9	395	770		
June			16	4.2	† 1	0	0.4	23.2	412	800		
July			10	7.2	† 1	0	.9	54.7	425	820		
Aug.				0		0	0	281	800	0		
Sept.				0		0	0	265	940	0		
Oct.				0		0	0	185	390	0		
Nov.				0		0	0	146	330	0		
Dec.				0		0	0	104	230	0		
Yearly				7.2		0	0.4	279.5	3,201	6,480	279.5	

† And other days

EAST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir located about 300 feet north of the international boundary near San Luis, Arizona, and 1.5 miles east of the Colorado River.

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning November 1, 1953, from head on control weir as measured by water-stage recorder and weir ratings as determined by current meter measurements. Records available: October 1946 through 1970. Records of monthly discharges also are available for the periods January 1924 through June 1928, January 1932 through 1933, and April 1935 through September 1946.

REMARKS: Wasteway discharges from the East Main Canal comprise regulatory waste and drainage waters from the eastern half of the Valley Division of the Yuma Project and are considered as part of the volumes arriving at the limitrophe section of the Colorado River.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.0	5.5	15.2	4.1	6.4	11.7	0.6	9.4	0	3.4	13.8	5.0
2	6.2	17.7	9.6	3.2	11.6	4.5	.1	15.4	5.0	3.7	13.0	3.1
3	4.7	12.6	9.0	8.2	.1	18.8	12.5	5.9	3.5	1.4	13.8	13.1
4	10.4	1.4	14.4	5.8	12.5	10.0	2.6	15.3	6.2	9.0	8.2	13.8
5	8.1	13.5	15.9	5.7	8.2	9.3	4.9	4.7	8.8	13.8	7.6	1.9
6	7.5	8.2	2.3	4.3	4.7	11.8	3.3	3.6	3.3	15.1	13.2	3.0
7	2.8	4.4	1.8	13.5	.3	6.3	3.1	10.1	2.9	23.3	27.1	8.8
8	4.2	4.3	2.6	.6	2.4	3.9	9.4	9.7	.1	9.6	11.2	6.6
9	10.0	18.2	12.9	.6	0	7.0	9.8	9.7	0	9.0	5.0	4.4
10	7.8	19.0	1.0	4.4	0	5.4	3.1	21.1	6.0	4.6	5.7	8.8
11	6.4	19.4	1.1	5.7	1.5	13.9	10.8	17.4	3.4	14.1	14.1	.2
12	3.6	9.8	11.0	4.0	1.8	4.0	10.2	16.9	0	9.5	15.0	3.5
13	11.0	7.9	1.9	.8	1.1	7.5	7.3	12.9	0	8.9	5.4	24.2
14	12.9	.5	4.5	.7	6.0	9.2	.2	1.4	6.8	9.3	15.9	11.3
15	10.7	7.2	3.8	13.8	1.3	5.5	2.0	.3	10.0	13.4	9.0	2.7
16	14.6	16.4	10.3	9.5	0	3.4	3.9	8.1	14.3	4.9	27.6	12.3
17	6.2	19.8	.6	2.2	12.6	1.1	.7	8.7	10.1	1.3	5.1	6.9
18	1.0	4.3	1.8	.7	9.2	.3	0	13.0	0	11.4	1.9	8.9
19	5.0	.2	0	7.6	4.5	0	10.0	.9	3.3	4.9	.1	6.8
20	4.5	1.2	2.5	9.8	.8	1.7	15.1	.9	4.7	8.0	19.9	3.8
21	4.9	1.3	9.9	2.5	.5	3.0	11.3	1.2	10.8	9.9	3.6	12.1
22	20.5	15.9	6.9	.1	1.7	1.6	2.2	3.3	3.8	.9	.8	9.6
23	12.6	16.6	3.1	2.3	0	15.6	4.3	9.2	2.8	1.6	0	5.9
24	1.8	16.4	0	10.4	0	22.8	1.5	11.8	8.5	.8	3.9	20.3
25	10.9	5.9	1.5	2.5	14.6	1.9	10.4	10.5	9.5	3.8	16.0	5.3
26	21.8	1.1	.4	13.9	3.1	0	5.5	4.0	2.9	13.4	1.0	.6
27	4.4	7.9	.6	25.0	.9	1.1	0	11.4	7.9	10.8	.1	13.7
28	1.0	1.3	.1	7.7	4.8	1.3	6.8	4.3	4.0	10.2	3.0	33.8
29	.2		2.0	2.8	9.9	4.1	2.3	8.2	2.0	7.3	.6	6.0
30	12.3		4.9	.6	10.6	3.6	.1	18.8	1.5	2.7	8.1	2.3
31	15.7		22.9		14.0		2.3	1.8		21.5		.6
Sum	251.7	257.9	174.5	173.0	145.1	190.3	156.3	269.9	142.1	261.5	269.7	259.3
	Current Year 1970							Period 1935-1970				
Month	Extreme Gage Feet		Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.	90.94	90.15	19	47.5	† 8	0	8.1	499	1,278	3,360	335	
Feb.	90.78	90.15	16	32.2	† 4	0	9.2	512	1,068	3,170	304	
Mar.	90.90	90.15	21	43.5	† 1	0	5.6	346	1,234	2,920	190	
Apr.	91.04	90.15	10	57.7	† 1	0	5.8	343	1,204	3,170	197	
May	90.83	90.15	17	36.8	† 1	0	4.7	288	1,323	3,040	302	
June	90.99	90.15	24	52.5	† 2	0	6.3	377	1,125	3,660	175	
July	90.87	90.15	9	40.6	† 1	0	5.0	310	1,216	3,590	182	
Aug.	90.90	90.15	22	43.5	† 6	0	8.7	535	1,238	3,960	169	
Sept.	90.95	90.15	5	48.5	† 1	0	4.7	282	1,127	3,170	159	
Oct.	91.00	90.15	14	53.5	† 1	0	8.4	519	1,185	3,280	432	
Nov.	91.05	90.15	20	58.8	† 10	0	9.0	535	1,302	3,570	313	
Dec.	90.98	90.15	9	51.5	† 2	0	8.4	514	1,281	3,080	364	
Yearly	91.05	90.15		58.8		0	7.0	5,060	14,581	38,310	4,448	

† And other days

YUMA MAIN DRAIN (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorders located in the forebay and afterbay, with flow meters in the four discharge pipes at the Boundary Pumping Plant on the Main Drain about 200 feet north of the international boundary near San Luis, Arizona, 1.3 miles east of the Colorado River.

RECORDS: Main Drain discharges are lifted 10 to 12 feet at the pumping plant. Prior to April 1, 1969 discharges were computed from pump ratings and the differential head measured by the two gages. Beginning April 1, 1969 discharges were computed from flow meter charts. Pump ratings and flow meter discharges are checked by current meter measurements. During the year, 14 measurements were made by the United States Section of the Commission. Records obtained and computed by the United States Section of the Commission. Records available: Monthly discharges June 1919 through 1951; daily discharges January 1952 through 1970.

REMARKS: Flows in the Main Drain are principally drainage waters from the Valley Division of the Yuma Project. Both the Main Drain and the East Main Canal Wasteway discharge into Mexico at the international land boundary near San Luis, Sonora. The water is used for irrigation in Mexico on the left (Sonora) bank of the Colorado River and is considered as part of the volumes arriving at the limitrophe section of the river.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	160	160	192	175	181	198	185	175	170	199	193	173
2	165	160	203	176	188	192	165	199	170	194	191	180
3	174	163	186	186	189	198	195	177	177	196	192	191
4	178	163	184	185	198	201	188	198	170	190	191	183
5	168	166	188	187	199	192	195	185	178	191	182	183
6	166	165	177	186	186	212	193	198	178	190	188	185
7	174	170	182	183	183	187	190	178	183	173	192	175
8	175	172	178	185	214	192	175	190	168	196	190	174
9	158	172	173	189	200	207	188	179	174	186	184	178
10	163	174	170	198	198	210	181	171	184	194	177	173
11	160	181	173	199	192	195	192	182	177	189	205	180
12	133	170	174	191	195	161	196	162	183	192	184	182
13	162	171	176	194	202	170	201	177	176	195	182	167
14	163	160	185	184	197	171	200	188	173	197	206	169
15	174	185	178	187	197	176	178	177	181	192	193	174
16	171	181	185	193	202	184	181	187	196	193	183	183
17	163	175	179	192	196	179	184	163	192	191	173	182
18	163	181	171	203	190	194	183	187	185	197	178	178
19	163	164	168	194	178	191	180	172	184	196	167	174
20	162	172	177	197	198	184	185	168	188	199	166	194
21	155	175	183	189	188	196	179	168	191	201	176	184
22	161	188	199	189	204	196	178	178	194	202	174	176
23	165	187	197	190	201	181	192	201	195	197	179	173
24	164	181	189	185	200	189	179	178	196	199	174	162
25	162	172	178	194	200	213	178	170	199	188	186	170
26	166	172	183	200	201	188	188	167	193	186	190	171
27	156	174	182	212	198	181	201	172	188	191	183	187
28	152	190	180	185	200	188	194	183	186	199	187	176
29	158		191	189	207	192	174	197	185	194	192	163
30	157		187	192	188	192	178	169	198	195	180	163
31	160		174		187		173	182		190		158
Sum	5,051	4,844	5,642	5,709	6,057	5,710	5,749	5,578	5,512	5,992	5,538	5,461

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1935-1970 Acre Feet		
	High	Low	Day	High		Low	Feet	Acre Feet	Average	Maximum	Minimum
				Day	Day						
Jan.			4	178	12	133	163	10,019	7,758	11,203	1,740
Feb.			28	190	† 1	160	173	9,608	7,692	11,988	1,640
Mar.			2	203	19	168	182	11,191	8,813	12,430	1,940
Apr.			27	212	1	175	190	11,324	8,573	11,890	1,920
May			8	214	19	178	195	12,014	8,719	13,140	1,950
June			25	213	12	161	190	11,326	8,043	12,040	2,290
July			† 13	201	2	165	185	11,403	7,826	11,830	2,530
Aug			23	201	12	162	180	11,064	7,747	11,960	2,560
Sept.			25	199	8	168	184	10,933	7,781	11,560	2,280
Oct.			22	202	7	173	193	11,885	8,839	12,385	2,940
Nov.			14	206	20	166	185	10,984	8,594	12,010	2,800
Dec.			20	194	31	158	176	10,832	8,307	11,480	2,450
Yearly				214		133	183	132,583	98,692	139,380	27,040

† And other days Ø Mean daily

TOTAL FLOWS CROSSING INTERNATIONAL BOUNDARY INTO MEXICO NEAR SAN LUIS, SONORA

DESCRIPTION: The tabulated data below are the combined flows of the East Main Canal Wasteway and the Yuma Main Drain and represent the total water crossing the international land boundary into the Sánchez Mejorada Canal near San Luis, Arizona. The Mexican Section maintains a water-stage recorder in Mexico on right bank of Sánchez Mejorada Canal and obtains check measurements on a bridge located 0.2 mile downstream from the international boundary, 1.2 miles east of the Colorado River and 0.6 mile west of San Luis, Sonora.

RECORDS: Records obtained and computed by the United States Section of the Commission. Records available: January 1935 through 1970.

REMARKS: Descriptions and flows of the individual stations, East Main Canal Wasteway and the Yuma Main Drain, are published separately in this bulletin on pages 30 and 31.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	168	166	207	179	187	210	186	184	170	202	207	178
2	171	178	213	179	200	196	165	214	175	198	204	183
3	179	176	195	194	189	217	208	183	180	197	206	204
4	188	164	198	191	210	211	191	213	176	199	199	197
5	176	180	204	193	207	201	200	190	187	205	189	185
6	173	173	179	190	191	224	196	202	181	205	201	188
7	177	174	184	196	183	193	193	188	186	196	219	184
8	179	176	181	185	216	196	184	200	168	206	201	181
9	168	190	186	190	200	214	198	189	174	195	189	182
10	171	193	171	202	198	215	184	192	190	199	183	182
11	166	200	174	205	193	209	203	199	180	203	219	180
12	137	180	185	195	197	165	206	179	183	202	199	185
13	173	179	178	195	203	178	208	190	176	204	187	191
14	176	161	189	185	203	180	200	190	180	206	222	180
15	185	192	182	201	198	181	180	177	191	205	202	177
16	186	198	195	202	202	187	185	195	210	198	211	195
17	169	195	180	194	209	180	185	172	202	192	178	189
18	164	185	173	204	199	194	183	200	185	208	180	187
19	168	164	168	202	182	191	190	173	187	201	167	181
20	167	173	179	207	199	186	200	169	193	207	186	198
21	160	176	193	191	189	199	190	169	202	211	180	196
22	181	204	206	189	206	198	180	181	198	203	175	185
23	178	204	200	192	201	197	196	210	198	199	179	179
24	166	197	189	195	200	212	181	190	204	200	178	182
25	173	178	179	197	215	215	188	181	209	192	202	175
26	188	173	183	214	204	188	194	171	196	199	191	172
27	160	182	183	237	199	182	201	183	196	202	183	201
28	153	191	180	193	205	189	201	187	190	209	190	210
29	158	193	192	192	217	196	176	205	187	201	193	169
30	169	192	193	199	199	196	178	188	200	198	188	165
31	176	197	197	201	201	201	175	184	200	212	188	159
Sum	5,303	5,102	5,816	5,882	6,202	5,900	5,905	5,848	5,654	6,254	5,808	5,720
Current Year 1970									Period 1935-1970			
Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			† 4	188	12	137	171	10,518	9,036	12,131	* 2,123	
Feb.			† 22	204	14	161	182	10,120	8,760	12,970	* 2,023	
Mar.			2	213	19	168	188	11,537	10,047	13,704	* 2,322	
Apr.			† 27	237	† 1	179	196	11,667	9,777	12,982	2,117	
May			29	217	19	182	200	12,302	10,042	13,900	2,473	
June			6	224	12	165	197	11,703	9,169	12,570	2,525	
July			† 3	208	2	165	190	11,712	9,041	12,420	2,927	
Aug.			2	214	† 20	169	189	11,599	8,985	12,657	2,989	
Sept.			16	210	† 8	168	188	11,215	8,908	12,450	2,602	
Oct.			31	212	† 17	192	202	12,404	10,025	13,898	3,444	
Nov.			† 14	222	19	167	194	11,519	9,896	12,712	3,407	
Dec.			28	210	31	159	185	11,346	9,588	12,050	2,888	
Yearly				237		137	190	137,642	113,274	149,010	31,840	

Ø Mean daily

† And other days

* Partly estimated

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder located in Mexico on the right bank of the river about 1,000 feet upstream from the southerly international boundary, 2 miles west of San Luis, Arizona, and 19.4 miles downstream from Morelos Dam. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Records obtained and furnished by the United States Section of the Commission. Computations by shifting control methods. Records available: Daily discharges, January 1950 through 1970; continuous record of gage heights, January 1947 through 1970. Monthly flows for this station have been derived for the period January 1935 through December 1949 based on the computed records of monthly flows of the Colorado River at the northerly international boundary combined with the measured monthly flows from the wasteways discharging into the boundary section of the river from the Yuma Project in Arizona.

REMARKS: Reservoirs, diversions in the United States and Mexico, drainage returns, and waste flows modify the river flow at this station.

EXTREMES: Since January 1950: Maximum instantaneous discharge, 28,610 second-feet on December 18, 1952; maximum gage height, 84.84 feet on November 29, 1957. Minimum discharge, no flow on several occasions since September 1, 1956.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	194	270	189	35.3	138	145	64.8	20.0	81.6	224	264	264
2	202	267	251	30.6	140	144	58.8	20.6	90.0	227	259	259
3	192	267	1,140	29.2	145	142	52.9	22.2	95.2	243	252	267
4	187	270	2,460	36.4	152	139	56.4	21.7	91.3	243	250	262
5	184	273	2,380	35.3	145	132	55.2	15.6	100	234	250	262
6	192	270	921	43.0	145	127	57.6	16.2	92.6	231	252	257
7	192	279	340	30.6	144	134	54.0	16.8	95.2	234	252	255
8	187	282	262	27.8	138	138	54.0	16.8	99.1	240	252	250
9	187	285	298	23.4	138	133	56.4	10.2	103	245	257	238
10	189	288	227	21.7	148	134	55.2	7.0	103	250	247	211
11	177	285	200	19.5	148	130	57.6	14.6	106	257	247	185
12	175	307	198	20.0	148	113	57.6	17.3	106	247	247	164
13	177	550	190	27.8	147	92.6	57.6	20.6	99.1	243	245	160
14	179	310	190	20.0	145	79.2	52.9	21.2	99.1	250	252	159
15	182	243	200	18.4	139	84.0	48.5	23.4	108	252	292	154
16	189	252	218	17.3	144	78.0	36.4	17.8	123	247	301	155
17	189	193	167	15.6	148	72.0	28.5	56.6	186	250	262	160
18	204	186	140	14.6	152	73.2	31.3	32.0	194	247	252	154
19	273	180	126	33.2	142	68.4	33.1	19.0	198	247	250	148
20	218	191	115	49.8	134	73.2	35.3	11.8	211	247	250	155
21	232	191	96.5	32.7	136	74.4	29.9	11.8	215	257	267	209
22	252	186	84.0	15.6	142	72.0	27.1	10.7	218	252	279	167
23	255	180	84.0	12.9	144	74.4	27.1	12.4	231	262	274	152
24	258	176	74.4	11.2	147	75.6	31.3	17.3	220	257	252	147
25	276	178	72.0	11.2	154	76.8	26.4	17.3	220	252	252	152
26	270	172	69.6	23.1	154	67.2	22.8	16.8	224	250	257	157
27	264	176	67.2	37.9	145	70.8	20.0	31.3	224	262	259	152
28	258	174	66.0	90.0	140	76.8	23.4	47.4	222	252	264	150
29	252		66.0	107	439	78.0	23.4	50.7	227	245	257	136
30	258		51.8	127	138	74.4	22.8	60.0	220	255	269	134
31	264		40.8		145		16.8	66.0		255		138
Sum	6,708	6,881	10,984.3	1,018.1	4,464	2,972	1,275.1	743.1	4,602.2	7,657	7,763	5,813

Month	Current Year 1970						Period 1935-1970				
	Extreme Gage Feet		Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day			Average	Maximum	Minimum	
Jan.	76.44	75.88	19	294	12	172	216	43,305	424,988	1,672,000	1,821
Feb.	77.17	75.77	13	595	26	170	246	13,648	353,787	1,385,000	2,040
Mar.	80.29	74.64	5	2,690	31	36.4	354	21,787	284,567	1,127,000	1,493
Apr.	75.40	74.24	30	139	24	10.7	33.9	2,019	181,322	700,900	977
May	75.52	75.32	25	164	20	132	144	8,854	249,138	1,160,000	1,045
June	75.44	74.85	1	152	26	64.8	99.1	5,895	191,616	1,180,000	143
July	74.90	74.29	1	72.0	31	15.6	41.1	2,529	139,952	772,800	0
Aug.	74.91	74.07	17	81.6	10	5.5	24.0	1,474	155,842	796,000	0
Sept.	75.90	74.86	23	236	1	74.4	153	9,128	189,227	1,033,000	0
Oct.	76.19	75.86	27	269	1	215	247	15,187	241,737	1,192,000	9,120
Nov.	76.52	76.15	15	312	13	240	259	15,398	318,158	1,428,000	7,180
Dec.	76.45	75.58	1	279	30	133	188	11,530	401,105	1,839,000	2,320
Yearly	80.29	74.07		2,690		5.5	167	120,754	3,131,439	10,688,800	83,792

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	75.94	76.25	75.86	74.63	75.39	75.40	74.84	74.37	74.92	75.90	76.20	76.39
2	75.97	76.24	76.13	74.58	75.40	75.39	74.79	74.38	74.99	75.91	76.18	76.37
3	75.92	76.24	77.97	74.56	75.42	75.38	74.74	74.41	75.03	75.98	76.15	76.40
4	75.90	76.26	79.96	74.64	75.46	75.37	74.77	74.40	75.00	75.98	76.15	76.38
5	75.89	76.27	79.84	74.63	75.42	75.32	74.76	74.29	75.06	75.94	76.17	76.38
6	75.92	76.26	77.63	74.70	75.42	75.30	74.78	74.30	75.00	75.92	76.20	76.36
7	75.92	76.29	76.35	74.58	75.41	75.35	74.75	74.31	75.02	75.93	76.22	76.35
8	75.90	76.30	76.07	74.54	75.37	75.37	74.75	74.31	75.05	75.96	76.24	76.33
9	75.91	76.31	76.21	74.47	75.37	75.34	74.77	74.19	75.08	75.98	76.28	76.28
10	75.93	76.32	75.92	74.44	75.44	75.35	74.76	74.13	75.08	76.01	76.25	76.14
11	75.90	76.31	75.80	74.40	75.43	75.32	74.78	74.26	75.10	76.04	76.26	75.99
12	75.90	76.32	75.79	74.41	75.43	75.21	74.78	74.30	75.10	76.00	76.27	75.85
13	75.93	77.05	75.75	74.54	75.42	75.06	74.78	74.35	75.05	75.98	76.26	75.83
14	75.94	76.33	75.75	74.41	75.41	74.96	74.74	74.35	75.05	76.01	76.29	75.82
15	75.95	76.10	75.80	74.38	75.37	75.00	*74.70	74.39	75.12	76.02	76.45	75.79
16	75.99	76.13	75.88	74.36	75.40	74.95	^u 74.58	74.28	75.24	76.00	76.48	75.80
17	76.00	75.88	75.63	74.33	75.43	74.91	*74.48	74.68	75.63	76.01	76.33	75.83
18	76.08	75.85	75.47	74.31	75.45	74.92	74.52	74.47	75.67	76.00	76.30	75.79
19	76.37	75.82	75.37	74.55	75.39	74.88	74.54	74.26	75.70	76.00	76.30	75.76
20	76.16	75.87	75.29	74.73	75.34	74.92	74.56	74.13	75.76	76.01	76.31	75.80
21	76.21	75.87	75.15	74.55	75.35	74.93	74.50	74.13	75.79	76.06	76.38	76.08
22	76.28	75.85	75.05	74.33	75.39	74.91	74.46	74.11	75.80	76.05	76.43	75.87
23	76.29	75.82	75.05	74.28	75.40	74.93	74.46	74.14	75.87	76.10	76.42	75.77
24	76.27	75.80	74.97	74.25	75.42	74.94	74.52	74.23	75.82	76.09	76.34	75.73
25	76.31	75.81	74.95	74.25	75.46	74.95	74.46	74.23	75.83	76.08	76.34	75.75
26	76.27	75.78	74.93	74.43	75.46	74.87	74.41	74.22	75.86	76.08	76.36	75.77
27	76.24	75.80	74.91	74.61	75.40	74.90	74.37	74.46	75.86	76.14	76.37	75.73
28	76.21	75.79	74.90	75.07	75.37	74.95	74.43	74.61	75.86	76.11	76.39	75.71
29	76.19		74.90	75.19	75.36	74.96	74.43	74.65	75.89	76.09	76.36	75.61
30	76.21		74.78	75.32	75.35	74.93	74.42	74.74	75.87	76.16	76.41	75.59
31	76.23		74.68		75.40		74.31	74.79		76.16		75.60
Avg.	76.07	76.10	75.89	74.55	75.40	75.10	74.61	74.35	75.40	76.02	76.30	75.96

^u Estimated * Partly estimated

WASTEWAY TO COLORADO RIVER AT KILOMETER 27 IN MEXICO

DESCRIPTION: Water-stage recorder and cableway located on the left bank of the canal wasteway immediately upstream from where it discharges into the Colorado River, 0.6 mile downstream from the wasteway gates on Canal de Conexión, 16.8 miles downstream from Morelos Dam, and 0.2 mile south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District of the Ministry of Hydraulic Resources and furnished by the Mexican Section of the Commission. Records shown in table below are waste returns to the Colorado River. Records available: April 1956 through 1970.

REMARKS: The Colorado River Irrigation District transports water for irrigation of land on the left bank of the Colorado River by the Canal de Conexión to a point called Kilometer 27. At this point, flows may be returned to the river through the wasteway or diverted to the Bacanora-Monumentos Canal system through the Sánchez Mejorada Siphon, which was placed in operation on June 28, 1963.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum	0	0	0	0	0	0	0	0	0	0	0	0
Current Year 1970								Period 1956 - 1970				
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum	
Jan.			0		0		0	6,700	69,527	0		
Feb.			0		0		0	1,347	8,679	0		
Mar.			0		0		0	7,797	35,492	0		
Apr.			0		0		0	17,644	68,714	0		
May			0		0		0	7,613	22,072	0		
June			0		0		0	12,157	28,915	0		
July			0		0		0	19,071	46,139	0		
Aug.			0		0		0	20,606	55,497	0		
Sept.			0		0		0	12,432	37,194	0		
Oct.			0		0		0	4,500	20,512	0		
Nov.			0		0		0	10,564	69,415	0		
Dec.			0		0		0	6,704	70,213	0		
Yearly			0		0		0	120,133	346,339	0		

WASTEWAY TO COLORADO RIVER AT COLONIA ELIAS IN MEXICO

DESCRIPTION: Wasteway structure located at Kilometer 7+570 of the Barrote Canal on the right bank of the Colorado River in Colonia Elias about 20.5 miles downstream from the southerly international boundary and the town of San Luis Río Colorado, Sonora; about 10 miles upstream from the Sonora-Baja California railroad bridge and 4.3 miles upstream from the Miguel C. Rodriguez Gaging Station. The wasteway gates are located about 2,500 feet from the right bank of the Colorado River.

RECORDS: Data obtained by the Ministry of Hydraulic Resources and furnished by the Mexican Section of the Commission are based on gate openings. Records available: January 1957 through 1970.

REMARKS: The wasteway structure has 3 manually operated rectangular gates which discharge directly from the Barrote Canal into a wasteway leading to the Colorado River.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum	0	0	0	0	0	0	0	0	0	0	0	0
Current Year 1970									Period 1957 - 1970			
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.				0		0	0	0	563	3,201	0	
Feb.				0		0	0	0	371	4,097	0	
Mar.				0		0	0	0	593	6,850	0	
Apr.				0		0	0	0	458	3,707	0	
May				0		0	0	0	105	1,163	0	
June				0		0	0	0	54.2	625	0	
July				0		0	0	0	306	4,296	0	
Aug.				0		0	0	0	295	1,845	0	
Sept.				0		0	0	0	356	1,548	0	
Oct.				0		0	0	0	106	791	0	
Nov.				0		0	0	0	255	1,891	0	
Dec.				0		0	0	0	315	3,047	0	
Yearly				0		0	0	0	3,778	13,429	0	

COLORADO RIVER AT MIGUEL C. RODRIGUEZ IN MEXICO - DISCHARGES

DESCRIPTION: Water-stage recorder and cableway located in Mexico on the left bank of the Colorado River about 24.5 miles downstream from the southerly international boundary, 44.5 miles downstream from Morelos Dam, and 4.5 miles upstream from the Sonora-Baja California railroad bridge. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 55 current meter measurements made during the year and a continuous record of gage heights. Data obtained and furnished by the Mexican Section of the Commission. From June 1951 to July 1954, discharges were computed from gage height records based on daily gage readings at 8:00 a.m., Pacific Standard Time. A continuous record of gage heights obtained since July 21, 1954. Records available: June 1951 through 1970.

REMARKS: Diversions and return flows modify the flow of the river at this station. On many occasions the flow at this station consists solely of seepage from canals which run parallel and adjacent to the river at a higher elevation.

