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WESTERN WATER BULLETIN 1968

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

COLORADO RIVER

TIJUANA RIVER

SANTA CRUZ RIVER

WHITEWATER DRAW

1968

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Quantity of Water

Climatological Data and Drainage Basin and Irrigated Areas

FOREWORD

This bulletin is the ninth 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. 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 River and Whitewater Draw which cross the Arizona-Sonora boundary. This volume contains the information for the year 1968.

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 1968.

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. 349 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 our 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:

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

GENERAL HYDROLOGIC CONDITIONS FOR 1968

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 1968. The average seasonal (October 1967-September 1968) rainfall over the upper basin, as gaged at 13 index stations, was about 12.65 inches compared to a seasonal average of about 13.75 inches for the 46 seasons (1923-1968). In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation (1968) measured at 6 index stations was 1.61 inches compared to an average of 2.01 inches during the last 10 years (1959-1968).

The flow of the Colorado River reaching Imperial Dam was 5,737,800 acre-feet, about 67% of the 34-year average (1935-1968) of 8,573,474 acre-feet. At the northerly international boundary, the total flow of the river during 1968 was 1,326,556 acre-feet, about 32% of the 1935-1968 average of 4,083,175 acre-feet. At the southerly international boundary, the flow during 1968 was only 83,792 acre-feet, or about 3% of the 1935-1968 average of 3,309,565 acre-feet. The total flow of the Colorado River reaching the El Marítimo Gaging Station, 47.9 miles downstream from the southerly international boundary, and 18.6 miles downstream from the Sonora-Baja California railroad bridge, was 59,335 acre-feet in 1968, about 32% of the 1960-1968 average of 183,863 acre-feet.

The total of all flows of the Colorado River entering Mexico in 1968 amounted to 1,562,737 acre-feet, 33% of the 1935-1968 average of 4,751,338 acre-feet, as measured 1) in the Colorado River at the northerly international boundary, 2) in the Wellton-Mohawk Main Outlet Drain Extension near Morelos Dam, 3) in the wasteways that discharge into the limitrophe 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 limitrophe section.

No flood peaks of importance occurred in streams of the lower Colorado River basin during 1968. A maximum instantaneous flow of 4,910 second-feet occurred in the Colorado River at the northerly boundary station on July 9.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 17,407,700 acre-feet, 61% of the usable capacity of 28,588,400 acre-feet. The greater part (15,355,000 acre-feet) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1968 due to drought or accident to the irrigation system.

The total reported acreage irrigated from waters of the Colorado River below Imperial Dam in 1968 was 1,090,662 acres; 652,848 acres in the United States and 437,814 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 1968 was 64.6 acre-feet, about 19% of the 1956-1968 average of 337 acre-feet.

Tijuana River Basin

During 1968, the temperatures at Barrett Dam, California (elevation 1,750 feet) in the upper portion of the basin in the United States averaged 60 degrees, 1.0 degree below the 38-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 degrees, equal to the long-term average, and at Rodríguez Dam, Baja California (elevation 459 feet), the recorded temperatures averaged 64 degrees, 2 degrees above the 23-year normal.

At Barrett Dam in the upper portion of the basin in the United States, the recorded precipitation was 8.33 inches, 48% of normal, and at Chula Vista near the lower end of the basin, 5.89 inches, or 61% of normal. The recorded precipitation at San Juan de Dios in the upper portion of the basin in Mexico, was 9.09 inches, approximately 58% of the normal during the 13-year period, and at Rodríguez Dam in the lower portion of the basin in Mexico, 3.78 inches, 47% of the 31-year average.

Runoff in the basin during 1968 averaged less than 5% of normal. Above Morena Reservoir the runoff was 243 acre-feet, or about 4% of the 32-year 1937-1968 mean of 6,222 acre-feet. At Rodríguez Reservoir, the runoff was 673 acre-feet, or about 5% of the 31-year mean of 14,885 acre-feet.

The flow of the Tijuana River at the international boundary was 207 acre-feet during 1968, and the flow in the Tijuana River near Nestor was 40.7 acre-feet.

Whitewater Draw

During 1968, the average annual temperature over the watershed was slightly below normal, while the annual precipitation was about normal. Runoff for the year at the gaging station near Douglas, Arizona, of 2,285 acre-feet was about 32% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1968

San Pedro River

During 1968, the average annual temperature was below normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 95% of the 1961-1968 mean of 20.56 inches. The stream flow at the international boundary was 5,952 acre-feet, 27% of the 1951-1968 normal.

Santa Cruz River

During 1968, the average annual temperature over the watershed was somewhat below normal and the annual precipitation was about 87% of the 30-year 1939-1968 mean. Runoff measured at the Nogales Gaging Station where the stream re-enters the United States was 15,743 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 905 acre-feet. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 14,838 acre-feet from the loop of the river lying in Mexico, or approximately 94% of the flows reaching the Nogales station.

Alamo and New Rivers

During 1968, 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 71.5 and 72 degrees, respectively, 0.8 and zero degrees below the respective normals.

At El Centro, the precipitation was 1.55 inches, about 61% of the 38-year average, and in Mexicali, the annual precipitation was 1.81 inches, 61% of the 43-year average. The total flow of the New River at the international boundary in 1968 was 106,019 acre-feet which was about 149% of the 1943-1968 normal.

Salton Sea

During 1968, the average annual temperature around the Salton Sea was about 97% of the long-term average while the annual precipitation recorded at Brawley, California, was approximately 79% of the long-term mean of 2.34 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 several days during March, April and May 1968. The minimum stage, 232.8 feet below mean sea level, was recorded on several days during October and December 1968.

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 December 1968, 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 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	113.02	113.16	113.02	114.04	113.24	113.11	113.12	¨113.23	113.13	112.89	113.32	113.37
2	112.85	113.15	113.05	114.12	113.23	113.12	113.10	¨113.17	113.68	112.85	113.30	113.30
3	112.81	113.16	113.01	114.01	113.24	113.10	113.11	¨113.17	113.39	113.05	113.26	113.34
4	112.79	113.17	112.99	113.74	113.24	113.11	113.24	¨113.18	113.19	113.19	113.17	113.38
5	112.96	113.17	112.95	113.62	113.23	113.11	113.92	*113.26	113.16	113.17	112.94	113.35
6	112.93	113.18	113.04	113.52	113.23	113.13	113.60	113.94	113.12	112.97	112.97	113.30
7	112.99	113.19	113.04	113.25	113.20	113.19	114.19	113.78	113.11	112.90	112.98	113.29
8	113.05	113.15	112.99	113.70	113.23	113.11	116.04	113.34	113.17	112.89	112.97	113.27
9	113.17	113.15	113.09	113.73	113.26	113.16	115.93	113.28	113.16	112.93	112.93	113.28
10	113.19	113.14	113.26	113.53	113.23	113.53	113.76	113.36	113.39	112.98	112.94	113.32
11	113.20	113.16	113.68	113.32	113.18	113.34	113.43	113.79	113.74	112.93	112.96	113.33
12	113.20	113.13	113.77	113.20	113.22	113.40	114.03	113.73	113.65	112.92	113.07	113.79
13	113.23	113.21	113.64	113.20	113.19	113.31	113.84	113.71	113.30	112.94	113.28	114.20
14	113.19	113.40	113.20	113.14	113.21	112.99	113.39	113.69	113.24	112.94	113.19	114.30
15	113.16	113.51	113.20	113.14	113.22	113.01	113.31	113.68	113.28	113.00	113.25	114.34
16	113.17	113.11	113.17	113.79	113.21	113.00	113.28	113.64	113.00	113.01	113.27	114.37
17	113.16	113.10	113.19	113.82	113.23	113.12	113.21	113.60	112.98	112.93	113.15	114.30
18	113.15	113.09	113.18	113.38	113.19	113.57	113.21	113.62	112.97	112.96	113.22	114.31
19	113.17	113.13	113.14	113.29	113.20	113.78	113.20	113.66	*112.90	112.92	113.31	114.33
20	113.13	113.14	113.23	113.31	113.18	113.50	113.13	113.49	112.82	112.91	113.33	114.34
21	113.12	113.07	113.22	113.34	113.62	113.23	113.20	113.15	112.87	112.94	113.31	114.30
22	113.11	113.02	113.24	113.29	113.29	113.20	113.30	113.27	112.89	112.91	113.28	114.22
23	113.09	113.00	113.26	113.27	113.23	113.20	113.94	113.79	112.87	112.95	113.37	114.30
24	113.10	113.40	113.28	113.29	113.15	113.20	113.43	113.64	112.84	112.90	113.28	114.31
25	113.13	113.45	113.29	113.22	113.14	113.22	113.27	113.23	112.86	112.93	113.29	114.21
26	113.16	113.35	113.28	113.07	113.23	113.23	113.21	113.20	112.87	113.13	113.30	114.20
27	113.67	113.10	113.25	113.70	113.20	113.18	*113.26	113.19	112.82	113.09	113.28	114.17
28	113.39	113.08	113.26	114.09	113.14	113.14	*113.45	113.24	112.84	113.26	113.31	114.11
29	113.14	113.04	113.18	113.58	113.17	113.05	*113.30	113.17	112.81	113.30	113.33	¨113.65
30	113.17		113.22	113.41	113.14	113.09	¨113.23	113.11	112.84	113.22	113.40	¨113.14
31	113.16		113.70		113.23		¨113.24	113.12		113.25		¨113.06
Avg.	113.12	113.18	113.23	113.50	113.22	113.21	113.58	113.43	113.10	113.01	113.20	113.82

¨ Estimated * Partly 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 14 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 1968.

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 in 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	37	36	56	59	52	53	52	57	57	57	43	49
2	38	36	52	51	64	53	50	58	56	53	47	40
3	36	40	56	50	57	50	50	58	54	49	50	39
4	36	45	55	51	61	58	50	58	58	49	44	42
5	50	40	53	52	52	54	51	57	48	48	44	42
6	45	38	47	56	50	55	63	64	50	53	43	42
7	50	43	53	56	50	52	54	64	49	48	47	46
8	39	41	55	50	51	58	58	54	51	52	52	42
9	36	46	54	48	51	51	62	53	47	46	45	42
10	37	51	50	48	55	50	56	55	47	47	45	48
11	43	45	52	50	50	52	51	54	47	49	45	47
12	44	51	56	51	51	53	54	54	47	47	43	46
13	37	53	61	53	49	52	55	60	45	46	54	44
14	49	51	55	52	49	51	55	53	45	44	46	47
15	43	55	53	52	56	50	54	56	50	47	44	46
16	40	45	54	52	49	56	53	59	44	47	43	43
17	42	44	62	57	49	55	52	55	45	47	43	46
18	40	45	56	54	49	55	55	50	45	51	43	43
19	41	44	55	52	56	52	61	51	45	51	44	42
20	38	44	50	62	49	55	59	58	45	53	41	52
21	39	47	48	50	49	52	54	51	45	47	42	47
22	37	53	47	49	48	56	56	52	45	45	46	43
23	37	51	48	51	50	52	62	48	45	44	47	43
24	43	51	46	52	52	48	64	57	45	52	47	44
25	47	55	46	56	47	49	60	51	45	53	41	48
26	40	50	48	49	48	51	62	51	49	50	47	51
27	40	54	49	53	54	58	62	49	46	47	43	45
28	42	61	47	57	54	53	59	48	50	48	50	44
29	37	53	52	52	50	55	56	50	51	48	40	50
30	36		56	52	52	60	56	49	51	47	40	51
31	36		58		53		60	53		47		49
Sum	1,255	1,368	1,630	1,577	1,607	1,599	1,746	1,687	1,447	1,512	1,349	1,403

Month	Current Year 1968 Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1937-1968 Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			† 5	50	† 3	36	40.5	2,489	3,288	4,780	877
Feb.			28	61	† 1	36	47.2	2,713	3,138	4,320	563
Mar.			17	62	†24	46	52.6	3,233	3,825	5,240	1,240
Apr.			20	62	† 9	48	52.6	3,128	3,853	5,250	1,160
May			2	64	25	47	51.8	3,187	3,955	5,590	992
June			30	60	24	48	53.3	3,172	3,842	5,580	885
July			24	64	† 2	50	56.3	3,463	4,148	6,550	816
Aug			† 6	64	†23	48	54.4	3,346	4,089	6,810	861
Sept.			4	58	16	44	48.2	2,870	3,868	6,220	889
Oct.			1	57	14	44	48.8	2,999	3,856	5,740	1,040
Nov.			13	54	†29	40	45.0	2,676	3,593	5,490	994
Dec.			20	52	3	39	45.3	2,783	3,499	4,960	966
Yearly				64		36	49.7	36,059	44,954	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. 1968 records good, except those below 100 second-feet, which are poor. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26	241	20	19	610	636	14	19	16	303	45	20
2	26	245	19	18	566	638	16	19	16	264	35	17
3	26	269	21	18	660	655	17	21	16	121	21	15
4	26	261	26	16	688	663	18	19	18	55	40	16
5	26	236	20	17	751	633	18	16	16	35	286	14
6	26	302	23	17	724	681	30	16	18	211	276	14
7	26	311	28	21	711	676	17	16	16	272	269	14
8	28	271	24	16	685	618	20	16	20	304	265	14
9	28	259	26	16	668	691	16	16	16	297	296	14
10	29	236	27	16	601	955	17	16	390	294	251	13
11	28	247	23	16	617	711	17	16	825	289	249	13
12	30	179	23	17	677	791	16	19	778	274	278	13
13	26	232	23	17	651	611	15	18	555	272	34	23
14	26	421	21	21	679	25	16	16	623	285	29	20
15	26	605	21	18	706	19	15	16	634	202	36	12
16	26	38	19	20	724	18	15	17	311	178	33	12
17	26	33	19	27	734	18	15	16	297	278	62	13
18	26	29	19	33	729	18	15	16	265	280	23	13
19	28	29	19	28	706	16	15	17	237	238	22	13
20	26	26	20	31	690	15	18	18	224	298	21	13
21	26	26	19	38	282	18	17	20	230	307	21	13
22	26	28	19	25	593	28	15	20	243	305	24	16
23	28	33	19	26	611	22	16	16	230	319	20	18
24	26	31	19	29	658	19	16	18	229	262	20	17
25	26	28	19	25	681	19	16	20	246	229	21	16
26	133	35	19	22	625	19	16	21	243	65	21	16
27	816	28	19	105	555	19	16	18	245	60	21	20
28	388	30	21	632	660	19	17	16	269	22	20	15
29	200	31	19	660	700	19	18	16	253	4	20	12
30	264		19	686	670	19	17	20	184	11	20	12
31	236		19		770		19	16		9		12
Sum	2,704	4,740	652	2,650	20,382	9,289	523	544	7,663	6,343	2,779	463