EXTREMES: Since January 1, 1952: Maximum mean daily gage height, 53.28 feet on January 4, 1958 with a discharge of 18,500 second-feet; minimum mean daily gage height, 37.73 feet on July 18, 1970 with a discharge of 2.8 second-feet; maximum mean daily discharge, 20,200 second-feet on December 19, 1952 with a gage height of 52.30 feet; minimum mean daily discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	106	150	101	12.7	13.1	28.3	8.8	8.8	6.4	6.4	128	135
2	106	153	113	12.7	14.1	31.8	9.9	8.8	6.4	8.8	135	138
3	106	153	142	12.0	14.1	31.8	8.8	8.8	6.4	14.8	142	138
4	101	153	381	12.7	13.1	31.8	8.8	8.8	6.4	26.1	142	138
5	96.8	155	1,271	12.7	14.1	30.0	14.1	8.8	6.4	40.3	128	138
6	92.5	155	1,462	10.9	13.1	24.7	13.1	8.8	7.1	45.9	119	138
7	90.8	153	759	10.2	13.1	19.8	7.4	8.8	7.8	48.4	117	138
8	92.5	153	388	10.9	13.1	19.8	5.7	8.8	7.8	50.1	117	136
9	89.0	155	256	12.0	13.1	21.2	5.3	8.8	7.8	53.0	117	131
10	89.0	159	239	12.0	13.1	21.2	5.3	8.8	7.8	58.3	121	124
11	87.6	162	199	12.0	13.1	22.6	5.3	9.9	7.8	63.9	126	113
12	84.0	162	159	12.0	12.4	22.6	5.3	9.9	7.8	68.9	128	99.6
13	80.9	155	142	12.0	11.3	22.6	4.6	8.8	7.8	71.0	130	85.5
14	80.9	234	132	10.9	11.3	14.8	3.5	9.9	6.4	71.0	130	73.1
15	80.9	208	126	12.0	13.1	11.3	3.5	9.9	6.4	72.0	130	69.6
16	80.9	150	126	12.0	15.2	11.3	3.5	9.9	7.8	73.8	151	67.5
17	82.6	138	132	12.0	15.2	9.9	4.2	9.9	7.8	74.9	157	67.5
18	82.6	120	107	12.0	16.2	9.9	2.8	8.8	8.8	75.9	163	67.5
19	85.8	102	78.4	12.0	18.4	9.9	2.8	8.8	8.8	79.8	121	66.4
20	110	100	65.7	10.2	19.4	8.8	5.3	8.8	8.8	81.9	126	63.9
21	108	98.2	56.2	9.2	17.3	8.1	7.4	8.8	8.8	84.4	130	63.9
22	108	96.1	43.1	9.2	18.4	7.4	7.4	8.8	8.8	87.6	135	76.6
23	118	93.9	30.7	10.2	20.8	7.4	8.8	8.8	8.8	90.1	139	74.2
24	124	93.9	24.0	10.2	21.9	7.4	8.8	8.8	8.8	93.6	142	65.0
25	127	91.8	19.8	10.2	23.3	7.4	8.8	8.8	8.8	99.6	145	60.7
26	139	89.7	15.5	9.2	25.8	8.1	8.8	8.1	8.8	103	139	59.3
27	143	89.7	13.4	10.2	31.1	8.8	8.8	9.9	8.8	101	139	61.8
28	143	89.7	12.7	12.0	31.1	8.8	8.8	8.8	6.4	101	137	59.3
29	139	12.7	12.0	25.8	7.4	8.8	8.1	5.3	103	137	58.3	
30	135	11.3	12.0	24.4	6.7	8.8	9.9	5.3	105	132	55.1	
31	139	9.9	23.3	8.8	8.8	8.8	8.8	106				52.3
Sum		3,814.3		340.8		481.7		280.8		2,159.1		2,812.8
	3,250.0		6,631.4		542.4		222.1		225.3		4,004.3	

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1951-1970		
	High	Low	Day	High		Day			Average	Maximum	Minimum
Jan.	40.29	39.44	† 26	143	† 13	79.5	105	6,446	253,451	1,047,732	426
Feb.	41.34	39.50	14	268	† 27	89.7	136	7,566	159,580	696,461	317
Mar.	46.26	38.19	6	1,642	30	9.9	214	13,153	112,343	807,342	0
Apr.	38.25	38.09	† 1	13.4	† 20	9.2	11.3	676	73,737	588,983	0
May	38.65	38.12	† 27	30.7	† 12	11.3	17.7	1,076	102,699	732,815	0
June	38.55	37.96	† 2	31.8	29	6.7	15.9	955	44,530	555,460	0
July	38.19	37.73	5	15.5	† 18	2.8	7.1	440	23,942	264,561	0
Aug.	38.06	37.99	† 11	9.9	26	8.1	9.2	557	35,508	309,320	0
Sept.	38.09	37.93	† 18	8.8	† 30	4.6	7.4	447	55,506	572,551	0
Oct.	41.11	37.99	31	107	1	6.4	69.6	4,282	91,350	769,939	2,459
Nov.	41.60	40.98	18	163	† 9	115	133	7,943	152,006	909,399	6,067
Dec.	41.31	39.21	† 6	139	31	52.3	90.8	5,579	205,299	1,060,767	687
Yearly	46.26	37.73		1,642		2.8	68.2	49,119	1,273,673	7,923,600	34,412

† And other days

COLORADO RIVER AT MIGUEL C. RODRIGUEZ IN MEXICO - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	39.90	40.29	39.50	38.22	38.19	38.48	38.02	38.02	37.99	37.99	41.17	41.21
2	39.90	40.32	39.67	38.22	38.22	38.55	38.06	38.02	37.99	38.09	41.27	41.27
3	39.90	40.32	39.96	38.19	38.22	38.55	38.02	38.02	37.99	38.29	41.37	41.27
4	39.83	40.32	41.86	38.22	38.19	38.55	38.02	38.02	37.99	38.58	41.37	41.27
5	39.76	40.35	45.60	38.22	38.22	38.52	38.16	38.02	37.99	38.98	41.17	41.27
6	39.70	40.35	45.96	38.16	38.19	38.42	38.12	38.02	37.99	39.17	41.04	41.27
7	39.67	40.32	43.96	38.12	38.19	38.32	37.96	38.02	38.02	39.27	41.01	41.27
8	39.70	40.32	41.93	38.16	38.19	38.32	37.89	38.02	38.06	39.34	41.01	41.24
9	39.63	40.35	40.94	38.19	38.19	38.35	37.86	38.02	38.06	39.44	41.01	41.14
10	39.63	40.39	40.81	38.19	38.19	38.35	37.86	38.02	38.06	39.63	41.08	41.01
11	39.60	40.42	40.49	38.19	38.19	38.39	37.86	38.06	38.06	39.83	41.14	40.78
12	39.53	40.42	40.12	38.19	38.16	38.39	37.86	38.06	38.06	39.99	41.17	40.49
13	39.47	40.35	39.96	38.19	38.12	38.39	37.83	38.02	38.06	40.06	41.21	40.16
14	39.47	41.08	39.86	38.16	38.12	38.22	37.76	38.06	37.99	40.06	41.21	39.83
15	39.47	40.85	39.80	38.19	38.19	38.12	37.76	38.06	37.99	40.09	41.21	39.73
16	39.47	40.29	39.80	38.19	38.25	38.12	37.76	38.06	38.06	40.16	41.47	39.67
17	39.50	40.16	39.86	38.19	38.25	38.09	37.80	38.06	38.06	40.19	41.54	39.67
18	39.50	39.93	39.60	38.19	38.29	38.09	37.73	38.02	38.09	40.22	41.60	39.67
19	39.57	39.70	39.30	38.19	38.35	38.09	37.73	38.02	38.09	40.35	41.08	39.63
20	39.96	39.67	39.17	38.12	38.39	38.06	37.86	38.02	38.09	40.42	41.14	39.57
21	39.93	39.63	39.07	38.09	38.32	38.02	37.96	38.02	38.09	40.49	41.21	39.57
22	39.93	39.60	38.91	38.09	38.35	37.99	37.96	38.02	38.09	40.58	41.01	39.93
23	40.06	39.57	38.75	38.12	38.42	37.99	38.02	38.02	38.09	40.65	41.34	39.86
24	40.12	39.57	38.62	38.12	38.45	37.99	38.02	38.02	38.09	40.75	41.37	39.60
25	40.16	39.53	38.52	38.12	38.48	37.99	38.02	38.02	38.09	40.91	41.40	39.47
26	40.26	39.50	38.42	38.09	38.55	38.02	38.02	37.99	38.09	41.01	41.34	39.44
27	40.29	39.50	38.35	38.12	38.62	38.06	38.02	38.06	38.09	40.94	41.34	39.50
28	40.29	39.50	38.32	38.19	38.62	38.06	38.02	38.02	37.99	40.94	41.31	39.44
29	40.26		38.32	38.19	38.55	37.99	38.02	37.99	37.96	41.01	41.31	39.40
30	40.22		38.25	38.19	38.52	37.96	38.02	38.06	37.96	41.04	41.24	39.30
31	40.26		38.19		38.48		38.02	38.02	41.08			39.21
Avg.	39.83	40.09	40.06	38.16	38.32	38.22	37.93	38.02	38.06	39.99	41.24	40.19

WASTEWAY TO COLORADO RIVER AT UNION IN MEXICO

DESCRIPTION: Wasteway structure located at Kilometer 21+736 of the Barrote Canal in the Colonia Hidalgo about 1,500 feet from right bank of the Colorado River. The wasteway discharges into the Colorado River at a point about 0.6 mile upstream from the Sonora-Baja California railroad bridge and 30 miles downstream from the southerly international boundary.

RECORDS: Data obtained by the Ministry of Hydraulic Resources and furnished by the Mexican Section of the Commission are based on gate openings. Records available: January 1957 through 1970.

REMARKS: The wasteway structure has 3 manually operated rectangular gates which discharge from the Barrote Canal into a wasteway leading to the Colorado River.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum	0	0	0	0	0	0	0	0	0	0	0	0
Month	Current Year 1970								Period 1957-1970			
	Extreme Gate Feet		Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.				0		0	0	852	3,166	0		
Feb.				0		0	0	463	2,788	0		
Mar.				0		0	0	1,152	7,074	0		
Apr.				0		0	0	839	4,462	0		
May				0		0	0	1,037	4,413	0		
June				0		0	0	216	1,505	0		
July				0		0	0	469	4,296	0		
Aug.				0		0	0	251	1,857	0		
Sept.				0		0	0	353	1,800	0		
Oct.				0		0	0	768	6,997	0		
Nov.				0		0	0	246	3,413	0		
Dec.				0		0	0	286	1,205	0		
Yearly				0		0	0	6,931	24,526	0		

COLORADO RIVER AT EL MARITIMO IN MEXICO - STAGES

DESCRIPTION: Water-stage recorder and cableway in Mexico, 47.6 miles downstream from the southerly international boundary, 18.6 miles downstream from the Sonora-Baja California railroad bridge and 3.7 miles east of Kilometer 70 of the Mexicali-San Felipe highway. The recorder is located on the right bank of the Colorado River. Zero of gage is 9.84 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records obtained and computed by the Mexican Section of the Commission. Records available: Mean daily discharges from January 1960 through 1968. Incomplete record of gage heights, March 1, 1946 through November 1947; twice daily readings of gage heights, January 1, 1948 through December 1949; continuous record of gage heights since installation of water-stage recorder February 8, 1956. Mean daily gage heights, January 1960 through 1970.

REMARKS: In former years the flow past this station was affected by the tides in the Gulf of California. After July 1968, measurement by current meter was suspended; beginning in 1969, twice daily readings of gage heights and no record of mean daily discharges.

EXTREMES: January 1960 through 1968: Maximum daily discharge, 4,410 second-feet, January 21 and December 7 and 8, 1960; minimum discharge, no flow on various occasions. Maximum monthly discharge, 225,224 acre-feet, January 1960; minimum monthly discharge, zero during various months of several years. Annual maximum discharge, 503,260 acre-feet during 1960; minimum 59,335 acre-feet in 1968. January 1960 through 1970: Maximum instantaneous gage height, 18.73 feet on January 21, 1960; minimum gage height, 12.47 feet on August 31 and September 1, 1960.

Mean Daily Gage Height in Feet 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.90	14.96	15.19	15.39	15.35	15.03	14.70	14.50	14.47	13.91	14.11	14.80
2	14.90	14.96	15.22	15.39	15.32	15.03	14.70	14.50	14.47	13.91	14.11	14.80
3	14.90	14.96	15.22	15.39	15.32	15.03	14.70	14.50	14.44	13.91	14.11	14.83
4	14.90	14.99	15.26	15.35	15.35	15.03	14.67	14.50	14.44	13.91	14.11	14.83
5	14.90	14.99	15.26	15.35	15.35	15.03	14.63	14.50	14.37	13.91	14.14	14.83
6	14.86	15.03	15.52	15.39	15.35	15.03	14.63	14.50	14.37	13.91	14.17	14.83
7	14.86	15.03	15.81	15.39	15.32	15.03	14.60	14.50	14.30	13.91	14.17	14.83
8	14.86	15.03	15.94	15.42	15.32	15.03	14.57	14.50	14.24	13.91	14.21	14.73
9	14.90	15.06	15.85	15.42	15.32	14.99	14.57	14.50	14.17	13.91	14.21	14.73
10	14.93	15.09	15.72	15.39	15.32	14.96	14.57	14.50	14.17	13.91	14.24	14.73
11	14.93	15.09	15.65	15.39	15.32	14.96	14.53	14.53	14.14	13.91	14.24	14.73
12	14.93	15.12	15.65	15.35	15.32	14.93	14.50	14.53	14.14	13.91	14.27	14.73
13	14.90	15.12	15.62	15.35	15.29	14.90	14.47	14.53	14.11	13.91	14.30	14.73
14	14.90	15.12	15.58	15.32	15.22	14.90	14.47	14.53	14.07	13.91	14.30	14.73
15	14.90	15.16	15.55	15.32	15.22	14.90	14.44	14.53	14.07	13.91	14.30	14.73
16	14.90	15.16	15.55	15.35	15.22	14.90	14.73	14.53	14.07	13.91	14.34	14.73
17	14.93	15.16	15.58	15.35	15.26	14.90	14.70	14.53	14.07	13.91	14.37	14.73
18	14.93	15.16	15.55	15.35	15.26	14.90	14.70	14.53	14.04	13.91	14.37	14.73
19	14.93	15.09	15.52	15.39	15.26	14.86	14.70	14.57	14.04	13.94	14.44	14.73
20	14.93	15.12	15.52	15.35	15.26	14.83	14.70	14.57	14.01	13.94	14.44	14.70
21	14.96	15.16	15.52	15.32	15.26	14.83	14.70	14.57	14.01	13.94	14.44	14.73
22	14.96	15.16	15.52	15.32	15.22	14.83	14.70	14.57	13.98	13.98	14.47	14.76
23	14.96	15.12	15.52	15.32	15.22	14.80	14.70	14.57	13.98	13.98	14.50	14.73
24	14.96	15.16	15.52	15.32	15.22	14.80	14.70	14.57	13.94	14.01	14.50	14.73
25	14.99	15.16	15.52	15.35	15.19	14.76	14.70	14.57	13.94	14.01	14.50	14.73
26	14.99	15.12	15.52	15.39	15.19	14.76	14.70	14.57	13.91	14.01	14.57	14.76
27	14.99	15.16	15.45	15.39	15.19	14.73	14.70	14.57	13.91	14.01	14.57	14.76
28	15.03	15.19	15.49	15.35	15.16	14.70	14.67	14.57	13.91	14.04	14.60	14.76
29	14.96		15.49	15.35	15.16	14.70	14.63	14.53	13.91	14.04	14.63	14.76
30	14.96		15.45	15.35	15.16	14.70	14.63	14.53	13.91	14.07	14.63	14.76
31	14.96		15.42		15.12		14.63	14.50		14.11		14.76
Avg.	14.93	15.09	15.52	15.35	15.26	14.90	14.63	14.53	14.11	13.94	14.34	14.76

STORED WATER IN LARGE RESERVOIRS OF THE COLORADO RIVER

Data are presented below for all large storage reservoirs in the Colorado River basin below Lee's Ferry, all of which are located in the United States. The monthly figures represent usable contents on the last day of the month, in thousands of acre-feet. The capacities indicated are usable capacities at the top of the spillway gates in closed position, for those dams having controlled spillways; for all others, capacities indicated are at spillway level. Records furnished by the U. S. Geological Survey.

In Thousands of Acre-Feet

Month	LAKE MEAD (Capacity 26, 159.0)		LAKE MOHAVE (Capacity 1, 810.0)		HAVASU LAKE (Capacity 619.4)		TOTAL IN UNITED STATES RESERVOIRS (Capacity 28, 588.4)	
	1970	Average 1935-1970	1970	Average 1951-1970	1970	Average 1939-1970	1970	Estimated Average
Jan.	16, 890.0	16, 455.4	1, 649.0	1, 654.2	546.3	556.3	19, 085.3	18, 665.9
Feb.	16, 853.0	16, 144.9	1, 616.0	1, 674.0	538.6	560.1	19, 007.6	18, 379.1
Mar.	16, 597.0	15, 849.0	1, 610.0	1, 675.3	546.3	574.5	18, 753.3	18, 098.7
Apr.	16, 568.0	16, 021.0	1, 612.0	1, 693.3	594.6	604.0	18, 774.6	18, 318.3
May	16, 576.0	17, 153.3	1, 732.0	1, 741.5	616.4	601.9	18, 924.4	19, 496.7
June	16, 560.0	18, 713.6	1, 666.0	1, 621.5	612.6	605.3	18, 838.6	20, 940.4
July	16, 538.0	18, 928.1	1, 566.0	1, 489.6	604.8	593.5	18, 708.8	21, 011.2
Aug.	16, 628.0	18, 648.5	1, 504.0	1, 408.0	581.9	576.1	18, 713.9	20, 632.6
Sept.	16, 769.0	18, 286.2	1, 376.0	1, 398.4	556.7	571.0	18, 701.7	20, 245.6
Oct.	16, 677.0	17, 961.3	1, 401.0	1, 417.6	555.8	575.3	18, 633.8	19, 954.3
Nov.	16, 675.0	17, 665.1	1, 450.0	1, 503.1	560.7	563.7	18, 685.7	19, 731.9
Dec.	16, 811.0	17, 318.9	1, 523.0	1, 608.1	546.3	558.7	18, 880.3	19, 485.7
Avg.	16, 678.5	17, 428.8	1, 558.8	1, 573.7	571.8	578.4	18, 809.3	19, 580.0
Max.	16, 890.0	27, 780.0	1, 732.0	1, 741.5	616.4	688.7	19, 085.3	28, 235.0
Min.	16, 538.0	* 10, 727.0	1, 376.0	1, 398.4	538.6	76.9	18, 636	13, 062.6

* Minimum since 1940

SUSPENDED SILT

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

A. By lowering a D-43 depth integrating sampler at verticals located at centers of sections of equal discharge in the river cross section, being careful to approach but not strike the bottom. The samples obtained in the section are combined to comprise a composite sample for that date.

B. By lowering a D-43 depth integrating sampler at verticals located at centers of each span of the service bridge across the Alamo Canal, being careful to approach but not strike the bottom. The samples obtained in the section are combined to comprise a composite sample for that date.

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. The gravimetric percentage in each sample is determined, a coefficient of 1.10 is applied to the average of the three, and the product applied to the volume of the stream flow represented by that set of samples.

For ease of comparison, the assumption is made that 1,847 tons of deposited silt would occupy a volume of one acre-foot, or one cubic foot of deposited silt would weigh 85 pounds.

Month	1970						Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum

Colorado River at Northerly International Boundary

Period 1956-1970

Jan.	137,653,000	7,400	4	0.0054	0.0082	0.0016	4.0	38.1	336	1.6
Feb.	108,299,000	7,800	4	0.0072	0.0149	0.0015	4.2	17.1	116	1.6
Mar.	273,166,000	40,400	6	0.0148	0.0224	0.0051	21.9	54.8	499	8.8
Apr.	273,355,000	25,600	5	0.0093	0.0138	0.0038	13.9	50.5	434	9.4
May	100,139,000	7,800	4	0.0078	0.0272	0.0045	4.2	18.7	201	2.7
June	138,982,000	9,000	4	0.0065	0.0083	0.0051	4.9	18.1	92.6	5.0
July	210,467,000	14,100	5	0.0067	0.0082	0.0052	7.6	25.1	89.3	7.4
Aug.	210,009,000	14,900	5	0.0071	0.0356	0.0050	8.1	23.6	103	6.2
Sept.	73,184,000	4,300	5	0.0059	0.0153	0.0029	2.3	10.6	43.6	2.8
Oct.	58,377,000	2,100	4	0.0036	0.0044	0.0027	1.1	4.9	20.0	.8
Nov.	57,418,000	1,400	4	0.0024	0.0027	0.0024	.8	13.8	89.9	1.0
Dec.	142,949,000	5,900	5	0.0041	0.0066	0.0026	3.2	26.5	174	.6
Yearly	1,783,998,000	140,700	55	0.0056	0.0356	0.0015	76.2	301.8	2,198	64.6

Samples by U. S. Section, and Analyses by United States Bureau of Reclamation, Method A

Intake Canal at Morelos Diversion Structure

Period 1952-1970

Jan.	137,326,000	10,464	5	0.0076	0.0084	0.0061	5.7	5.9	22.3	0.2
Feb.	106,164,000	9,329	4	0.0088	0.0330	0.0053	5.1	6.1	19.4	.9
Mar.	249,899,000	61,206	6	0.0245	0.0583	0.0130	33.1	49.6	154	11.1
Apr.	272,652,000	37,175	4	0.0136	0.0282	0.0031	20.1	44.9	121	13.2
May	99,963,000	2,920	5	0.0029	0.0048	0.0018	1.6	12.3	51.2	1.6
June	138,688,000	12,056	5	0.0087	0.0138	0.0028	6.5	35.3	109	4.7
July	210,042,000	15,361	5	0.0073	0.0082	0.0068	8.3	51.3	156	8.3
Aug.	209,289,000	15,785	4	0.0075	0.0080	0.0070	8.5	47.1	135	7.6
Sept.	72,925,000	3,495	4	0.0048	0.0077	0.0014	1.9	19.3	64.7	1.9
Oct.	58,096,000	3,169	5	0.0055	0.0071	0.0033	1.7	4.4	12.0	.3
Nov.	57,105,000	1,956	4	0.0034	0.0043	0.0024	1.1	2.3	9.3	.2
Dec.	142,698,000	4,711	5	0.0033	0.0056	0.0018	2.6	4.8	14.8	1.1
Yearly	1,754,847,000	177,627	56	0.0101	0.0583	0.0014	96.1	283.3	696	68.6

Samples and Analyses by Mexican Section, Method B

SUSPENDED SILT

Month	1970						Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum

Colorado River at Southerly International Boundary

Period 1946-1970

Jan.	18,081,000	3,000	2	0.0166	0.0184	0.0156	1.6			
Feb.	18,548,000	2,300	4	.0124	.0173	.0020	1.2			
Mar.	29,609,000	2,200	6	.0074	.0149	.0010	1.2			
Apr.	2,744,000	300	5	.0109	.0271	0	.2			
May	12,033,000	400	4	.0033	.0031	0	.2			
June	8,011,000	300	4	.0037	.0061	.0020	.2			
July	3,437,000	200	5	.0058	.0067	.0042	.1			
Aug.	2,003,000	90	4	.0045	.0062	.0031	0			
Sept.	12,405,000	600	3	.0048	.0061	.0040	.3			
Oct.	20,639,000	2,000	5	.0097	.0130	.0038	1.1			
Nov.	20,926,000	900	4	.0043	.0065	.0020	.5			
Dec.	15,669,000	200	5	.0013	.0021	.0010	.1			
Yearly	164,105,000	12,490	51	0.0076	0.0184	0	6.7			

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

Colorado River at Miguel C. Rodriguez Gaging Station

Period 1960-1970

Jan.	8,764,000	960	4	0.0110	0.0126	0.0090	0.5	25.6	25.1	0
Feb.	10,286,000	1,089	4	0.0106	0.0141	0.0044	.6	13.9	13.9	0
Mar.	17,883,000	1,351	8	0.0076	0.0115	0.0020	.7	.6	4.1	0
Apr.	919,000	26	4	0.0029	0.0061	0.0010		.2	1.1	0
May	1,462,000	48	4	0.0033	0.0057	0.0011		.4	1.5	0
June	1,298,000	67	5	0.0052	0.0061	0.0040			.08	0
July	598,000	41	4	0.0070	0.0081	0.0043			.2	0
Aug.	757,000	52	5	0.0070	0.0090	0.0050		.08	.2	0
Sept.	607,000	38	3	0.0064	0.0089	0.0017		.5	4.5	0
Oct.	5,822,000	679	4	0.0117	0.0194	0.0010	.4	2.7	20.8	.08
Nov.	10,799,000	418	5	0.0039	0.0075	0.0020	.2	4.5	36.0	.2
Dec.	7,586,000	249	4	0.0033	0.0057	0.0011	.2	4.3	13.0	0
Yearly	66,786,000	5,023	54	0.0075	0.0194	0.0010	2.6	42.7	288.9	2.4

Samples and Analyses by Mexican Section, Method C

CHEMICAL ANALYSES OF WATER SAMPLES

1970

The tables below are based on chemical analyses of weekly samples from the Colorado River at the Northerly International Boundary taken by the United States Section of the Commission and analyzed by the U. S. Geological Survey. Samples from the Intake Canal at Morelos Diversion Structure were taken by the Mexican Section of the Commission and analyzed by the Ministry of Hydraulic Resources.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20.04; Mg, 12.16; Na, 22.99; (CO₃ plus HCO₃) expressed as CO₃, 30.00; SO₄, 48.03; Cl, 35.45; NO₃, 62.00. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as ECx10⁶ at 25°C, is a relative measure of the total salt concentration.