Month	Current Year 1968								Period 1935-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			27	816	† 1	26	87.2	5,363	66,172	110,700	3,230
Feb.			15	605	†20	26	163	9,402	57,710	89,140	2,856
Mar.			7	28	† 2	19	21.0	1,293	61,314	90,190	1,293
Apr.			30	686	† 4	16	88.3	5,256	61,579	86,580	2,500
May			31	770	21	282	657	40,427	66,535	88,280	5,480
June			10	955	20	15	310	18,424	60,460	86,960	3,330
July			6	30	1	14	16.9	1,037	60,685	91,220	1,037
Aug			† 3	21	† 5	16	17.5	1,079	61,021	89,890	1,079
Sept.			11	825	† 1	16	255	15,199	60,071	83,660	12,419
Oct.			23	319	29	4	205	12,581	57,962	90,050	2,176
Nov.			9	296	†23	20	92.6	5,512	58,581	101,500	3,850
Dec.			13	23	†15	12	14.9	918	66,100	108,800	918
Yearly				955		4	160	116,491	738,190	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 24 current meter measurements during the year, 13 by the U. S. Geological Survey, 11 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 1968. 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	544	736	486	1,130	932	902	575	643	630	660	736	730
2	452	732	486	1,180	910	902	569	598	935	617	728	689
3	436	745	487	1,100	962	896	575	516	768	633	691	702
4	419	749	478	908	985	936	622	583	656	663	686	742
5	500	725	458	827	1,000	939	1,040	623	635	638	688	733
6	482	755	503	781	1,000	980	906	1,060	614	643	693	704
7	514	764	512	619	985	1,020	1,230	971	601	656	689	690
8	521	714	486	860	1,020	963	3,170	681	624	666	682	677
9	572	716	537	883	997	1,030	3,100	656	617	684	675	681
10	581	710	628	766	932	1,390	895	683	946	706	671	717
11	589	714	917	646	883	1,200	701	954	1,390	696	667	720
12	592	657	949	592	931	1,260	1,090	953	1,310	688	733	1,000
13	595	721	913	591	911	1,130	1,000	955	996	694	720	1,320
14	579	959	598	576	942	559	743	915	992	704	673	1,330
15	562	1,130	597	561	964	556	707	904	1,020	687	672	1,310
16	564	520	577	919	955	552	678	896	713	682	682	1,320
17	564	530	598	969	968	597	651	862	673	702	670	1,290
18	559	525	586	683	935	793	645	870	644	712	642	1,290
19	578	540	572	629	943	921	636	898	607	676	684	1,310
20	554	545	620	654	925	774	604	830	579	707	688	1,350
21	560	510	624	661	920	630	612	632	589	714	682	1,320
22	553	495	628	634	924	622	643	681	605	698	672	1,270
23	549	485	634	614	915	620	1,060	985	586	725	707	1,340
24	552	656	636	626	906	608	759	939	571	675	667	1,340
25	571	690	638	604	909	625	644	687	584	673	672	1,270
26	635	651	635	533	926	630	621	664	590	656	698	1,270
27	1,380	519	631	846	884	609	635	646	580	639	671	1,250
28	960	510	622	1,480	896	586	745	670	594	662	703	1,200
29	704	495	580	1,150	933	552	656	644	576	695	699	882
30	764		616	1,050	910	570	629	623	546	648	728	543
31	748		873		1,020		654	623		743		515
Sum	18,733	19,198	19,105	24,072	29,223	24,352	27,795	23,845	21,771	21,042	20,669	31,505

Month	Current Year 1968							Period 1951-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	11.36	9.81	27	1,480	4	400	604	37,156	278,299	979,890	37,156
Feb.	11.13	9.86	15	1,260	23	431	662	38,079	205,784	826,600	33,790
Mar.	11.00	9.84	11	1,160	9	431	616	37,894	226,261	1,073,270	36,623
Apr.	11.58	10.05	28	1,610	26	510	802	47,746	214,166	843,010	47,746
May	11.16	10.45	31	1,230	21	701	943	57,963	197,143	863,860	56,493
June	11.40	9.95	10	1,560	16	535	812	48,301	188,278	833,970	44,485
July	13.40	9.99	9	3,710	2	555	897	55,131	206,249	649,820	41,407
Aug	10.82	9.89	6	1,110	3	485	769	47,296	213,092	670,050	45,719
Sept.	11.46	9.87	10	1,530	30	426	726	43,182	175,171	775,930	43,182
Oct.	11.02	10.03	31	1,180	27	530	679	41,736	144,838	802,210	34,965
Nov.	10.69	10.15	1	932	4	590	689	40,996	172,791	911,370	36,924
Dec.	11.39	10.08	23	1,400	31	500	1,016	62,489	225,440	1,114,550	48,377
Yearly	13.40	9.81		3,710		400	769	557,969	2,447,512	10,220,870	557,969

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

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.11	10.38	10.00	10.95	10.76	10.70	10.04	10.20	10.22	10.33	10.39	10.41
2	9.93	10.37	10.00	11.02		10.70	10.02	10.11	10.69	10.24	10.39	10.34
3	9.89	10.40	9.99	10.91		10.70	10.03	9.95	10.45	10.26	10.33	10.36
4	9.85		9.97	10.66		10.72	10.11	10.10	10.28	10.31	10.32	10.43
5	10.03		9.92	10.54		10.71	10.74	10.17	10.24	10.27	10.33	10.41
6	9.99		10.02	10.47		10.75	10.55	10.81	10.21	10.28	10.33	10.36
7	10.06	10.41	10.03	10.20		10.78	11.00	10.70	10.19	10.29	10.33	10.34
8	10.07	10.36	9.97	10.59	10.89	10.70	12.72	10.27	10.23	10.31	10.33	10.32
9	10.16	10.38	10.06	10.62	10.88	10.77		10.23	10.22	10.34	10.31	10.32
10	10.18	10.36	10.20	10.45	10.79	11.21		10.28	10.68	10.37	10.30	10.39
11	10.20	10.37	10.66	10.25	10.72	10.95		10.69	11.30	10.35	10.30	10.39
12	10.20	10.28	10.72	10.15	10.79	11.02		10.69	11.21	10.34	10.41	10.79
13	10.21	10.38	10.65	10.16	10.76	10.85		10.69	10.81	10.35	10.39	11.25
14	10.18	10.73	10.16	10.13	10.80	10.00		10.64	10.81	10.35	10.31	11.32
15	10.14	10.96	10.16	10.11	10.83	9.99		10.63	10.85	10.33	10.31	11.29
16	10.15	10.03	10.12	10.69	10.82	9.98	10.25	10.62	10.41	10.32	10.32	11.30
17	10.14	9.96	10.16	10.77	10.84	10.07	10.21	10.57	10.34	10.35	10.30	11.26
18	10.13		10.14	10.35	10.79	10.40	10.20	10.59	10.29	10.37	10.25	11.27
19	10.16		10.11	10.26	10.80	10.59	10.18	10.62	10.23	10.30	10.33	11.29
20	10.11		10.20	10.31	10.78	10.36	10.13	10.53	10.18	10.36	10.34	11.33
21	10.11		10.21	10.33	10.77	10.13	10.14	10.22	10.20	10.37	10.33	11.30
22	10.10		10.22	10.28	10.78	10.12	10.19	10.30	10.23	10.34	10.31	11.24
23	10.08		10.23	10.25	10.76	10.11	10.81	10.75	10.20	10.39	10.37	11.33
24	10.08		10.23	10.27	10.75	10.09	10.38	10.69	10.17	10.30	10.30	11.33
25	10.11		10.24	10.23	10.76	10.12	10.20	10.31	10.20	10.30	10.31	11.24
26	10.21		10.23	10.10	10.78	10.13	10.16	10.28	10.21	10.27	10.35	11.23
27	11.25	10.06	10.22	10.62	10.72	10.09	10.18	10.25	10.19	10.23	10.31	11.21
28	10.71	10.05	10.21	11.44	10.74	10.05	10.37	10.30	10.22	10.28	10.36	11.15
29	10.34	10.02	10.13	11.03	10.79	9.98	10.22	10.25	10.18	10.34	10.36	10.70
30	10.43		10.19	10.91	10.75	10.02	10.17	10.21	10.12	10.25	10.40	10.17
31	10.39		10.61		10.87		10.22	10.21		10.39		10.11
Avg.	10.18		10.19	10.50		10.43		10.41	10.39	10.32	10.33	10.84

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 12 current meter measurements during the year. Records available: May 1948 through 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.7	0.6	2.4	1.3	1.0	1.3	1.7	1.6	0.9	0.9	0.9	1.0
2	.7	.6	2.2	1.3	1.0	1.3	1.7	1.6	.9	.9	.9	1.0
3	.7	.6	2.0	1.3	1.0	1.3	1.7	1.6	.9	.9	.9	1.0
4	.7	.6	1.9	1.2	1.0	1.3	1.7	1.6	.9	.9	.9	1.0
5	.7	.6	1.7	1.2	1.0	1.3	1.7	1.6	.9	.9	.9	1.0
6	.7	.6	1.6	1.2	1.0	1.4	1.7	1.6	.9	.9	.9	.9
7	.7	.7	1.6	1.2	1.0	1.4	1.7	1.6	.9	.9	.9	.9
8	.7	.8	1.5	1.2	1.0	1.4	1.6	1.6	.9	.9	.9	.9
9	.7	.9	1.5	1.2	1.0	1.4	1.6	1.6	.9	.9	.9	.9
10	.7	1.0	1.4	1.2	1.0	1.4	1.6	1.6	.9	.9	1.0	.9
11	.7	1.0	1.4	1.2	1.0	1.4	1.6	1.6	.9	.9	1.0	.9
12	.7	1.1	1.3	1.2	1.0	1.4	1.6	1.6	.9	.9	1.0	.9
13	.6	1.2	1.3	1.2	1.0	1.4	1.6	1.6	.9	.9	1.0	.9
14	.6	1.2	1.3	1.1	1.1	1.5	1.6	1.6	.9	.9	1.0	.8
15	.6	1.2	1.3	1.1	1.1	1.5	1.6	1.6	.9	.9	1.0	.8
16	.6	1.2	1.3	1.1	1.1	1.5	1.6	1.6	.9	.9	1.0	.8
17	.6	1.2	1.3	1.1	1.1	1.5	1.6	1.6	.9	.9	1.0	.8
18	.6	1.2	1.3	1.1	1.1	1.5	1.6	1.6	.9	.9	1.0	.8
19	.6	1.2	1.3	1.1	1.1	1.5	1.6	1.6	.9	.9	1.0	.8
20	.6	1.2	1.3	1.1	1.1	1.6	1.6	1.6	.9	.9	1.0	.8
21	.6	1.2	1.3	1.1	1.1	1.6	1.6	1.6	.9	.9	1.0	.8
22	.6	1.2	1.3	1.0	1.2	1.6	1.6	1.6	.9	.9	1.0	.8
23	.6	1.2	1.3	1.0	1.2	1.6	1.6	1.6	.9	.9	1.0	.7
24	.6	1.2	1.3	1.0	1.2	1.6	1.6	1.6	.9	.9	1.0	.7
25	.6	1.2	1.3	1.0	1.2	1.6	1.6	1.6	.9	.9	1.0	.7
26	.6	1.8	1.3	1.0	1.2	1.6	1.6	1.6	.9	.9	1.0	.7
27	.6	2.2	1.3	1.0	1.2	1.7	1.6	1.6	.9	.9	1.0	.7
28	.6	2.5	1.3	1.0	1.2	1.7	1.6	1.6	.9	.9	1.0	.7
29	.6	2.5	1.3	1.0	1.2	1.7	1.6	1.6	.9	.9	1.0	.7
30	.6		1.3	1.0	1.2	1.7	1.6	1.6	.9	.9	1.0	.7
31	.6		1.3		1.2		1.6	1.6		.9		.7
Sum	19.8	33.7	45.2	33.7	33.8	44.7	50.3	49.6	27.0	27.9	29.1	25.7

Month	Current Year 1968 Extreme Gage Feet High	Extreme Gage Feet Low	ø Extreme Second Feet High Day	High	Low Day	Low	Average Second Feet	Total Acre Feet	Period May 1948-1968 Acre Feet Average	Maximum	Minimum
Jan.			† 1	0.7	†13	0.6	0.6	39.3	426	899	39.3
Feb.			†28	2.5	† 1	.6	1.2	66.8	371	746	40.5
Mar.			1	2.4	†12	1.3	1.5	89.7	449	853	73.8
Apr.			† 1	1.3	†22	1.0	1.1	66.8	471	1,000	66.8
May			†22	1.2	† 1	1.0	1.1	67.0	469	966	61.5
June			†27	1.7	† 1	1.3	1.5	88.7	493	1,030	67.4
July			† 1	1.7	† 8	1.6	1.6	99.8	562	1,260	72.8
Aug				1.6		1.6	1.6	98.4	621	1,350	73.8
Sept.				.9		.9	.9	53.6	590	1,370	53.6
Oct.				.9		.9	.9	55.3	596	1,220	55.3
Nov.			†10	1.0	† 1	.9	1.0	57.7	535	1,240	57.7
Dec.			† 1	1.0	†23	.7	.8	51.0	489	1,050	51.0
Yearly				2.5		0.6	1.1	834	6,072	12,429	834

ø Mean daily † And other days

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 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 1968. 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,340	0	1,230	2,890	0	0	1,890	2,030	1,310	0	0	0
2	1,470	10	1,230	2,900	0	0	1,850	2,120	1,060	0	0	0
3	1,540	0	1,160	2,950	0	0	1,810	2,260	1,140	0	0	0
4	1,560	0	1,380	3,080	0	0	1,800	2,060	1,330	0	0	0
5	1,380	0	1,430	3,150	0	0	1,410	2,130	1,370	0	0	0
6	1,420	0	1,460	3,150	0	0	1,420	1,760	1,400	0	0	0
7	1,430	0	1,420	3,140	0	0	1,710	1,760	1,360	0	0	0
8	1,420	0	1,480	2,970	0	0	1,790	2,020	1,350	0	0	0
9	1,380	0	1,430	2,900	0	0	1,880	2,060	1,240	0	0	0
10	1,300	0	1,450	2,990	0	0	1,250	2,080	711	0	0	0
11	1,320	0	1,250	2,790	0	0	1,740	2,030	0	0	0	0
12	1,350	0	1,240	2,800	0	0	1,360	1,780	0	0	0	0
13	1,340	0	1,120	2,670	0	0	1,410	1,910	0	0	0	0
14	1,280	0	1,540	2,650	0	1,030	1,880	1,940	0	0	0	0
15	1,050	34	1,600	2,730	0	1,010	1,900	1,900	0	0	0	0
16	1,100	998	1,610	2,400	0	957	1,900	1,950	0	0	0	0
17	1,100	1,000	1,820	2,260	0	1,060	1,910	1,780	0	0	0	0
18	1,120	1,130	2,050	2,490	0	914	1,940	1,810	0	0	0	0
19	1,100	1,170	2,470	2,570	0	1,030	1,940	1,780	0	0	0	0
20	1,130	1,200	2,540	2,600	0	1,310	2,100	1,760	0	0	0	0
21	1,150	1,150	2,550	2,560	0	1,540	2,130	1,800	0	0	0	0
22	1,130	1,250	2,510	2,610	0	1,480	2,110	1,550	0	0	0	0
23	1,190	1,280	2,500	2,350	0	1,540	1,740	1,280	0	0	0	0
24	1,180	1,130	2,510	2,030	0	1,520	1,920	1,230	0	0	0	0
25	1,100	1,060	2,510	1,740	0	1,470	2,090	1,490	0	0	0	0
26	980	1,080	2,560	1,620	0	1,490	2,130	1,560	0	0	0	0
27	0	1,250	2,860	1,020	0	1,550	2,150	1,570	0	0	0	0
28	0	1,260	2,850	0	0	1,590	2,030	1,610	0	0	0	0
29	0	1,260	2,850	0	0	1,680	2,060	1,660	0	0	0	391
30	0		2,930	0	0	1,720	2,100	1,660	0	0	0	864
31	0		2,870		0		2,000	1,620		0		1,260
Sum	32,860	16,262	60,410	70,010	0	22,891	57,350	55,950	12,271	0	0	2,515

Month	Current Year 1968								Period 1944-1968		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			4	1,560	†27	0	1,060	65,177	42,291	400,200	0
Feb.			23	1,280	† 1	0	561	32,255	16,834	149,500	0
Mar.			30	2,930	13	1,120	1,949	119,821	60,002	279,300	0
Apr.			† 5	3,150	†28	0	2,334	138,863	90,632	260,900	0
May				0		0	0	0	22,169	165,400	0
June			30	1,720	† 1	0	763	45,404	65,567	204,300	0
July			27	2,150	10	1,250	1,850	113,752	115,335	260,000	0
Aug			3	2,260	24	1,230	1,805	110,975	119,843	270,100	0
Sept.			6	1,400	†11	0	409	24,339	62,241	173,300	0
Oct.				0		0	0	0	12,642	51,460	0
Nov.				0		0	0	0	17,765	182,600	0
Dec.			31	1,260	† 1	0	81.1	4,988	35,035	319,700	0
Yearly				3,150		0	903	655,574	660,356	1,944,700	0

Ø 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. I were determined from the gate 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 48 discharge measurements during the year and a continuous record of gage heights. Records furnished by Bureau of Reclamation. The record shown below is the combination of diversions at M.O.D.E. No. I and M.O.D.E. No. 2. Records available: February 10, 1961 through December 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	79	0	198	288	129	162	277	261	226	0	0	0
2	97	0	198	282	131	159	289	265	225	0	0	0
3	97	0	198	288	129	157	287	258	226	0	0	0
4	110	0	241	286	126	158	297	255	230	0	0	0
5	123	0	266	239	125	164	290	195	234	0	0	0
6	123	0	263	180	124	164	293	250	231	0	0	0
7	123	0	261	220	126	161	292	265	224	0	0	0
8	123	0	265	224	128	158	145	265	226	0	0	0
9	125	0	261	222	130	162	3.6	268	226	0	0	0
10	126	0	260	253	126	186	213	326	206	0	0	0
11	124	0	282	290	128	192	271	291	176	0	0	44
12	123	0	282	295	126	188	263	282	155	0	0	52
13	123	0	279	301	161	190	250	294	125	0	0	68
14	122	0	266	303	164	214	250	289	126	0	0	86
15	108	33.1	265	306	165	233	252	283	125	0	0	88
16	106	52.9	261	303	162	230	249	272	1	0	0	89
17	104	134	301	300	164	260	257	270	0	0	0	90
18	104	189	308	300	162	289	255	271	0	0	0	89
19	104	189	300	305	164	292	253	281	0	0	0	90
20	104	188	284	306	166	287	255	185	0	0	0	90
21	104	180	282	274	164	281	250	258	0	0	0	86
22	104	182	293	308	158	284	268	241	0	0	0	89
23	103	183	303	316	157	285	276	245	0	0	0	88
24	103	173	237	313	158	285	276	249	0	0	0	89
25	104	179	290	268	158	281	273	250	0	0	0	89
26	102	185	289	236	162	277	277	245	0	0	0	89
27	90	198	289	210	157	282	277	239	0	0	0	87
28	71	194	293	208	155	269	265	242	0	0	0	86
29	7	195	297	150	152	263	265	244	0	0	0	86
30	0		343	126	157	261	269	242	0	0	0	86
31	0		289		157		265	244		0		133
Sum	3,036	2,455.0	8,444	7,900	4,571	6,774	7,902.6	8,025	2,962	0	0	1,794

Current Year 1968 — **Period 1961-1968**

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			10	126	†30	0	97.9	6,022	9,210	19,452	0
Feb.			27	198	† 1	0	84.7	4,869	8,715	16,784	0
Mar.			30	343	† 1	198	272	16,748	15,315	18,742	8,434
Apr.			23	316	30	126	263	15,668	15,396	18,573	11,948
May			20	166	6	124	147	9,066	14,109	19,783	9,066
June			19	292	3	157	226	13,436	15,077	19,186	12,829
July			4	297	9	3.6	255	15,675	17,379	19,295	15,072
Aug			10	326	20	185	259	15,918	17,113	18,887	15,102
Sept.			5	234	†17	0	98.7	5,875	13,267	18,313	5,875
Oct.				0		0	0	0	8,883	18,625	0
Nov.				0		0	0	0	8,493	17,627	0
Dec.			31	133	† 1	0	57.9	3,558	8,125	18,988	930
Yearly				343		0	147	106,835	151,082	215,087	102,265

Ø 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, 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 377 current meter measurements during the year, 205 by the United States Section, 160 by the Mexican Section of the Commission, 12 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 December 1968; daily discharge records available January 1, 1950 through December 1968.

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 1968, the flow at this point represented the total amount of 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,970	760	1,980	3,880	1,220	1,230	2,710	2,920	2,180	707	700	781
2	2,000	718	2,000	3,980	1,160	1,170	2,700	2,940	2,180	708	792	720
3	2,070	728	1,930	3,970	1,150	1,180	2,710	2,990	2,210	673	750	716
4	2,070	766	2,140	3,960	1,160	1,240	2,710	2,930	2,220	733	738	777
5	2,050	738	2,220	3,980	1,160	1,200	2,740	2,950	2,240	707	712	761
6	2,040	709	2,210	3,980	1,180	1,190	2,710	2,960	2,260	696	729	746
7	2,050	779	2,240	3,980	1,150	1,240	3,000	3,000	2,240	704	714	740
8	2,040	746	2,240	3,990	1,140	1,220	4,440	2,970	2,220	712	710	730
9	2,090	735	2,230	3,940	1,140	1,220	4,650	2,980	2,110	705	733	720
10	2,060	735	2,260	3,930	1,130	1,560	2,540	2,990	1,790	752	733	750
11	2,010	754	2,430	3,700	1,100	1,530	2,650	3,010	1,540	724	709	758
12	2,030	701	2,400	3,670	1,120	1,460	2,620	2,770	1,510	737	747	1,000
13	2,030	728	2,410	3,520	1,180	1,490	2,640	2,870	1,180	739	793	1,340
14	2,040	981	2,420	3,480	1,180	1,760	2,810	2,900	1,160	743	735	1,500
15	1,770	1,290	2,480	3,480	1,230	1,810	2,790	2,840	1,220	750	713	1,480
16	1,790	1,640	2,430	3,550	1,180	1,840	2,790	2,860	808	711	774	1,470
17	1,810	1,750	2,610	3,510	1,190	1,940	2,810	2,720	750	707	739	1,440
18	1,810	1,910	2,900	3,480	1,190	2,130	2,810	2,740	709	718	682	1,450
19	1,800	1,960	3,200	3,520	1,200	2,280	2,820	2,710	677	736	741	1,450
20	1,770	2,030	3,350	3,490	1,180	2,390	2,900	2,740	632	721	737	1,460
21	1,830	1,950	3,400	3,490	1,230	2,430	2,960	2,710	630	733	740	1,430
22	1,800	1,980	3,400	3,500	1,180	2,400	2,970	2,440	647	713	722	1,400
23	1,790	1,960	3,370	3,290	1,160	2,400	2,960	2,440	653	741	771	1,480
24	1,830	2,000	3,390	3,000	1,180	2,430	3,010	2,410	618	732	743	1,550
25	1,800	2,020	3,410	2,620	1,200	2,380	2,970	2,400	636	692	720	1,520
26	1,750	1,980	3,440	2,340	1,190	2,370	3,000	2,440	660	728	709	1,490
27	1,460	2,010	3,660	2,110	1,190	2,420	3,010	2,430	641	681	694	1,460
28	1,130	2,030	3,710	1,790	1,160	2,420	3,000	2,470	669	694	726	1,400
29	746	2,040	3,720	1,440	1,160	2,440	3,000	2,470	653	773	705	1,420
30	732		3,730	1,300	1,210	2,480	2,990	2,480	625	688	779	1,490
31	772		3,740		1,240		2,950	2,480		772		1,780
Sum	54,940	39,128	87,050	99,870	36,440	55,250	91,370	84,960	38,268	22,330	21,990	37,209

Current Year 1968

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	**Period 1935-1968** Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	103.77	102.32	5	2,180	30	669	1,770	108,972	474,444	1,644,000	31,900
Feb.	103.75	102.21	29	2,140	12	608	1,350	77,609	395,697	1,378,000	60,400
Mar.	105.12	103.55	30	3,840	3	1,910	2,810	172,661	384,037	1,120,000	19,400
Apr.	105.25	102.90	5	4,090	30	1,250	3,330	198,089	294,532	823,850	0
May	103.04	102.66	31	1,430	† 10	1,040	1,180	72,278	313,771	1,151,000	72,278
June	104.00	102.72	30	2,540	5	1,140	1,840	109,587	291,303	1,175,000	8,500
July	106.16	103.65	9	4,910	10	2,080	2,950	181,230	276,185	763,800	24,400
Aug	104.86	103.85	8	3,080	24	2,310	2,740	168,516	294,882	791,600	43,800
Sept.	104.01	101.99	1	2,480	30	556	1,280	75,903	274,405	1,029,000	60,000
Oct.	102.58	102.05	31	1,020	1	574	720	44,291	279,600	1,186,000	43,016
Nov.	102.45	102.09	1	893	1	600	733	43,617	353,106	1,422,000	42,363
Dec.	103.47	102.25	31	1,840	3	698	1,200	73,803	451,213	1,832,000	42,000
Yearly	106.16	101.99		4,910		556	1,827	1,326,556	4,083,175	10,596,900	722,100

† And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103.60	102.36	103.63	105.10	102.85	102.82	104.13	104.31	103.73	102.24	102.23	*102.33
2	103.65	102.36	103.64	105.19	102.79	102.77	104.11	104.35	103.75	102.24	102.33	*102.28
3	103.70	102.39	103.58	105.17	102.79	102.77	104.09	104.38	103.76	102.19	102.26	*102.26
4	103.69	102.41	103.74	105.15	102.82	102.79	104.11	104.30	103.78	102.27	*102.25	102.34
5	103.67	102.36	103.79	105.15	102.82	102.76	104.14	104.32	103.82	102.22	*102.24	102.34
6	103.66	102.36	103.83	105.13	102.82	102.80	104.12	104.35	103.82	102.23	102.26	102.31
7	103.70	102.43	103.83	105.13	102.79	102.83	104.41	104.38	103.76	*102.23	102.25	102.29
8	103.70	102.38	103.83	105.14	102.80	102.80	105.63	104.37	103.76	*102.24	102.24	102.26
9	103.72	102.38	103.83	105.12	102.79	102.79	105.99	104.34	103.67	*102.26	102.25	102.25
10	103.68	102.37	103.88	105.11	102.76	103.10	104.15	104.35	103.38	*102.30	102.25	102.30
11	103.68	102.38	104.00	104.91	102.74	103.08	104.14	104.42	103.17	102.29	102.24	102.32
12	103.70	102.32	103.99	104.86	102.77	103.03	104.08	104.59	103.14	102.28	102.28	102.58
13	103.70	102.34	103.94	104.74	102.81	103.06	104.10	104.26	102.81	102.28	102.34	102.95
14	103.69	102.64	103.96	104.71	102.80	103.30	104.24	104.26	102.81	102.27	102.26	103.12
15	103.46	102.94	104.01	104.74	102.85	103.32	104.22	104.23	102.86	102.25	102.24	103.11
16	103.47	103.31	104.00	104.76	102.81	103.36	104.21	104.27	*102.45	102.23	102.30	103.13
17	103.47	103.41	104.16	104.71	102.83	103.48	104.20	104.15	*102.36	102.23	102.27	103.10
18	103.46	103.55	104.33	104.69	102.82	103.61	104.21	104.18	102.31	102.26	102.21	103.10
19	103.46	103.60	104.58	104.71	102.84	103.73	104.22	104.19	*102.29	102.25	102.26	103.11
20	103.45	103.65	104.67	104.73	102.80	103.85	104.32	104.17	*102.20	102.25	102.28	103.14
21	103.50	103.60	104.70	104.71	102.85	103.89	104.36	104.14	*102.22	*102.29	102.29	103.14
22	103.47	103.64	104.71	104.74	102.78	103.85	104.37	103.93	"102.24	*102.25	102.25	103.10
23	103.49	103.65	104.69	104.54	102.80	103.89	104.35	103.95	"102.22	102.28	102.30	103.16
24	103.50	103.66	104.68	104.33	102.79	103.88	104.36	103.92	"102.18	102.26	102.26	103.22
25	103.48	103.68	104.70	104.08	102.80	103.85	104.36	103.94	*102.20	102.23	102.26	103.17
26	103.43	103.63	104.70	103.89	102.83	103.85	104.39	103.95	102.20	102.25	*102.26	103.13
27	103.14	103.65	104.93	103.65	102.81	103.88	104.41	103.94	102.19	102.21	*102.26	103.14
28	102.36	103.65	104.95	103.39	102.76	103.89	104.40	103.99	102.21	102.22	*102.30	103.07
29	102.80	103.66	104.92	103.09	102.78	103.91	104.36	103.99	102.18	*102.28	*102.28	103.10
30	102.38		104.95	102.96	102.81	103.97	104.34	103.97	102.14	*102.20	*102.34	103.13
31	102.42		104.96		102.85		104.30	103.99		102.31		103.41
Avg.	103.43	102.99	104.26	104.61	102.81	103.36	104.35	104.19	102.85	102.25	102.27	102.82

* Partly estimated " 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 8 miles downstream from the Yuma Gaging Station. Zero of gage is 0.16 foot below mean sea level, U. S. C. & G. S. datum.

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 1968.

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 gage height, 112.86 feet on January 2, 1958; minimum mean daily gage height, ~~101.67~~ 101.51 feet on February 17, 1957.

Mean Daily Gage Height in Feet 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102.76	101.84	102.76	103.97	102.23	102.23	103.25	103.38	102.92	101.80	101.87	101.94
2	102.79	101.84	102.76	104.04	102.20	102.20	103.25	103.41	102.92	101.80	101.94	101.90
3	102.82	101.84	102.72	104.04	102.17	102.20	103.22	103.41	102.95	101.77	101.87	101.90
4	102.82	101.87	102.85	104.04	102.20	102.23	103.22	103.35	102.95	101.84	101.90	101.94
5	102.82	101.84	102.92	104.04	102.20	102.20	103.25	103.38	102.99	101.80	101.87	101.94
6	102.82	101.84	102.95	104.04	102.20	102.23	103.22	103.31	102.99	101.80	101.87	101.90
7	102.85	101.87	102.92	104.04	102.20	102.23	103.38	103.44	102.92	101.80	101.87	101.90
8	102.82	101.84	102.92	104.00	102.20	102.20	104.43	103.41	102.95	101.80	101.87	101.87
9	102.82	101.84	102.92	104.00	102.20	102.20	104.92	103.41	102.85	101.84	101.87	101.87
10	102.79	101.84	102.95	104.00	102.17	102.46	103.41	103.41	102.66	101.87	101.87	101.90
11	102.79	101.84	103.08	103.87	102.17	102.46	103.25	103.54	102.49	101.84	101.87	101.94
12	102.82	101.80	103.08	103.84	102.20	102.43	103.18	103.97	102.46	101.84	101.90	102.13
13	102.82	101.84	103.05	103.77	102.20	102.43	103.22	103.31	102.23	101.84	101.97	102.40
14	102.79	102.03	103.05	103.74	102.23	102.62	103.31	103.35	102.20	101.87	101.90	102.53
15	102.62	102.26	103.12	103.74	102.26	102.62	103.28	103.31	102.26	101.87	101.87	102.49
16	102.66	102.53	103.08	103.77	102.23	102.66	103.28	103.35	101.94	101.84	101.94	102.49
17	102.66	102.59	103.22	103.74	102.23	102.76	103.28	103.28	101.87	101.87	101.90	102.46
18	102.66	102.69	103.35	103.74	102.23	102.85	103.28	103.28	101.80	101.87	101.84	102.46
19	102.66	102.72	103.54	103.74	102.26	102.95	103.28	103.28	101.80	101.87	101.90	102.46
20	102.66	102.76	103.61	103.74	102.23	103.02	103.35	103.28	101.77	101.87	101.90	102.49
21	102.66	102.72	103.61	103.74	102.23	103.05	103.38	103.25	101.77	101.90	101.90	102.49
22	102.62	102.76	103.61	103.77	102.20	103.02	103.38	103.08	101.80	101.87	101.87	102.46
23	102.62	102.76	103.61	103.61	102.20	103.05	103.38	103.08	101.77	101.90	101.90	102.49
24	102.62	102.79	103.58	103.41	102.20	103.05	103.41	103.05	101.77	101.90	101.90	102.53
25	102.62	102.79	103.61	103.25	102.20	103.02	103.38	103.08	101.77	101.87	101.87	102.49
26	102.59	102.76	103.61	103.08	102.23	103.02	103.41	103.08	101.77	101.87	101.90	102.46
27	102.40	102.79	103.74	102.85	102.20	103.05	103.48	103.08	101.77	101.84	101.87	102.46
28	102.17	102.79	103.74	102.62	102.17	103.05	103.48	103.12	101.80	101.87	101.90	102.40
29	101.84	102.79	103.81	102.40	102.20	103.08	103.41	103.12	101.80	101.90	101.90	102.43
30	101.84		103.77	102.30	102.23	103.12	103.41	103.08	101.74	101.84	101.90	102.43
31	101.87		103.81		102.26		103.38	103.12		101.94		102.66
Avg.	102.62	102.29	103.27	103.63	102.21	102.66	103.41	103.29	102.26	101.85	101.89	102.26