Month	No. of Samples	Dissolved Solids		ECx10 ⁶ @25°C	Boron p. p. m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter						
		Tons Per Acre-Foot	Total Tons						Ca	Mg	Na	CO ₃ + HCO ₃	SO ₄	Cl	NO ₃

Colorado River at Northerly International Boundary

Jan.	4	1.58	160,000	1,900		8.1	51	38	5.76	3.74	9.98	3.33	8.79	7.36	
Feb.	4	1.47	117,000	1,790		8.1	50	34	5.63	3.44	9.08	3.46	8.56	6.12	
Mar.	5	1.43	287,000	1,710		8.1	49	40	5.51	3.40	8.40	3.25	8.28	5.78	
Apr.	4	1.52	305,000	1,880		8.2	50	37	5.76	3.58	9.49	3.24	8.68	6.92	
May	4	1.55	114,000	1,870		8.1	49	34	5.91	3.62	9.22	3.46	8.99	6.30	
June	5	1.63	167,000	1,970		8.1	51	36	5.82	3.80	10.20	3.46	9.16	7.21	
July	4	1.67	259,000	2,040		8.1	53	38	5.83	3.82	10.87	3.37	9.27	7.86	
Aug.	5	1.56	241,000	1,960		8.1	52	37	5.89	3.47	10.32	3.38	9.07	7.23	
Sept.	4	1.54	83,000	1,870		8.2	51	34	5.82	3.41	9.65	3.50	8.97	6.39	
Oct.	4	1.47	63,000	1,750		8.1	50	32	5.72	3.16	8.90	3.50	8.58	5.70	
Nov.	5	1.56	66,000	1,840		8.1	51	34	5.90	3.30	9.54	3.62	8.72	6.40	
Dec.	4	1.64	172,000	2,030		8.1	53	37	5.95	3.64	10.80	3.51	9.33	7.55	
Mean @	Ø52	1.55	Ø2,034,000	1,883		8.1	51	36	5.79	3.53	9.73	3.43	8.87	6.75	
Period Avg.		1.75	2,631,000	2,129		7.9			6.26	3.92	11.14	3.30	8.62	9.41	
Tons of Constituents 1970									207,000	76,600	399,000	184,000	760,000	428,000	
Avg. Tons Period 1962-1970									255,000	97,200	524,000	200,000	839,000	690,000	

Intake Canal at Morelos Diversion Structure

Jan.	31	1.70	172,098	1,940	1.253	7.9	49		5.66	3.93	9.35	3.52	7.93	7.50	
Feb.	28	1.59	124,154	1,811	1.169	8.0	48		5.38	3.81	8.46	3.47	7.75	6.44	
Mar.	31	1.58	289,042	1,799	1.157	8.0	48		5.34	3.81	8.54	3.32	7.72	6.65	
Apr.	30	1.69	337,348	1,922	1.237	8.0	50		5.59	4.01	9.45	3.39	8.05	7.63	
May	31	1.66	121,726	1,873	1,218	8.0	48		5.67	3.92	9.01	3.52	8.15	6.93	
June	30	1.75	178,508	1,975	1,287	8.0	50		5.79	4.00	9.80	3.59	8.23	7.77	
July	31	1.81	279,918	2,074	1,333	8.0	51		5.90	4.12	10.53	3.48	8.37	8.70	
Aug.	31	1.71	263,404	1,956	1,259	8.0	51		5.48	4.08	9.80	3.45	8.10	7.87	
Sept.	30	1.62	86,896	1,817	1,192	8.1	48		5.46	3.89	8.56	3.48	7.87	6.47	
Oct.	31	1.51	64,391	1,715	1,108	8.1	46		5.25	3.81	7.79	3.43	7.52	5.90	
Nov.	30	1.60	67,115	1,824	1,175	7.9	47		5.42	3.99	8.51	3.57	7.73	6.63	
Dec.	31	1.77	185,555	2,011	1,300	8.0	51		5.72	4.02	10.09	3.62	8.03	8.19	
Mean @	Ø365	1.66	Ø2,170,156	1,893	1,224	8.0	49		5.56	3.95	9.16	3.49	7.95	7.22	
Period Avg.		1.79	2,559,782	2,103	1,324	8.0	50		5.85	4.46	10.51	3.37	8.10	9.36	
Tons of Constituents 1970									178,000	133,000	343,000	337,000	612,000	421,000	
Avg. Tons Period 1962-1970									199,000	104,000	380,000	340,000	664,000	568,000	

** Percent of total cations

*** Percent of total anions

Ø Weighted mean

Ø Total

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1970

The following tables show electrical conductivity, expressed in mhos per centimeter cube x 10⁶ at 25°C, of individual water samples taken at Colorado River stations and in Mexican canals. Samples were taken at the Northerly and Southerly International Boundary stations by the United States Section of the Commission and conductivity determinations were made by the United States Geological Survey. Samples for the Intake Canal at Morelos Dam, Sánchez Mejorada Canal, and Miguel C. Rodríguez Gaging Station were taken by the Mexican Section of the Commission and determinations were made by the Ministry of Hydraulic Resources.

Date	ECx10 ⁶ @25°C										
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Colorado River at Northerly International Boundary

January	February	April	May	July	August	October	November	
1 1,690	15 1,650	1 1,760	16 1,800	1 2,030	16 1,740	1 1,730	16 1,820	
2 1,970	16 1,900	2 1,760	17 1,800	2 2,030	17 1,860	2 1,740	17 1,890	
3 1,890	17 1,930	3 1,820	18 1,890	3 1,950	18 1,890	3 1,710	18 1,910	
4 1,860	18 1,870	4 1,710	19 1,890	4 1,960	19 1,850	4 1,700	19 1,920	
5 1,910	19 1,830	5 1,730	20 1,890	5 1,960	20 1,810	5 1,730	20 1,900	
6 1,850	20 1,810	6 1,800	21 1,870	6 2,030	21 1,830	6 1,730	21 1,830	
7 1,860	21 1,840	7 1,790	22 1,860	7 2,020	22 1,720	7 1,700	22 1,840	
8 1,850	22 1,790	8 1,840	23 1,830	8 2,020	23 1,750	8 1,700	23 1,840	
9 1,890	23 1,730	9 1,830	24 1,840	9 2,030	24 1,890	9 1,700	24 1,850	
10 1,890	24 1,750	10 1,850	25 1,900	10 2,000	25 1,850	10 1,700	25 1,840	
11 1,880	25 1,780	11 1,750	26 1,910	11 1,910	26 1,860	11 1,720	26 1,830	
12 1,900	26 1,750	12 1,820	27 1,890	12 1,930	27 1,880	12 1,730	27 1,800	
13 1,890	27 1,760	13 1,850	28 1,800	13 2,020	28 1,830	13 1,740	28 1,840	
14 1,890	28 1,710	14 1,870	29 1,870	14 2,030	29 1,640	14 1,750	29 1,880	
15 1,860		15 1,850	30 1,880	15 2,000	30 1,780	15 1,720	30 1,920	
16 1,870	1 1,660	16 1,820	31 1,870	16 2,020	31 1,930	16 1,680		
17 1,890	2 1,540	17 1,850		17 2,010		17 1,700	1 1,920	
18 1,870	3 1,400	18 1,760	1 1,910	18 1,910	1 1,920	18 1,730	2 1,950	
19 1,950	4 1,360	19 1,790	2 1,910	19 1,870	2 1,880	19 1,730	3 1,950	
20 1,900	5 1,560	20 1,870	3 1,900	20 2,060	3 1,880	20 1,740	4 1,980	
21 1,820	6 1,630	21 1,860	4 1,950	21 2,050	4 1,910	21 1,770	5 1,970	
22 1,800	7 1,830	22 1,870	5 1,900	22 2,050	5 1,800	22 1,710	6 1,950	
23 1,790	8 1,660	23 1,870	6 1,870	23 1,970	6 1,810	23 1,710	7 1,940	
24 1,770	9 1,710	24 1,930	7 1,850	24 1,990	7 1,840	24 1,720	8 1,980	
25 1,760	10 1,940	25 1,860	8 1,910	25 1,850	8 1,910	25 1,770	9 2,040	
26 1,780	11 1,920	26 1,910	9 1,860	26 2,000	9 1,930	26 1,780	10 2,030	
27 1,780	12 1,920	27 2,020	10 1,910	27 2,080	10 1,890	27 1,750	11 2,040	
28 1,780	13 1,870	28 1,970	11 1,910	28 2,050	11 1,880	28 1,750	12 1,770	
29 1,740	14 1,760	29 1,770	12 2,040	29 2,090	12 1,740	29 1,760	13 1,690	
30 1,730	15 1,860	30 1,770	13 1,870	30 2,090	13 1,880	30 1,710	14 1,990	
31 1,740	16 1,840		14 1,880	31 2,010	14 1,910	31 1,740	15 1,980	
	February	1 1,740	15 1,990		August	15 1,820	November	16 1,960
	17 1,840	2 1,760	16 1,990	1 1,890	16 1,700	1 1,720	17 1,940	
	18 1,770	3 1,780	17 2,000	2 1,880	17 1,720	2 1,750	18 1,900	
	19 1,790	4 1,800	18 2,020	3 2,120	18 1,740	3 1,770	19 1,730	
	20 1,730	5 1,840	19 2,020	4 2,070	19 1,730	4 1,780	20 1,760	
	21 1,740	6 1,860	20 1,850	5 2,050	20 1,710	5 1,760	21 2,030	
	22 1,710	7 1,820	21 1,890	6 2,040	21 1,700	6 1,740	22 2,010	
	23 1,710	8 1,830	22 2,000	7 1,990	22 1,740	7 1,820	23 2,000	
	24 1,760	9 1,820	23 1,980	8 1,710	23 1,760	8 1,820	24 2,020	
	25 1,730	10 1,840	24 1,990	9 1,770	24 1,770	9 1,860	25 1,920	
	26 1,720	11 1,900	25 1,960	10 1,960	25 1,770	10 1,860	26 1,930	
	27 1,580	12 1,840	26 1,990	11 1,930	26 1,760	11 1,860	27 2,030	
	28 1,470	13 1,900	27 1,940	12 1,920	27 1,770	12 1,870	28 2,120	
	29 1,570	14 1,840	28 1,850	13 1,890	28 1,790	13 1,870	29 2,070	
	30 1,640	15 1,930	29 2,000	14 1,880	29 1,810	14 1,840	30 2,070	
			30 1,990	15 1,680	30 1,780	15 1,820	31 2,070	

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1970

| Date ECx10 ⁶
@25°C |
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Intake Canal at Morelos Diversion Structure

January	February	April	May	July	August	October	November
1 2,000	15 1,700	1 1,800	17 1,850	1 2,125	16 1,900	1 1,750	16 1,850
2 2,050	16 1,900	2 1,800	18 1,900	2 2,000	17 1,850	2 1,700	17 1,850
3 2,050	17 1,900	3 1,850	19 1,900	3 2,100	18 1,900	3 1,700	18 1,900
4 1,950	18 2,000	4 1,800	20 1,900	4 2,100	19 1,900	4 1,700	19 1,900
5 1,950	19 1,900	5 1,850	21 1,875	5 2,050	20 1,850	5 1,700	20 1,900
6 1,900	20 1,950	6 1,850	22 1,850	6 2,050	21 1,900	6 1,700	21 1,850
7 1,950	21 1,900	7 1,850	23 1,850	7 2,100	22 1,950	7 1,700	22 1,850
8 1,900	22 1,850	8 1,900	24 1,900	8 2,050	23 1,850	8 1,700	23 1,850
9 1,900	23 1,850	9 1,900	25 1,900	9 2,025	24 1,900	9 1,700	24 1,850
10 2,000	24 1,800	10 1,900	26 1,850	10 2,050	25 1,900	10 1,700	25 1,800
11 2,000	25 1,950	11 1,800	27 1,900	11 2,000	26 1,875	11 1,700	26 1,850
12 2,000	26 1,875	12 1,950	28 1,900	12 2,050	27 1,850	12 1,700	27 1,825
13 2,000	27 1,875	13 1,900	29 1,900	13 2,050	28 1,900	13 1,700	28 1,825
14 2,000	28 1,850	14 1,950	30 1,900	14 2,100	29 2,000	14 1,750	29 1,900
15 1,950	March	15 1,900	31 1,900	15 2,050	30 1,900	15 1,700	30 1,900
16 1,950	1 1,850	16 1,900	June	16 2,050	31 1,950	16 1,650	December
17 2,200	2 1,700	17 1,900	1 1,900	17 2,050	September	17 1,700	1 1,900
18 2,100	3 1,400	18 1,950	2 1,900	18 2,100	1 1,900	18 1,700	2 1,900
19 2,200	4 1,400	19 1,950	3 1,900	19 2,100	2 1,900	19 1,700	3 1,950
20 2,000	5 1,500	20 1,950	4 1,900	20 2,075	3 1,900	20 1,750	4 1,975
21 1,875	6 1,650	21 1,950	5 1,875	21 2,050	4 1,875	21 1,800	5 1,950
22 1,850	7 1,900	22 2,000	6 1,900	22 2,050	5 1,900	22 1,750	6 1,950
23 1,850	8 1,725	23 1,950	7 1,900	23 2,100	6 1,875	23 1,700	7 1,900
24 1,800	9 1,775	24 2,050	8 1,900	24 2,050	7 1,875	24 1,700	8 2,050
25 1,825	10 2,000	25 2,000	9 1,900	25 2,100	8 1,900	25 1,700	9 2,100
26 1,825	11 1,950	26 2,125	10 1,900	26 2,150	9 1,950	26 1,750	10 2,000
27 1,850	12 1,950	27 2,100	11 1,900	27 2,150	10 1,900	27 1,700	11 2,000
28 1,825	13 1,950	28 2,050	12 2,000	28 2,075	11 1,900	28 1,750	12 1,900
29 1,800	14 1,900	29 1,900	13 2,000	29 2,100	12 1,850	29 1,750	13 2,000
30 1,800	15 1,900	30 1,900	14 2,050	30 2,150	13 1,900	30 1,700	14 2,000
31 1,800	16 1,900	May	15 1,950	31 2,050	14 1,900	31 1,750	15 1,950
February	17 1,900	1 1,850	16 2,000	August	15 1,850	November	16 1,900
1 1,800	18 1,900	2 1,800	17 2,000	1 2,100	16 1,700	1 1,725	17 1,950
2 1,800	19 1,900	3 1,875	18 2,000	2 2,100	17 1,700	2 1,750	18 1,950
3 1,850	20 1,825	4 1,850	19 2,050	3 2,100	18 1,700	3 1,750	19 1,950
4 1,800	21 1,825	5 1,900	20 2,100	4 2,125	19 1,750	4 1,725	20 2,050
5 1,800	22 1,850	6 1,850	21 2,050	5 2,100	20 1,700	5 1,750	21 2,000
6 1,750	23 1,825	7 1,825	22 2,000	6 2,100	21 1,700	6 1,700	22 2,000
7 1,750	24 1,800	8 1,850	23 2,075	7 2,100	22 1,750	7 1,775	23 2,125
8 1,775	25 1,800	9 1,850	24 2,050	8 1,900	23 1,750	8 1,800	24 2,050
9 1,775	26 1,750	10 1,900	25 2,000	9 1,950	24 1,775	9 1,850	25 2,100
10 1,800	27 1,800	11 1,900	26 2,000	10 2,000	25 1,700	10 1,850	26 2,100
11 1,700	28 1,800	12 1,850	27 2,000	11 1,950	26 1,750	11 1,850	27 2,250
12 1,500	29 1,700	13 1,850	28 2,050	12 1,950	27 1,750	12 1,850	28 2,050
13 1,550	30 1,800	14 1,850	29 2,000	13 1,975	28 1,800	13 1,875	29 2,150
14 1,750	31 1,850	15 1,950	30 2,000	14 1,950	29 1,850	14 1,800	30 2,050
		16 1,850		15 1,850	30 1,750	15 1,775	31 2,150

Colorado River at Southerly International Boundary

January	March	May	August	September	October	November	December
29 6,770	31 3,990	28 4,760	4 4,610	30 5,560	30 6,520	20 6,850	18 6,030
February	April	June	28 3,450				
27 4,900	30 5,210	30 5,260					

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1970

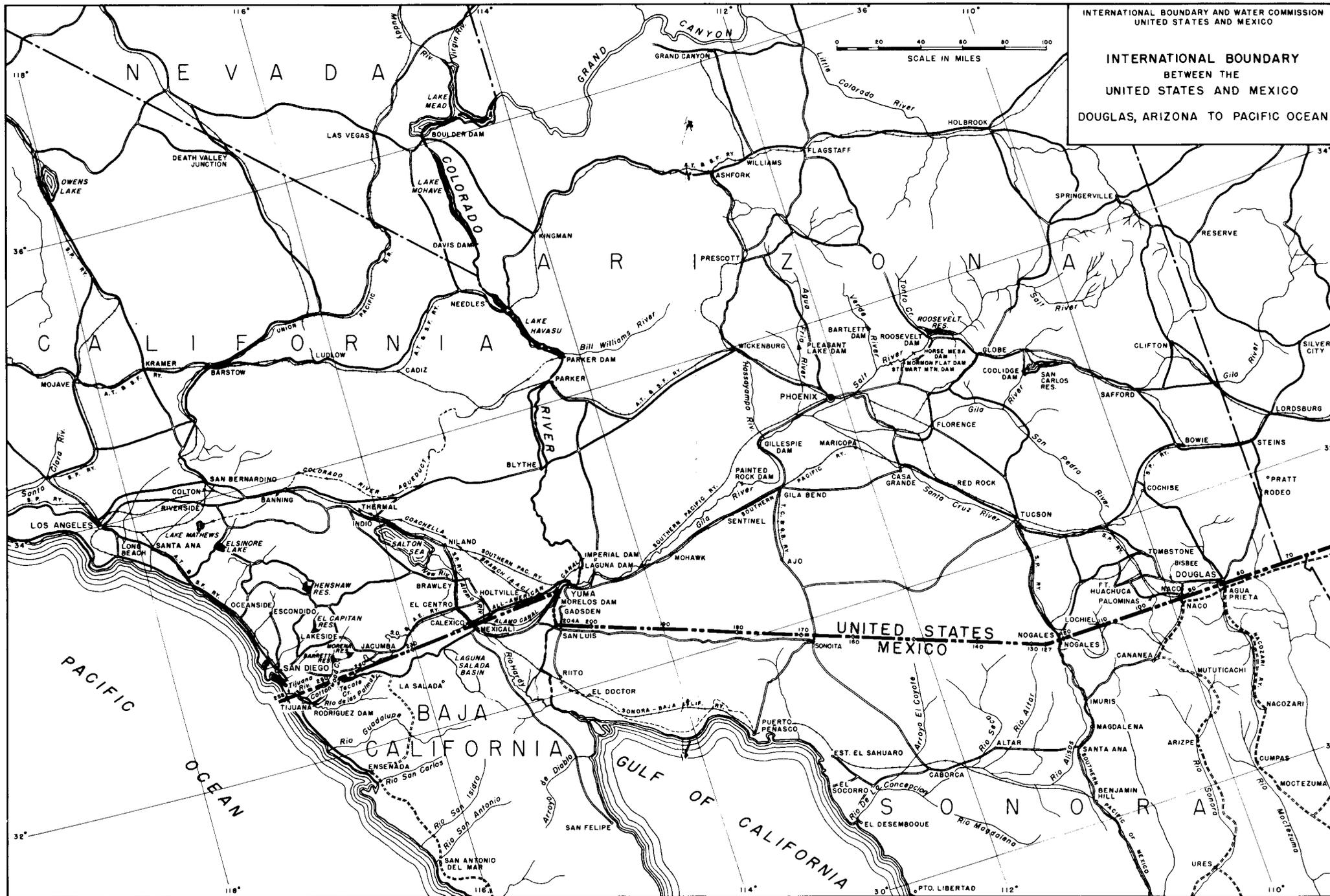
Date	ECx10 ⁶ @25°C										
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Sánchez Mejorada Canal

January	February	April	May	July	August	October	November
6 2,500	20 2,450	9 2,600	28 2,500	10 2,550	28 2,700	9 2,400	27 2,500
14 2,600	25 2,350	15 2,500	June	17 2,500	September	16 2,400	December
27 2,500	March	23 2,500	5 2,500	24 2,400	4 2,600	23 2,500	4 2,200
February	10 2,500	30 2,500	12 2,600	31 2,600	11 2,400	30 2,400	11 2,500
4 2,700	18 2,500	May	21 2,600	August	18 2,600	November	18 2,200
5 2,400	24 2,550	7 2,550	26 2,600	8 2,400	October	6 2,500	23 2,500
12 2,600	April	16 2,500	July	14 2,400	2 2,500	13 2,500	30 2,800
	1 2,500	21 2,400	5 2,400	21 2,600	4 2,400	20 2,500	

Colorado River at Miguel C. Rodríguez Gaging Station

January	February	March	May	June	August	October	November
5 6,500	25 4,600	23 4,000	12 3,300	29 3,400	10 3,200	5 6,000	23 6,000
9 6,250	March	31 3,200	20 4,000	July	17 3,300	13 6,000	30 6,250
15 6,250	4 2,100	April	24 4,300	6 3,400	24 3,400	19 6,000	December
27 6,250	6 1,800	9 3,400	June	13 3,400	31 3,300	November	7 6,100
February	7 2,400	15 3,400	1 4,300	20 3,200	September	3 3,000	14 6,000
3 6,750	12 4,100	29 3,350	8 4,200	27 3,400	7 3,400	9 6,500	22 5,600
11 6,250	15 1,700	May	15 3,400	August	14 3,150	16 6,500	28 6,000
18 3,700	18 3,700	6 3,400	22 3,200	3 3,400	29 3,200		





RAINFALL ON THE COLORADO RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall at stations located in California and Arizona in the United States and in Baja California and Sonora in Mexico, with averages for their periods of record. Records of daily rainfall amounts, where available, are on file in the offices of the United States or Mexican Sections of the Commission. For location, elevation, period of record, and the observer, see alphabetical listings of these stations on page 51 in this bulletin.

In United States

Month	Brawley, California		El Centro, California		Blythe, California		Davis Dam No. 2, Arizona		Yuma Citrus Station, Arizona	
	1970	Average 1931-1970	1970	Average 1931-1970	1970	Average 1931-1970	1970	Average 1955-1970	1970	Average 1931-1970
Jan.	.01	.32	0	.35	.14	.46	.03	.40	.01	.38
Feb.	.53	.30	.87	.35	.38	.39	.23	.42	.72	.34
Mar.	.94	.16	0	.18	1.87	.41	1.51	.37	1.05	.22
Apr.	0	.08	0	.10	0	.15	T	.33	0	.11
May	0	.01	0	0	0	.02	0	.12	0	.01
June	0	.01	0	.01	0	.03	.02	.03	0	.02
July	0	.04	T	.10	.06	.19	.03	.22	0	.17
Aug.	T	.30	.12	.33	1.82	.78	.97	.52	.70	.41
Sept.	.30	.33	T	.26	0	.32	.05	.30	.17	.37
Oct.	.01	.21	0	.22	0	.27	.18	.30	.05	.38
Nov.	.03	.15	.02	.18	.06	.26	.49	.47	.02	.20
Dec.	.16	.44	.05	.45	.10	.55	.83	.53	T	.41
Yearly	1.98	2.35	1.06	2.53	4.43	3.83	4.34	4.01	2.72	3.02

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
	1970	Average 1948-1970	1970	Average 1926-1970	1970	Average 1948-1970	1970	Average 1949-1970	1970	Average 1948-1970
Jan.	0	.04	0	.35	0	.35		.28	0	.35
Feb.	.47	.20	.94	.31	.67	.08	.67	.20	.43	.08
Mar.	.87	.12	.79	.20	.51	.04	.94	.16	.75	.12
Apr.	0	.08	0	.08	0	.08	0		0	.04
May	0	0	0	0	0	0	0		0	0
June	0	0	0	0	1.14	.04	0	0	0	0
July	0	.08	0	.12	0	.04	.16	.20		.04
Aug.	.71	.20	.12	.31	0	.12	.39	.35	.08	.12
Sept.	0	.20		.35	.08	.04	0	.12	0	.16
Oct.	0	.28	0	.24	.31	.20	1.18	.20	0	.16
Nov.	0	.20		.16	0	.16	0	.63	0	.16
Dec.	0	.31	.04	.79	0	.20	.12	.59		.28
Yearly	2.05	2.05	1.89	2.99	2.72	1.38	3.46	1.97	1.26	1.46

Month	Kilometer 50, Baja California		Riito, Sonora		El Mayor, Baja California		San Felipe, Baja California			
	1970	Average 1952-1970	1970	Average 1959-1970	1970	Average 1949-1970	1970	Average 1948-1970		
Jan.	0	.59		.24	0	.20	.59	.28		
Feb.	.87	.24	.55	.12	.24	.12	.55	.12		
Mar.	.67	.28	.51	.08	.39	.12	.31	.20		
Apr.	0	.12	0		0		0	.08		
May	0	.04	0		0		0			
June	0	0	0		.08		0	.08		
July	0	.16		.08		.08	.31	.16		
Aug.	.43	.31		.08	.24	.31	.20	.28		
Sept.	.08	.24	.04	.63	0	.55	.20	.43		
Oct.	.67	.35		.04	.08	.20	0	.28		
Nov.	0	.28	0	.35		.16	0	.16		
Dec.	.08	.35		.43	.04	.35	0	.39		
Yearly	2.80	1.97	1.10	2.09	1.06	2.17	2.17	2.48		

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LOCATION OF RAINFALL STATIONS ON THE COLORADO RIVER WATERSHED

The precipitation records of the stations listed alphabetically below began on the date shown and extend through 1970.

In United States

NAME OF STATION	LATI- TUDE	LONGI- TUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
* Blythe, California	33° 37'	114° 36'	268	1909	State Division of Forestry
Brawley, California	32° 57'	115° 33'	100	1908	Agricultural Research Service
* Davis Dam No. 2, Arizona	35° 12'	114° 34'	657	1954	U. S. Bureau of Reclamation
El Centro, California	32° 46'	115° 34'	30	1930	El Centro Water Department
Yuma Citrus Station, Arizona	32° 37'	114° 39'	191	1923	University of Arizona Experimental Farm

In Mexico

NAME OF STATION	LATI- TUDE	LONGI- TUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Bataques, Baja California	32° 33'	115° 04'	** 66	1948	Hydraulic Resources
Delta, Baja California	32° 21'	115° 11'	** 39	1948	Hydraulic Resources
El Mayor, Baja California	32° 08'	115° 15'	** 33	1949	Hydraulic Resources
Kilometer 50, Baja California	32° 15'	115° 03'	49	1952	Hydraulic Resources
Los Algodones, Baja California	32° 42'	114° 44'	115	1948	Hydraulic Resources
Mexicali, Baja California	32° 40'	115° 28'	13	1926	Hydraulic Resources
Riito, Sonora	32° 10'	114° 57'	** 39	1959	Hydraulic Resources
* San Felipe, Baja California	31° 02'	114° 53'	33	1948	Hydraulic Resources
San Luis, R.C., Sonora	32° 28'	114° 47'	131	1949	Hydraulic Resources

* Not shown on map δ Elevation above mean sea level except Brawley and El Centro which are elevations below mean sea level

** Elevations obtained from International Boundary and Water Commission topographic maps

EVAPORATION IN THE COLORADO RIVER BASIN IN INCHES

Tabulated below are records of evaporation observed at two stations in Arizona and at nine stations in Baja California and Sonora, Mexico. The stations in the United States are operated by the U. S. Bureau of Reclamation and by the University of Arizona Experimental Farm. The stations in Mexico are operated by the Ministry of Hydraulic Resources. The type of pan used at all these stations was the U. S. Weather Bureau standard pan, four feet in diameter. For specific location of these stations, refer to data opposite the same station name shown in "Location of Rainfall Stations", page 51 in this bulletin.

In United States

Month	Davis Dam No. 2, Arizona		Yuma Citrus Station, Arizona	
	1970	Average 1955-1970	1970	Average 1931-1970
Jan.	5.25	7.35	3.63	3.91
Feb.	8.41	7.62	4.74	4.90
Mar.	10.58	10.18	7.14	7.86
Apr.	12.88	13.44	9.34	10.29
May	19.05	17.21	12.85	13.36
June	20.17	19.72	14.17	14.58
July	18.84	20.15	14.69	15.75
Aug.	17.41	18.30	13.16	13.95
Sept.	17.05	15.02	11.15	11.06
Oct.	12.41	12.37		7.82
Nov.	9.02	8.92	5.06	5.09
Dec.	5.39	7.94	3.06	3.68
Yearly	156.46	158.22		112.25

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis R. C., Sonora	
	1970	Average 1949-55 1961-1970	1970	Average 1926-1970	1970	Average 1963-1970	1970	Average 1953-1970
Jan.	4.09	4.17	2.52	2.60	3.19	3.86	2.40	3.31
Feb.	4.49	5.12	3.50	3.50	4.29	5.12	3.74	3.98
Mar.	7.01	7.20	5.91	5.83	7.28	7.40	5.63	6.22
Apr.	9.92	9.76	7.76	7.91	9.84	9.33	6.57	8.39
May	13.70	12.44	11.14	10.51	13.86	12.13	11.10	11.02
June	14.49	12.87	12.48	11.50	13.62	12.28	12.52	12.56
July	14.41	12.99	12.32	11.73	14.80	12.68	13.50	14.13
Aug.	12.64	11.86	10.91	10.08	11.30	10.51	12.13	12.91
Sept.	12.80	9.76	9.02	8.15	9.76	9.09	10.00	10.08
Oct.	8.46	7.80	6.02	5.63	6.61	6.30	6.30	6.73
Nov.	6.02	4.92	3.50	3.39	4.29	4.84	4.25	4.25
Dec.	3.90	3.94	2.36	2.44	2.83	3.43	2.99	3.23
Yearly	111.93	104.29	87.44	83.27	101.69	97.17	91.14	98.58

Month	Delta, Baja California		Kilometer 50, Baja California		Riito, Sonora		El Mayor, Baja California		San Felipe, Baja California	
	1970	Average 1959-1970	1970	Average	1970	Average 1963-1970	1970	Average 1953-1970	1970	Average 1952-1970
Jan.	2.68	3.19	3.15		2.52	3.19	2.91	3.50	6.46	5.24
Feb.	4.37	4.25	3.90		3.11	4.17	2.83	4.25	6.02	5.94
Mar.	5.91	6.38	5.47		4.80	5.91	4.53	6.14	8.03	7.09
Apr.	7.99	8.19	6.77		6.30	7.20	5.63	8.03	6.65	8.54
May	10.98	10.39	10.28		9.72	9.57	9.06	10.03	10.75	10.59
June	11.42	11.14	10.98		11.02	10.87	8.54	11.02	10.31	10.94
July	12.56	11.26	12.20		11.54	11.77	8.39	12.36	12.44	11.81
Aug.	11.54	9.96	9.33		10.75	9.53	11.10	11.73	10.47	11.02
Sept.	9.80	7.99	8.15		7.80	7.48	6.65	10.04	11.33	9.96
Oct.	6.18	5.83	5.43		5.00	5.12	5.08	7.68	9.76	8.66
Nov.	4.21	3.70	3.98		3.27	3.35	3.15	4.57	8.46	6.38
Dec.	2.91	2.72	2.72		2.05	2.72	4.09	3.78	6.93	5.28
Yearly	90.55	85.67	82.36		77.64	84.41	71.97	92.17	107.68	101.81

0 One year missing

TEMPERATURE IN THE COLORADO RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly mean temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximums and minimums for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations", page 51 in this bulletin.