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 1968. 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 Heading 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 1968 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,960	752	1,970	3,850	1,210	1,230	2,700	2,910	2,170	706	699	777
2	1,980	713	2,000	3,960	1,150	1,170	2,690	2,930	2,160	706	791	717
3	2,050	724	1,920	3,960	1,150	1,180	2,700	2,970	2,200	671	749	713
4	2,040	763	2,130	3,960	1,150	1,240	2,700	2,910	2,210	731	738	773
5	2,030	731	2,210	3,960	1,150	1,200	2,730	2,930	2,230	706	710	756
6	2,030	703	2,200	3,960	1,180	1,190	2,700	2,950	2,250	696	727	742
7	2,040	770	2,240	3,960	1,150	1,240	2,990	2,990	2,230	703	713	735
8	2,030	742	2,240	3,960	1,140	1,210	4,170	2,950	2,210	710	710	727
9	2,080	727	2,220	3,920	1,140	1,210	4,130	2,960	2,090	703	731	717
10	2,060	731	2,260	3,920	1,130	1,550	2,510	2,970	1,780	752	731	745
11	2,010	749	2,420	3,670	1,090	1,530	2,640	2,990	1,540	724	706	756
12	2,030	696	2,390	3,670	1,120	1,450	2,620	2,750	1,500	735	745	996
13	2,030	713	2,400	3,510	1,170	1,480	2,640	2,860	1,180	738	791	1,330
14	2,030	978	2,420	3,470	1,170	1,750	2,810	2,890	1,150	742	735	1,500
15	1,770	1,280	2,480	3,470	1,220	1,800	2,770	2,830	1,210	749	713	1,480
16	1,780	1,640	2,430	3,530	1,170	1,830	2,790	2,850	805	710	773	1,470
17	1,800	1,740	2,600	3,500	1,180	1,930	2,800	2,710	745	706	738	1,440
18	1,800	1,900	2,890	3,470	1,190	2,120	2,800	2,730	706	717	682	1,450
19	1,790	1,960	3,190	3,510	1,200	2,270	2,810	2,700	675	735	738	1,450
20	1,770	2,030	3,340	3,480	1,180	2,380	2,900	2,730	629	720	735	1,450
21	1,820	1,950	3,390	3,490	1,230	2,430	2,950	2,700	625	731	738	1,430
22	1,790	1,980	3,390	3,490	1,180	2,390	2,960	2,430	643	713	720	1,390
23	1,780	1,960	3,360	3,280	1,150	2,400	2,950	2,420	650	738	770	1,480
24	1,830	2,000	3,390	2,990	1,170	2,430	3,000	2,400	614	731	742	1,550
25	1,790	2,020	3,400	2,620	1,200	2,380	2,960	2,390	632	692	720	1,510
26	1,740	1,970	3,430	2,330	1,190	2,360	2,990	2,430	657	727	706	1,490
27	1,450	2,010	3,640	2,100	1,190	2,410	3,000	2,420	639	678	692	1,450
28	1,130	2,030	3,710	1,780	1,150	2,420	2,990	2,450	667	692	724	1,390
29	742	2,030	3,710	1,440	1,150	2,430	2,990	2,460	653	773	703	1,420
30	724		3,710	1,300	1,200	2,480	2,980	2,460	625	685	777	1,490
31	763		3,710		1,240		2,950	2,460		770		1,780
Sum	54,669	38,992	86,790	99,510	36,290	55,090	90,320	84,530	38,075	22,290	21,947	37,104

Month	Current Year 1968								Period 1950-1968		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			9	2,080	30	724	1,770	108,465	54,907	114,523	966
Feb.			29	2,030	12	696	1,350	77,302	52,368	101,685	9,232
Mar.			†28	3,710	3	1,920	2,800	172,165	164,466	216,994	97,902
Apr.			† 2	3,960	30	1,300	3,320	197,324	196,973	264,127	158,162
May			31	1,240	11	1,090	1,170	71,972	99,053	159,010	66,207
June			30	1,280	2	1,170	1,840	109,242	174,500	269,632	109,242
July			8	4,170	10	2,510	2,910	179,134	246,855	304,263	170,953
Aug			11	2,990	25	2,390	2,730	167,639	246,596	341,044	167,639
Sept.			6	2,250	24	614	1,270	75,537	144,247	198,095	75,537
Oct.			29	773	3	671	720	44,213	49,520	90,639	10,453
Nov.			† 2	791	18	682	731	43,534	35,490	103,954	7,516
Dec.			31	1,780	3	713	1,200	73,569	55,568	131,440	8,825
Yearly				4,170		614	1,820	1,320,095	1,523,337	1,961,556	1,306,276

Ø Mean daily † And other days

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	101.15	99.08	101.02	103.41	100.20	101.05	102.07	102.79	102.46	99.48	99.97	99.70
2	101.21	99.11	101.02	103.48	100.10	99.84	102.03	102.82	102.66	99.44	99.97	99.67
3	101.21	99.15	100.98	103.48	100.07	99.97	102.03	102.85	102.53	99.31	99.93	99.64
4	101.21	99.21	101.18	103.48	100.10	100.00	102.07	102.76	102.53	99.48	99.97	99.74
5	101.21	99.16	101.28	103.51	100.10	99.97	102.13	102.82	102.56	99.38	99.93	99.70
6	101.21	99.11	101.31	103.48	100.10	100.03	102.10	102.82	102.56	99.38	99.97	99.67
7	101.25	99.28	101.31	103.51	100.00	100.03	102.56	102.82	102.49	99.41	99.93	99.67
8	101.21	99.18	101.31	103.51	100.00	100.00	104.23	102.79	102.53	99.41	99.93	99.64
9	101.71	99.15	101.31	103.51	99.97	100.00	104.69	102.79	102.36	99.41	99.93	99.64
10	102.13	99.18	101.35	103.51	99.97	100.56	103.02	102.79	102.10	99.44	99.90	99.64
11	102.10	99.18	101.51	103.41	99.93	100.49	102.66	103.12	102.00	99.44	99.90	99.67
12	102.07	99.11	101.48	103.38	99.97	100.39	102.59	103.81	101.97	99.44	99.97	99.90
13	102.07	99.11	101.38	103.35	100.26	100.43	102.66	102.76	101.67	99.44	100.13	100.30
14	102.07	99.61	101.44	103.31	101.44	100.82	102.72	102.76	101.57	99.44	99.93	100.62
15	102.00	99.97	101.61	103.38	101.54	100.85	102.69	102.72	101.61	99.38	99.90	100.56
16	101.61	100.39	101.61	103.38	101.54	100.89	102.72	102.85	101.21	99.31	99.87	100.72
17	100.75	100.69	101.87	103.38	101.51	101.08	102.72	102.85	100.52	99.31	99.70	100.82
18	100.75	100.82	102.10	103.35	101.51	101.21	102.72	102.89	99.61	99.41	99.61	100.75
19	100.75	100.89	102.33	103.38	101.51	101.38	102.72	102.89	99.41	99.64	99.64	100.85
20	100.75	101.02	102.40	103.38	101.48	101.54	102.79	102.92	99.28	99.70	99.64	100.92
21	100.79	100.95	102.53	103.35	101.54	101.61	102.79	102.89	99.28	100.03	99.67	101.02
22	100.75	101.02	102.59	103.38	101.48	101.54	102.82	102.62	99.28	100.00	99.64	101.08
23	100.75	101.02	102.59	103.18	101.48	101.61	102.79	102.62	99.28	100.00	99.67	101.15
24	100.79	101.02	102.56	102.95	101.51	101.54	102.79	102.59	99.21	100.00	99.61	101.18
25	100.75	101.05	102.59	102.82	101.48	101.61	102.79	102.62	99.25	99.97	99.64	101.12
26	100.72	101.02	102.59	102.66	101.54	101.61	102.82	102.59	99.28	99.93	99.61	101.12
27	100.46	101.05	103.02	102.40	101.51	101.74	102.82	102.62	99.25	100.00	99.64	101.12
28	100.16	101.02	103.08	102.17	101.51	101.74	102.82	102.66	99.25	99.93	99.67	101.08
29	99.57	101.02	103.18	101.71	101.48	101.77	102.79	102.62	99.25	100.00	99.64	101.12
30	99.11		103.15	100.43	101.51	101.80	102.82	102.62	99.18	99.90	99.70	101.12
31	99.15		103.15		101.57		102.79	102.62		100.03		101.28
Avg.	101.01	100.05	101.96	103.12	100.90	100.90	102.73	102.80	100.87	99.63	99.81	100.46

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. Zero of the gage is 0.16 foot below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; a continuous record of gage heights, June 7, 1966 through 1968.

REMARKS: Prior to June 7, 1966, when a continuous water-stage recorder was installed, mean daily gage height records were determined from hourly readings of a staff gage painted on sloping concrete apron of Morelos Dam.

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

Mean Daily Gage Height in Feet 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	101.21	101.18	100.16	98.85	99.93	100.23	98.98	99.38	99.61	101.94	101.94	101.54
2	101.12	101.18	100.16	98.85	99.97	100.26	98.85	99.38	99.67	101.94	101.94	101.54
3	101.12	101.18	100.20	98.85	100.00	100.26	98.85	99.38	99.67	101.90	101.94	101.51
4	101.15	101.18	99.90	98.85	100.03	100.20	98.88	99.25	99.64	101.84	101.94	101.54
5	101.02	101.18	99.70	98.85	100.07	100.10	98.82	99.15	99.67	101.87	101.94	101.54
6	100.95	101.18	99.67	98.95	100.03	100.13	98.85	99.15	99.70	101.97	101.94	101.48
7	100.95	101.18	99.67	98.88	100.03	100.13	98.82	99.25	99.74	102.00	101.94	101.44
8	100.92	101.21	99.67	98.88	100.03	100.16	100.79	99.25	99.70	102.03	101.94	101.41
9	100.92	101.21	99.67	98.88	100.07	100.16	102.66	99.15	99.70	102.00	101.94	101.41
10	100.92	101.18	99.67	98.88	100.13	99.97	99.44	99.15	99.84	102.03	101.90	101.41
11	100.92	101.18	99.44	99.02	100.13	99.97	99.21	99.08	100.07	102.00	101.90	101.21
12	100.89	101.08	99.41	99.02	100.16	100.00	99.28	99.11	100.16	102.03	101.87	101.02
13	100.89	100.52	99.38	98.85	100.03	100.03	99.38	99.08	100.36	102.07	101.87	100.89
14	100.89	100.00	99.28	98.88	99.97	99.87	99.34	99.08	100.43	102.03	101.80	100.75
15	100.95	99.41	99.44	98.92	100.03	99.74	99.41	99.08	100.52	102.00	101.80	100.72
16	100.95	99.21	99.51	98.82	100.07	99.67	99.34	99.05	101.21	102.00	101.84	100.75
17	100.92	99.80	99.08	98.85	100.10	99.34	99.31	99.05	101.05	102.00	101.80	100.75
18	100.92	100.03	98.95	98.85	100.13	98.98	99.34	99.05	101.08	102.00	101.80	100.69
19	100.92	100.10	98.92	98.85	100.16	98.92	99.34	99.05	101.48	102.03	101.80	100.69
20	100.92	100.16	98.88	98.82	100.20	98.85	99.34	99.05	101.51	102.07	101.80	100.69
21	100.89	100.26	98.88	99.18	100.23	98.79	99.38	99.25	101.57	102.10	101.77	100.66
22	100.85	100.23	98.88	98.88	100.23	98.75	99.25	99.38	101.61	102.10	101.80	100.62
23	100.82	100.23	98.88	98.79	100.26	98.75	99.25	99.34	101.64	102.10	101.77	100.62
24	100.82	100.13	99.54	98.79	100.23	98.82	99.28	99.38	101.64	102.07	101.77	100.59
25	100.82	100.16	99.02	99.18	100.23	98.95	99.28	99.41	101.67	102.07	101.77	100.59
26	100.82	100.13	98.88	99.38	100.26	98.95	99.21	99.41	101.67	102.00	101.74	100.59
27	100.89	100.07	98.85	99.44	100.33	98.92	99.28	99.41	101.77	102.00	101.48	100.59
28	100.92	100.13	98.85	99.44	100.33	98.98	99.34	99.31	101.80	102.00	101.57	100.56
29	101.15	100.16	98.85	99.77	100.26	99.05	99.31	99.34	101.87	101.94	101.54	100.56
30	101.18		98.85	99.90	100.23	99.08	99.28	99.34	101.90	101.94	101.48	100.56
31	101.18		98.85		100.23		99.38	99.41		101.90		100.30
Avg.	100.96	100.51	99.33	99.01	100.13	99.53	99.37	99.23	100.73	102.00	101.81	100.94

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 26 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 1968.

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, 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 1968 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	222	289	112	0	142	107	11.8	47.3	76.3	301	300	300
2	201	294	114	0	144	113	0	45.8	77.2	300	298	301
3	205	290	114	0	149	114	0	44.3	76.3	292	303	303
4	197	292	77.2	0	153	104	0	19.8	71.9	280	301	312
5	182	292	50.5	0	153	98.2	0	1.6	71.9	283	300	314
6	182	294	48.9	0	149	104	0	7.6	73.6	296	301	314
7	178	290	48.9	0	146	106	0	28.0	71.9	298	303	309
8	179	301	52.8	0	148	108	107	22.0	66.6	301	304	304
9	180	300	53.6	0	149	109	283	12.8	62.4	300	303	304
10	183	292	53.6	0	153	84.7	56.5	12.3	76.3	300	304	308
11	180	292	31.8	* 8.4	153	90.4	20.3	1.3	105	298	301	273
12	178	276	28.0	* 7.6	155	92.4	36.5	0	111	298	303	251
13	180	139	27.4	0	124	95.3	48.1	0	132	296	304	235
14	180	60.4	20.6	* 3.8	114	79.0	43.6	0	136	294	296	211
15	194	18.3	37.3	* 4.0	119	65.8	46.6	0	144	290	294	208
16	194	10.0	43.2	0	119	62.4	48.9	0	247	292	301	209
17	192	55.1	8.7	0	121	29.2	42.8	0	208	292	295	211
18	192	81.8	0	0	122	5.6	45.0	0	219	294	292	206
19	193	91.4	0	0	122	.5	46.6	0	286	298	301	208
20	196	102	0	0	122	1.0	48.9	0	288	303	304	209
21	193	118	0	* 28.0	122	.5	49.7	33.0	290	303	301	205
22	193	118	0	* 3.8	121	0	29.9	48.1	290	304	300	205
23	193	119	0	0	119	0	30.5	43.6	289	304	301	210
24	193	100	49.1	0	115	2.2	32.4	48.9	286	303	301	211
25	194	110	7.9	31.1	115	10.5	31.1	49.7	283	300	303	213
26	192	103	0	52.2	118	11.4	26.1	56.0	279	296	304	213
27	206	91.4	0	64.3	125	4.0	33.1	52.0	290	292	265	214
28	223	107	0	67.5	124	17.7	45.8	44.3	292	295	290	211
29	279	111	0	121	113	23.8	33.1	46.6	294	294	294	211
30	288		0	139	107	24.9	32.4	44.3	298	295	296	211
31	289		0		107		45.8	53.6		294		163
Sum	6,231	5,037.4	979.5	530.7	4,043	1,664.5	1,275.5	762.9	5,491.4	9,186	8,963	7,557