In United States

Month	Blythe, California				Davis Dam No. 2, Arizona				Yuma Citrus Station, Arizona			
	1970			Average 1931-70	1970			Average 1955-70	1970			Average 1931-70
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	52.0	77	22	52.6	51.8	75	28	52.9	53.1	79	28	53.1
Feb.	60.1	84	34	57.3	59.5	79	40	56.7	59.1	86	34	57.0
Mar.	61.2	91	38	63.0	61.6	90	43	62.1	60.9	91	35	
Apr.	65.4	95	37	70.3	65.3	94	42	69.6	63.2	95	38	68.9
May	78.3	111	48	77.5	79.7	108	54	78.8	76.0	110	35	76.0
June	87.1	121	59	84.9	84.9	119	62	88.3	83.5	116	50	83.3
July	94.7	115	71	92.1	96.1	116	64	94.8	91.6	114	62	91.2
Aug.	94.1	116	74	91.2	94.4	114	68	93.6	91.9	113	73	90.7
Sept.	83.5	112	54	85.1	83.7	111	58	86.1	82.8	111	43	85.2
Oct.	70.3	97	39	73.3	70.6	97	45		70.3	98	40	73.8
Nov.	60.8	88	36	60.3	61.1	85	40		61.8	86	38	61.7
Dec.	51.0	76	31	53.4	50.8	70	30	54.3	53.0	77	33	54.7
Yearly	71.5	121	22	71.8	72.0	119	28		70.6	116	28	

Month	Brawley, California				El Centro, California			
	1970			Average 1931-70	1970			Average 1931-70
	Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	53.1	77	24	53.7	54.0	78	26	53.6
Feb.	59.0	83	34	58.1	59.3	85	35	57.8
Mar.	61.5	91	38	63.4	61.7	93	35	63.1
Apr.	64.6	93	38	70.5	64.4	95	38	70.0
May	76.0	110	41	77.9	76.8	109	45	77.4
June	84.2	120	52	85.1	85.2	120	54	84.8
July	91.9	112	68	92.2	93.0	113	70	91.9
Aug.	92.4	114	71	91.9	93.7	115	73	91.2
Sept.	83.2	111	53	86.6	84.0	114	52	85.8
Oct.	71.0	98	37	75.3	71.8	99	40	74.8
Nov.	62.1	88	38	62.7	63.0	89	40	62.2
Dec.	53.3	78	31	55.2	54.2	79	34	54.9
Yearly	71.0	120	24	72.7	71.8	120	26	72.3

In Mexico

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1970		1948-1970		1970		1926-1970		1970		1948-1970	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	79	32	86	23	79	27	93	19	79	32	113	19
Feb.	86	39	95	28	81	36	93	23	84	36	99	21
Mar.	90	43	100	32	93	39	100	32	91	37	113	25
Apr.	95	41	109	37	93	39	106	34	97	37	118	16
May	109	54	117	43	109	50	117	43	117	48	124	34
June	115	59	126	52	117	55	120	50	118	52	135	43
July	113	72	118	61	113	70	118	55	120	68	133	45
Aug.	113	75	120	61	115	73	118	54	120	68	129	46
Sept.	109	59	122	54	111	55	122	48	102	50	135	39
Oct.	99	45	111	32	99	39	109	39	102	39	118	39
Nov.	86	43	100	27	86	41	99	28	95	37	115	32
Dec.	79	36	88	28	77	34	90	23	79	32	97	25
Yearly	115	32	126	23	117	27	122	19	120	32	135	16

**TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES FAHRENHEIT**

In Mexico

Month	San Luis, R. C., Sonora				Delta, Baja California				Kilometer 50, Baja California			
	1970		1949-1970		1970		1948-1970		1970		1950-59&61-70	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	79	23	100	19	82	28	104	28	86	27	91	19
Feb.	84	36	109	27	84	41	104	28	84	34	97	21
Mar.	90	37	108	32	93	43	113	28	86	37	99	28
Apr.	93	39	115	37	99	43	118	32	95	34	106	30
May	108	50	115	41	113	52	129	32	108	43	117	36
June	111	57	126	45	118	55	133	36	118	52	118	39
July	113	72	126	59	115	70	135	45	115	66	120	45
Aug.	109	75	122	55	113	73	140	52	115	70	118	50
Sept.	108	50	118	50	111	54	135	39	117	46	117	39
Oct.	97	37	118	37	102	43	117	36	99	39	108	36
Nov.	86	37	113	30	90	41	120	32	90	34	104	25
Dec.	77	30	102	23	82	36	104	27	81	30	97	19
Yearly	113	23	126	19	118	28	140	27	118	27	120	19

Month	Riito, Sonora				El Mayor, Baja California				San Felipe, Baja California			
	1970		1949-1970		1970		1949-1970		1970		1948-1970	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	75	27	91	19	84	27	108	23	79	30	99	30
Feb.	81	36	95	21	82	36	93	27	75	37	102	32
Mar.	88	39	100	25	91	39	100	32	86	39	104	32
Apr.	93	37	109	37	93	39	108	36	86	43	113	37
May	109	45	115	43	108	43	113	37	104	50	120	41
June	113	45	124	45	111	50	122	37	104	52	124	50
July	111	70	140	52	113	59	122	39	100	59	124	50
Aug.	109	73	122	46	115	59	122	41	100	75	135	41
Sept.	106	52	118	39	113	57	120	34	104	57	126	37
Oct.	95	36	115	34	99	54	120	37	93	50	117	41
Nov.	86	37	118	27	97	39	120	34	82	46	118	21
Dec.	79	32	86	21	91	43	106	19	75	43	97	28
Yearly	113	27	140	19	115	27	122	19	104	30	135	21

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM 1970

The total drainage area within the Colorado River basin is about 246,000 square miles, of which 184,600 square miles lie above Imperial Dam and about 61,400 square miles are below the dam. Of the area below Imperial Dam, 59,400 square miles are in the United States and about 2,000 square miles are in Mexico. The area below Imperial Dam includes the Gila River watershed with a total area of about 58,200 square miles, of which about 1,100 square miles are in Mexico.

The irrigated areas tabulated below comprise the areas in the United States and Mexico which are served by diversions from the Colorado River at or below Imperial Dam. The diversions are supplemented by some pumping from wells in both countries. The areas in the United States include: 1) those within the U. S. Bureau of Reclamation Projects and in the North and South Gila Valleys located near Yuma, Arizona, the data for which are furnished by the U. S. Bureau of Reclamation; 2) those within the Coachella Valley, California, the data for which are furnished by the Coachella Valley County Water District and State of California Department of Water Resources; and 3) those within the Imperial Valley, California, the data for which are furnished by the Imperial Irrigation District. The areas in Mexico include those in the Mexicali Valley located in the states of Baja California and Sonora, the data for which are furnished by the Ministry of Hydraulic Resources of Mexico. The areas tabulated below refer to the total areas farmed, and insofar as possible, duplication of irrigated areas because of double cropping has been eliminated.

Point of Diversion from Colorado River and Designation of Areas	Total Irrigated Areas Acres
IN UNITED STATES:	
Imperial Dam	
Yuma Valley Division	45,077
Reservation Division	11,287
Yuma Mesa	17,212
Yuma Aux. Project Unit "B" (Yuma Mesa)	3,116
South Gila Valley	10,208
North Gila Valley	5,982
Wellton-Mohawk	60,756
Coachella Valley	52,276
Imperial Valley	437,336
Warren Act	80
Non-Project lands adjacent to Colorado River	9,832
Total in United States	653,162
IN MEXICO:	
Morelos Dam	
Mexicali Valley	* 426,590
Total in United States and Mexico	1,079,752

* An estimated one-third of total acreage is served by pumping from ground water in Mexicali Valley

ALAMO RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Staff gage located on the right bank of the river, about 7 miles east of Calexico, California, immediately downstream from the international land boundary between the United States and Mexico and a few feet upstream from a 4-foot Cipolletti weir set in the throat of a twin-tube concrete culvert which carries the river flow under the All-American Canal.

RECORDS: Computed on the basis of head on the Cipolletti weir from daily staff gage readings, and weir ratings as determined by monthly current meter measurements. Records obtained and furnished by Imperial Irrigation District. Records available: June 1942 through 1970.

REMARKS: The flow at this station normally comprises seepage from the All-American Canal and drainage water from the Mexicali Valley which enters the United States.

EXTREMES: Maximum mean daily discharge, 258 second-feet (estimated), April 13, 1946; minimum discharge, no flow July 22-23, 29-30, 1949. Prior to the period of record, and since 1900, considerably higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a part of its flow passed through the Alamo River channel.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.91	2.79	2.21	1.89	1.79	1.89	2.44	2.21	2.32	2.21	2.44	3.03
2	2.91	2.79	2.21	1.89	1.89	1.49	2.44	2.21	2.21	2.32	2.32	3.03
3	2.44	2.79	2.21	1.79	1.89	1.20	1.79	2.21	2.21	2.21	2.44	3.03
4	2.21	2.79	2.67	2.21	1.68	1.20	1.89	2.21	2.21	2.44	2.44	3.03
5	2.44	2.79	2.44	2.00	2.00	1.20	1.68	1.39	2.79	2.21	2.55	3.03
6	2.32	2.79	2.10	2.21	1.89	1.20	2.21	1.39	2.67	2.21	2.44	3.03
7	2.21	2.67	2.67	2.00	2.21	1.20	2.00	1.49	2.55	2.00	2.44	3.03
8	2.21	2.67	2.67	2.00	2.00	1.39	2.21	1.39	2.21	2.00	2.91	3.03
9	2.10	2.79	2.67	2.00	1.89	1.30	2.21	1.39	2.21	2.10	2.91	2.55
10	2.55	2.79	2.21	1.89	1.89	1.20	2.21	1.58	2.10	2.10	2.55	2.55
11	2.55	2.79	3.41	1.89	2.00	1.49	2.00	1.49	2.10	2.10	2.91	2.44
12	2.44	2.79	2.44	2.00	1.89	1.49	2.00	1.79	2.21	2.00	2.67	2.44
13	2.55	2.79	2.21	2.00	2.00	1.39	2.00	1.79	2.00	2.00	2.67	2.44
14	2.44	2.79	2.32	2.00	1.68	1.39	2.10	1.58	2.00	2.00	2.44	2.55
15	2.55	2.79	2.21	1.68	1.68	1.39	2.10	1.58	2.21	1.89	2.55	2.44
16	2.44	2.79	2.10	1.68	1.89	1.39	2.10	1.39	2.67	2.21	2.55	2.55
17	2.55	2.55	2.00	1.68	2.00	2.10	2.21	1.39	2.67	2.21	2.44	2.44
18	2.67	2.55	2.44	1.68	2.00	2.10	2.00	1.58	2.91	2.21	2.79	2.44
19	2.32	2.55	2.21	2.10	1.68	2.21	1.89	2.10	3.15	2.21	2.79	2.44
20	3.54	2.55	2.21	2.00	1.68	2.21	2.10	2.21	3.15	2.00	2.79	2.55
21	2.79	2.79	2.67	1.79	1.49	2.21	2.21	1.68	2.91	2.55	2.79	2.55
22	2.79	2.79	2.32	2.00	1.68	2.00	3.15	1.68	2.91	2.55	2.79	2.44
23	2.67	2.79	2.21	2.00	1.68	1.89	3.03	1.68	2.79	2.21	2.79	2.55
24	3.03	2.55	2.44	1.89	1.89	1.89	2.79	1.79	2.79	2.21	2.79	2.44
25	3.15	3.15	2.55	1.89	1.89	1.58	2.67	1.89	2.91	2.00	2.91	2.55
26	2.79	2.21	2.32	1.79	1.89	1.68	2.44	2.91	2.91	2.21	2.91	2.55
27	2.67	2.21	2.55	2.00	2.10	1.79	2.79	2.79	2.91	2.21	2.91	2.44
28	2.55	2.21	2.67	2.00	1.89	1.89	2.44	2.21	2.79	2.44	2.79	2.55
29	2.67	2.79	2.79	1.68	1.79	2.10	2.91	2.21	2.21	2.32	2.91	2.44
30	2.67	2.79	2.21	1.68	1.89	1.89	2.91	2.21	1.68	2.44	2.79	2.55
31	2.79	2.79	2.21	2.21	1.79	1.79	2.21	2.21	2.21	2.44	2.79	2.55
Sum	80.92	75.30	74.55	57.31	57.61	49.35	71.13	57.63	75.36	68.21	80.42	81.68
Current Year 1970										Period 1943-1970		
Month	Ø Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	0.41	0.30	20	3.54	9	2.10	2.61	161	397	2,790	99	
Feb.	.38	.30	25	3.15	† 26	2.21	2.69	149	360	2,822	100	
Mar.	.40	.28	11	3.41	17	2.00	2.40	148	404	3,154	111	
Apr.	.30	.25	† 4	2.21	† 15	1.68	1.91	114	434	2,222	97	
May	.30	.23	7	2.21	21	1.49	1.86	114	334	1,799	73	
June	.30	.20	† 19	2.21	† 3	1.20	1.65	98	331	1,686	61	
July	.38	.25	22	3.15	5	1.68	2.29	141	304	1,712	59	
Aug.	.36	.22	26	2.91	† 5	1.39	1.86	114	364	1,672	83	
Sept.	.38	.25	† 19	3.15	30	1.68	2.51	149	343	1,406	91	
Oct.	.33	.27	† 21	2.55	15	1.89	2.20	135	372	1,845	102	
Nov.	.36	.31	† 8	2.91	2	2.32	2.68	160	379	2,080	86	
Dec.	.37	.32	† 1	3.03	† 11	2.44	2.63	162	350	1,686	80	
Yearly	.41	.20		3.54		1.20	2.28	1,645	4,372	22,146	1,251	

Ø Mean daily † And other days

NEW RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder located on the right (east) bank of the river in the limits of the city of Calexico, California, 1,400 feet downstream (north) of the international land boundary between the United States and Mexico. Measurements are made from a foot bridge at the gage.

RECORDS: Based on a continuous record of gage heights and weekly current meter measurements, supplemented by additional measurements during periods of high flow by the Imperial Irrigation District. Measurements are also made generally once each month by the United States Section of the Commission. Records computed and furnished by the District. Records available: June 1942 through 1970.

REMARKS: The New River flows northward from Mexico into the United States and thence into the Salton Sea. The flow at this station normally comprises 1) a portion of the waste and drainage water from the irrigation system in the Mexicali Valley, and 2) sewage and other wastes from Mexicali, Baja California. Flood waters enter the river from local drainage in Mexico and such waters can reach damaging rates during violent desert storms. Waste flows from the Mexican system of canals are limited to an average annual quantity of 35,000 acre-feet during any successive five-year period under the provisions of Minute No. 197 of the Commission.

EXTREMES: Maximum mean daily discharge, 691 second-feet on December 3, 1962; minimum mean daily discharge, 2 second-feet on May 14, 1945. Prior to the period of record, and since 1900, much higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a considerable part of its flow passed through the New River channel.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	120	128	198	174	187	141	116	130	146	122	116	108
2	125	131	292	176	183	135	119	132	143	119	120	106
3	122	130	290	174	178	128	120	133	144	116	116	103
4	124	130	199	171	177	126	119	136	141	116	112	106
5	125	129	194	173	177	125	122	137	140	115	110	106
6	128	128	205	177	172	121	119	134	145	121	110	107
7	127	128	199	177	165	120	120	130	150	123	106	109
8	130	126	196	180	170	123	123	126	144	119	103	109
9	131	132	197	183	161	123	126	121	136	117	102	106
10	133	155	190	182	161	123	123	125	133	116	104	103
11	132	151	184	182	157	120	124	125	129	116	108	104
12	136	152	180	183	158	118	124	124	124	117	107	104
13	136	153	177	184	159	120	125	124	121	119	100	108
14	138	161	176	179	158	118	124	117	121	120	98	110
15	137	154	175	179	158	121	127	127	123	117	96	108
16	138	156	172	200	158	121	129	128	121	114	96	111
17	141	157	170	205	155	122	134	130	122	112	97	115
18	143	152	165	210	157	128	137	128	120	110	100	118
19	143	150	165	223	151	114	138	128	117	109	104	122
20	142	145	163	208	144	110	140	133	118	113	112	122
21	137	143	162	199	144	105	132	123	119	115	115	127
22	137	141	162	200	144	104	123	123	116	114	118	128
23	134	138	166	199	146	113	121	126	114	112	123	128
24	133	137	166	199	152	118	120	128	113	109	115	127
25	133	137	169	200	155	115	118	136	119	105	110	126
26	135	139	186	204	152	113	120	151	126	101	109	128
27	131	145	191	205	156	114	119	153	120	102	107	132
28	127	150	177	198	147	112	120	145	118	109	108	135
29	127	174	174	189	145	116	126	147	120	112	115	136
30	128	173	188	140	116	116	128	146	122	113	114	133
31	128	173	173	140	140	116	129	150	112	112	114	134
Sum	4,101	3,978	5,786	5,701	4,907	3,583	3,865	4,096	3,825	3,539	3,251	3,619

Current Year 1970							Period 1943-1970				
Month	Ø Extreme Gage ** Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	41.69	42.06	† 18	143	1	120	132	8,134	7,035	20,160	1,751
Feb.	41.59	41.85	14	161	† 8	126	142	7,890	5,807	17,845	1,258
Mar.	40.13	41.55	2	292	† 21	162	187	11,476	6,401	12,960	1,008
Apr.	40.91	41.40	19	223	4	171	190	11,308	6,564	14,489	1,390
May	41.25	41.86	1	187	† 30	140	158	9,733	5,802	10,618	629
June	41.82	42.12	1	141	22	104	119	7,107	5,004	9,689	1,087
July	41.95	42.09	20	140	1	116	125	7,666	4,899	9,086	817
Aug.	41.80	42.09	27	153	14	117	132	8,124	5,894	10,921	1,139
Sept.	41.75	42.16	7	150	24	113	127	7,587	6,258	12,688	1,795
Oct.	42.07	42.20	7	123	26	101	114	7,020	6,451	11,710	2,081
Nov.	42.03	42.27	23	123	† 15	96	108	6,448	6,213	12,323	2,483
Dec.	41.94	42.26	29	136	† 3	103	117	7,178	6,873	21,205	1,763
Yearly	40.13	42.27		292		96	138	99,671	73,201	138,906	24,573

† And other days Ø Mean daily ** Feet below mean sea level

WASTES FROM MEXICALI POTABLE WATER PLANT TO NEW RIVER IN MEXICO

DESCRIPTION: The Potable Water Plant of Mexicali, Baja California, discharges waste water into a canal, approximately 2.5 miles long, that empties into the Rivera Drain and thence into New River, approximately 0.9 mile above the international boundary. The measurements are taken in the wasteway canal 0.4 mile above the confluence with Rivera Drain, 1.2 miles below the plant, and 1.2 miles south of the international boundary.

RECORDS: Based on 51 double current meter measurements made during the year by wading. Data obtained and furnished by the Mexican Section of the Commission. Data available: January 1968 through 1970.

REMARKS: The Potable Water Plant is operated by the State Commission of Public Services of Mexicali and water is obtained from the West Main Canal which is a part of Mexico's system of canals in the Colorado River Irrigation District. The plant was completed in 1963 and began operation on September 28, 1963. Prior to 1968, the volumes wasted were small and infrequent.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	3.2	2.1	6.7	3.2	1.8	3.9	5.3	7.1	6.4	4.6	3.2
2	2.1	3.2	2.1	7.1	3.2	1.4	3.9	5.7	7.4	6.0	4.9	3.2
3	2.1	3.5	2.1	6.7	3.5	1.4	3.9	5.7	7.4	5.7	4.9	3.2
4	2.1	3.9	2.1	6.0	3.5	1.4	4.2	6.0	7.8	5.3	4.9	3.2
5	2.5	4.2	2.1	5.7	3.5	1.4	4.2	6.0	7.8	4.9	4.9	3.2
6	2.5	4.2	2.1	4.9	3.9	1.4	4.2	6.0	8.1	4.6	4.6	3.2
7	2.5	4.6	2.1	4.6	4.2	1.8	4.2	6.0	8.1	4.6	4.6	3.2
8	2.5	4.2	2.1	4.2	4.2	1.8	4.2	6.0	8.5	4.2	4.6	3.2
9	2.8	4.2	2.1	3.5	3.9	1.8	4.2	6.0	8.1	4.2	4.6	3.2
10	2.8	3.9	2.1	3.2	3.9	1.8	4.2	6.0	7.8	3.9	4.2	3.5
11	2.8	3.5	2.1	2.8	3.5	1.8	4.2	6.0	7.4	3.9	4.2	3.5
12	2.8	3.2	2.1	2.5	3.5	1.8	4.2	6.0	7.1	3.5	4.2	3.5
13	2.8	3.2	2.1	2.5	3.2	1.8	4.2	6.4	6.7	3.5	3.9	3.5
14	2.8	2.8	2.1	2.1	2.8	2.1	4.6	6.4	6.4	4.2	3.5	3.5
15	2.8	2.8	2.5	1.8	2.8	2.1	4.6	6.7	6.0	4.9	3.5	3.5
16	2.8	2.8	2.5	2.1	2.5	2.1	4.9	6.7	6.7	6.0	3.5	3.9
17	2.8	2.8	2.8	2.5	3.2	2.1	4.9	7.1	7.1	6.7	3.2	3.9
18	2.8	2.8	2.8	2.5	3.5	2.1	5.3	7.1	7.8	7.4	3.2	4.2
19	2.8	2.8	3.2	2.8	4.2	1.8	5.7	7.1	8.5	8.1	3.2	4.6
20	2.8	2.8	3.2	3.2	4.9	1.8	5.7	6.7	8.8	8.8	3.2	4.6
21	2.8	2.8	3.5	3.5	5.7	1.8	6.0	6.7	9.5	9.9	3.5	4.9
22	2.8	2.8	3.9	3.5	6.0	1.4	5.7	6.4	9.9	10.6	3.5	5.3
23	2.8	2.8	4.6	3.9	6.7	1.4	5.7	6.4	10.6	11.3	3.5	5.3
24	2.8	2.5	4.9	4.2	6.0	1.4	5.3	6.0	9.9	9.5	3.5	5.7
25	2.8	2.5	5.3	4.2	5.3	1.8	4.9	6.0	9.5	7.8	3.5	5.3
26	2.8	2.5	5.7	4.2	4.6	2.1	4.6	6.0	8.8	6.0	3.5	4.9
27	2.8	2.5	5.7	3.9	4.2	2.5	4.6	6.4	8.1	4.2	3.5	4.6
28	2.8	2.1	6.0	3.9	3.5	3.2	4.2	6.4	7.8	4.2	3.5	4.2
29	2.8	6.4	3.9	2.8	3.5	4.6	6.7	7.1	4.6	4.6	3.5	3.9
30	2.8	6.4	3.5	2.1	3.9	4.6	6.7	6.7	4.6	4.6	3.2	4.2
31	2.8	6.7		1.8		4.9	7.1		4.6			4.6
Sum	83.7	89.4	105.6	116.2	120.1	58.3	144.8	195.3	238.4	184.3	117.6	124.0
Current Year 1970								Period 1968-1970				
Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum	
Jan.			† 9	2.8		† 2	2.1	2.8	166	182	196	166
Feb.			7	4.6		28	2.1	3.2	178	167	178	157
Mar.			31	6.7		† 1	2.1	3.5	209	404	871	132
Apr.			2	7.1		15	1.8	3.9	230	199	233	135
May			23	6.7		31	1.8	3.9	238	185	286	238
June			30	3.9		† 2	1.4	2.1	116	173	203	116
July			21	6.0		† 1	3.9	4.6	287	246	287	198
Aug.			† 17	7.1		1	5.3	6.4	388	290	388	200
Sept.			23	10.6		15	6.0	7.8	473	333	473	131
Oct.			23	11.3		† 12	3.5	6.0	366	243	366	131
Nov.			† 2	4.9		† 17	3.2	3.9	233	196	233	159
Dec.			24	5.7		† 1	3.2	3.9	246	194	246	149
Yearly				11.3			1.4	4.2	3,129	2,895	3,129	2,745

Ø Mean daily

† And other days

WISTERIA WASTEWAY TO NEW RIVER IN MEXICO

DESCRIPTION: Staff gage located near operator's house upstream from wasteway gates, 1,000 feet downstream from the confluence of the Cerro Prieto and West Main Canals of the Colorado River Irrigation District in Colonia Wisteria, 4.3 miles upstream from the international boundary, 1.9 miles east of the highway to Tijuana at the Tijuana-San Felipe junction, 3.0 miles west of the highway to San Felipe, and 3.1 miles south of Mexicali. The wasteway structure is composed of three rectangular gates, two of which operate manually and one automatically.

RECORDS: Based on gate openings and water surface elevations upstream from the wasteway gates obtained by the Ministry of Hydraulic Resources and 50 check measurements during the year at various locations by the Mexican Section of the Commission. Records computed and furnished by the Mexican Section of the Commission. Records available: January 1951 through 1970. Records reported below are part of the waste flows from the Mexican system of canals discharging into the territory of the United States, which wastes are not to exceed an average annual quantity of 35,000 acre-feet during any successive five-year period under the provisions of Minute No. 197 of the Commission.

EXTREMES: Maximum instantaneous discharge, 675 second-feet on January 24, 1962; minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0.4
26	0	0	0	0	0	0	0	0	0	0	0	1.1
27	0	0	0	0	0	0	0	0	0	0	0	1.4
28	0	0	0	0	0	0	0	0	0	0	0	2.1
29	0	0	0	0	0	0	0	0	0	0	0	2.5
30	0	0	0	0	0	0	0	0	0	0	0	2.1
31	0	0	0	0	0	0	0	0	0	0	0	1.8
Sum	0	0	0	0	0	0	0	0	0	0	0	11.3
	0	0	0	0	0	0	0	0	0	0	0	11.3
Current Year 1970								Period 1951-1970				
Month	Extreme Gage Feet		Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.				0	0	0	0	1,727	8,735	0		
Feb.				0	0	0	0	1,073	7,218	0		
Mar.				0	0	0	0	796	2,568	0		
Apr.				0	0	0	0	770	4,433	0		
May				0	0	0	0	542	1,892	0		
June				0	0	0	0	319	1,450	0		
July				0	0	0	0	251	2,040	0		
Aug.				0	0	0	0	487	1,926	0		
Sept.				0	0	0	0	675	2,915	0		
Oct.				0	0	0	0	923	2,993	0		
Nov.				0	0	0	0	1,032	3,768	0		
Dec.			29	2.5	†1	0	0.4	1,518	8,669	0		
Yearly				2.5		0	0	22.4	10,112	27,083	22.4	

† And other days

‡ Mean daily

WASTE WATERS FROM MEXICAN SYSTEM OF CANALS ENTERING THE UNITED STATES

DESCRIPTION: During 1970, the discharge to the New River in Mexico was from Wisteria Wasteway, located 2.9 miles upstream from the international boundary in Colonia Wisteria, and from the Mexicali Potable Water Plant which discharges, by canal, into the Rivera Drain thence to New River.

RECORDS: Computations of flows from Wisteria Wasteway are based on gate openings and water-stage elevations upstream from the wasteway made by the Ministry of Hydraulic Resources, and of weekly measurements taken downstream from the weir by the Mexican Section of the Commission. Computation of flows from the Potable Water Plant are based on weekly readings from the discharge canal. Data obtained and furnished by the Mexican Section of the Commission. Records available: Wisteria Wasteway, January 1951 through 1970; Sifón Wasteway, January 1952 through April 1964; Pueblo Nuevo Wasteway, January 1956 through 1965; and the Potable Water Plant, January 1968 through 1970.

REMARKS: Mean daily discharges for Wisteria Wasteway and the Potable Water Plant are shown on pages 59 and 58, respectively in this bulletin. Records for Pueblo Nuevo and Sifón Wasteways are shown in previously published bulletins, 1960 through 1965; flows from these two Wasteways are used for irrigation and no longer reach New River.

Monthly Discharge in Acre-Feet

Month	Current Year 1970	Period 1956-1970		
		Average	Maximum	Minimum
January	166	1,667	8,758	15.4
February	178	1,119	7,281	19.6
March	209	696	2,610	21.7
April	230	497	2,843	16.1
May	238	336	1,141	9.1
June	116	235	1,477	0
July	287	158	348	0
August	388	369	1,413	0
September	473	448	2,081	21.0
October	366	599	2,024	8.4
November	233	867	3,784	0
December	268	1,574	8,691	0
Yearly	3,152	8,566	27,430	399

SALTON SEA - ELEVATIONS OF WATER SURFACE

DESCRIPTION: Water-stage recorder and staff gage located on the western shore of the Salton Sea, 15.5 miles northwest of Westmoreland, California. The Salton Sea is situated in Imperial and Riverside counties of California in the United States, 125 miles northwest of the Gulf of California, 18 miles northwest of Brawley, California, and 42 miles north of the international boundary between the United States and Mexico. The sea lies in the bottom of a closed basin known as the Salton Sink, which has a drainage area of 8,360 square miles. Zero of gage is 250.00 feet below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through 1970. From January 1925 to October 22, 1951, records were collected by Imperial Irrigation District and based generally upon one water surface reading each month, determined from a bench mark at Figtree John's Spring about 22 miles northwest along the western shore from the present gage. Since October 24, 1951, a continuous record of gage heights has been obtained by the U. S. Geological Survey at new gaging station published as "Salton Sea near Westmoreland, California." The elevation of the old station is at a datum of one foot higher than that of the present station, therefore to make the records comparable it is necessary to subtract one foot from the elevations of the records obtained at the old station. All records reported below and the area and capacity table are adjusted to the datum of the present station. The area and capacity table, dated January 8, 1965, is based on reservoirs made in 1957 above elevation -240 feet and in 1962 below elevation -236 feet.

REMARKS: Runoff from the basin, irrigation drainage and waste water from Imperial and Coachella Valleys in the United States, and drainage and waste water from part of the Mexicali Valley in Mexico discharge into the Salton Sea. Water from Mexico enters the United States in the Alamo River and New River channels. The bottom of the sea is 277.7 feet below mean sea level, U. S. C. & G. S. datum.

EXTREMES: Maximum elevation during year, 231.7 feet below mean sea level. Minimum elevation during year, 232.8 feet below mean sea level. Prior to 1935, and since the sea was filled by flood waters of the Colorado River 1905-1906, maximum elevation 195.9 feet below mean sea level (present datum), February 10 to March 29, 1907; minimum elevation 251.6 feet below mean sea level in November 1924.

Mean Daily Water Surface Elevation in Feet below Mean Sea Level - 1970

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	232.6	232.4	232.2	231.8	231.8	231.7	232.0	232.1	232.4	232.7	232.8	232.7
2	232.6	232.3	232.1	231.8	231.8	231.7	232.0	232.1	232.4	232.7	232.8	232.7
3	232.6	232.3	232.1	231.8	231.8	231.7	232.0	232.1	232.4	232.7	232.8	232.7
4	232.6	232.3	232.2	231.8	231.8	231.8	232.0	232.1	232.4	232.7	232.8	232.7
5	232.6	232.3	232.1	231.8	231.8	231.8	232.0	232.1	232.4	232.7	232.8	232.7
6	232.6	232.3	232.1	231.8	231.8	231.8	232.0	232.1	232.4	232.7	232.8	232.7
7	232.6	232.3	232.1	231.8	231.8	231.8	232.0	232.1	232.4	232.7	232.8	232.7
8	232.6	232.2	232.0	231.8	231.8	231.8	232.0	232.1	232.5	232.7	232.8	232.7
9	232.6	232.2	232.1	231.8	231.8	231.8	232.0	232.2	232.5	232.7	232.8	232.7
10	232.6	232.2	232.0	231.8	231.8	231.9	232.0	232.2	232.5	232.7	232.8	232.7
11	232.6	232.2	232.1	231.8	231.8	231.9	232.0	232.2	232.5	232.7	232.8	232.7
12	232.6	232.2	232.0	231.8	231.8	231.9	232.0	232.2	232.5	232.7	232.8	232.7
13	232.5	232.2	232.0	231.7	231.8	231.9	232.0	232.2	232.5	232.7	232.8	232.7
14	232.5	232.1	232.0	231.8	231.8	231.9	232.0	232.2	232.5	232.7	232.8	232.7
15	232.5	232.1	232.0	231.8	231.8	231.9	232.0	232.2	232.6	232.7	232.8	232.6
16	232.5	232.1	232.0	231.8	231.8	231.9	232.0	232.2	232.6	232.7	232.8	232.6
17	232.5	232.1	232.0	231.8	231.8	231.9	232.0	232.2	232.6	232.7	232.8	232.6
18	232.5	232.1	232.0	231.8	231.8	231.9	232.0	232.3	232.6	232.7	232.8	232.6
19	232.5	232.1	231.9	231.8	231.8	231.9	232.0	232.3	232.6	232.7	232.8	232.6
20	232.5	232.2	231.9	231.8	231.8	231.9	232.0	232.3	232.6	232.7	232.8	232.6
21	232.5	232.2	231.9	231.8	231.8	232.0	232.0	232.3	232.6	232.7	232.8	232.6
22	232.4	232.2	231.9	231.8	231.7	232.0	232.0	232.3	232.6	232.7	232.8	232.6
23	232.4	232.2	231.9	231.8	231.7	232.0	232.0	232.3	232.6	232.7	232.8	232.6
24	232.4	232.2	231.9	231.8	231.7	232.0	232.0	232.3	232.6	232.7	232.7	232.6
25	232.4	232.2	231.9	231.8	231.7	232.0	232.0	232.3	232.7	232.7	232.7	232.6
26	232.4	232.2	231.9	231.8	231.7	232.0	232.0	232.3	232.7	232.8	232.7	232.6
27	232.4	232.2	231.9	231.8	231.7	232.0	232.0	232.3	232.7	232.8	232.7	232.6
28	232.4	232.2	231.9	231.8	231.7	232.0	232.0	232.3	232.7	232.8	232.7	232.6
29	232.4	232.2	231.9	231.8	231.7	232.0	232.0	232.3	232.7	232.8	232.7	232.6
30	232.4	232.2	231.8	231.8	231.7	232.0	232.1	232.4	232.7	232.8	232.7	232.6
31	232.4	232.2	231.8	231.8	231.7	232.0	232.1	232.4	232.7	232.8	232.7	232.6
Avg:	232.51	232.21	231.99	231.80	231.77	231.89	232.01	232.23	232.55	232.72	232.78	232.65

Month	Current Year 1970			Period 1935-1970		
	Ø Extreme Elev. Feet		Average	Elevation Feet		‡ Min.
	High	Low		# Max.	†	
Jan.	232.4	232.6	238.81	232.05	249.3	
Feb.	232.1	232.4	238.49	231.79	248.8	
Mar.	231.8	232.2	238.23	231.57	248.6	
Apr.	231.7	231.8	238.03	231.39	248.7	
May	231.7	231.8	238.03	231.54	248.5	
June	231.7	232.0	238.20	231.71	248.8	
July	232.0	232.1	238.36	231.92	249.1	
Aug.	232.1	232.4	238.56	232.17	249.4	
Sept.	232.4	232.7	238.75	232.49	249.4	
Oct.	232.7	232.8	238.83	232.49	249.8	
Nov.	232.7	232.8	238.82	232.30	250.0	
Dec.	232.6	232.7	238.66	232.23	249.6	
Yearly	231.7	232.8	238.48	232.06	250.0	

Area and Capacity Table		
Elevation	Area	Capacity
Feet below M.S.L.	Acres	Acres-Foot
277.7	0	0
274.0	20,600	25,700
270.0	62,900	188,700
266.0	94,600	510,600
260.0	122,600	1,170,000
256.0	134,700	1,684,000
252.0	148,800	2,250,000
244.0	179,700	3,562,000
240.0	196,900	4,315,000
235.0	221,800	5,360,000
230.0	235,800	6,504,000
220.0	262,000	8,993,000
210.0	288,500	11,740,000
200.0	315,500	14,760,000

Ø Mean daily # Mean monthly † Reading near first day of month

CHEMICAL ANALYSES OF WATER SAMPLES

1970

The tables below are based on four samples from the Alamo and New Rivers taken and analyzed by the State of California Department of Water Resources.

Samples from the Alamo River are taken near the international boundary upstream from seepage pipes from the All-American Canal. Samples from New River are taken from the right bank at road bridge 450 feet north of international boundary. Records of sampling extend from April 1951 through 1970.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20.04; Mg, 12.16; Na, 22.99; (CO₃ plus HCO₃) expressed as CO₃, 30.00; SO₄, 48.03; Cl, 35.45; NO₃, 62.00. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as ECx10⁶ at 25°C, is a relative measure of the total salt concentration.

Month	No. of Samples	Dissolved Solids		ECx10 ⁶ @25°C	Boron p. p. m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter					
		Tons Per Acre- Foot	Total Tons						Ca	Mg	Na	CO ₃ + HCO ₃	SO ₄	Cl

Alamo River

Jan.	1	5.17	5,565	1.66	8.2	61	53	11.83	11.18	36.89	5.41	22.65	31.50	0.07
Feb.														
Mar.														
Apr.														
May	1	4.60	4,719	1.4	7.7	59	52	10.73	10.77	31.84	4.45	20.60	27.78	.05
June														
July														
Aug.	1	4.28	4,558	1.1	8.0	56	52	10.63	11.18	28.19	4.55	19.44	26.23	.07
Sept.														
Oct.														
Nov.	1	4.48	4,817	1.38	7.9	58	50	11.28	10.77	30.45	5.72	20.46	26.51	.08
Dec.														
Total	4													

New River

Jan.	1	6.51	7,496	1.95	7.0	68	73	12.57	10.03	51.77	4.58	15.72	55.55	0.29
Feb.														
Mar.														
Apr.														
May	1	5.66	6,231	1.7	7.2	66	70	11.18	10.28	44.15	5.28	14.35	46.53	.02
June														
July														
Aug.	1	5.55	6,345	1.6	7.3	67	70	11.63	9.29	45.24	5.12	15.27	47.52	.02
Sept.														
Oct.														
Nov.	1	6.46	7,650	2.1	6.9	69	74	12.48	9.62	53.59	5.38	14.75	58.37	.03
Dec.														
Total	4													

** Percent of total cations

*** Percent of total anions

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES 1970

The following tables show electrical conductivity expressed in mhos per centimeter cube x 10⁶ at 25°C of individual water samples from the wasteway canal at the Potable Water Plant in Mexicali, Baja California, the New River in Mexico at the international boundary, and the Wisteria Wasteway to New River. Samples from the Potable Water Plant, the New River, and Wisteria Wasteway are taken by the Mexican Section of the Commission and determinations are made by the Ministry of Hydraulic Resources of Mexico.

Electrical conductivity is a relative indication of the concentration of dissolved solids in the water samples.

Date	ECx10 ⁶ @25°C												
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Mexicali Potable Water Plant to New River

January		March		April		May		July		August		September		November	
3	2,100	2	1,850	15	1,900	30	1,900	2	2,000	16	1,900	29	1,900	17	1,850
10	1,900	13	2,000	24	2,000		June	14	2,100	25	2,000		October	24	1,900
17	2,000	20	1,850		May	2	2,100	21	2,100		September	5	2,200		December
31	2,100	25	1,950	2	1,900	9	2,000	28	2,400	1	1,900	13	1,800	4	1,950
	February		April	8	1,950	16	2,000		August	8	2,300	23	1,800	15	2,000
7	1,950	2	1,800	16	1,800	23	2,600	4	2,200	15	2,000	27	1,900	24	2,250
14	1,500	10	1,900	23	1,700	30	2,150	11	2,000	23	2,000		November	29	2,450
21	1,950											3	1,750		

New River at International Boundary

January		March		April		May		June		August		September		November	
10	7,250	13	8,000	15	7,000	23	6,500	23	6,500	4	6,250	18	7,000	10	7,000
17	8,000	20	7,250	24	6,500	30	6,000	30	6,900	11	6,000	23	6,500	17	7,000
31	8,000	25	6,500		May		June		July	18	6,500	29	6,500		December
	February		April	2	6,000	2	6,500	7	6,700	25	6,500		October	15	7,750
7	8,500	2	6,600	8	6,750	9	7,000	14	6,500		September	5	6,500	24	7,800
14	9,000	10	7,000	16	6,500	16	6,500	21	6,250	1	6,500	23	7,000	29	7,500
21	9,250							28	7,000	15	7,000	27	6,250		

Wisteria Wasteway to New River

January		March		April									
3	2,200	2	1,950	2	1,800								

COTTONWOOD CREEK ABOVE MORENA DAM, CALIFORNIA

DESCRIPTION: Staff gage located on east side of outlet tower immediately upstream from face of Morena Dam. The dam is located on Cottonwood Creek 1.8 miles upstream from the mouth of Hauser Creek, 8.5 miles upstream from Barrett Dam, and about 20 miles upstream from the international boundary. Zero of gage is 2,882.4 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Reservoir inflows shown below were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall, by the International Boundary and Water Commission, United States Section. They represent all water reaching Morena Reservoir, including rainfall on reservoir water surface. Basic data were furnished by the city of San Diego, California. Records available: April 1911 through 1970.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1970 computed on basis of area-capacity curves determined from 1948 re-survey. Various changes have been made to the spillway section since construction of the dam. Elevation of present crest of ungated spillway is 157.00 feet, gage datum. Reservoir capacity at spillway crest, 1948 survey, is 50,210 acre-feet. The entire capacity of Morena Reservoir is used to furnish a part of the water supply of the city of San Diego, California. Water is released from Morena Reservoir down Cottonwood Creek to Barrett Reservoir as required.

EXTREMES: Prior to 1937, maximum monthly inflow, 37,200 acre-feet, January 1916; minimum, no flow during parts of many years. Reference table below for extremes since 1937.

Monthly Discharge in Acre-Feet

Month	Current Year 1970	Period 1937-1970		
		Average	Maximum	Minimum
January	61.6	47.1	3,520	4.8
February	44.5	1,162	16,700	8.0
March	188	1,730	13,220	19.3
April	68.0	1,098	11,490	0
May	0	388	3,550	0
June	.6	197	1,660	0
July	19.0	140	1,010	0
August	17.5	99.7	1,260	0
September	29.3	69.6	1,070	0
October	3.0	80.0	1,270	0
November	39.8	150	1,380	0
December	178	494	3,590	4.4
Yearly	649.3	6,079.3	39,439	121

COTTONWOOD CREEK BELOW MORENA DAM, CALIFORNIA

DESCRIPTION: Two water-stage recorders, one on the upstream side of the southeast abutment of Morena Dam for measuring head on the spillway crest and one immediately below the dam with a rectangular control weir for measuring ordinary reservoir releases, and cableway located about 0.8 mile downstream from the dam. Discharge measurements made at the cableway include leakage, controlled releases, and spillway discharges.

RECORDS: Monthly records shown below represent the water available immediately below Morena Dam, consisting of spillway waste, draft, and leakage from the dam. They are computed by the International Boundary and Water Commission, United States Section, from basic data furnished by the city of San Diego, California. Records available: January 1911 through 1970.

REMARKS: Flows at this station are regulated by Morena Dam; storage began March 1910. Water is released from Morena Reservoir as required and flows down the natural channel of Cottonwood Creek to Barrett Reservoir. There are no major diversions above Morena Dam.

EXTREMES: Prior to 1937, maximum monthly discharge, 21,400 acre-feet, February 1916; minimum, zero during December 1936.

Monthly Discharge in Acre-Feet

Month	Current Year 1970	Period 1937-1970		
		Average	Maximum	Minimum
January	9.0	128	1,700	1.0
February	0.2	358	4,260	0.2
March	0	291	1,731	0
April	0	888	12,950	0
May	0	242	3,040	0
June	0	333	7,360	0
July	0	189	2,340	0
August	0	157	1,550	0
September	48.3	310	5,880	.2
October	0	92.3	529	0
November	0	124	1,260	0
December	0	344	5,350	0
Yearly	57.5	3,456.3	24,825	15.6

COTTONWOOD CREEK ABOVE BARRETT DAM, CALIFORNIA

DESCRIPTION: Staff gage located immediately upstream from face of dam on west side of outlet tower. Barrett Dam is located on Cottonwood Creek 8.5 miles downstream from Morena Dam, 1 mile downstream from the mouth of Pine Valley Creek and about 12 miles upstream from the international boundary. Zero of gage is 1,446.12 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records reported below represent all water reaching Barrett Dam from the sub-basin below Morena Dam, including rainfall on the reservoir water surface. Leakage, releases and spills from Morena Reservoir are not included. The inflows were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation and rainfall furnished by the city of San Diego, California. Records available: January 1921 through 1970. Records of stream flow for a station at the dam site are also available for the periods 1906-1915 and 1917-1920.

REMARKS: Storage began at Barrett Reservoir in January 1921. The area-capacity-elevation curves used in the inflow calculations are dated 1948, 1951 and 1955 and were furnished by the city of San Diego. Capacity of reservoir at top of flash gates on spillway (gage height 168.88 feet) is 44,755 acre-feet. Capacity at spillway crest (gage height 160.88 feet) is 37,950 acre-feet. Dead storage, 719 acre-feet below lowest outlet (gage height 58.88 feet) is not included in these capacities. The entire capacity of Barrett Reservoir is used to furnish a part of the water supply of the city of San Diego, California.

EXTREMES: Prior to 1937, maximum monthly discharge, 54,800 acre-feet, February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1970	Period 1937-1970		
		Average	Maximum	Minimum
January	99.1	610	3,430	5.2
February	141	1,686	26,790	7.6
March	399	2,778	18,860	14.1
April	31.4	1,837	21,630	.2
May	0	562	5,130	0
June	160	231	1,730	0
July	2.6	148	1,010	0
August	44.8	89.9	579	0
September	25.0	102	759	0
October	16.7	64.8	645	.1
November	45.0	134	1,200	0
December	364	505	3,380	5.5
Yearly	1,328.6	8,747.7	59,387	129

DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder 0.5 mile downstream from Barrett Dam on right bank of Dulzura Conduit 50 feet upstream from road crossing to Barrett Dam. Elevation of gage has not been determined.

RECORDS: Computed on basis of head on control section of flume, as measured by water-stage recorder, and rating curve determined from current meter measurements. Records obtained and furnished by the city of San Diego, California. Records available: January 1909 through 1970.

REMARKS: Barrett Dam was completed in 1921. Prior to this date the intake of Dulzura Conduit was located 1.5 miles upstream. The conduit carries diversions from Barrett Reservoir on Cottonwood Creek westerly across the divide into Otay Reservoir for municipal use by the city of San Diego. Prior to September 30, 1958, station was located 8 miles along the conduit from Barrett Dam, being reported as "Dulzura Conduit Near Dulzura" and the draft from Barrett Reservoir was computed from the discharges obtained at the conduit gaging station, multiplied by the factor 1.05 to allow for channel losses in the reach from the reservoir to the gaging station.

EXTREMES: Since 1937: Maximum mean daily discharges, 55 second-feet on March 15, 1954; minimum discharge, no flow for long periods on many occasions.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	6.8	31.7	33.0	31.5	0	0	0	0	0
2	0	0	0	15.1	30.3	35.7	31.1	0	0	0	0	0
3	0	0	0	21.4	29.4	37.4	30.5	0	0	0	0	0
4	0	0	0	27.3	28.8	37.0	31.0	0	0	0	0	0
5	0	0	0	31.5	32.2	36.7	33.4	0	0	0	0	0
6	0	0	0	36.1	34.1	36.3	34.3	0	0	0	0	0
7	0	0	0	37.2	34.1	36.1	33.2	0	0	0	0	0
8	0	0	0	33.2	34.1	35.6	34.6	0	0	0	0	0
9	0	0	0	32.8	34.1	35.2	35.6	0	0	0	0	0
10	0	0	0	32.6	34.1	35.0	34.5	0	0	0	0	0
11	0	0	0	32.4	34.1	34.8	33.4	0	0	0	0	0
12	0	0	0	32.0	34.1	34.5	32.0	0	0	0	0	0
13	0	0	0	31.5	34.1	34.3	30.9	0	0	0	0	0
14	0	0	0	33.4	34.8	33.9	33.9	0	0	0	0	0
15	0	0	0	34.8	35.0	33.9	34.5	0	0	0	0	0
16	0	0	0	34.8	35.0	33.7	32.6	0	0	0	0	0
17	0	0	0	34.1	35.4	33.4	30.7	0	0	0	0	0
18	0	0	0	33.2	35.4	33.7	28.4	0	0	0	0	0
19	0	0	0	32.8	35.4	32.0	27.1	0	0	0	0	0
20	0	0	0	32.2	35.9	31.5	27.8	0	0	0	0	0
21	0	0	0	32.0	36.5	31.1	32.0	0	0	0	0	0
22	0	0	0	31.3	36.3	30.7	30.3	0	0	0	0	0
23	0	0	0	31.1	36.1	30.1	25.9	0	0	0	0	0
24	0	0	0	31.1	36.1	29.4	21.6	0	0	0	0	0
25	0	0	0	32.0	35.6	28.6	20.2	0	0	0	0	0
26	0	0	0	32.8	35.2	27.8	16.6	0	0	0	0	0
27	0	0	0	32.8	34.8	27.3	11.3	0	0	0	0	0
28	0	0	0	32.4	34.5	26.9	8.0	0	0	0	0	0
29	0	0	0	32.0	34.1	31.0	3.2	0	0	0	0	0
30	0	0	0	31.7	33.4	32.4	0	0	0	0	0	0
31	0	0	0		33.4		0	0	0	0	0	0
Sum	0	0	0	924.4	1,058.1	989.0	810.1	0	0	0	0	0
Current Year 1970								Period 1937-1970				
Month	Extreme Gage Feet		β Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.				0		0	0	418	2,350	0		
Feb.				0		0	0	420	2,130	0		
Mar.				0		0	0	563	2,330	0		
Apr.			7	37.2	1	6.8	30.8	1,834	906	2,860	0	
May			21	36.5	4	28.8	34.1	2,099	1,032	3,040	0	
June			3	37.4	28	26.9	33.0	1,962	1,049	2,920	0	
July			9	35.6	† 30	0	26.1	1,607	867	2,920	0	
Aug.				0		0	0	751	2,820	0		
Sept.				0		0	0	487	2,320	0		
Oct.				0		0	0	372	2,450	0		
Nov.				0		0	0	513	2,760	0		
Dec.				0		0	0	474	2,305	0		
Yearly				37.4		0	10.3	7,502	7,852	27,170	0	

β Mean daily

† And other days

COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located about 2.5 miles downstream from Barrett Dam and 0.5 mile upstream from Rattlesnake Canyon for measuring Barrett Dam spills, and staff gage and control weir located immediately below the dam for measuring leakage. The elevation of the gage is about 1,000 feet (from topographic map).

RECORDS: Data furnished by the city of San Diego, California. Prior to January 1953, the records were furnished by the city of San Diego and reviewed and revised by the United States Section of the Commission. The recorder is to be operated only when Barrett Reservoir is near or above spillway level. There have been no spillway discharges since May 1943. Spillway discharges included in the period record below were computed by the city of San Diego from the head on the spillway crest, read on the reservoir gage, and applied to a broad-crested weir formula. Records available: January 1921 through 1970. Storage began in Barrett Reservoir in January 1921.

REMARKS: Records reported below represent the water available in the natural channel of Cottonwood Creek immediately below Barrett Dam. Records of draft from Barrett Reservoir are not included inasmuch as all releases are made to Dulzura Conduit which transports water outside the basin. Leakage is mainly through the spillway gates.

EXTREMES: Prior to 1937, maximum monthly discharge 38,400 acre-feet February 1927; minimum discharge, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1970	Period 1937-1970		
		Average	Maximum	Minimum
January	0	17.8	590	0
February	0	30.3	990	0
March	0	814	13,390	0
April	0	1,195	33,400	0
May	0	271	7,520	0
June	0	38.2	890	0
July	0	2.1	21	0
August	0	1.9	21	0
September	0	1.5	21	0
October	0	1.3	21	0
November	0	1.0	15	0
December	0	1.6	21	0
Yearly	0	2,375.7	50,364	0

COTTONWOOD CREEK ABOVE TECATE CREEK NEAR DULZURA, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located 1.6 miles upstream from the international land boundary between the United States and Mexico, 0.8 mile upstream from the confluence with Tecate Creek, and 5.1 miles south of Dulzura, California. Low water discharge measurements are made by wading at the gage; high water measurements are made from the cableway which is located 700 feet downstream from the gage. Zero of gage is 569.40 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow generally made twice each month. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1970.

REMARKS: Flow is largely controlled by Barrett and Morena Reservoirs, 10 and 18 miles, respectively, upstream from this station. During 1970, there were no releases or spills to the natural channel of Cottonwood Creek at Barrett Dam, the lowermost dam in Cottonwood Creek Basin.