Month	Current Year 1968								Period 1966-1968		
	Ø Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	3.05	2.23	31	289	† 7	178	201	12,359	15,187	17,740	12,359
Feb.	3.13	.35	8	301	16	10.0	174	9,992	11,717	15,154	9,992
Mar.	1.74	0	† 2	114	†18	0	31.6	1,943	3,391	4,879	1,943
Apr.	1.95	0	30	139	† 1	0	17.7	1,053	2,102	3,977	1,053
May	2.08	1.66	12	155	†30	107	130	8,019	5,655	8,019	3,160
June	1.72	0	3	114	†22	0	55.5	3,301	2,982	3,546	2,098
July	3.04	0	9	283	† 2	0	41.1	2,530	1,065	2,530	0
Aug	1.07	0	26	56.0	†12	0	24.6	1,513	747	1,513	34.9
Sept.	3.09	1.15	30	298	9	62.4	183	10,892	7,323	10,892	3,575
Oct.	3.13	2.97	†22	304	4	280	296	18,220	17,878	18,220	17,599
Nov.	3.15	2.88	† 8	304	27	265	299	17,778	17,570	17,778	17,234
Dec.	3.20	2.10	† 5	314	31	163	244	14,989	15,630	16,290	14,989
Yearly	3.20	0		314		0	141	102,589	101,247	102,589	100,028

Ø Mean daily † And other days * Partly estimated

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 monthly meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, March 1950 through December 1968, 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.5	0.3	0.5	0.9	0.6	0.7	1.5	0.6	0.9	5.0	0	0.4
2	1.8	.3	1.5	.1	.4	.6	.5	.4	.8	.4	1.4	.7
3	.3	.3	4.5	0	.4	.5	3.0	.8	.8	0	1.1	.6
4	1.9	4.0	2.4	.6	.4	.7	3.0	5.0	.7	.3	1.2	3.3
5	5.1	4.3	.4	1.8	4.4	5.4	.6	1.2	.4	.8	1.0	1.3
6	.4	1.0	0	4.8	2.7	1.8	3.4	.3	.4	.7	.7	.4
7	.4	1.3	0	6.9	5.0	.6	.9	.1	.4	.5	.7	.6
8	2.1	.5	.2	2.6	1.6	.4	.6	.1	4.1	.8	5.8	3.6
9	.7	.5	1.9	.6	3.6	1.2	2.3	.5	.1	.6	9.2	3.7
10	.4	.5	.5	3.1	3.9	1.0	2.2	.9	.1	.4	3.8	2.3
11	.5	.9	.3	4.5	.5	1.6	1.4	3.0	.4	.1	7.3	1.6
12	.5	.7	.2	2.1	2.2	.6	1.0	1.7	2.3	6.2	1.0	.5
13	1.1	.4	.1	1.6	6.9	.7	.7	.6	.2	4.8	4.5	.4
14	.3	.6	1.0	.5	.7	2.5	.4	2.2	2.4	4.3	.4	.2
15	.2	.7	.7	0	1.5	4.5	.8	.6	.8	5.0	1.2	0
16	.2	.7	4.1	.2	1.8	.8	1.2	.4	.3	.8	.3	0
17	1.2	.9	1.3	.6	.3	5.7	4.5	1.0	.1	1.2	3.9	0
18	4.0	1.0	.3	1.1	2.7	1.9	1.1	1.0	0	.7	.8	.8
19	2.3	.9	2.7	.7	1.8	2.4	.8	2.7	.1	.4	.4	2.0
20	2.5	.8	5.0	.5	.6	.5	1.4	.7	0	.9	.1	0
21	4.1	.6	1.3	.3	.5	.6	.5	.5	1.6	6.3	.2	0
22	.9	.6	.3	.7	.9	.6	3.5	1.3	.6	1.9	5.1	1.5
23	.7	.6	3.3	1.3	1.4	2.2	1.2	.6	.8	.6	2.1	1.4
24	.5	.5	1.8	2.9	1.9	5.5	.7	1.8	1.1	5.0	2.8	.9
25	.4	.5	.7	1.8	3.9	1.8	.2	1.4	2.0	.5	1.8	.3
26	2.8	1.8	2.8	.5	1.3	6.0	1.9	1.8	3.2	.3	1.6	.5
27	1.7	1.2	.9	.4	.8	1.2	2.4	1.2	.4	2.2	2.1	2.6
28	2.6	1.3	2.4	.4	.7	2.7	.8	1.8	.3	.7	2.3	.9
29	.9	1.2	3.3	.3	1.1	2.9	1.0	1.7	.3	.2	1.8	1.1
30	.5		1.6	.8	1.9	9.2	1.2	1.3	.8	0	.1	3.2
31	.3		2.3		.9		1.6	1.2		0		2.4
Sum	41.8	28.9	48.3	42.6	57.3	66.8	46.3	38.4	26.4	51.6	64.7	37.2

Month	Current Year 1968								Period 1935-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	112.34	111.00	5	21.6	8	0	1.3	82.9	195	914	0
Feb.	112.00	111.03	4	14.1	1	.2	1.0	57.3	171	400	6
Mar.	112.34	111.00	15	21.6	† 6	0	1.6	95.8	184	517	0
Apr.	112.45	111.00	24	24.4	† 2	0	1.4	84.5	198	425	40
May	112.58	111.00	25	27.6	17	0	1.8	114	188	440	76
June	112.61	111.00	26	28.4	21	0	2.2	132	178	595	47
July	112.60	111.02	17	28.1	†11	.1	1.5	91.8	163	516	0
Aug	112.31	111.00	19	20.8	† 7	0	1.2	76.2	126	617	0
Sept.	112.31	111.00	12	20.8	† 9	0	.9	52.4	126	462	0
Oct.	112.68	111.00	21	30.1	† 3	0	1.7	102	153	490	0
Nov.	112.49	111.00	11	25.4	† 1	0	2.2	128	179	462	9
Dec.	112.40	111.00	4	23.1	† 1	0	1.2	73.8	210	592	64.9
Yearly	112.68	111.00		30.1		0	1.5	1,091	2,071	4,500	1,024

† 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 145 current meter measurements during the year, 80 by the United States Section, 65 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 December 1968; continuous record of gage heights, July 20, 1952 through December 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	231	296	117	10.0	140	114	* 20.6	* 57.6	¨ 89.5	307	300	305
2	226	300	118	9.5	141	117	* 8.6	* 57.6	* 92.8	301	300	307
3	222	296	123	9.0	144	115	10.6	* 60.9	89.5	293	305	309
4	227	300	87.3	9.0	150	105	11.7	* 44.0	85.1	281	303	319
5	204	305	57.6	10.0	153	101	7.7	* 18.5	82.9	284	301	319
6	195	303	55.4	21.0	150	107	10.6	19.2	84.0	298	303	318
7	190	300	55.4	13.9	149	108	8.6	41.0	81.8	298	305	314
8	189	307	57.6	10.6	150	111	382	39.0	79.6	303	310	312
9	188	307	59.8	9.5	153	113	812	30.1	77.4	301	312	312
10	189	298	58.7	11.7	156	92.8	89.0	31.0	85.1	301	309	314
11	186	298	39.0	19.9	154	93.9	31.0	20.6	105	298	309	294
12	183	283	34.0	19.2	161	97.4	40.0	18.5	118	304	305	260
13	186	155	34.0	11.7	143	102	49.0	13.9	129	301	309	249
14	188	63.1	25.6	12.2	124	92.8	46.0	15.7	136	298	298	226
15	200	27.0	41.0	15.0	129	79.6	69.3	13.9	143	296	296	218
16	202	15.5	52.1	9.5	129	73.0	53.2	13.4	213	293	303	216
17	198	60.9	19.8	10.0	127	45.0	52.1	12.8	204	293	300	216
18	200	89.5	10.6	10.0	129	15.0	54.3	13.9	207	296	293	214
19	200	97.4	10.0	9.5	127	11.2	55.4	16.4	264	298	303	212
20	204	106	12.2	9.0	125	8.6	56.5	15.0	276	305	305	212
21	204	123	9.0	33.8	124	6.8	57.6	47.0	ò 281	310	303	208
22	200	121	8.2	13.9	125	5.4	44.0	65.3	ò 289	307	305	213
23	200	121	10.6	10.0	125	5.0	40.0	60.9	ò 291	305	303	216
24	198	106	51.7	11.7	123	12.8	44.0	64.2	ò 289	309	305	218
25	200	113	19.8	37.0	123	16.4	42.0	64.2	ò 288	301	305	219
26	201	111	12.2	60.9	121	24.7	40.0	70.8	ò 281	296	307	220
27	213	97.4	10.0	69.7	129	13.9	46.0	67.5	ò 286	296	269	220
28	230	111	12.2	73.0	129	25.6	56.5	62.0	ò 291	296	293	216
29	284	117	12.8	120	120	34.0	* 47.0	62.0	ò 294	294	296	214
30	296		10.6	138	117	39.0	* 45.0	* 63.1	ò 298	296	296	214
31	298		11.2		113		53.2	¨ 70.8		294		175
Sum	6,532	5,227.8	1,236.4	808.2	4,183	1,885.9	2,383.5	1,250.8	5,530.7	9,253	9,051	7,779

Current Year 1968									Period 1954-1968		
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	100.62	99.59	4	316	11	182	211	12,956	204,377	969,540	949
Feb.	100.13	97.73	8	309	16	12.2	180	10,369	103,144	414,310	977
Mar.	98.85	97.54	3	126	22	8.2	39.9	2,452	65,669	630,230	780
Apr.	98.72	97.50	30	141	6	8.6	26.9	1,603	51,445	532,320	899
May	98.80	98.40	12	176	31	113	135	8,297	60,699	375,970	460
June	98.61	97.41	2	126	23	4.0	62.9	3,741	14,054	119,980	834
July	103.56	97.45	9	1,240	3	7.2	76.9	4,728	13,446	89,430	654
Aug	98.70	97.62	26	99.8	13	11.2	40.3	2,481	22,978	125,590	702
Sept.	101.12	98.58	30	298	1	75.2	184	10,970	19,111	87,830	113
Oct.	101.40	101.07	21	321	4	277	298	18,353	54,033	172,940	9,750
Nov.	101.31	100.83	9	314	27	249	302	17,952	100,961	356,390	4,869
Dec.	101.08	99.38	5	327	31	164	251	15,429	139,831	643,850	1,111
Yearly	103.56	97.41		1,240		4.0	151	109,331	849,748	3,957,730	101,758

* Partly estimated ¨ Estimated ò Deduced

COLORADO RIVER AT MORELOS GAGING STATION - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100.19	100.10	98.76	97.56	98.63	98.50	97.69	98.11	¨ 98.71	101.19	101.24	101.04
2	100.05	100.11	98.77	97.55	98.64	98.53	97.48	98.11	* 98.77	101.20	101.25	101.05
3	100.02	100.09	98.82	97.54	98.66	98.54	97.52	98.14	98.77	101.16	101.25	101.00
4	100.05	100.09	98.53	97.55	98.70	98.47	97.54	97.98	98.76	101.10	¨ 101.27	101.06
5	99.87	100.12	98.27	97.57	98.71	98.44	97.46	97.70	98.77	101.10	¨ 101.26	101.03
6	99.80	100.11	98.25	97.69	98.68	98.49	97.52	97.71	98.81	101.20	¨ 101.26	101.01
7	99.76	100.09	98.25	97.62	98.65	98.50	97.48	97.95	98.82	101.23	¨ 101.26	100.96
8	99.75	100.12	98.26	97.55	98.65	98.52	99.56	97.93	98.83	101.23	¨ 101.28	100.92
9	99.73	100.12	98.27	97.52	98.66	98.54	102.02	97.84	98.81	101.25	¨ 101.30	100.90
10	99.73	100.07	98.25	97.56	98.66	98.39	98.32	97.85	98.94	101.26	¨ 101.27	100.90
11	99.70	100.06	98.05	97.69	98.65	98.41	97.82	97.75	99.18	101.25	¨ 101.25	100.72
12	99.66	99.99	97.99	97.68	98.70	98.44	97.91	97.73	99.31	101.27	* 101.23	100.50
13	99.67	99.24	97.99	97.56	98.58	98.48	98.00	97.68	99.46	101.28	101.24	100.38
14	99.67	98.53	97.90	97.57	98.46	98.40	97.97	97.71	99.54	101.29	101.18	100.21
15	99.73	98.08	98.05	97.62	98.50	98.29	98.16	97.68	99.60	101.25	101.16	100.15
16	99.73	97.82	98.14	97.52	98.50	98.24	98.04	97.67	100.28	101.24	101.15	100.14
17	99.69	98.34	97.74	97.53	98.49	97.98	98.01	97.67	100.21	101.23	101.16	100.14
18	99.69	98.60	97.61	97.53	98.52	97.64	98.00	97.70	100.24	101.25	101.18	100.10
19	99.67	98.67	97.60	97.52	98.53	97.57	98.01	97.75	100.68	101.26	101.14	100.07
20	99.67	98.73	97.64	97.51	98.53	97.52	98.02	97.74	100.76	101.28	101.15	100.06
21	99.67	98.87	97.57	97.82	98.53	97.48	98.04	98.11	100.79	101.34	101.15	100.03
22	99.63	98.86	97.55	97.59	98.54	97.45	97.92	98.29	100.84	101.33	101.16	¨ 99.97
23	99.61	98.86	97.60	97.51	98.54	97.44	97.88	98.28	100.88	101.31	101.14	¨ 99.97
24	99.60	98.73	98.07	97.53	98.52	97.60	97.92	98.34	100.90	101.31	101.14	¨ 99.90
25	99.60	98.78	97.70	97.83	98.52	97.66	97.90	98.37	100.91	101.28	101.14	¨ 99.90
26	99.60	98.75	97.60	98.02	98.51	97.76	97.88	98.44	100.91	101.26	101.14	* 99.88
27	99.67	98.63	97.56	98.09	98.58	97.60	97.95	98.42	101.01	101.27	100.95	99.85
28	99.75	98.72	97.60	98.12	98.58	97.76	98.06	98.38	101.06	101.31	101.01	99.82
29	100.03	98.76	97.61	98.49	98.52	97.84	97.98	98.39	101.10	101.26	101.03	99.80
30	100.10		97.57	98.61	98.50	97.89	97.97	98.42	101.12	101.25	101.03	99.79
31	100.11		97.58		98.48		98.06	98.51		101.24		99.47
Avg.	99.78	99.24	97.97	97.70	98.58	98.08	98.07	98.01	99.89	101.25	101.18	100.35