EXTREMES: Maximum discharge 4,340 second-feet February 7, 1937 (gage height 9.65 feet), from rating curve extended above 1,500 second-feet by logarithmic plotting. Minimum discharge, no flow during part of each year.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	.05	2.3	.07	.03	0	0	0	0	0	0	0
2	0	.05	3.1	.06	0	0	0	0	0	0	0	0
3	0	.05	.53	.05	0	0	0	0	0	0	0	0
4	0	.05	.33	.04	0	0	0	0	0	0	0	0
5	0	.06	6.0	.02	0	0	0	0	0	0	0	0
6	0	.05	1.0	.02	0	0	0	0	0	0	0	0
7	0	.05	.58	.02	0	0	0	0	0	0	0	0
8	0	.04	.47	.03	0	0	0	0	0	0	0	0
9	0	.04	.47	.04	0	0	0	0	0	0	0	0
10	0	.22	1.4	.03	0	0	0	0	0	0	0	0
11	0	.29	.87	.01	0	0	0	0	0	0	0	0
12	0	.10	.58	0	0	0	0	0	0	0	0	0
13	0	.07	.47	0	0	0	0	0	0	0	0	0
14	0	.06	.42	0	0	0	0	0	0	0	0	0
15	0	.06	.37	0	0	0	0	0	0	0	0	0
16	0	.05	.33	.01	0	0	0	0	0	0	0	0
17	0	.06	.33	.05	0	0	0	0	0	0	0	0
18	0	.07	.33	.10	0	0	0	0	0	0	0	0
19	0	.07	.25	.10	0	0	0	0	0	0	0	0
20	0	.05	.25	.06	0	0	0	0	0	0	0	0
21	0	.05	.22	.04	0	0	0	0	0	0	0	.80
22	0	.07	.22	.03	0	0	0	0	0	0	0	1.0
23	0	.09	.17	.03	0	0	0	0	0	0	0	.09
24	0	.10	.17	.01	0	0	0	0	0	0	0	.05
25	.01	.12	.17	0	0	0	0	0	0	0	0	.04
26	.02	.14	.17	0	0	0	0	0	0	0	0	.04
27	.03	.14	.17	.06	0	0	0	0	0	0	0	.04
28	.04	.57	.12	.19	0	0	0	0	0	0	0	.04
29	.05	.10	.10	.09	0	0	0	0	0	0	0	.04
30	.05	.10	.10	.04	0	0	0	0	0	0	0	.05
31	.05	.10	.10	0	0	0	0	0	0	0	0	.05
Sum	.25	2.82	22.09	1.20	.03	0	0	0	0	0	0	2.24
Current Year 1970										Period 1937-1970		
Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			† 29	.05	† 1	0	.008	.5	205	1,190	0	
Feb.			28	.57	† 8	.04	.10	5.6	657	9,940	0	
Mar.			5	6.0	† 29	.10	.71	44	1,757	20,880	0	
Apr.			28	.19	† 12	0	.04	2.4	1,658	40,240	0	
May			1	.03	† 2	0	.001	.06	385	10,040	0	
June				0		0	0	0	73.3	1,590	0	
July				0		0	0	0	8.2	206	0	
Aug.				0		0	0	0	.4	7.7	0	
Sept.				0		0	0	0	2.2	72	0	
Oct.				0		0	0	0	4.2	101	0	
Nov.				0		0	0	0	23.6	440	0	
Dec.				0		0	0	0	149	1,316	0	
Yearly				22	1.0	† 1	0	.072	4.4	149	1,316	0

Ø Mean daily

† And other days

CAMPO CREEK NEAR CAMPO, CALIFORNIA

DESCRIPTION: Water-stage recorder and broad-crested weir on left bank, 0.5 mile upstream from the international land boundary between the United States and Mexico, just upstream from bridge on California State Highway 94, 3.5 miles southwest of Campo, California. Low water discharge measurements are made by wading at the gage; high water measurements are made from the bridge. Zero of gage is 2,178.92 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1970.

REMARKS: Campo Creek originates in the United States and flows southwestward into Mexico where it joins Tecate Creek. The flow at this station is partially regulated by a small conservation reservoir a quarter of a mile upstream, completed in August 1956.

EXTREMES: Maximum instantaneous discharge during 1970, 0.80 c.f.s. on March 5 (gage height 1.33 feet); no flow most of the year including maximum day, which was less than 0.03 c.f.s. Maximum discharge 880 second-feet, February 6, 1937 (gage height 4.80 feet, present datum), from rating curve extended above 110 second-feet on basis of velocity-depth relation and cross-section area at the control. Minimum discharge, no flow during part of most years.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.09	.14	.24	.09	.14	.09	.06	.06	.07	.04	.03	.11
2	.09	.14	.24	.09	.11	.09	.06	.06	.07	.04	.03	.09
3	.09	.14	.17	.09	.11	.09	.06	.06	.07	.05	.04	.09
4	.09	.14	.17	.09	.14	.09	.06	.09	.07	.05	.04	.06
5	.09	.14	.56	.09	.14	.09	.06	.09	.06	.05	.05	.05
6	.09	.14	.39	.09	.14	.09	.06	.09	.06	.05	.05	.05
7	.09	.14	.24	.11	.14	.09	.05	.09	.06	.05	.05	.05
8	.09	.14	.24	.11	.14	.09	.05	.09	.06	.05	.05	.06
9	.09	.14	.24	.14	.14	.09	.05	.09	.06	.05	.05	.06
10	.14	.20	.27	.14	.14	.11	.05	.09	.06	.05	.05	.06
11	.11	.17	.24	.14	.14	.09	.06	.09	.06	.05	.05	.06
12	.11	.17	.20	.14	.11	.09	.06	.09	.05	.05	.05	.07
13	.11	.17	.20	.14	.09	.09	.06	.06	.05	.05	.05	.08
14	.11	.17	.20	.14	.09	.09	.06	.06	.05	.05	.05	.09
15	.11	.17	.20	.14	.09	.09	.06	.11	.06	.05	.05	.14
16	.11	.17	.17	.14	.09	.09	.06	.09	.05	.05	.05	.09
17	.14	.17	.17	.14	.09	.06	.05	.09	.05	.05	.05	.10
18	.11	.17	.14	.14	.09	.06	.09	.09	.05	.05	.05	.10
19	.11	.17	.14	.14	.09	.06	.06	.09	.05	.05	.05	.11
20	.11	.17	.14	.14	.09	.06	.11	.09	.05	.05	.05	.11
21	.11	.17	.14	.14	.09	.06	.09	.09	.05	.05	.05	.50
22	.11	.17	.14	.14	.09	.06	.09	.09	.05	.05	.05	.10
23	.11	.17	.11	.14	.09	.06	.09	.09	.05	.05	.05	.09
24	.11	.17	.11	.14	.09	.06	.09	.08	.05	.05	.05	.09
25	.11	.17	.11	.14	.09	.06	.09	.08	.05	.05	.05	.09
26	.11	.17	.11	.14	.09	.06	.09	.08	.04	.05	.06	.09
27	.14	.17	.11	.24	.09	.06	.09	.08	.04	.03	.06	.09
28	.14	.20	.09	.20	.09	.06	.09	.08	.04	.03	.06	.09
29	.14		.09	.17	.09	.06	.09	.08	.04	.03	.27	.09
30	.14		.09	.17	.09	.06	.09	.07	.04	.03	.14	.09
31	.14		.09		.09		.09	.07		.03		.09
Sum	3.44	4.55	5.75	4.06	3.30	2.30	2.22	2.56	1.61	1.43	1.78	3.04
Current Year 1970								Period 1937-1970				
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			† 10	.14	† 1	.09	.11	6.8	138	906	0	
Feb.			† 10	.20	† 1	.14	.16	9.0	243	1,730	0	
Mar.			5	.56	† 28	.09	.19	11.4	349	2,360	0	
Apr.			27	.24	† 1	.09	.14	8.1	245	3,250	0	
May			† 1	.14	† 13	.09	.11	6.5	112	1,540	0	
June			10	.11	† 17	.06	.077	4.6	44.1	719	0	
July			20	.11	† 7	.05	.072	4.4	17.9	361	0	
Aug.			15	.11	† 1	.06	.083	5.1	13.2	321	0	
Sept.			† 1	.07	† 26	.04	.054	3.2	12.5	264	0	
Oct.			† 3	.05	† 27	.03	.046	2.8	21.6	543	0	
Nov.			29	.27	† 1	.03	.059	3.5	39.8	542	0	
Dec.			21	.50	† 5	.05	.098	6.0	110.2	808	0	
Yearly				.56		.03	.10	71.4	1,346.3	11,141	0	

† And other days

Ø Mean daily

COTTONWOOD CREEK NEAR INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and cableway, 0.6 mile upstream from the international land boundary between the United States and Mexico, 0.5 mile downstream from the confluence of Cottonwood Creek and Tecate Creek, and 5.5 miles south of Dulzara, California. Low water discharge measurements are made by wading at the gage. Zero of gage is 542.42 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow generally made twice each month. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1970.

REMARKS: Flow is partially controlled by Barrett and Morena Reservoirs, 11 and 19 miles respectively, upstream from this station. The flow at this station represents the amount of water passing the Marron Dam site.

EXTREMES: Maximum discharge, 4,700 second-feet, February 7, 1937 (gage height 8.50 feet) from rating curve extended above 300 second-feet on basis of velocity, mean-depth and area computations. Minimum discharge, no flow for part of most years.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.16	.16	2.3	1.0	.28	.16	.11	.08	.07	.07	.14	.16
2	.14	.16	4.6	.94	.25	.14	.11	.08	.07	.07	.14	.16
3	.14	.14	1.5	.86	.22	.14	.11	.08	.07	.07	.14	.14
4	.16	.14	.94	.78	.22	.11	.11	.08	.07	.08	.14	.16
5	.19	.14	9.2	.64	.22	.11	.11	.08	.07	.11	.11	.19
6	.11	.14	2.1	.47	.25	.11	.11	.08	.07	.11	.08	.24
7	.11	.14	1.0	.32	.22	.14	.08	.08	.07	.11	.08	.25
8	.11	.14	.70	.28	.19	.16	.08	.07	.06	.11	.08	.24
9	.11	.16	.58	.28	.22	.14	.08	.07	.07	.11	.08	.26
10	.11	.25	1.3	.25	.22	.16	.08	.07	.08	.11	.08	.25
11	.11	.28	1.5	.22	.22	.14	.08	.07	.08	.11	.08	.25
12	.14	.28	.86	.19	.22	.11	.08	.07	.08	.11	.08	.25
13	.14	.32	.70	.22	.22	.11	.08	.07	.11	.14	.11	.25
14	.14	.37	.64	.19	.22	.11	.08	.07	.08	.14	.11	.29
15	.16	.37	.64	.19	.19	.11	.08	.07	.08	.14	.11	.28
16	.16	.37	.64	.22	.16	.11	.08	.07	.08	.14	.14	.28
17	.19	.37	.70	.25	.16	.11	.08	.07	.08	.14	.14	.35
18	.19	.37	.64	.22	.16	.11	.08	.07	.08	.14	.14	.33
19	.19	.37	.58	.25	.16	.11	.08	.07	.08	.14	.14	.41
20	.19	.37	.58	.25	.19	.11	.08	.07	.08	.14	.16	.32
21	.19	.42	.64	.22	.19	.11	.08	.07	.08	.14	.16	14
22	.19	.42	.64	.22	.19	.14	.08	.07	.07	.14	.16	4.2
23	.19	.42	.86	.22	.22	.14	.08	.07	.07	.14	.16	.58
24	.19	.47	.94	.19	.19	.16	.08	.07	.07	.14	.19	.32
25	.19	.47	.94	.19	.22	.14	.08	.07	.07	.14	.25	.32
26	.19	.47	1.1	.19	.19	.14	.08	.07	.07	.14	.28	.32
27	.19	.47	1.3	.37	.22	.14	.08	.07	.07	.14	.19	.32
28	.19	.58	.94	.37	.22	.14	.08	.07	.07	.14	.22	.32
29	.19		1.0	.42	.19	.14	.08	.07	.07	.14	.22	.32
30	.19		1.2	.32	.16	.14	.08	.07	.07	.14	.19	.32
31	.16		1.1		.16		.08	.07		.14		.32
Sum	5.01	8.76	42.36	10.73	6.34	3.89	2.66	2.24	2.24	3.83	4.27	26.40
Current Year 1970										Period 1937-1970		
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			† 5	.19	† 6	.11	.16	9.9	436	2,750	0	
Feb.			28	.58	† 3	.14	.31	17.4	1,181	13,680	0	
Mar.			5	9.2	† 9	.58	1.37	84.0	2,791	27,140	0	
Apr.			1	1.0	† 12	.19	.36	21.3	2,265	51,060	0	
May			1	.28	† 16	.16	.20	12.6	572	14,110	0	
June			† 1	.16	† 4	.11	.13	7.7	117	2,630	0	
July			† 1	.11	† 7	.08	.086	5.3	18.9	312	0	
Aug.			† 1	.08	† 8	.07	.072	4.4	6.9	171	0	
Sept.			† 13	.11	† 8	.06	.075	4.4	9.5	152	0	
Oct.			† 13	.14	† 1	.07	.12	7.6	24.2	705	0	
Nov.			† 26	.28	† 6	.08	.14	8.5	60.5	839	0	
Dec.			21	.14	3	.14	.85	52.4	367	3,330	0	
Yearly				14		.06	.323	235.5	7,849.0	97,900	0	

∅ Mean daily

† And other days

INFLOWS TO RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Rodríguez Dam is located in Mexico on Río de las Palmas, the principal tributary to the Tijuana River, about 5.5 miles upstream from its confluence with Cottonwood Creek, 11 miles upstream from the point where the Tijuana River crosses the international boundary between the United States and Mexico, and 10 miles southeast of Tijuana, Baja California.

RECORDS: Computed from monthly reservoir records of storage, releases, spills, leakage, evaporation and rainfall. Records obtained by the Ministry of Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1970. Storage began in Rodríguez Reservoir on September 22, 1936.

REMARKS: Records of runoff represent all water reaching Rodríguez Reservoir including rainfall on the reservoir water surface. Area-capacity-elevation rating for reservoir used in the computations is dated 1927 when the reservoir area was initially surveyed. Elevation of crest of spillway 380.08 feet above mean sea level; at top of spillway gates 410.10 feet above mean sea level. Reservoir capacity at spillway crest 76,210 acre-feet; at top of spillway gates 111,070 acre-feet.

EXTREMES: Maximum monthly inflow, 77,320 acre-feet, April 1941; minimum, no flow during part of most years.

Monthly Discharge in Acre-Feet

Month	Current Year 1970	Period 1938-1970		
		Average	Maximum	Minimum
January	31.3	885	6,569	0
February	62.6	2,454	41,295	5.8
March	320	6,112	68,321	4.2
April	236	3,196	77,790	0
May	204	408	9,962	0
June	0	75.8	891	0
July	0	77.6	326	0
August	0	51.6	770	0
September	0	50.8	466	0
October	0	61.8	344	0
November	106	162	1,940	0
December	107	955	15,686	12.8
Yearly	1,067	14,489	177,668	254

DIVERSIONS FROM RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Sparling flow meter located immediately below the dam in the pipe line which carries water released from Rodríguez Reservoir to the North and South Canals.

RECORDS: Direct recording by Sparling flow meter. Records obtained by the Ministry of Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano of Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Service for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1970.

REMARKS: Since the dam was completed in 1937, water has been diverted directly into the aqueduct for domestic use for Tijuana, Baja California and into the North and South Canals for irrigation in Mexico. The North Canal delivers water to lands in the Tijuana Valley north of the Río de las Palmas and the South Canal delivers water to lands in the valley south of the Río de las Palmas and the Tijuana River. During 1970, no water was released for irrigation of farm lands.

EXTREMES: Maximum monthly diversion, 1,963 acre-feet, July 1944; minimum, no flow March and April 1941, August 1960, and December 1962.

Monthly Discharge in Acre-Feet

Month	Current Year 1970	Period 1938-1970		
		Average	Maximum	Minimum
January	127	247	782	2.3
February	271	276	1,132	1.9
March	229	333	1,223	0
April	259	474	1,602	0
May	206	647	1,676	1.8
June	290	752	1,857	1.9
July	258	798	1,963	1.9
August	270	686	1,859	0
September	264	554	1,420	1.9
October	284	481	1,187	1.9
November	181	367	1,037	2.3
December	138	323	981	0
Yearly	2,777	5,938	15,317	59.6

TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on right bank about 550 feet downstream from the international boundary and about 0.8 mile west of the international gate at San Ysidro, California. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 8 current meter measurements and observations of no flow and a continuous record of gage heights. Records obtained and furnished by the United States Section of the Commission. Records available: May 1947 through 1970.

EXTREMES: Since May 1947: Maximum instantaneous discharge, 2,570 second-feet, March 15, 1952; minimum discharge, no flow during part or all of each year since 1951.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	57.8	0	0	0	0	0	0	0	0	0.23
2	0	0	41.1	0	0	0	0	0	0	0	0	0.28
3	0	0	5.0	0	0	0	0	0	0	0	0	0.01
4	0	0	3.1	0	0	0	0	0	0	0	0	0
5	0	0	30.3	0	0	0	0	0	0	0	0	0
6	0	0	3.8	0	0	0	0	0	0	0	0	0
7	0	0	.6	0	0	0	0	0	0	0	0	0
8	0	0	1.2	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0.69
10	0	1.5	1.1	0	0	0	0	0	0	0	0	0.36
11	0	1.9	.2	0	0	0	0	0	0	0	0	.04
12	0	0	0	0	0	0	0	0	0	0	0	.32
13	0	0	0	0	0	0	0	0	0	0	0	.02
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0.11	0	0	0	0	0	0	0	0	0	0	0
16	0.26	0	0	0	0	0	0	0	0	0	0	0
17	0.36	0	0	0	0	0	0	0	0	0	0	2.59
18	0	0	0	0	0	0	0	0	0	0	0	1.13
19	0	0	0	0	0	0	0	0	0	0	0	23.74
20	0	0	0	0	0	0	0	0	0	0	0	13.52
21	0	0	0	0	0	0	0	0	0	0	0	74.06
22	0	0	0	0	0	0	0	0	0	0	0	16.38
23	0	0	0	0	0	0	0	0	0	0	0	0.92
24	0	0	0	0	0	0	0	0	0	0	0	0.38
25	0	0	0	0	0	0	0	0	0	0	0	0.15
26	0	0	0	0	0	0	0	0	0	0	0.34	0.10
27	0	0	0	1.6	0	0	0	0	0	0	0	0.10
28	0	25.9	0	0	0	0	0	0	0	0	0	0.04
29	0	0	0	0	0	0	0	0	0	0	33.9	0
30	0	0	0	0	0	0	0	0	0	0	2.33	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum	1.1	29.3	143.2	1.6	0	0	0	0	0	0	36.57	135.04
Current Year 1970								Period 1947-1970				
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	46.41		16	7.5	† 1	0	.04	2.2	433	4,603	0	
Feb.	48.20		28	183	† 1	0	1.0	58.1	297	1,496	0	
Mar.	47.87	46.05	1	126	† 9	0	4.6	284	906	13,309	0	
Apr.	46.53	46.05	27	11.7	† 1	0	0.1	3.2	261	2,926	0	
May				0		0	0	0	42.5	312	0	
June				0		0	0	0	27.8	309	0	
July				0		0	0	0	21.9	239	0	
AUG				0		0	0	0	19.0	193	0	
Sept.				0		0	0	0	24.8	216	0	
Oct.				0		0	0	0	36.7	305	0	
Nov.	48.21	45.85	29	185	† 1	0	1.2	72.5	110	1,084	0	
Dec.	48.55		21	265	† 4	0	4.4	268	300	2,725	0	
Yearly	48.55	45.85		265		0	.95	688.0	2,479.7	19,882	0	

† And other days

TIJUANA RIVER NEAR NESTOR, CALIFORNIA

DESCRIPTION: Water-stage recorder on county road bridge 4.1 miles downstream from the international land boundary between the United States and Mexico, 2.9 miles upstream from mouth of the river, and 1.7 miles south of Nestor, California. Zero of gage is 15.14 feet above mean sea level, U. S. C. & G. S. datum. From April 10, 1953 to August 5, 1958, station was located 2 miles upstream at different datum.

RECORDS: Based on current meter measurements or observation of no flow generally made twice a month. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1914 through September 1915, and October 1922 through 1970 (October 1922 through May 1936 are from city of San Diego, California).

REMARKS: The flow at this station is partially controlled by Morena and Barrett Reservoirs on Cottonwood Creek in the United States and by Rodriguez Reservoir on Río de las Palmas in Mexico. Some diversions for irrigation are normally made in Mexico whenever surface runoff occurs in the river or in its two principal tributaries.

EXTREMES: Since October 1, 1936: Maximum discharge, 17,700 second-feet, February 7, 1937 (gage height 8.20 feet), obtained from rating curve extended above 2,000 second-feet on basis of velocity-depth relationship, and cross section after peak of the flood. Minimum discharge, no flow during parts of most years.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	5.0	0	0	0	0	0	0	0	0	0
2	0	0	6.3	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	6.3	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	2.9
22	0	0	0	0	0	0	0	0	0	0	0	3.0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum	0	0	17.6	0	0	0	0	0	0	0	0	5.9
Current Year 1970									Period 1937-1970			
Month	Extreme Gage Feet		Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.				0		0	0	758	4,070	0		
Feb.				0		0	0	4,173	66,920	0		
Mar.			†2	6.3	†3	.57	35	7,293	107,000	0		
Apr.				0		0	0	6,237	181,900	0		
May				0		0	0	696	18,340	0		
June				0		0	0	118	3,060	0		
July				0		0	0	23.4	523	0		
Aug.				0		0	0	16.6	242	0		
Sept.				0		0	0	24.2	234	0		
Oct.				0		0	0	83.2	1,340	0		
Nov.				0		0	0	142	1,490	0		
Dec.			22	3.0	21	.19	12	764	7,930	0		
Yearly				6.3		.063	47.0	20,328.4	332,749	0		

Ø Mean daily

† And other days

STORED WATER IN RESERVOIRS, TIJUANA RIVER BASIN

Data are presented below for all storage reservoirs in the Tijuana River Basin. The data represent contents on the last day of the month in acre-feet. The reservoir capacities indicated are total capacities, at the top of the spillway gates in closed position on the controlled spillways of Barrett and Rodríguez Dam, and at spillway level for Morena Dam, which has had an uncontrolled spillway since the spillway gates were removed in 1942. The records of storage reported below for Morena, Barrett, and Rodríguez Reservoirs are based on the capacities as determined by the following surveys: Morena 1948; Barrett 1948, 1951, and 1955; and Rodríguez 1927, when the reservoir area was initially surveyed.

Records for Morena and Barrett Reservoirs are obtained and furnished by the city of San Diego, the U. S. Geological Survey, and the U. S. Weather Bureau. Records for Rodríguez Reservoir are obtained and furnished by the State Department of Public Works and Services for Tijuana, Baja California.

In Acre-Feet

Month	Morena Reservoir, California (Capacity 50,210)		Barrett Reservoir, California (Capacity 44,760)		Rodríguez Reservoir, Baja California (Capacity 111,880)		Total in Tijuana River Basin Reservoirs (Capacity 206,850)	
	1970	Average 1937-1970	1970	Average 1937-1970	1970	Average 1937-1970	1970	Average 1937-1970
Jan.	4,559	16,537	7,517	11,763	4,670	33,219	16,746	61,519
Feb.	4,546	17,245	7,608	13,263	4,361	34,181	16,515	64,689
Mar.	4,672	18,534	7,948	14,860	4,344	37,758	16,964	71,152
Apr.	4,637	18,533	6,025	15,381	4,197	37,741	14,859	71,655
May	4,486	18,373	3,886	14,635	4,044	37,041	12,416	70,049
June	4,332	17,870	2,203	13,828	3,543	35,918	10,078	67,616
July	4,148	17,395	831	12,989	3,055	34,726	8,034	65,110
Aug.	4,008	16,955	834	12,199	2,603	33,649	7,445	62,803
Sept.	3,833	16,410	815	11,904	2,190	32,732	6,838	78,271
Oct.	3,748	16,171	814	11,539	1,798	31,961	6,360	59,671
Nov.	3,711	16,058	845	11,167	1,658	31,430	6,214	58,655
Dec.	3,877	16,113	1,204	11,474	1,579	31,771	6,660	59,358
Average	4,213	17,183	3,378	12,917	3,170	34,344	10,761	65,879
Maximum	4,672	# 61,670	7,948	θ 45,920	4,670	109,608	16,964	213,600
Minimum	3,711	10	814	106	1,579	0	6,214	1,264

March 31, 1941 - Prior to removal of spillway gates

θ April 30, 1937 - Sand bags were placed on crest of spillway

RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall with averages for their periods of record at stations located in California and Baja California. Daily records, where available, are on file in the offices of the United States and Mexican Sections of the Commission. For location, elevation, period of record, and the observer, see alphabetical listing of these stations on the following page.