¨ Estimated * Partly estimated

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 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 monthly current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through December 1968, obtained by the United States Section; monthly discharge, January 1924 through December 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.3	1.2	7.0	39.3	1.4	* 8.4	5.1	0.9	5.6	6.0	0.9	3.5
2	12.7	13.2	1.3	6.3	1.6	¤ 1.7	2.0	.8	.9	9.9	1.2	8.6
3	.7	6.5	48.8	5.4	2.9	* 1.3	3.1	1.6	1.0	4.0	.8	4.1
4	.9	1.0	54.2	1.0	2.7	1.0	.8	65.3	6.0	10.2	8.3	1.2
5	5.7	.9	7.5	* .8	3.1	4.7	1.0	26.3	4.6	6.0	.9	10.5
6	4.7	.9	5.2	* .8	4.2	.8	2.1	3.4	1.3	2.1	4.0	1.3
7	.8	.9	.8	* .8	1.9	1.0	6.1	2.5	.9	5.3	1.3	1.0
8	1.5	1.0	6.1	* 2.5	3.0	* .9	9.8	2.3	3.5	1.1	1.7	1.7
9	6.3	1.1	.7	1.1	1.6	2.3	.7	.8	7.0	1.2	7.4	2.0
10	1.4	.8	.7	1.1	3.0	2.1	1.6	.7	1.0	1.0	2.6	4.6
11	10.4	1.0	.7	1.5	1.6	2.0	2.3	* .6	1.0	1.4	.8	2.7
12	9.1	.9	.7	2.1	4.3	1.0	.6	* .8	1.2	2.7	.8	2.1
13	1.1	8.9	.7	1.4	9.9	.9	.5	.8	5.1	6.3	.8	2.5
14	.9	5.8	1.5	18.0	1.2	.9	.7	1.3	3.7	10.4	.8	1.0
15	1.0	1.6	1.0	8.2	1.2	1.0	.9	4.9	.9	1.4	3.0	1.0
16	4.6	14.3	1.1	1.0	1.0	4.4	.9	1.3	.8	.9	16.5	2.4
17	3.6	8.8	1.8	1.0	3.8	8.2	4.3	1.0	1.1	.9	70.3	8.0
18	1.0	7.3	2.4	1.2	1.7	1.2	5.0	.9	4.7	.9	16.7	1.2
19	3.0	1.0	1.1	1.4	7.5	1.0	.9	2.4	7.6	1.6	1.2	1.2
20	1.1	3.3	2.8	1.2	* 12.4	1.0	1.0	1.0	7.7	2.7	.8	6.9
21	8.3	2.9	1.4	4.4	1.2	.9	3.2	1.1	.8	13.7	.8	2.0
22	1.2	4.5	1.3	14.3	3.2	1.1	1.2	1.0	3.0	2.0	3.1	1.3
23	.8	1.0	1.1	1.1	.8	4.0	2.3	2.5	2.5	* .7	.9	4.7
24	3.2	1.7	1.1	1.1	.9	1.4	1.9	1.3	.7	* 1.8	11.9	4.6
25	2.1	1.1	1.0	1.1	1.3	3.0	.8	11.5	.9	.9	9.0	10.1
26	.8	4.9	1.2	1.3	1.1	5.7	.8	1.2	.8	4.4	2.4	4.1
27	3.2	1.2	8.0	1.1	2.9	.6	.8	1.4	1.6	73.3	2.1	8.1
28	6.4	2.1	1.0	1.3	1.2	.7	* 1.1	1.4	2.7	13.1	.8	3.6
29	.9	1.7	.8	* 1.3	* 3.3	1.3	* 1.5	1.0	1.6	2.1	.7	8.9
30	1.5		7.0	* 1.2	¤ 3.3	.8	.8	1.4	1.3	1.3	1.1	1.2
31	3.6		45.0		* 2.5		3.5	2.2		1.3		1.1
Sum	110.8	101.5	215.0	124.3	91.7	65.3	67.3	145.6	81.5	190.6	173.6	117.2

Month	Current Year 1968								Period 1935-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	112.83	111.81	1	60.1	1	0.6	3.6	220	3,904	9,570	215
Feb.	112.76	111.83	26	55.2	12	.8	3.5	201	3,134	8,430	201
Mar.	115.47	111.81	3	238	7	.6	6.9	426	2,945	6,230	171
Apr.	114.85	111.83	1	182	† 5	.8	4.1	247	2,722	6,300	0
May	112.59	111.82	20	37.5	†21	.7	3.0	182	3,289	9,320	101
June	112.90	111.81	5	65.0	†26	.6	2.2	130	3,109	7,440	130
July	112.52	111.80	7	38.0	†12	.5	2.2	133	3,151	8,320	133
Aug	115.98	111.77	4	307	7	.3	4.7	289	2,667	9,740	289
Sept.	112.51	111.81	18	37.2	30	.6	2.7	162	1,962	6,140	133
Oct.	115.94	111.80	27	301	31	.5	6.1	378	2,659	5,680	372
Nov.	115.71	111.78	17	266	21	.4	5.8	344	3,153	8,220	344
Dec.	112.73	111.81	3	46.8	1	.6	3.8	232	4,199	9,430	164
Yearly	115.98	111.77		307		0.3	4.1	2,944	36,894	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 December 1968; 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 limitrophe 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 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	96.98	97.04	96.00	95.36	96.17	96.03	95.19	95.45	95.84	98.21	98.25	98.03
2	96.93	97.11	95.99	95.09	96.20	96.02	95.00	95.44	95.89	98.26	98.25	98.06
3	96.82	97.08	96.23	95.14	96.25	96.02	95.02	95.42	95.92	98.19	98.27	98.01
4	96.86	97.07	96.19	95.10	96.29	95.94	95.00	95.72	95.92	98.19	98.32	98.06
5	96.73	97.10	95.74	95.09	96.33	95.92	94.98	95.44	95.94	98.18	98.25	98.09
6	96.66	97.09	95.70	95.19	96.32	95.94	95.02	95.21	95.94	98.26	98.27	98.04
7	96.60	97.08	95.70	95.17	96.29	95.94	95.01	95.35	95.94	98.32	98.25	98.00
8	96.58	97.11	95.70	*95.03	96.32	95.95	96.49	95.37	95.95	98.31	98.27	97.96
9	96.60	97.12	95.66	*95.01	96.33	95.95	99.43	95.26	95.94	98.33	98.33	97.96
10	96.57	97.09	95.65	95.04	96.35	95.82	95.98	95.26	95.96	98.33	98.27	97.99
11	96.60	97.08	*95.43	95.12	96.33	95.82	95.35	95.21	96.14	98.32	98.24	97.84
12	96.58	97.03	*95.30	95.16	96.39	95.81	95.36	95.18	96.26	98.36	98.23	97.62
13	96.54	96.46	*95.28	95.06	96.27	95.82	95.47	95.14	96.40	98.41	98.23	97.49
14	96.53	95.88	*95.19	95.18	96.10	95.78	95.45	95.16	96.50	98.42	98.19	97.34
15	96.60	95.60	*95.27	95.16	96.12	95.66	95.62	95.17	96.55	98.33	98.15	97.27
16	96.64	95.49	*95.34	95.03	96.12	95.64	95.51	95.11	97.19	98.31	98.24	97.25
17	96.60	95.66	*95.18	95.03	96.13	95.48	95.50	95.11	97.20	98.31	98.44	97.29
18	96.60	95.82	*95.06	95.02	96.14	95.16	95.51	95.13	97.20	98.31	98.32	97.21
19	96.61	95.85	*95.02	95.04	96.15	95.07	95.49	95.16	97.64	98.32	98.14	97.19
20	96.57	95.89	95.07	95.04	96.20	95.04	95.49	95.12	97.75	98.36	98.15	97.21
21	96.62	96.01	95.01	95.24	96.13	94.98	95.54	95.32	97.76	98.46	98.13	97.17
22	96.56	96.01	95.01	95.25	96.14	94.95	95.41	95.48	97.82	98.37	98.15	97.12
23	96.54	96.00	95.01	95.09	96.10	94.98	95.36	95.50	97.85	98.35	98.10	97.18
24	96.55	95.92	95.35	95.11	96.09	95.02	95.40	95.54	97.85	98.35	98.14	97.18
25	96.54	95.94	95.16	95.30	96.08	95.06	95.38	95.64	97.85	98.32	98.15	97.19
26	96.52	96.02	95.01	95.53	96.07	95.16	95.32	95.61	97.84	98.30	98.10	97.15
27	96.59	95.84	95.05	95.63	96.07	95.04	95.37	95.60	97.94	98.61	97.95	97.18
28	96.71	95.92	95.04	95.68	96.06	95.10	95.47	95.56	98.00	98.44	97.94	97.12
29	96.94	95.97	95.05	95.99	96.04	95.19	95.40	95.57	98.04	98.29	98.01	97.13
30	97.03		95.12	96.13	96.02	95.24	95.37	95.58	98.11	98.27	98.00	97.09
31	97.06		95.28		96.00		95.44	95.63		98.25		96.83
Avg.	96.67	96.39	95.38	95.23	96.18	95.52	95.53	95.37	96.90	98.32	98.19	97.49

* 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 monthly current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through December 1968, obtained by the United States Section; monthly discharge, March 1939 through December 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 in 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.0	2.0	1.2	22.5	0.2	3.1	0.4	1.5	0.7	0.2	0.1	10.7
2	2.9	1.5	0	2.1	.3	.8	5.5	.8	3.3	.2	.1	.2
3	.4	4.3	13.4	.5	8.3	6.6	3.6	3.7	.4	.2	5.6	0
4	.3	2.7	23.4	.4	12.7	.5	1.0	16.4	2.6	1.9	10.7	1.6
5	.3	.2	2.5	8.7	8.2	1.3	3.2	32.9	4.9	3.7	1.5	0
6	2.8	.2	2.5	1.7	13.0	6.2	14.9	2.0	2.0	3.8	2.7	.6
7	4.3	.2	1.9	1.8	2.1	1.7	1.2	.3	.7	4.6	1.4	2.0
8	2.9	2.9	.4	.2	3.0	3.5	* 1.7	.1	.6	.5	.1	1.9
9	5.6	5.8	8.8	2.6	1.9	2.3	* .1	1.9	.3	2.9	.1	.8
10	4.8	1.7	.6	2.3	.9	.1	.1	1.6	1.2	2.8	* 1.0	0
11	2.6	13.2	3.7	9.4	1.5	.1	.3	6.7	.8	2.3	¨ .1	0
12	.5	4.8	0	2.8	.8	.1	1.1	4.3	.5	4.0	.9	1.1
13	4.2	1.6	0	.9	.9	.8	.9	.4	.1	1.6	5.9	5.3
14	0	1.2	0	4.9	.4	.6	2.0	2.7	1.1	2.5	6.7	3.5
15	6.5	.6	.8	1.3	.1	1.8	1.1	1.3	.1	2.1	5.3	.6
16	1.7	12.1	5.6	.1	.4	5.3	4.5	.4	3.2	3.5	4.4	.5
17	.1	1.4	7.2	0	3.3	8.6	4.7	3.1	3.1	1.4	21.3	.4
18	.7	.3	1.5	1.2	7.5	0	1.1	1.0	.1	5.7	18.3	.3
19	.7	.5	.7	.4	3.0	0	1.4	11.2	.1	.2	1.1	.2
20	7.1	.5	5.4	.6	.2	0	1.8	.2	1.1	.1	.4	2.2
21	1.8	.4	.1	2.4	1.8	.1	3.5	.1	0	3.4	.2	3.2
22	1.8	.3	.2	5.3	.8	1.7	.5	2.3	1.3	5.3	.2	.1
23	.2	.3	.1	6.0	.1	1.4	1.1	.1	5.7	1.1	.4	3.6
24	1.4	.4	0	.6	.1	.7	.2	0	5.0	0	3.6	.9
25	4.7	.7	2.6	.4	0	1.2	.2	.3	.3	1.1	1.1	1.3
26	.2	4.9	.4	.2	.1	0	.2	1.4	.7	3.7	.4	2.9
27	.3	.4	5.4	* .4	6.4	.1	2.1	2.5	7.9	29.3	.4	3.5
28	3.2	4.1	.8	* .5	.5	1.0	.4	1.4	11.6	25.8	.1	2.2
29	4.3	.2	1.1	* .2	3.7	13.0	3.5	2.7	.2	1.3	.2	.4
30	.6		2.9	.2	.1	3.6	0	1.0	.7	.4	1.8	1.3
31	1.8		14.5		.6		.1	.6		.2		.9
Sum	72.7	69.4	107.7	80.6	82.9	66.2	62.4	104.9	60.3	115.8	96.1	52.2

Current Year 1968 — **Period 1939-1968**

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	94.02	92.93	15	21.6	14	0	2.3	144	987	2,860	144
Feb.	94.29	92.93	16	30.6	29	0	2.4	138	844	2,510	138
Mar.	94.38	92.92	31	33.8	† 2	0	3.5	214	781	1,660	214
Apr.	94.34	92.92	5	32.4	†17	0	2.7	160	840	1,940	160
May	94.72	92.92	4	47.3	25	0	2.7	164	1,031	2,470	59.3
June	94.55	92.92	3	40.5	†18	0	2.2	131	899	2,350	105
July	94.83	92.93	5	51.7	†27	0	2.0	124	777	1,950	82.7
Aug	94.55	92.92	4	40.5	† 8	0	3.4	208	816	2,530	121
Sept.	94.17	92.92	28	26.4	†21	0	2.0	120	728	2,180	120
Oct.	95.05	92.92	18	60.8	†24	0	3.7	230	880	2,100	217
Nov.	94.36	92.92	17	33.1	† 2	0	3.2	191	1,014	2,380	191
Dec.	93.96	92.92	1	19.8	† 2	0	1.7	104	1,140	2,680	104
Yearly	95.05	92.92		60.8		0	2.7	1,928	10,737	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 December 1968.

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

Mean Daily Discharge in Second Feet 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	7.2	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	2.7	0	0	0	0	0
3	0	4.2	0	0	5.7	0	2.1	0	0	0	0	0
4	0	3.6	0	0	5.7	0	4.2	0	0	0	0	0
5	0	0	0	0	2.7	0	0	0	0	0	0	0
6	0	0	0	0	1.8	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	6.0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	4.2	3.3	0	0	0	0	0	0	0	0	0
12	0	7.2	0	0	0	0	0	0	0	0	0	0
13	0	2.1	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	6.6	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	4.8	0	0	0	0	4.8	0	0	0	0	0
17	0	3.6	3.9	0	4.5	0	1.8	0	0	0	6.3	0
18	0	0	0	0	4.5	0	0	0	0	0	5.7	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	7.2	0	0	0	0	2.1	0	0	0
23	0	0	0	6.0	0	0	0	0	7.2	0	0	0
24	0	0	0	0	0	0	0	0	5.1	0	0	0
25	.9	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	3.3	0	0	0
28	0	0	0	0	0	0	0	0	7.2	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
31	0		6.6		0		0	0		0		0
Sum	0.9	29.7	19.8	20.4	24.9	0	22.2	0	24.9	0	12.0	0

Month	Current Year 1968								Period 1956-1968		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High		Low				Average	Maximum	Minimum
			Day		Day						
Jan.			25	0.9	† 1	0	0	1.8	145	280	0
Feb.			12	7.2	† 1	0	1.0	58.9	253	500	26.2
Mar.			31	6.6	† 1	0	.6	39.3	316	600	11.3
Apr.			† 1	7.2	† 2	0	.7	40.5	402	670	36.3
May			† 3	5.7	† 1	0	.8	49.4	448	770	49.4
June				0		0	0	0	472	800	0
July			14	6.6	† 1	0	.7	44.0	484	820	44.0
Aug				0		0	0	0	323	800	0
Sept.			†23	7.2	† 1	0	.8	49.4	306	940	0
Oct.				0		0	0	0	212	390	0
Nov.			17	6.3	† 1	0	.4	23.8	168	330	23.8
Dec.				0		0	0	0	120	230	0
Yearly				7.2		0	0.4	307	3,649	6,480	307

Ø Mean daily † 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 southerly international land boundary 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 December 1968. Records of monthly discharges also are available for the periods January 1924 through June 1928; January 1932 through December 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 river.

Mean Daily Discharge in Second Feet 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.9	0.0	9.7	2.9	6.4	8.6	2.9	9.4	5.0	19.1	0	2.4
2	4.5	1.3	4.9	4.5	1.8	2.0	4.4	4.0	1.0	15.3	.8	1.6
3	1.1	2.5	9.3	6.4	3.2	5.0	5.5	.6	3.3	11.1	4.8	7.5
4	0	1.2	11.2	9.9	6.7	7.1	8.8	6.4	2.2	9.5	1.8	4.0
5	3.8	2.5	14.4	14.9	15.4	.7	.4	6.8	11.4	11.3	8.6	0
6	6.6	.2	8.2	9.6	13.6	5.1	2.5	6.8	9.3	12.0	3.1	2.0
7	5.1	10.3	11.6	5.0	13.1	3.2	3.0	5.8	5.3	10.8	16.8	5.0
8	8.3	4.3	5.3	1.4	7.6	12.4	1.1	.5	.9	11.3	6.4	3.1
9	4.1	1.5	12.0	6.6	6.8	12.6	5.8	.5	0	6.0	5.2	4.7
10	8.8	4.2	11.2	1.3	3.7	10.7	4.5	10.0	4.8	3.6	7.7	4.5
11	9.6	1.7	3.5	10.4	4.9	7.9	6.0	10.1	1.4	11.3	5.9	5.2
12	3.2	5.7	14.4	6.2	5.6	6.5	2.7	5.0	6.5	3.8	2.8	10.5
13	4.4	5.0	4.4	5.4	2.1	3.7	1.4	14.0	12.3	5.4	0	7.0
14	3.8	10.8	12.9	7.0	5.8	4.7	0	12.9	3.4	13.7	11.5	14.4
15	7.5	3.2	5.9	8.9	2.8	1.6	.3	7.3	2.3	.7	7.2	5.4
16	6.9	2.1	9.0	2.2	8.8	.3	2.6	3.5	6.9	8.5	10.4	4.6
17	3.7	5.1	20.4	.5	4.9	2.7	13.4	4.0	4.2	5.9	4.0	2.7
18	9.8	6.2	26.9	0	4.1	.6	8.4	5.7	10.9	2.2	22.0	1.5
19	6.9	19.1	3.6	3.0	2.0	1.7	7.8	17.9	1.8	10.8	3.6	1.7
20	10.9	3.1	.3	.1	12.3	5.1	11.0	2.6	10.2	11.6	.5	9.0
21	6.0	.7	0	2.9	1.7	3.3	6.7	.1	9.5	* 5.7	0	12.7
22	3.6	0	3.2	14.1	4.5	4.1	.7	0	3.8	* 5.0	0	10.7
23	4.5	0	3.5	11.4	16.0	4.4	1.6	9.4	15.0	10.4	0	6.3
24	3.7	2.9	12.0	15.2	8.7	5.4	0	0	11.2	8.4	1.8	15.1
25	2.8	6.2	17.9	8.2	13.6	15.9	3.7	.4	5.2	2.5	0	3.3
26	5.4	16.1	3.1	13.2	6.0	10.1	.2	8.5	7.1	7.3	10.8	7.4
27	9.9	2.6	1.9	8.2	16.6	0	2.7	20.2	11.6	5.3	3.1	3.0
28	9.4	14.0	12.2	13.3	18.3	3.7	0	13.7	3.0	7.5	4.1	1.0
29	3.1	20.9	9.2	4.1	9.4	3.6	4.3	8.7	17.1	4.7	6.6	4.7
30	1.9		8.4	3.8	9.1	3.9	12.6	.2	14.3	1.7	8.1	11.7
31	.6		5.3		.1		5.8	2.3		.3		10.9
Sum	168.8	153.4	275.8	200.6	235.6	156.6	130.8	197.3	200.9	242.7	157.6	183.6

Month	Current Year 1968 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	Extreme Second Feet High	Extreme Second Feet Low Day	Extreme Second Feet Low	Average Second Feet	Total Acre Feet	Period 1935-1968 Acre Feet Average	Maximum	Minimum
Jan.	90.80	90.15	6	26.8	† 2	0	5.4	335	1,329	3,360	335
Feb.	91.00	90.15	24	43.4	† 1	0	5.3	304	1,104	3,170	304
Mar.	91.12	90.15	24	54.6	† 2	0	8.9	547	1,284	2,920	190
Apr.	91.03	90.15	30	46.2	† 1	0	6.7	398	1,253	3,170	197
May	91.06	90.15	14	48.9	† 2	0	7.6	467	1,377	3,040	302
June	91.15	90.15	11	57.5	† 1	0	5.2	311	1,170	3,660	175
July	90.82	90.15	12	28.4	† 5	0	4.2	259	1,264	3,590	182
Aug	90.82	90.15	19	28.4	† 3	0	6.4	391	1,284	3,960	169
Sept.	91.17	90.15	26	59.5	† 2	0	6.7	398	1,168	3,170	159
Oct.	91.11	90.15	28	53.7	† 8	0	7.8	481	1,223	3,280	432
Nov.	91.01	90.15	26	48.4	† 1	0	5.3	313	1,349	3,570	313
Dec.	91.14	90.15	30	60.5	† 1	0	5.9	364	1,328	3,080	364
Yearly	91.17	90.15		60.5		0	6.3	4,568	15,133	38,310	4,448

* Partly estimated † And other days

YUMA MAIN DRAIN (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorders located in the forebay and afterbay of 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 and are computed from pump ratings and the differential head measured by the two gages. Pump ratings are checked by monthly current meter measurements. During the year, 37 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 December 1951; daily discharges January 1952 through December 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	144	167	179	180	172	181	178	158	171	182	159	* 156
2	148	170	181	187	186	183	170	156	165	175	159	163
3	142	173	184	180	181	179	169	158	169	182	169	152
4	152	173	174	187	195	177	175	166	165	175	169	152
5	152	163	175	185	181	182	165	167	148	171	162	163
6	160	167	174	184	177	181	139	157	156	166	175	171
7	165	170	172	189	175	178	169	165	146	174	160	155
8	161	178	175	189	187	189	176	167	151	161	158	155
9	161	177	187	168	186	182	166	151	149	144	162	161
10	160	181	177	180	185	182	176	172	159	173	153	155
11	166	193	180	192	193	177	165	166	161	171	161	161
12	169	171	174	183	182	171	165	167	159	174	155	169
13	152	171	179	189	158	175	165	169	162	170	166	161
14	161	178	175	175	171	173	167	158	159	170	167	156
15	161	181	185	189	179	185	171	162	168	175	159	165
16	150	181	181	180	184	182	165	154	160	172	157	165
17	152	184	189	183	189	178	162	151	163	175	172	161
18	145	198	193	185	191	182	162	170	158	176	165	166
19	150	196	178	195	198	176	149	167	163	173	157	161
20	157	187	168	197	198	185	158	167	162	180	155	163
21	156	178	179	172	188	184	151	167	165	161	160	170
22	159	182	180	179	177	182	157	160	170	172	159	167
23	152	186	178	173	173	176	149	164	173	184	165	160
24	149	188	187	181	175	181	146	156	164	165	177	171
25	151	193	173	181	191	176	153	165	166	163	169	153
26	153	188	172	180	186	179	160	157	158	176	172	146
27	152	190	178	177	194	175	155	165	167	171	175	145
28	153	180	181	179	183	177	154	162	178	175	153	146
29	161	179	187	180	177	174	158	158	173	163	153	155
30	167		180	184	181	177	166	165	185	158	161	146
31	178		188		184		167	165		152		148
Sum	4,839	5,223	5,563	5,483	5,677	5,379	5,028	5,032	4,893	5,279	4,884	4,918

Month	Current Year 1968								Period 1935-1968		
	Extreme Gage Feet		ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			31	178	3	142	156	9,598	7,657	11,203	1,740
Feb.			18	198	5	163	180	10,360	7,612	11,988	1,640
Mar.			18	193	20	168	179	11,034	8,711	12,430	1,940
Apr.			20	197	9	168	183	10,875	8,413	11,890	1,920
May			†19	198	13	158	183	11,260	8,528	13,140	1,950
June			8	189	12	171	179	10,669	7,849	12,040	2,290
July			1	178	6	139	162	9,973	7,609	11,830	2,530
Aug			10	172	† 9	151	162	9,981	7,539	11,960	2,560
Sept.			30	185	7	146	163	9,705	7,597	11,560	2,280
Oct.			23	184	9	144	170	10,471	8,662	12,385	2,940
Nov.			24	177	†10	153	163	9,687	8,458	12,010	2,800
Dec.			† 6	171	27	145	159	9,755	8,176	11,480	2,450
Yearly				198		139	170	123,368	96,811	139,380	27,040

ø Mean daily † And other days * Partly estimated

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

DESCRIPTION: The tabulated data below is the combined flows of the East Main Canal Wasteway and the Yuma Main Drain and represents 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 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	153	167	189	183	178	189	181	167	176	201	159	* 158
2	152	171	186	192	188	185	174	160	166	190	160	165
3	143	176	193	187	184	184	174	159	172	193	174	160
4	152	174	185	197	202	184	184	172	167	184	171	156
5	156	166	190	200	196	183	165	174	160	182	171	163
6	167	167	182	194	191	186	142	164	165	178	178	173
7	170	180	184	194	188	181	172	171	151	185	177	160
8	169	182	180	191	194	201	177	167	152	172	164	158
9	165	178	199	175	193	195	172	152	149	150	167	166
10	169	185	188	181	189	193	180	182	164	177	161	160
11	176	195	184	202	198	185	171	176	163	182	167	166
12	172	177	188	189	188	177	168	172	166	178	158	179
13	156	176	183	194	160	179	166	183	174	175	166	168
14	165	189	188	182	177	178	167	171	162	184	178	170
15	168	184	191	198	182	187	171	169	170	176	166	170
16	157	183	190	182	193	182	168	158	167	181	167	170
17	156	189	209	184	194	181	175	155	167	181	176	164
18	155	204	220	185	195	183	170	176	169	178	187	167
19	157	215	182	198	200	178	157	185	165	184	161	163
20	168	190	168	197	210	190	169	170	172	192	155	172
21	162	179	179	175	190	187	158	167	175	167	160	183
22	163	182	183	193	181	186	158	160	174	177	159	178
23	156	186	182	184	189	180	151	173	188	194	165	166
24	153	191	199	196	184	186	146	156	175	173	179	186
25	154	199	191	189	205	192	157	165	171	166	169	156
26	158	204	175	193	192	189	160	165	165	183	183	153
27	162	193	180	185	211	175	158	185	179	176	178	148
28	162	194	193	192	201	181	154	176	181	183	157	147
29	164	200	196	184	186	178	162	167	190	168	160	160
30	169		189	188	190	181	179	165	199	160	169	158
31	179		193		184		173	167		152		159
Sum	5,008	5,376	5,839	5,684	5,913	5,536	5,159	5,229	5,094	5,522	5,042	5,102

	Current Year 1968								Period 1935-1968		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
Month			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			31	179	3	143	161	9,933	8,986	12,131	* 2,123
Feb.			19	215	5	166	185	10,664	8,716	12,970	* 2,023
Mar.			18	220	20	168	188	11,581	9,995	13,704	* 2,322
Apr.			11	202	† 9	175	190	11,273	9,666	12,982	2,117
May			27	211	13	160	191	11,727	9,905	13,900	2,473
June			8	201	27	175	184	10,980	9,019	12,570	2,525
July			4	184	6	142	166	10,232	8,873	12,420	2,927
Aug			†19	185	9	152	168	10,372	8,823	12,657	2,989
Sept.			30	199	9	149	170	10,103	8,765	12,450	2,602
Oct.			1	201	9	150	178	10,952	9,885	13,898	3,444
Nov.			18	187	20	155	168	10,000	9,807	12,712	3,407
Dec.			24	186	28	147	165	10,119	9,504	12,050	2,888
Yearly				220		142	176	127,936	111,944	149,010	31,840

* Partly estimated Ø Mean daily † And other days

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 December 1968; continuous record of gage heights, January 1947 through December 1968. 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. The river flow past this station is depleted by pumps and gravity diversions before it reaches the Gulf of California.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	212	261	108	57.5	93.3	84.5	8.8	18.2	16.9	192	217	247
2	217	264	111	36.2	98.8	86.7	7.0	19.5	33.1	197	220	244
3	197	274	114	19.6	101	91.1	0	20.3	32.3	197	226	244
4	187	272	174	17.8	116	83.4	0	23.4	33.9	193	239	244
5	189	272	108	18.8	113	76.8	0	67.4	36.4	189	235	252
6	178	267	76.8	15.6	122	73.5	0	26.6	33.9	193	231	257
7	168	266	71.3	20.1	116	75.7	0	5.4	33.1	199	235	255
8	159	266	68.0	17.8	116	76.8	0	4.7	30.7	200	233	252
9	166	280	70.2	16.5	115	77.9	213	6.8	31.5	202	235	250
10	168	276	66.0	15.3	116	75.7	450	3.4	27.5	206	244	248
11	164	280	63.0	19.2	120	65.0	135	0	32.3	204	239	248
12	163	276	51.0	18.8	115	64.0	52.0	0	* 44.9	209	238	230
13	161	242	46.2	17.8	119	62.0	41.7	0	⁺ 55.7	210	242	217
14	158	132	41.7	15.2	105	65.0	39.0	0	⁺ 69.2	213	242	203
15	164	98.1	36.8	19.6	94.4	57.0	35.2	0	⁺ 75.0	210	239	188
16	171	86.2	42.6	17.4	94.4	47.1	44.0	0	⁺ 84.3	211	238	180
17	170	78.5	47.1	12.9	93.3	51.0	32.3	0	*115	204	247	179
18	168	89.0	33.0	11.2	98.8	27.9	29.1	0	114	210	271	179
19	168	93.9	24.6	11.2	93.3	13.8	26.7	0	125	209	247	173
20	175	96.0	24.2	11.2	99.9	6.2	23.5	0	155	209	233	176
21	170	102	22.4	11.6	96.6	3.9	28.3	0	168	211	234	181
22	175	106	20.6	26.8	94.4	2.1	26.7	0	172	225	234	173
23	163	107	19.2	28.0	93.3	1.5	17.6	0	177	218	235	175
24	163	108	18.8	11.2	93.3	1.2	15.0	2.6	180	218	236	179
25	173	104	32.8	10.8	92.2	.8	14.3	11.4	180	220	240	185
26	166	108	25.0	25.5	93.3	3.0	11.4	17.6	179	217	238	192
27	170	106	20.6	39.0	96.6	6.6	8.0	21.9	179	236	236	189
28	189	101	21.4	46.2	98.8	1.4	10.8	20.3	193	278	220	190
29	208	106	18.8	52.0	98.8	4.2	19.5	18.2	189	239	225	185
30	247		19.2	79.0	90.0	9.6	13.0	15.6	189	220	233	186
31	258		21.0		84.5		11.4	13.0		218		182
Sum	5,585	5,117.7	1,617.3	719.8	3,172.0	1,295.4	1,313.3	316.3	2,985.7	6,557	7,082	6,483

Month	Current Year 1968 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	Extreme Second Feet High	Extreme Second Feet Low Day	Extreme Second Feet Low	Average Second Feet	Total Acre Feet	Period 1935-1968 Acre Feet Average	Maximum	Minimum
Jan.	76.57	75.94	31	261	14	156	180	11,078	449,303	1,672,000	1,821
Feb.	76.80	75.11	12	289	17	75.7	176	10,151	373,901	1,385,000	2,040
Mar.	76.19	74.50	4	191	24	18.3	52.2	3,208	300,554	1,127,000	1,493
Apr.	75.25	74.35	30	87.8	25	10.4	24.0	1,428	191,883	700,900	977
May	75.53	75.17	4	125	31	83.4	102	6,292	263,348	1,160,000	1,045
June	75.29	74.04	3	95.5	28	0	43.2	2,569	202,628	1,180,000	143
July	78.27	74.04	10	487	† 3	0	42.4	2,605	148,095	772,800	0
Aug	75.20	73.90	5	90.0	†10	0	10.2	627	164,955	796,000	0
Sept.	76.06	74.28	28	197	1	12.4	99.5	5,922	199,909	1,033,000	0
Oct.	76.85	75.99	28	291	5	188	212	13,006	255,120	1,192,000	9,120
Nov.	76.90	76.24	18	281	28	213	236	14,047	335,928	1,428,000	7,180
Dec.	76.64	75.89	6	258	22	170	209	12,859	423,941	1,839,000	2,320
Yearly	78.27	73.90		487		0	115	83,792	3,309,565	10,688,800	83,792