In United States

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Potrero, California	
	1970	Average 1906-1970	1970	Average 1907-1970	1970	Average 1951-1970	1970	Average 1914-1970
Jan.	1.18	3.83	0.90	3.37	0.88	2.63	1.13	3.42
Feb.	.47	3.83	1.11	3.42	.68	1.92	1.02	3.73
Mar.	4.49	3.40	4.47	2.91	4.77	2.32	3.79	2.94
Apr.	1.03	1.81	1.41	1.62	.72	1.44	1.05	1.85
May	0	.63	0	.57	0	.41	0	.65
June	.03	.14	.06	.06	.07	.04	.05	.09
July	.14	.38	.11	.10	0	.03	.08	.20
Aug.	.88	.52	.82	.20	.12	.12	1.09	.20
Sept.	.70	.34	0	.25	0	.20	0	.25
Oct.	.16	.86	.15	.68	.04	.27	.61	.71
Nov.	2.14	1.57	2.76	1.35	1.80	1.60	2.31	1.47
Dec.	3.99	3.31	3.28	2.93	2.80	2.28	3.71	3.21
Yearly	15.21	20.62	15.07	17.46	11.88	13.26	14.84	18.72

Month	Sawday Ranch, California		Campo, California		Chula Vista, California	
	1970	Average 1950-1970	1970	Average 1900-1970	1970	Average 1930-1970
Jan.	0.57	3.09	0.85	3.03	0.84	1.82
Feb.	1.02	2.34	.96	3.35	.83	1.75
Mar.	4.67	2.76	3.95	2.76	2.48	1.49
Apr.	1.62	1.86	1.18	1.50	.21	.87
May	0	.45	0	.54	.03	.24
June	0	.04	.03	.07	T	.05
July	.62	.48	.03	.54	0	.02
Aug.	.33	.75	2.66	.52	0	.07
Sept.	0	.36	.08	.33	0	.17
Oct.	.10	.35	.12	.61	.07	.39
Nov.	2.13	1.82	1.28	1.36	1.68	1.06
Dec.	4.34	2.42	2.66	2.60	2.22	1.75
Yearly	15.40	16.72	13.80	17.21	8.36	9.68

In Mexico

Month	La Rumorosa, Baja California		Tecate, Baja California		Tijuana, Baja California		Rodríguez Dam, Baja California	
	1970	Average 1945-1970	1970	Average 1961-1970	1970	Average 1961-1970	1970	Average 1938-1970
Jan.	0	0.71	.79	2.36	0.71	1.81	0.39	1.46
Feb.	.55	.35	1.22	1.34	2.13	1.30	1.22	1.26
Mar.	1.30	.55	3.31	1.93	2.05	1.22	2.56	1.38
Apr.		.35	.98	1.18	.39	.67	.31	.79
May	0	.08	0	.31		.20		.12
June	0	.04	.08	.08		.04		
July	.16	.31	0	.08	0	.04	0	
Aug.	.04	.59	.87	.16	0	.04		.04
Sept.	0	.24	0	.12		.16		.24
Oct.	.55	.35	.16	.28	.04	.24		.28
Nov.	.28	.47	2.20	1.26	1.42	1.10	1.18	.91
Dec.	.87	.71	3.15	2.13	2.68	1.38	2.05	1.65
Yearly	3.74	4.72	12.76	11.85	9.41	8.70	7.72	8.03

RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

In Mexico

Month	Valle de las Palmas, Baja California		El Pinal, Baja California		San Juan de Dios, Baja California			
	1970	Average 1948-1970	1970	Average 1964-1970	1970	Average 1956-1970		
Jan.	0.16	1.34	0.87	2.52	0.87	2.09		
Feb.	1.81	1.02	3.19	2.52	3.31	2.01		
Mar.	1.97	1.10	4.21	2.20	3.39	1.77		
Apr.	.63	.63	1.50	2.17	.55	1.26		
May	0	.12		.12	0	.28		
June	0		0	0	0	.20		
July	0	.04	.04	.87	.91	1.02		
Aug.	.55	.08	1.50	.83	.04	.63		
Sept.	0	.16	.12	.51	.08	.47		
Oct.	0	.16	0	.08	.35	.51		
Nov.	1.10	.24	1.81	2.01	.98	1.34		
Dec.	1.38	1.02		4.09	3.94	2.05		
Yearly	7.60	6.73		18.43	14.41	15.55		

LOCATION OF RAINFALL STATIONS

In United States

NAME OF STATION	LATI- TUDE	LONGI- TUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Barrett Dam, California	32° 41'	116° 40'	1,750	1907	City of San Diego
Campo, California	32° 37'	116° 28'	2,630	1877	Archie C. Leach
Chula Vista, California	32° 36'	117° 06'	9	1930	Western Salt Company
Marron Valley, California	32° 34'	116° 46'	550	1951	Fred Mellor
Morena Dam, California	32° 41'	116° 32'	3,010	1906	City of San Diego
Potrero, California	32° 37'	116° 37'	2,390	1914	L. W. Whitehouse
Sawday Ranch, California	32° 45'	116° 29'	3,200	1950	William Tulloch

In Mexico

NAME OF STATION	LATI- TUDE	LONGI- TUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
El Pinal, Baja California	32° 12'	116° 17'	4,429	1964	Hydraulic Resources
La Rumorosa, Baja California	32° 33'	116° 03'	3,937	1946	Hydraulic Resources
Rodríguez Dam, Baja California	32° 26'	116° 55'	459	1938	Hydraulic Resources
San Juan de Dios, Baja California	32° 08'	116° 10'	3,280	1956	Hydraulic Resources
Tecate, Baja California	32° 32'	116° 39'	1,690	1946	Hydraulic Resources
Tijuana, Baja California	32° 31'	117° 02'	180	1948	Hydraulic Resources
Valle de las Palmas, Baja California	32° 23'	116° 40'	148	1948	Hydraulic Resources

δ Elevation above mean sea level

° Estimated from topographic maps

EVAPORATION IN THE TIJUANA RIVER BASIN IN INCHES

Tabulated below are records of evaporation observed at four stations in California and at five stations in Baja California, with averages for their periods of record. The stations in California are observed by Western Salt Company, City of San Diego, California, and the United States Section of the Commission; those in Baja California are observed by the Ministry of Hydraulic Resources. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations", page 79 in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 3-foot by 3-foot by 18-inch deep floating pan. October 1926 through 1970, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.
2. Chula Vista: September 1918 through 1970, U. S. Weather Bureau 4-foot diameter pan, 10 inches deep, set on 2-inch by 4-inch timber grill.
3. Marron Valley: February 1951 to April 30, 1956, 2-foot diameter screened pan, 36 inches deep with automatic level attachment. From April 30, 1956 through April 29, 1963, same type of pan 22.5 inches in diameter. From April 30, 1963 to date, 2-foot diameter screened pan, same type.
4. Morena Reservoir: October 1915 through December 1921, square 3-foot by 3-foot by 18-inch deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 3-foot by 3-foot by 18-inch deep floating pan and a land pan of the same dimensions. September 1926 through 1970, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

In United States

Month	Morena Dam, California		Barrett Dam, California		Marron Valley California		Chula Vista, California	
	1970	Average 1916-1970	1970	Average 1921-1970	1970	Average 1951-1970	1970	Average 1919-1970
Jan.	1.39	2.27	1.82	1.87	3.97	2.89	2.84	2.83
Feb.	2.25	2.31	2.62	2.22	2.54	3.13	4.00	3.34
Mar.	2.65	3.60	3.05	3.58	3.42	3.93	5.24	5.01
Apr.	4.23	4.89	3.85	4.86	5.50	5.38	7.14	5.91
May	6.31	6.89	6.38	6.98	6.89	6.77	6.89	6.87
June	7.58	8.77	6.95	8.49	7.83	8.05	7.27	6.97
July	8.36	10.23	8.05	10.17	8.82	9.60	7.59	7.62
Aug.	7.01	9.55	7.75	9.60	8.84	9.28	7.89	7.33
Sept.	6.57	7.73	7.01	7.83	8.10	8.04	6.95	6.10
Oct.	4.07	5.44	3.34	5.52	8.13	6.67	5.45	4.90
Nov.	2.54	3.58	2.68	3.48	4.37	4.45	3.96	3.64
Dec.	0.64	2.52	0.88	2.12	2.48	3.12	2.20	2.75
Yearly	53.60	67.78	54.38	66.72	70.89	71.31	67.42	63.27

In Mexico

Month	Tecate, Baja California		Tijuana, Baja California		Rodríguez Dam, Baja California		Valle de las Palmas, Baja California		San Juan de Dios, Baja California	
	1970	Average 1961-70	1970	Av. 1952-59 1961-1970	1970	Av. 1939-42 1946-1970	1970	Average 1952-70	1970	Average 1960-70
Jan.	3.82	3.39	2.80	2.87	3.23	3.74	*	3.78	3.82	2.60
Feb.	4.13	3.35	4.53	3.39	4.21	3.82	3.31	3.66	3.15	2.60
Mar.	4.72	4.17	3.58	4.02	4.53	5.00	4.41	5.24	3.90	3.86
Apr.	6.46	5.28	5.43	4.72	5.75	5.79	3.66	6.42	4.09	4.57
May	6.81	6.38	*	5.83	7.87	7.36	6.61	7.44	7.68	6.38
June	6.89	6.14	*	5.71	7.05	7.91	6.85	9.17	9.33	6.65
July	8.82	8.66	*	6.73	8.50	9.02	8.11	10.75	10.00	8.46
Aug.	7.44	8.07	*	7.01	8.07	8.31	8.82	10.20	7.72	7.40
Sept.	6.85	6.89	5.75	6.02	8.23	7.09	9.53	8.82	10.39	7.87
Oct.	5.98	6.50	5.04	4.72	5.47	5.98	5.91	6.42	5.12	5.24
Nov.	4.76	4.02	2.76	3.35	4.06	5.00	4.13	4.57	5.47	3.62
Dec.	4.09	3.90	2.09	2.91	.28	4.09	1.93	3.98	3.23	3.11
Yearly	70.79	67.76		55.51	68.82	73.43		79.88	73.90	60.71

* Record incomplete

TEMPERATURE IN THE TIJUANA RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly average temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations", page 79 in this bulletin.

In United States

Month	Barrett Dam, California			Average 1931- 1970	Chula Vista, California			Average 1931- 1970	Campo, California			Average 1951- 1970
	1970				1970				1970			
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	49.5	76	21	48.6	53.4	75	31	52.5	47.4	75	14	46.8
Feb.	53.1	80	29	50.4	56.6	75	40	53.8	50.4	77	24	48.0
Mar.	53.7	83	32	53.2	57.0	72	44	55.2	49.9	79	25	49.3
Apr.	53.7	85	32	57.8	57.1	76	42	57.9	50.1	82	24	
May	62.9	98	38	62.8	60.8	84	47	60.6	60.2	98	28	58.2
June	69.2	103	43	67.9	63.3	74	51	62.9	67.4	105	33	64.4
July	77.7	102	53	76.0	67.0	77	57		76.1	101	47	73.4
Aug.	78.5	107	53	76.3	70.2	78	61		77.4	105	52	73.6
Sept.	69.4	99	39	72.3	66.0	94	50		67.0	98	33	69.1
Oct.	62.5	93	38	64.2	62.9	80	45	62.8	59.5	92	28	61.0
Nov.	56.1	88	31	56.0	58.4	81	43		53.7	85	27	52.8
Dec.	48.3	79	30	50.6	53.2	69	39	54.3	46.6	82	26	
Yearly	61.2	107	21	61.3	60.5	94	31		58.8	105	14	

In Mexico

Month	La Rumorosa, Baja California				Tecate, Baja California				Tijuana, Baja California			
	1970		1946-1970		1970		1946-59 & 61-70		1970		1948-59 & 61-70	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	73	25	81	5	75	34	100	21	75	39	91	27
Feb.	68	32	82	10	82	32	100	21	84	43	102	32
Mar.	72	32	88	16	79	32	93	25	79	46	90	34
Apr.	72	28	91	23	81	32	99	32	82	43	97	34
May	93	36	97	28	95	36	100	36	95	46	97	43
June	102	43	113	34	100	39	104	36	82	57	99	41
July	99	57	104	39	100	50	115	36	91	59	120	46
Aug.	95	64	102	46	102	54	113	34	91	64	106	52
Sept.	93	48	104	34	93	39	115	36	93	54	120	46
Oct.	82	41	93	25	90	36	106	32	86	46	117	43
Nov.	73	36	88	14	88	32	97	27	82	48	108	34
Dec.	77	27	81	10	77	32	97	23	79	41	99	25
Yearly	102	25	113	5	102	32	115	21	95	39	120	25

Month	Rodríguez Dam, Baja California				Valle de las Palmas, Baja California				El Pinal, Baja California			
	1970		1938-1970		1970		1948-1970		1970		1964-1970	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	75	32	88	27	79	23	88	12	66	19	73	12
Feb.	86	41	91	32	88	34	99	23	75	34	75	23
Mar.	84	43	88	32	88	36	100	28	72	28	77	23
Apr.	93	39	93	36	90	36	104	32	72	41	82	18
May	99	46	99	37	104	39	108	36	97	32	99	27
June	93	50	108	46	108	45	118	39	97	32	99	30
July	99	55	104	48	108	52	120	45	102	46	102	39
Aug.	99	57	104	52	108	54	111	48	97	48	104	39
Sept.	95	50	108	48	102	45	117	43	91	36	102	36
Oct.	93	46	108	43	97	37	108	37	79	30	95	30
Nov.	84	41	99	30	90	37	100	19	77	28	84	28
Dec.	81	39	93	27	84	32	91	21			79	36
Yearly	99	32	108	27	108	23	120	12			104	12

**TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES FAHRENHEIT**

In Mexico

Month	San Juan de Dios, Baja California										
	1970		1956-1970								
	Max.	Min.	Max.	Min.							
Jan.	72	14	88	7							
Feb.	70	23	84	16							
Mar.	72	32	84	18							
Apr.	75	25	102	19							
May	88	32	91	21							
June	97	34	106	28							
July	95	41	120	36							
Aug.	95	34	106	32							
Sept.	93	34	100	25							
Oct.	84	32	100	19							
Nov.	84	34	99	12							
Dec.	73	19	88	14							
Yearly	97	14	120	7							

DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS ALONG TIJUANA RIVER AND TRIBUTARIES

1970

The total area within Tijuana River basin is 1,731 square miles, as determined from the best available maps from both the United States and Mexico. The drainage areas shown below are tabulated according to their downstream sequence.

The irrigated areas, tabulated in downstream sequence, are from the most reliable sources available. Those in the United States were furnished by the United States Department of Agriculture and the State Engineer, State of California, or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana Basin in 1970 was by pumping from ground water.

Designation of Areas	Drainage Basin-Square Miles			Irrigated Areas-Acres		
	United States	Mexico	Total	United States	Mexico	Total
Cottonwood Creek						
above Morena Dam	114	0	114	(a) 75	0	(a) 75
Morena Dam to Barrett Dam	133	0	133	(a) 0	0	0
above Barrett Dam	247	0	247	(a) 75	0	(a) 75
below Barrett Dam and above						
Tecate Creek	65	0	65	(a) 145	0	(a) 145
above Tecate Creek	312	0	312	(a) 220	0	(a) 220
Campo Creek						
above International Boundary	82	4	86	(a) 320	0	(a) 320
Tecate Creek						
above International Boundary						
(does not include Campo Creek)	19	64	83	0	0	0
Cottonwood Creek						
above International Boundary						
Station	413	68	481	(a) 540	0	(a) 540
Río de las Palmas						
above Rodríguez Dam	7	981	988	0	(b) 0	0
Tijuana River						
above Nestor Gaging Station	458	1,266	1,724			
above the Mouth	462	1,269	1,731	3,000	(c) 346	3,346

(a) Estimated as of 1948. During extremely dry years these areas may be materially reduced.

(b) Areas in upper valleys may be irrigated by pumping from ground water.

(c) There was no irrigation in 1970 in the Tijuana Irrigation District, Tijuana Valley, Baja California, Mexico, from the Rodríguez Reservoir, but an estimated area of about 346 acres was irrigated by pumping from ground water. Depending upon the availability of water this acreage varies considerably from year to year.



WHITWATER DRAW NEAR DOUGLAS, ARIZONA

DESCRIPTION: Water-stage recorder located on U. S. Highway 80 bridge between Douglas and Bisbee, Arizona, about 450 feet upstream from the Southern Pacific Railroad bridge, 1.5 miles upstream from the international boundary, and 2 miles west of Douglas, Arizona. Zero of gage is 3,906.94 feet above mean sea level, U. S. C. & G. S. datum of 1929.

RECORDS: Based on 11 current meter measurements or observations of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Geological Survey. Records fair except for periods of fragmentary or no gage height record, which are poor. Records available: August to October 1911 (gage heights and discharge measurements only), July to October 1912, January to June 1913, October 1913, December 1913 to June 1914, February to June 1915, October 1915 to September 1919, October 1919 to April 1922 (gage heights and discharge measurements only), June 1930 to December 1933, May 1935 to July 1947, October 1947 through 1970 (July 1954 to March 1955 monthly discharge only).

REMARKS: Diversions above this station are mainly by pumping from ground water for irrigation. Records show flow at the international boundary into Mexico except for some smelter waste water entering the stream a short distance below this station.

EXTREMES: Prior to 1936: Maximum recorded discharge, 3,450 second-feet August 10, 1931 (gage height 12.15 feet); maximum estimated discharge, 4,050 second-feet July 27, 1919; minimum discharge, no flow for several days of many years. Since 1936: Maximum discharge, 5,060 second-feet August 7, 1955; maximum gage height 16.55 feet July 29, 1966; minimum daily discharge, no flow at times during most years.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	.24	0	0	3.5	.02	0	0	0
2	0	0	.72	0	.01	0	0	6.6	.05	0	0	0
3	0	0	.93	0	0	0	0	86	.10	0	0	0
4	0	.02	.96	0	0	0	0	.07	.32	0	0	0
6	0	.02	1.1	0	0	0	0	35	2.1	0	0	0
6	0	.02	3.9	0	0	0	0	97	.23	0	0	0
7	0	.02	2.2	0	0	0	0	19	.12	0	0	0
8	0	.02	.22	0	0	0	24	84	.09	0	0	0
9	0	.01	.04	.04	0	0	.24	86	.07	0	0	0
10	0	0	.02	.22	0	0	.04	280	40	0	0	0
11	0	.05	.02	.30	0	0	0	297	3.6	0	0	0
12	0	.03	.02	.15	0	0	0	38	1.5	0	0	0
13	.02	.03	0	.04	0	0	0	28	.97	0	0	0
14	.01	.02	0	0	0	0	0	25	.35	0	0	0
15	0	.01	0	0	0	0	0	39	.26	0	0	0
16	0	0	0	0	0	0	0	145	.20	0	0	0
17	0	.01	0	0	0	0	0	888	.13	0	0	0
18	0	.01	0	0	0	0	0	277	.09	0	0	0
19	0	0	0	.09	0	0	0	31	.06	0	0	0
20	.01	0	0	.14	0	0	6.4	8.7	.04	0	0	0
21	.01	0	0	.19	0	0	.60	3.0	.02	0	0	0
22	.01	.04	0	.12	0	0	0	1.7	.01	0	0	0
23	.01	.02	0	.01	0	0	0	1.2	0	0	0	0
24	.01	.02	0	0	0	0	10	3.4	0	0	0	0
25	.02	.02	0	0	0	0	3.8	.13	0	0	0	0
26	.01	.02	0	0	0	0	.30	.11	0	0	0	0
27	.01	.02	0	0	0	0	52	3.8	0	0	0	0
28	.01	.01	0	0	0	0	19	.23	0	0	0	0
29	0	0	0	0	0	0	3.6	.13	0	0	0	0
30	0	0	0	.21	0	0	1.7	.10	0	0	0	0
31	.01	0	0	0	0	0	6.9	.09	0	0	0	0
Sum	0.14	0.42	10.13	1.51	0.25	0	128.58	2,487.76	50.33	0	0	0

Month	Extreme Gage Feet		Current Year 1970				Average Second Feet	Total Acre Feet	Period 1936-1970		
	High	Low	Ø Extreme Second Feet		Total Acre Feet	Acre Feet					
			High	Low		Average			Maximum	Minimum	
Jan.			† 13	.02	† 1	0	.005	.3	45.8	451	1.0
Feb.			11	.05	† 1	0	.015	.8	24.5	132	0
Mar.			6	3.9	† 1	0	.33	20.1	27.2	130	0
Apr.			11	.30	† 1	0	.050	3.0	24.5	173	0
May			1	.24	† 3	0	.008	.5	17.7	138	0
June				0		0	0	0	154	1,590	0
July			27	52	† 1	0	4.15	255	2,173	8,110	39
Aug.			17	888	4	.07	80.3	4,934.4	3,438	14,480	.3
Sept.			10	40	† 23	0	1.68	99.8	766	3,170	.8
Oct.				0	0	0	0	0	156	2,210	.4
Nov.				0	0	0	0	0	44.8	352	.2
Dec.				0	0	0	0	0	147	2,363	.4
Yearly				888		0	7.2	5,313.9	7,019	22,321	900

Ø Mean daily † And other days

SEWAGE INFLUENT, DOUGLAS, ARIZONA INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Parshall flume in influent line to the international treatment plant, equipped with Simplex digital meter for measuring combined sewage flows from Douglas, Arizona and Agua Prieta, Sonora; and Parshall flume with recorder for measuring the sewage from Douglas. Flows from Agua Prieta are deduced from total flows and the city of Douglas flows; however, since April 8, 1968, all the sewage from Agua Prieta has been diverted to new oxidation ponds located in Mexico, 1.6 miles south of the international boundary.

RECORDS: Continuous monthly records since March 1948; daily records from March 18, 1948 through 1950 and from January 1952 through 1970.

REMARKS: The Douglas-Agua Prieta International Treatment Plant was constructed by the Governments of the United States and Mexico in 1947 to correct a serious international sanitation problem. The plant is located in the United States adjacent to the international boundary about one mile west of the Douglas-Agua Prieta Port of Entry. Prior to December 1970, the treatment of sewage was complemented by the use of old oxidation ponds in Mexico adjacent to the international boundary. Since December 1970, sewage effluent from the plant flows into Mexico and then across to the right bank of the Agua Prieta Arroyo, by means of a canal bridge, to be used for irrigation.

Month	Total Monthly Flows			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1970			Period 1952-1970		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	30.590	0	30.590	1.050	0.884	0.987	1.618	0.619	1.058
Feb.	27.354	0	27.354	1.054	.814	.977	1.784	.584	1.060
Mar.	30.484	0	30.484	1.046	.906	.983	1.598	.590	1.062
Apr.	29.692	0	29.692	1.030	.900	.990	1.536	.619	1.060
May	31.522	0	31.522	1.102	.824	1.017	1.595	.619	1.066
June	31.526	0	31.526	1.142	.976	1.051	1.784	.626	1.126
July	33.906	0	33.906	1.192	1.015	1.094	3.209	.619	1.182
Aug.	35.219	0	35.219	1.200	1.054	1.136	1.985	.619	1.200
Sept.	33.199	0	33.199	1.200	1.016	1.107	1.884	.626	1.182
Oct.	31.690	0	31.690	1.074	.970	1.022	1.667	.626	1.118
Nov.	30.426	0	30.426	1.045	.970	1.014	1.586	.619	1.079
Dec.	31.920	0	31.920	1.119	.968	1.029	1.736	.619	1.085
Yearly	377.528	0	377.528	1.200	.814	1.034	3.209	.584	1.106

SEWAGE INFLUENT, AGUA PRIETA, SONORA INTERNATIONAL OXIDATION PONDS

DESCRIPTION: Parshall flume equipped with staff gage in influent line to oxidation ponds. Since April 8, 1968, all sewage from Agua Prieta, Sonora has been diverted to oxidation ponds, which are located in Mexico; if necessary, sewage from Douglas, Arizona may be included, but this has never been done.

RECORDS: Discharges are computed from daily 11:00 a.m. readings of the staff gage by applying an index for that hour, determined from 7 days of hourly measurements from which the relationship between mean daily readings and 11:00 a.m. readings was developed. Records available: Mean daily flows from April 8, 1968 through 1970.

REMARKS: The construction of the international oxidation ponds in Agua Prieta, Sonora was completed in April 1968 by the Government of Mexico, fulfilling an international agreement to solve the problem of insufficient capacity at the international treatment plant in Douglas, where the combined flows from Douglas and Agua Prieta were treated. If necessary, sewage from Agua Prieta may be treated in this plant, but since the completion of the oxidation ponds, this has never been done. The ponds are located 1.6 miles south of international monument 85A.

Month	Total Monthly Flows			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1970			Period June 1968-1970		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	0	15,814	15,814	.526	.497	.510	.640	.497	.553
Feb.	0	13,653	13,653	.497	.474	.488	.666	.474	.570
Mar.	0	15,130	15,130	.526	.474	.488	.666	.474	.573
Apr.	0	14,891	14,891	.526	.474	.496	.666	.474	.564
May	0	15,642	15,642	.526	.474	.505	.666	.474	.561
June	0	15,317	15,317	.526	.497	.511	.617	.414	.496
July	0	16,276	16,276	.572	.497	.525	.617	.259	.507
Aug.	0	17,392	17,392	.967	.497	.561	.967	0	.439
Sept.	0	15,586	15,586	.526	.497	.520	.617	.459	.553
Oct.	0	16,247	16,247	.549	.497	.524	.595	.187	.537
Nov.	0	14,973	14,973	.526	.474	.499	.717	.414	.561
Dec.	0	15,709	15,709	.526	.474	.507	.709	.474	.566
Yearly	0	186,630	186,630	.967	.474	.511	.967	0	.540

SAN PEDRO RIVER AT PALOMINAS, ARIZONA

DESCRIPTION: Water-stage recorder located near left bank on the downstream side of pier on bridge on Highway 92, 0.7 mile east of Palominas, 2.5 miles upstream from Green Brush Draw, 4.5 miles downstream from international boundary, and 12 miles southwest of Bisbee, Arizona. Zero of gage is 4,187.62 feet above mean sea level (State Highway bench mark).

RECORDS: Based on current meter measurements or observations of no flow during the year. Records available: May 1930 to October 1933, May 1935 to July 1941, and July 1950 through 1970. Records obtained and furnished by U. S. Geological Survey.

REMARKS: There are some small diversions for irrigation of a few hundred acres above this station, mostly in Mexico. Record shows approximate flow of river at international boundary.

EXTREMES: Maximum daily discharge, 22,000 second-foot on August 14, 1940 (gage height, 16.16 feet present datum), from rating curve extended above 5,600 second-foot on basis of slope-area measurement of peak flow; no flow at times in most summers. Greatest flood known occurred on September 28, 1926 (gage height, about 23.9 feet present datum, from floodmarks; discharge not determined).

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.3	.30	.30	.80	0	0	0	76	4.1	7.1	.60	0
2	2.3	.20	1.9	.10	0	0	0	77	3.3	5.1	.70	0
3	2.5	.10	2.8	0	0	0	0	1,480	8.9	3.8	.70	.10
4	2.8	.50	2.5	0	0	0	0	279	36	2.5	.60	.20
5	2.1	.50	3.5	.10	0	0	0	23	27	1.4	.80	.30
6	1.6	.50	5.8	.20	0	0	0	17	9.6	1.0	1.0	.20
7	1.6	.40	4.1	.30	0	0	0	6.9	7.7	.70	1.1	.40
8	1.7	.50	4.1	.10	0	0	0	23	6.1	.60	1.4	.20
9	2.1	.40	4.1	.10	0	0	0	1,850	55	.60	1.6	.40
10	2.1	.40	4.1	.20	.10	0	0	281	36	.50	1.6	1.2
11	2.1	1.7	4.4	0	.10	0	0	428	8.2	.50	1.7	1.4
12	2.3	3.5	4.1	0	0	0	0	86	5.4	.30	1.7	1.4
13	2.5	3.0	3.8	0	0	0	0	40	10	.40	1.6	1.1
14	2.3	3.0	3.5	0	0	0	0	138	7.7	.30	.60	1.6
15	2.3	2.8	3.3	0	0	0	0	49	6.1	.20	.50	2.8
16	2.3	2.1	2.8	0	0	0	0	268	6.1	.20	.60	2.8
17	2.3	2.5	2.3	.20	0	0	0	298	5.8	.20	.50	3.0
18	2.3	2.5	2.3	.60	0	0	0	393	4.0	.10	.30	3.5
19	2.3	2.1	2.1	.40	0	0	0	176	3.0	.20	.10	3.5
20	2.5	1.9	1.7	0	0	0	20	73	2.0	.20	.10	4.7
21	2.1	2.3	.70	0	0	0	26	52	1.0	.20	.10	5.1
22	2.4	3.0	.80	0	0	0	91	33	.60	.20	.10	3.5
23	.80	2.5	.70	0	0	0	4.4	30	.50	.20	0	4.7
24	1.2	1.6	.60	0	0	0	226	38	.50	.20	0	5.4
25	1.2	1.6	.40	0	0	0	285	17	.50	.20	0	3.3
26	1.0	1.1	.10	0	0	0	15	13	.40	.30	0	3.0
27	.50	.60	.10	0	0	0	57	9.6	.40	.20	0	5.1
28	.30	.50	0	0	0	0	258	8.2	.40	.40	0	3.8
29	1.0	1.0	0	0	0	7.1	109	6.5	.50	.60	0	3.3
30	.70	1.0	.70	0	0	2.2	3.8	4.7	.50	.60	0	3.0
31	1.4	1.1	1.1	0	0	0	1.4	4.4	.60	.60	0	3.0
Sum	56.90	42.10	69.70	3.10	.20	9.3	1,096.6	6,278.3	257.30	29.60	18.00	72.00

Month	Extreme Gage Feet		Current Year 1970				Average Second Feet	Total Acre Feet	Period 1951-1970		
	High	Low	Ø Second Year Feet		Day	Low			Acre Feet		
			Day	High					Average	Maximum	Minimum
Jan.			4	2.8	28	.30	1.84	112.9	706	7,813	2.6
Feb.			12	3.5	3	.10	1.50	83.5	380	1,577	3.0
Mar.			6	5.8	28	0	2.25	138.2	309	2,043	36.0
Apr.			1	.80	3	0	.10	6.1	87.0	330	0
May			† 10	.10	† 1	0	.006	18.4	18.8	68.8	0
June			29	7.1	† 1	0	.31	18.4	184	1,391	0
July			25	285	† 1	0	35.4	2,175.1	6,347	17,238	184
Aug.			9	1,850	† 1	4.4	203	12,452.8	10,562	36,369	165
Sept.			9	55	† 26	.40	8.58	510.3	1,702	16,344	28.4
Oct.			1	7.1	† 18	1.0	.95	58.7	149	1,201	0
Nov.			† 11	1.7	† 23	0	.60	35.7	127	609	0
Dec.			24	5.4	† 1	0	2.32	142.8	914	10,959	6.2
Yearly				1,850		0	21.4	15,735	21,485	55,364	4,400

Ø Mean daily † And other days

SANTA CRUZ RIVER NEAR LOCHIEL, ARIZONA

DESCRIPTION: Water-stage recorder located in the United States near left bank on the downstream side of concrete bridge pier of county highway bridge, 2.5 miles northeast of Lochiel, Arizona, and 1.5 miles upstream from the international land boundary. The elevation of the zero of the gage has not been determined but topographic maps indicate the elevation of the stream bed at the gage is about 4,620 feet.

RECORDS: Based on 14 current meter measurements or observations of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Geological Survey. Records available: January 1949 through 1970.

REMARKS: There are small diversions by ground water pumping for irrigating about 200 acres above this station.

EXTREMES: Maximum discharge, 4,810 second-feet on September 12, 1965 (gage height 8.90 feet); minimum discharge, no flow for several days of each year.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.76	.71	.55	.22	.57	.10	.10	.10	.43	.40	.50	.62
2	.73	.71	.83	.22	.64	.10	.10	.10	.43	.41	.50	.62
3	.75	.71	.53	0	.66	0	0	54	.51	.42	.51	.62
4	.76	.72	.54	0	.70	0	0	3.7	.80	.36	.50	.68
5	.75	.69	.61	0	.64	0	0	.31	.57	.36	.50	.70
6	.74	.69	.61	0	.69	0	.10	.23	.55	.39	.50	.70
7	.77	.70	.55	0	.44	0	.50	.22	.56	.40	.50	.72
8	.77	.67	.53	0	.27	0	.20	.18	.61	.38	.54	.72
9	.71	.68	.54	0	.17	0	.20	.29	.89	.39	.45	.74
10	.73	.68	.56	0	.26	0	.30	7.7	.87	.39	.41	.74
11	.73	.73	.60	0	.40	0	.20	1.6	.59	.38	.44	.75
12	.74	.67	.54	0	.45	0	.10	.35	.59	.38	.45	.75
13	.73	.72	.54	0	.51	0	.10	.30	.57	.44	.54	.75
14	.74	.72	.54	0	.31	0	.20	.36	.55	.44	.57	.75
15	.74	.71	.55	0	.14	0	.20	.36	.54	.46	.62	.75
16	.74	.70	.57	0	.13	0	.10	.36	.54	.50	.62	.75
17	.74	.52	.54	.22	.12	0	.10	2.0	.51	.56	.62	.75
18	.74	.39	.57	.31	.16	0	0	5.7	.52	.56	.60	.75
19	.74	.30	.54	.26	.20	0	.10	3.1	.52	.56	.57	.75
20	.74	.24	.57	.30	.31	0	.40	.88	.50	.56	.56	.80
21	.70	.42	.57	.33	.38	0	39	.39	.46	.49	.56	.80
22	.71	.46	.59	.36	.44	0	.30	.37	.46	.50	.57	.80
23	.72	.50	.60	.39	.49	0	0	.44	.47	.48	.57	.80
24	.71	.54	.53	.42	.26	0	.90	.36	.46	.46	.56	.80
25	.68	.54	.40	.45	.10	0	.20	.31	.46	.44	.56	.80
26	.68	.54	.29	.42	0	0	0	.33	.44	.42	.56	.80
27	.67	.52	.21	.49	.10	0	.20	.41	.38	.38	.57	.91
28	.66	.48	.26	.39	.10	.38	.10	.43	.41	.38	.62	.81
29	.63	.28	.33	.33	.10	.30	0	.45	.43	.42	.62	.79
30	.65	.28	.45	0	0	0	0	.39	.44	.48	.62	.75
31	.65	.20	.10	.10	.10	0	.10	.42	.50	.50	.62	.74
Sum	22.31	16.66	15.62	5.56	9.84	0.88	43.80	86.14	16.06	13.69	16.31	23.21
Current Year 1970								Period 1949-1970				
Month	Extreme Gage Feet		g Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			† 7	.77	29	.63	.72	44.3	47.9	226	1.3	
Feb.			11	.73	20	.24	.60	33.0	41.8	261	1.8	
Mar.			2	.83	31	.20	.50	31.0	36.4	250	.7	
Apr.			27	.49	† 3	0	.19	11.0	20.5	148	0	
May			4	.70	† 26	0	.32	19.5	9.3	49.5	0	
June			28	.38	† 3	0	.029	1.7	2.9	22.3	0	
July			21	.39	† 3	0	1.41	86.9	523	4,270	1.6	
Aug.			3	.54	† 1	.10	2.78	170.9	1,118	10,120	.08	
Sept.			9	.89	27	.38	.54	31.9	342	2,634	0	
Oct.			† 17	.56	† 4	.36	.44	27.2	86.4	448	0	
Nov.			† 15	.62	10	.41	.54	32.4	41.5	182	0	
Dec.			27	.91	† 1	.62	.75	46.0	72.8	693	0	
Yearly					54	0	.73	535.8	2,343	12,633	126	

g Mean daily † And other days

SANTA CRUZ RIVER AT EL CAJON, SONORA

DESCRIPTION: Water-stage recorder, cableway, and Cipolletti weir with crest length of 26.25 feet and depth of 0.82 foot, 4.3 miles southwest of Santa Cruz, Sonora and approximately 30 miles southeast of Nogales, Sonora. Zero of gage is 4,270.24 feet above mean sea level, U. S. C. & C. S. datum, which is the same elevation as the crest of the weir.

RECORDS: Data is based on river stages and on current meter measurements made during the year. Data obtained and furnished by the Mexican Section of the Commission. Records available: January 14, 1954 through August 1959; October 1, 1959 to June 14, 1960; July 1960; January 6, 1961 to September 5, 1963; October 15, 1963 to August 3, 1964; January 9 to February 11 and April 1 through December 1965; January 1, 1966 through November 30, 1967; February 8 to October 23, and December 13 through 31, 1968; January 1 to April 9, June 5 to July 30, August 15 through 24, and October 17, 1969 through 1970.

REMARKS: Irrigation diversions above the station affect the regimen of the river. A flood in August 1955 destroyed the weir which was repaired in February 1957.

EXTREMES: Maximum instantaneous discharge, 4,590 second-feet on August 6, 1955 with stage of 6.00 feet. Minimum discharge, zero on August 12, and September 22, 1968.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.7	17.7	8.1	21.2	.7	.7	1.1	21.9	15.5	8.1	5.7	3.5
2	13.1	17.7	7.4	22.6	.7	.7	1.1	21.2	14.8	8.1	5.7	3.5
3	13.8	20.8	7.1	21.5	.7	θ	1.4	15.9	14.5	7.4	5.7	3.5
4	14.8	22.2	7.8	24.0	.7	.7	1.1	22.2	13.8	7.4	5.7	3.9
5	15.9	22.6	7.8	21.5	.7	1.1	.4	28.6	13.8	8.5	6.0	4.9
6	15.9	23.0	7.4	23.3	.7	1.4	1.4	22.6	17.7	8.8	6.0	6.0
7	16.2	25.1	7.4	21.5	1.1	1.4	1.4	18.0	26.5	8.8	6.7	6.4
8	15.9	26.1	7.4	14.8	1.1	1.8	1.4	20.5	19.1	8.1	7.8	5.7
9	17.0	12.0	7.4	13.1	1.1	1.8	1.4	33.9	17.0	8.1	7.1	5.7
10	17.3	8.8	7.8	10.6	1.1	1.8	.7	22.2	16.6	6.7	6.4	5.3
11	13.4	8.5	7.8	11.3	1.1	1.8	1.1	28.6	21.2	7.1	5.7	5.3
12	14.5	8.5	7.4	8.1	1.1	1.8	.7	153	21.2	7.1	5.3	5.7
13	13.1	7.4	7.4	7.8	1.1	1.4	.7	34.3	36.0	6.7	5.3	6.0
14	14.5	8.1	7.4	8.1	1.1	1.1	1.4	27.2	14.1	6.7	5.3	6.4
15	13.8	8.1	7.8	7.8	1.1	1.4	1.8	34.3	14.5	7.1	5.3	6.4
16	11.7	8.1	8.1	7.8	1.1	.7	2.1	29.7	13.8	6.4	5.3	6.7
17	8.8	7.8	8.5	7.8	1.1	.7	2.1	26.5	13.4	6.0	5.3	6.7
18	7.4	7.4	8.1	7.8	.7	.7	2.5	26.5	13.1	6.0	4.9	6.7
19	7.4	7.4	8.1	8.1	1.4	.4	1.8	89.0	12.4	6.0	4.9	6.7
20	7.4	7.4	8.1	8.1	1.1	.7	1.4	65.7	13.1	6.0	4.9	6.7
21	8.1	7.4	8.5	8.1	1.1	.7	1.1	25.1	11.7	6.0	4.9	6.7
22	8.5	7.4	9.2	8.5	1.1	1.4	.7	17.0	9.5	4.9	4.9	6.7
23	9.5	7.8	11.7	8.5	.7	1.4	.7	19.4	8.8	4.2	4.9	6.4
24	8.8	8.5	20.5	8.5	.7	1.4	2.1	25.1	7.8	4.9	4.2	6.4
25	9.5	7.8	24.4	8.5	.4	1.4	1.4	23.7	7.8	5.3	3.5	6.4
26	10.9	8.1	26.8	8.1	.7	1.1	1.1	22.2	8.1	5.3	3.2	5.7
27	8.8	9.9	26.1	7.8	.7	.7	1.8	21.5	7.8	4.2	3.5	5.7
28	8.5	9.2	20.1	7.8	.4	.7	12.7	21.5	7.4	3.9	3.5	6.0
29	8.5		19.4	7.8	.4	1.8	12.0	20.8	7.4	3.9	3.5	6.0
30	9.9		19.4	7.8	.4	1.4	5.7	18.7	7.8	5.3	3.5	6.0
31	16.2		21.2		.4		7.4	17.7		5.7		5.7
Sum	371.8	340.8	361.6	358.2	26.5	34.1	73.7	974.5	426.2	198.7	154.6	179.4

Month	Current Year 1970						Period #1954-1970				
	Extreme Gage Feet		Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
Jan.	0.33	0.16	† 9	17.7	7.4	12.0	738	538	1,486	203	
Feb.	.46	.13	† 7	26.1	5.3	12.0	677	458	1,598	98.1	
Mar.	.46	.16	† 26	27.5	7.1	11.7	717	413	885	176	
Apr.	.43	.16	4	24.7	7.4	12.0	711	266	711	74.9	
May	.03	0	† 21	1.8	† 23	0	.70	50.3	188	512	50.3
June	.03	0	† 12	1.8	† 2	0	1.1	67.8	148	486	63.1
July	.59	0	† 31	41.7	† 5	0	2.5	146	649	1,227	83.5
Aug.	2.79	0	12	516	† 1	0	31.4	1,931	4,788	32,608	229
Sept.	.75	.13	13	59.3	† 28	7.1	14.1	845	922	3,000	106
Oct.	.20	.07	† 5	9.2	† 23	3.5	6.4	395	403	1,165	78.5
Nov.	.16	.07	8	7.8	25	2.8	5.3	306	384	838	134
Dec.	.13	.07	† 7	6.7	4	3.2	5.7	352	454	831	186
Yearly	2.79	0		516	0	9.6	6,936	10,904	38,895	2,317	

Some months and years missing

θ Recorder inoperative

† And other days

SANTA CRUZ RIVER NEAR NOGALES, ARIZONA

DESCRIPTION: Water-stage recorder, cable with sit-down cable car located 5.5 miles east of Nogales, Arizona, 0.75 mile downstream from the international land boundary and 6 miles upstream from the Santa Cruz River bridge on State Highway No. 82. Zero of gage is 3,702.54 feet above mean sea level, U. S. C. & G. S. datum (levels by International Boundary and Water Commission).

RECORDS: Based on 17 current meter measurements or observation of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Geological Survey. Records available: March to November 1907 and April 1909 to December 1912 (discharge measurements and fragmentary gage height record), January 1913 to June 1922 (October 1915 to September 1916, monthly discharges only), May 1930 to December 1933, July 1935 through 1970.

REMARKS: Diversions in both countries affect the flow at this station. The major diversions occur in Mexico for domestic and irrigation uses. There are no storage dams above the station as of December 1970.

EXTREMES: Prior to 1936: Maximum discharge, 12,000 second-feet on August 31, 1935 (gage height 12.3 feet); minimum discharge, no flow for several days each year. Since 1936: Maximum discharge, 10,600 second-feet on July 10, 1954 (gage height 13.27 feet); minimum discharge, no flow for several days of many years.

Mean Daily Discharge in Second Feet 1970 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	5.3	3.8	3.0	2.6	.20	0	2.8	6.6	10	4.5	6.6
2	11	6.6	8.9	2.6	1.8	.20	0	.70	4.5	11	4.5	5.7
3	12	7.1	6.6	1.8	1.8	.20	0	451	18	12	4.5	5.7
4	12	6.1	4.9	2.2	1.8	.10	0	29	77	11	4.5	5.7
5	11	6.1	6.1	2.2	1.6	.20	0	93	60	9.4	4.5	5.3
6	11	6.6	8.3	2.6	1.3	.20	0	72	32	7.7	4.9	5.3
7	11	6.1	7.1	2.6	1.1	.20	0	24	23	7.7	5.3	5.3
8	11	6.1	6.6	2.6	.90	.20	0	49	90	5.7	5.3	5.3
9	9.4	4.9	5.7	2.6	.90	.10	0	849	88	6.6	5.3	5.3
10	8.3	4.9	6.1	2.2	1.1	.10	0	255	103	7.1	4.9	5.3
11	10	6.6	7.7	2.6	.90	.10	0	137	56	6.1	4.5	5.3
12	9.4	7.1	7.1	2.2	.90	.10	0	134	104	4.9	4.5	5.3
13	8.9	6.1	5.7	3.0	.70	.10	0	58	63	5.7	4.2	4.9
14	8.3	6.1	6.1	3.0	.70	.10	0	109	42	5.3	4.2	4.9
15	8.3	6.1	6.1	3.4	.60	.10	0	182	32	5.3	4.2	4.9
16	7.1	5.7	5.7	3.8	.50	.10	0	376	29	5.3	4.5	5.3
17	8.3	5.7	4.9	3.8	.40	.10	0	143	26	5.3	4.9	4.9
18	8.3	6.1	4.5	4.2	.40	.10	0	67	21	4.9	5.7	4.9
19	7.1	5.9	4.2	3.8	.30	0	0	56	20	5.3	5.7	5.7
20	7.1	5.7	3.8	3.4	.30	0	0	40	19	5.3	6.1	6.1
21	6.1	5.7	2.2	3.8	.30	0	46	28	14	5.3	6.6	5.7
22	6.6	5.7	2.6	3.4	.30	0	30	29	13	4.9	7.1	5.7
23	6.1	5.3	3.0	3.0	.20	0	.40	40	12	4.2	7.1	4.9
24	4.9	4.9	3.4	3.4	.20	0	.10	32	11	4.2	6.1	4.9
25	4.9	3.8	3.4	3.4	.20	0	14	23	8.9	4.2	5.7	4.9
26	5.3	4.5	2.2	3.4	.20	0	1.8	20	6.6	4.2	5.3	4.9
27	5.3	4.2	2.2	3.0	.20	0	1.1	19	6.1	4.2	6.1	5.7
28	5.3	3.8	2.2	3.0	.20	27	3.4	16	7.7	4.2	6.1	6.1
29	5.3		3.0	2.6	.20	0	28	12	7.7	4.2	6.1	4.5
30	5.3		2.2	2.6	.20	0	1.1	11	10	4.9	6.6	4.9
31	5.3		2.2		.20		.50	7.1		4.5		4.5
Sum	250.9	158.8	148.5	89.2	23.00	29.50	126.40	3,364.60	1,011.1	190.6	159.5	164.4
Current Year 1970										Period 1936-1970		
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			† 3	12	† 24	4.9	8.09	498	1,236	16,710	62	
Feb.			† 3	7.1	† 25	3.8	5.67	315	887	11,129	59	
Mar.			2	8.9	† 21	2.2	4.79	295	638	2,692	95	
Apr.			18	4.2	3	1.8	2.97	177	220	1,186	19	
May			1	2.6	† 23	.20	.74	45.6	69.5	338	2	
June			28	27	† 19	0	.98	58.5	72.0	1,020	0	
July			21	46	† 1	0	4.08	251	2,482	15,610	45	
Aug.			9	849	2	.70	109	6,674	6,354	45,790	91	
Sept.			12	104	2	4.5	33.7	2,005	1,379	7,507	17	
Oct.			3	12	† 23	4.2	6.15	378	333	1,550	1.2	
Nov.			† 22	7.1	† 13	4.2	5.32	316	272	1,140	1.2	
Dec.			1	6.6	† 29	4.5	5.30	326	1,916	28,559	27	
Yearly				849		0	15.57	11,339	15,858	57,671	3,499	

† And other days

Ø Mean daily

SEWAGE EFFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Two 12-inch Parshall flumes, each with a recording flow meter and continuous totalizer, one located at the international boundary for measuring effluent coming from Nogales, Sonora and the second located at the treatment plant in the influent line of secondary settling tank; and two calibrated sludge pumps of which pumping times are recorded. One pumps from primary settling tank into digester and the other recirculates sludge from secondary tank to primary tank. Bypass of raw sewage may be made to Nogales Wash, the quantity being estimated on basis of head in a control box in influent line ahead of primary tank. Nogales international sewage treatment plant is located near the north edge of Nogales, Arizona on right bank of Nogales Wash, approximately 2 miles downstream from the international boundary.

RECORDS: Total effluent is computed by adding to the flow measured in the flume from primary to secondary tank, the sludge pumped from primary tank into digester, which does not pass through this flume; subtracting the sludge recirculated from secondary to primary tank, which passes through this flume twice; and adding those flows of bypassed raw sewage into Nogales Wash. Flows from the United States are deduced from total measured flows less measured flows from Mexico. Records available: Continuous monthly record since the plant was placed in operation in August 1951, daily record January 1952 through 1970.

REMARKS: Nogales International Treatment Plant treats combined sewage from Nogales, Arizona and Nogales, Sonora by means of primary and secondary sedimentation, sludge digestion, and trickling filters. Chlorination of plant effluent, which may be used for irrigation of lands lying north of the plant, is carried out by the United States at its expense.

Month	Total Monthly Flows			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1970			Period 1952-1970		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	47.792	50.610	98.402	3.428	2.956	3.174	* 4.800	0.650	2.199
Feb.	43.556	44.029	87.585	3.308	2.975	3.128	* 6.130	.650	2.281
Mar.	47.011	51.625	98.636	3.400	2.929	3.182	4.610	.750	2.171
Apr.	44.062	46.854	90.916	3.315	2.800	3.031	4.301	.700	2.124
May	44.954	46.011	90.965	3.092	2.667	2.934	4.000	.550	2.027
June	41.522	43.105	84.627	2.946	2.625	2.821	3.800	.700	1.913
July	39.931	53.685	93.616	3.687	2.671	3.020	3.689	.700	1.965
Aug.	40.729	61.471	102.200	4.202	2.963	3.297	4.928	.750	2.283
Sept.	48.031	58.834	106.865	3.788	3.094	3.562	4.541	.800	2.584
Oct.	53.357	52.201	105.558	3.771	2.912	3.405	3.999	.700	2.424
Nov.	45.572	51.721	97.293	3.362	3.054	3.243	3.510	.800	2.196
Dec.	43.787	53.380	97.167	3.302	2.850	3.134	* 5.200	.350	2.238
Yearly	540.304	613.526	1,153.830	4.202	2.625	3.161	* 6.130	.350	2.200

* Partly estimated

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall with averages for their periods of record at stations located in the United States and Mexico. Four stations are operated and maintained by the United States Section of the Commission, two by the U. S. Weather Bureau and one by the Mexican Section of the Commission. For location, elevation, period of record, type of gage in use, and the observer, see alphabetical listing of stations on the following page.

In United States

Month	Meigs Ranch, Arizona		Jones Ranch, Arizona		Nogales Sanitation Plant 2N, Arizona		Nogales, Arizona	
	1970	Average 1952-1970	1970	Average 1952-1970	1970	Average 1953-1970	1970	Average 1914-1970
Jan.	0	0.84	0	0.03	0	0.95	0.03	1.05
Feb.	.81	.52	.38	.04	.51	.58	.67	.83
Mar.	.75	.89	1.75	.09	1.35	.78	1.43	.76
Apr.	.16	.23	0	.20	T	.13	.02	.29
May	0	.09	0	.05	0	.08	0	.14
June	.20	.46	0		.34	.44	.25	.46
July	4.97	4.90	4.50	5.77	3.40	4.79	3.29	4.20
Aug.	6.32	4.81	3.10	.71	3.20	4.15	3.31	3.94
Sept.	2.17	1.50	2.95	.22	1.92	1.43	1.91	1.60
Oct.	0	.65	0		.15	.79	.27	.70
Nov.	0	.49	0	.04	.02	.54	.02	.68
Dec.	0	1.20	0	1.27	.29	1.44	.31	1.32
Yearly	15.38	16.58	12.68		11.18	16.10	11.51	15.97

Month	Canelo, Arizona		Patagonia, Arizona				
	1970	Average 1930-1970	1970	Average 1930-1970			
Jan.	0.02	1.13	0	1.20			
Feb.	.55	1.08	.82	1.03			
Mar.	1.67	.78	2.11	.83			
Apr.	.34	.37	.05	.33			
May	0	.13	.05	.17			
June	.04	.86	.40	.45			
July	4.33	4.36	4.39	4.51			
Aug.	3.47	4.55	2.89	4.25			
Sept.	1.98	1.67	2.34	1.80			
Oct.	.02	.83	.44	.77			
Nov.	0	.74	0	.77			
Dec.	.61	1.42	.56	1.43			
Yearly	13.03	17.92	14.05	17.54			

In Mexico

Month	San Lázaro, Sonora	
	1970	Average 1961-1970
Jan.	.04	.75
Feb.	.39	.55
Mar.	1.26	.71
Apr.	.39	.55
May	0	.20
June	.24	.47
July	3.15	4.76
Aug.	4.76	3.58
Sept.	2.17	1.77
Oct.	.16	.55
Nov.	.12	.59
Dec.	.35	1.65
Yearly	13.03	13.86

LOCATION OF RAINFALL STATIONS IN THE SANTA CRUZ RIVER BASIN

The precipitation records of the stations listed alphabetically below begin on the date shown and extend through 1970.

In United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	OBSERVER
Canelo, Arizona	S	31° 33'	110° 32'	4,985	1930	R. E. Ewing
Jones Ranch, Arizona	S	31° 22'	110° 36'	4,960	Mar. 1952	I. B. & W. C.
Meigs Ranch, Arizona	S	31° 26'	110° 36'	4,836	Mar. 1952	I. B. & W. C.
Nogales, Arizona	R	31° 21'	110° 55'	3,808	1914	I. B. & W. C.
Nogales Sanitation Plant 2N, Arizona	S	31° 21'	110° 56'	3,757	June 1952	I. B. & W. C.
Patagonia, Arizona	S	31° 33'	110° 45'	4,044	1930	O. J. Rothrock

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	OBSERVER
San Lázaro, Sonora	S	*	*	4,199	Mar. 1954	I. B. & W. C. Mexican Section

S Standard 8" rain gage

R Recording rain gage

* Unavailable

TEMPERATURE, HUMIDITY, EVAPORATION, AND WIND IN THE SANTA CRUZ RIVER BASIN

Tabulated below are monthly records of temperature, humidity, evaporation, and wind at the station two miles north of the Nogales Sanitation Plant in Arizona. This station is operated and maintained by the United States Section of the Commission. Also tabulated below are the monthly records of temperature and evaporation for a station at San Lázaro, Sonora, located approximately 6.5 miles southwest of Santa Cruz, Sonora, and approximately 22 miles southeast of Nogales, Sonora. This station is operated and maintained by the Mexican Section of the Commission. The equipment at the Nogales Sanitation Plant - 2N consists of: Standard 8-inch rain gage, 48-inch diameter evaporation pan with stillwell and hook gage, maximum and minimum thermometer, anemometer (registers miles), hygrothermograph, and psychrometer, hand turbine type. The equipment at the station at San Lázaro, Sonora, consists of: Maximum and minimum thermometer, standard 8-inch rain gage and a 48-inch diameter evaporation pan.

For specific location of these two stations, refer to data opposite same station name shown in "Location of Rainfall Stations", page 94 of this bulletin.

In United States

Temperature - Degrees Fahrenheit

Month	Nogales Sanitation Plant - 2N		
	1970		
	Mean	Max.	Min.
Jan.	44.2	80	12
Feb.	49.5	77	17
Mar.	49.6	79	25
Apr.	54.6	90	25
May	67.1	98	30
June	75.3	107	46
July	80.4	104	59
Aug.	77.3	98	55
Sept.	71.2	100	43
Oct.	58.7	95	24
Nov.	53.0	87	23
Dec.	48.5	83	20
Yearly	60.8	107	12

Mean Relative Humidity - Percent

Month	Nogales Sanitation Plant - 2N	
	1970	
	Max.	Min.
Jan.	100	35
Feb.	100	56
Mar.	91	30
Apr.	92	37
May	90	38
June	81	42
July	95	60
Aug.	95	61
Sept.	100	51
Oct.	100	45
Nov.	91	42
Dec.	100	42
Yearly	100	30

Evaporation - Inches

Month	Nogales Sanitation Plant - 2N	
	1970	Average 1953-1970
	Jan.	3.60
Feb.	4.88	4.65
Mar.	6.57	7.19
Apr.	9.26	9.81
May	13.44	12.57
June	14.12	13.92
July	10.60	9.91
Aug.	8.71	7.53
Sept.	9.59	7.65
Oct.	7.31	6.94
Nov.	5.41	4.39
Dec.	4.76	3.27
Total	98.25	91.35

Mean Wind Speed - Miles Per Hour

Month	Nogales Sanitation Plant - 2N	
	1970	Average 1953-1970
	Jan.	1.6
Feb.	2.4	2.3
Mar.	2.8	2.6
Apr.	2.9	2.5
May	2.7	2.4
June	2.9	2.3
July		1.5
Aug.		0.8
Sept.		1.0
Oct.		1.4
Nov.	2.0	1.5
Dec.	1.8	1.7
Yearly	2.4	1.8

In Mexico

Temperature - Degrees Fahrenheit

Month	San Lázaro, Sonora			
	1970		1961-1970	
	Max.	Min.	Max.	Min.
Jan.	79	19	93	14
Feb.	77	19	88	16
Mar.	81	27	99	21
Apr.	81	32	106	28
May	97	28	117	28
June	106	48	124	43
July	100	59	126	52
Aug.	93	55	117	52
Sept.	97	45	115	39
Oct.	84		111	
Nov.	86	27	102	21
Dec.	81	23	95	14
Yearly	106	19	126	14

Evaporation - Inches

Month	San Lázaro, Sonora	
	1970	Average 1961-1970
	Jan.	3.98
Feb.	4.72	4.21
Mar.	6.38	6.89
Apr.	9.53	9.76
May	12.13	12.08
June	13.27	12.83
July	8.94	8.03
Aug.	6.85	7.05
Sept.	6.69	7.09
Oct.	6.93	7.05
Nov.	5.75	4.69
Dec.	3.78	3.43
Total	88.94	87.28

**DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS
ALONG SANTA CRUZ RIVER, SAN PEDRO RIVER, AND WHITEWATER DRAW
1970**

The drainage basin areas tabulated below are derived from the best available maps from both the United States and Mexico.

Data on irrigated areas in the Whitewater Draw Basin were furnished by the Smoke Control Section, Phelps-Dodge Smelter at Douglas, Arizona.

Designation of Areas	Drainage Basin-Square Miles			Irrigated Areas-Acres		
	United States	Mexico	Total	United States	Mexico	Total
Santa Cruz River:						
Above Lochiel, Arizona Gaging Station	82	0	82	200	0	200
Above El Cajon, Mexico Gaging Station	179	125	304	200	2,352	2,552
Above Nogales, Arizona Gaging Station	185	348	533	200	2,696	2,896
San Pedro River:						
Above Palominas, Arizona Gaging Station	92	649*	741	412	3,460	3,872
Whitewater Draw:						
Above Douglas, Arizona Gaging Station	1,023	0	1,023	16,373	0	16,373

* An additional 47 square miles in Mexico is tributary to the San Pedro River downstream from this station