* Partly estimated ⁺ Estimated † And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	76.26	76.57	75.52	74.94	75.24	75.19	74.38	74.38	74.35	76.02	76.24	76.53
2	76.28	76.59	75.56	74.72	75.29	75.21	74.32	74.40	74.55	76.06	76.26	76.51
3	76.16	76.66	75.60	74.52	75.31	75.25	74.04	74.41	74.54	76.06	76.31	76.51
4	76.10	76.64	76.08	74.49	75.45	75.19	74.04	74.45	74.56	76.03	76.42	76.52
5	76.11	76.64	75.56	74.51	75.43	75.13	74.04	74.96	74.59	76.00	76.39	76.59
6	76.06	76.62	75.28	74.44	75.51	75.11	74.04	74.48	74.56	76.03	76.35	76.63
7	76.01	76.62	75.23	74.53	75.46	75.13	74.04	74.14	74.55	76.07	76.38	76.61
8	75.96	76.63	75.20	74.48	75.45	75.14	74.04	74.12	74.52	76.08	76.36	76.59
9	76.00	76.73	75.22	74.45	75.43	75.15	75.70	74.18	74.53	76.09	76.38	76.57
10	76.01	76.70	75.18	74.42	75.44	75.13	77.93	74.06	74.49	76.12	76.45	76.56
11	75.99	76.73	75.15	74.51	75.47	75.03	75.60	73.90	74.55	76.11	76.41	76.56
12	75.98	76.70	75.03	74.51	75.43	75.02	74.78	73.90	* 74.70	76.14	76.40	76.40
13	75.97	76.48	74.98	74.50	75.46	75.00	74.67	73.90	ⁿ 74.81	76.15	76.44	76.28
14	75.95	75.84	74.93	74.45	75.35	75.03	74.64	73.90	ⁿ 74.96	76.17	76.44	76.16
15	75.98	75.43	74.87	74.56	75.26	74.95	74.59	73.90	ⁿ 75.04	76.16	76.42	76.03
16	76.02	75.26	74.94	74.52	75.26	74.86	74.70	73.90	ⁿ 75.13	76.18	76.41	75.97
17	76.01	75.15	74.99	74.42	75.25	74.91	74.56	73.90	* 75.41	76.14	76.55	75.96
18	76.00	75.30	74.82	74.38	75.30	74.68	74.52	73.90	75.40	76.19	76.80	75.96
19	76.00	75.37	74.68	74.38	75.25	74.48	74.49	73.90	75.49	76.19	76.55	75.92
20	76.05	75.40	74.67	74.38	75.30	74.34	74.45	73.90	75.74	76.20	76.41	75.94
21	76.02	75.48	74.63	74.39	75.27	74.27	74.51	73.90	75.84	76.23	76.42	75.98
22	76.05	75.55	74.59	74.55	75.25	74.21	74.49	73.90	75.87	76.33	76.42	75.92
23	75.99	75.55	74.56	74.56	75.24	74.18	74.37	73.90	75.91	76.28	76.43	75.93
24	75.99	75.55	74.55	74.37	75.24	74.15	74.33	74.02	75.93	76.28	76.44	75.96
25	76.05	75.48	74.78	74.36	75.23	74.11	74.32	74.26	75.93	76.29	76.47	76.00
26	76.01	75.53	74.64	74.54	75.24	74.24	74.27	74.36	75.92	76.27	76.46	76.04
27	76.03	75.49	74.54	74.71	75.27	74.35	74.21	74.42	75.92	76.42	76.45	76.02
28	76.14	75.42	74.56	74.79	75.28	74.14	74.26	74.40	76.03	76.74	76.32	76.03
29	76.25	75.49	74.55	74.85	75.28	74.20	74.40	74.37	76.00	76.43	76.36	75.99
30	76.47		74.51	75.11	75.22	74.40	74.30	74.33	76.00	76.27	76.42	76.00
31	76.55		74.55		75.18		74.27	74.29		76.25		75.97
Avg.	76.08	75.99	74.97	74.54	75.32	74.74	74.56	74.15	75.19	76.19	76.42	76.21

* Partly estimated ⁿ 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. 1968 records good. Records available: April 1956 through 1968.

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 1968 — 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
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	0	0	0	0	0	0	0	0	0	0	0	0

Month	Current Year 1968								Period 1956 - 1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.				0		0	0	0	7,816	69,527	0
Feb.				0		0	0	0	1,572	8,679	0
Mar.				0		0	0	0	9,097	35,492	0
Apr.				0		0	0	0	20,359	68,714	0
May				0		0	0	0	8,784	22,072	0
June				0		0	0	0	14,027	28,915	0
July				0		0	0	0	22,006	46,139	0
Aug				0		0	0	0	23,777	55,497	0
Sept.				0		0	0	0	14,346	37,194	0
Oct.				0		0	0	0	5,193	20,512	0
Nov.				0		0	0	0	12,190	69,415	0
Dec.				0		0	0	0	7,735	70,213	0
Yearly				0		0	0	0	140,156	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. Rodríguez 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 1968.

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 1968 — 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
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	0	0	0	0	0	0	0	0	0	0	0	0

Month	Current Year 1968								Period 1957 - 1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.				0		0	0	0	657	3,201	0
Feb.				0		0	0	0	433	4,097	0
Mar.				0		0	0	0	692	6,850	0
Apr.				0		0	0	0	534	3,707	0
May				0		0	0	0	122	1,163	0
June				0		0	0	0	63.2	625	0
July				0		0	0	0	358	4,296	0
Aug				0		0	0	0	344	1,926	0
Sept.				0		0	0	0	415	1,548	0
Oct.				0		0	0	0	124	791	0
Nov.				0		0	0	0	298	1,891	0
Dec.				0		0	0	0	366	3,047	0
Yearly				0		0	0	0	4,407	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 53 double 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 1968.

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, 37.86 feet on June 11, 1965, with a discharge of 1.4 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	130	129	73.8	2.8	8.1	9.9	10.6	12.7	19.1	12.7	92.2	117
2	130	132	76.3	3.2	8.1	10.6	11.3	12.7	19.4	12.7	91.1	113
3	130	132	78.4	4.2	8.1	9.9	9.9	12.7	19.4	12.7	85.1	113
4	123	135	76.3	5.7	8.1	9.2	9.9	13.1	18.0	12.7	83.3	113
5	117	135	92.9	4.2	8.1	9.9	9.9	13.1	17.3	12.7	86.2	113
6	120	135	90.4	3.2	8.1	9.9	11.3	13.1	17.7	12.7	94.3	122
7	117	138	67.1	2.8	8.1	9.9	11.3	13.1	17.7	11.7	84.0	122
8	117	138	60.4	2.5	7.8	11.3	12.4	13.1	16.6	10.6	83.3	122
9	110	138	53.7	3.5	7.8	12.4	10.6	13.4	16.2	10.6	86.5	122
10	117	144	49.4	4.9	7.1	12.4	11.3	13.4	18.7	10.2	85.1	113
11	126	144	45.2	4.9	7.8	12.4	11.3	13.4	19.4	9.9	92.5	108
12	110	144	39.2	4.9	8.1	13.1	11.3	13.4	20.1	10.2	95.3	105
13	117	144	39.2	4.2	8.8	13.1	11.3	13.4	20.1	15.2	93.9	98.5
14	113	141	35.3	4.2	8.8	13.1	12.4	13.4	20.1	29.7	97.5	89.7
15	110	115	31.8	3.9	8.8	13.1	10.6	13.4	20.5	42.7	96.4	85.1
16	110	93.6	28.6	3.5	8.8	13.1	11.3	13.4	21.2	49.1	99.9	79.1
17	110	105	26.8	3.9	8.8	13.1	10.6	13.4	21.2	52.3	99.2	74.2
18	113	91.1	26.8	3.9	8.8	13.1	8.8	13.4	21.2	55.8	103	73.5
19	113	89.0	26.8	3.9	8.8	13.1	11.3	14.1	20.5	55.8	123	73.5
20	110	78.8	25.1	3.5	9.2	13.1	11.3	15.2	20.5	62.5	129	72.7
21	113	77.0	23.3	4.2	9.2	12.4	13.1	15.5	20.1	62.5	112	71.0
22	113	77.0	7.4	3.5	9.2	10.6	11.3	15.9	20.1	66.4	112	69.9
23	113	78.8	7.4	3.5	8.8	9.9	12.4	16.2	20.1	70.6	112	69.9
24	113	82.6	7.4	3.9	8.8	11.3	15.5	16.2	19.1	74.5	117	69.9
25	113	82.6	7.4	3.5	8.8	9.9	15.5	16.6	19.1	74.5	116	69.9
26	113	82.6	7.4	2.5	8.8	9.9	13.8	15.9	18.7	74.5	116	71.0
27	117	80.5	6.7	2.5	9.9	9.2	13.8	15.9	18.7	78.8	126	70.3
28	113	78.8	6.7	3.2	10.9	8.8	16.6	17.3	18.7	78.8	126	70.3
29	117	74.9	6.0	3.5	10.9	8.1	19.1	18.4	18.7	93.2	113	70.3
30	123		3.5	3.5	11.7	9.2	20.1	18.7	18.7	109	108	70.3
31	133		2.8		12.4		20.1	18.7		87.9		69.9
Sum	3,624	3,216.3	1,129.5	111.6	275.5	335.0	390.0	452.2	576.9	1,373.2	3,058.8	2,802.0

Month	Current Year 1968								Period 1951-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	39.99	39.67	31	141	9	108	117	7,193	282,660	1,047,732	426
Feb.	40.19	39.27	†10	144	29	74.9	111	6,380	177,571	696,461	317
Mar.	39.67	38.02	† 5	99.9	30	2.1	36.4	2,241	124,699	807,342	0
Apr.	38.32	37.99	21	6.0	27	2.1	3.9	222	82,341	588,983	0
May	38.39	38.09	31	12.4	† 9	7.1	8.8	547	114,690	732,815	0
June	38.52	38.25	†10	13.1	29	7.8	11.3	663	49,386	555,460	0
July	38.78	38.29	†29	20.1	18	8.1	12.7	773	26,541	264,561	0
Aug	39.63	38.75	†30	18.7	† 1	12.7	14.5	897	39,371	309,320	0
Sept.	39.80	39.34	†16	21.2	† 8	15.5	19.1	1,145	61,582	572,551	0
Oct.	40.72	39.44	30	115	†10	9.9	44.1	2,724	101,001	769,939	2,459
Nov.	40.52	39.86	20	129	† 4	83.3	102	6,067	167,900	909,399	6,067
Dec.	39.96	39.14	† 6	122	†22	69.9	90.4	5,558	227,383	1,060,767	687
Yearly	40.72	37.99		144		2.1	47.7	34,412	1,418,422	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 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	39.90	40.03	39.30	38.09	38.16	38.39	38.42	38.78	39.67	39.60	40.49	39.93
2	39.90	40.06	39.34	38.12	38.16	38.42	38.45	38.75	39.70	39.60	40.45	39.90
3	39.90	40.06	39.37	38.22	38.16	38.39	38.39	38.78	39.70	39.60	40.39	39.90
4	39.83	40.09	39.34	38.29	38.16	38.35	38.39	38.85	39.57	39.60	40.35	39.90
5	39.76	40.09	39.57	38.22	38.16	38.39	38.39	38.88	39.50	39.60	40.35	39.90
6	39.80	40.09	39.53	38.12	38.16	38.39	38.45	38.91	39.53	39.60	40.39	39.96
7	39.76	40.12	39.21	38.09	38.16	38.39	38.45	38.91	39.53	39.57	40.29	39.96
8	39.76	40.12	39.11	38.06	38.12	38.45	38.48	38.94	39.44	39.50	40.26	39.96
9	39.70	40.12	39.01	38.16	38.12	38.48	38.42	38.98	39.40	39.50	40.26	39.96
10	39.76	40.19	38.94	38.25	38.09	38.48	38.45	39.01	39.63	39.47	40.22	39.90
11	39.86	40.19	38.88	38.25	38.12	38.48	38.45	39.04	39.70	39.44	40.26	39.86
12	39.70	40.19	38.78	38.25	38.16	38.52	38.45	39.04	39.73	39.47	40.26	39.83
13	39.76	40.19	38.78	38.22	38.19	38.52	38.45	39.04	39.73	39.70	40.22	39.76
14	39.73	40.16	38.71	38.22	38.19	38.52	38.48	39.01	39.73	39.99	40.22	39.67
15	39.70	39.86	38.65	38.19	38.19	38.52	38.42	39.04	39.76	40.16	40.19	39.60
16	39.70	39.57	38.58	38.16	38.19	38.52	38.45	39.01	39.80	40.22	40.19	39.50
17	39.70	39.73	38.55	38.19	38.19	38.52	38.42	38.98	39.80	40.26	40.16	39.37
18	39.73	39.53	38.55	38.19	38.19	38.52	38.32	39.04	39.80	40.29	40.16	39.34
19	39.73	39.50	38.55	38.19	38.19	38.52	38.45	39.17	39.76	40.29	40.26	39.34
20	39.70	39.34	38.52	38.16	38.22	38.52	38.45	39.30	39.76	40.35	40.26	39.30
21	39.73	39.30	38.48	38.22	38.22	38.48	38.52	39.34	39.73	40.35	40.12	39.24
22	39.73	39.30	38.39	38.16	38.22	38.42	38.45	39.37	39.73	40.39	40.09	39.17
23	39.73	39.34	38.39	38.16	38.19	38.39	38.48	39.40	39.73	40.42	40.06	39.17
24	39.73	39.40	38.39	38.19	38.19	38.45	38.62	39.40	39.67	40.45	40.06	39.17
25	39.73	39.40	38.39	38.16	38.19	38.39	38.62	39.44	39.67	40.45	40.03	39.17
26	39.73	39.40	38.39	38.06	38.19	38.39	38.55	39.37	39.63	40.45	39.99	39.24
27	39.76	39.37	38.35	38.06	38.25	38.35	38.55	39.37	39.63	40.49	39.99	39.21
28	39.73	39.34	38.35	38.12	38.32	38.32	38.65	39.50	39.63	40.49	39.99	39.21
29	39.76	39.27	38.32	38.16	38.32	38.29	38.75	39.60	39.63	40.58	39.90	39.21
30	39.83		38.16	38.16	38.35	38.35	38.78	39.63	39.63	40.68	39.86	39.21
31	39.93		38.09		38.39		38.78	39.63		40.55		39.17
Avg.	39.77	39.77	38.74	38.17	38.20	38.44	38.50	39.15	39.66	40.04	40.19	39.55

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 1968.

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 1968 — 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
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	0	0	0	0	0	0	0	0	0	0	0	0

Month	Current Year 1968 Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1957 - 1968 Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.				0		0	0	0	994	3,166	0
Feb.				0		0	0	0	540	2,788	0
Mar.				0		0	0	0	1,344	7,074	0
Apr.				0		0	0	0	979	4,462	0
May				0		0	0	0	1,210	4,413	0
June				0		0	0	0	251	1,505	0
July				0		0	0	0	548	4,296	0
Aug				0		0	0	0	292	1,857	0
Sept.				0		0	0	0	412	1,800	0
Oct.				0		0	0	0	895	6,997	0
Nov.				0		0	0	0	288	3,413	0
Dec.				0		0	0	0	334	1,205	0
Yearly				0		0	0	0	8,086	24,526	0

COLORADO RIVER AT EL MARITIMO IN MEXICO - DISCHARGES

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 furnished by the Mexican Section of the Commission. From January to April 1968, 14 current meter measurements were obtained. Because the flows at this station are affected by the tide and backwater, the discharge measurements taken later were questionable and not considered in these calculations. During 1968, the mean daily discharges were deduced from the sum of discharges of measurements at the Carranza damsite which is located 13.7 miles above El Marítimo taking into consideration the drains and Wasteway on the Hardy River which enters the Colorado River immediately upstream from this station. Records available: Mean daily stages and discharges from January 1960 through 1968. Incomplete record of gage heights, March 1, 1946 through November 1947; twice daily reading of gage heights, January 1, 1948 through December 1949; continuous record of gage heights since installation of water-stage recorder February 8, 1956.

REMARKS: The flow past this station is affected by the tides in the Gulf of California. After July 1968, the number of measurements were reduced by half. Measurements for basic computations are taken near the date of the first or third quarter moon (neap tide).

EXTREMES: Maximum discharge, 4,410 second-feet, January 21, 1960; minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	210	214	145	73.8	84.4	66.7	18.0	14.5	32.5	45.6	64.3	80.2
2	212	215	150	73.1	92.2	65.3	18.7	14.1	38.8	45.9	64.3	81.9
3	213	216	154	72.7	100	64.3	19.8	13.8	45.2	45.6	65.0	84.0
4	210	217	159	72.4	108	73.1	20.5	13.1	51.6	45.2	65.3	85.8
5	207	219	164	72.0	116	82.3	21.2	12.7	57.9	44.8	65.7	87.6
6	203	219	168	71.7	124	75.9	22.2	12.4	57.2	45.2	66.0	86.9
7	201	220	173	71.3	123	69.6	23.0	12.0	56.2	44.8	66.4	86.9
8	197	222	161	71.0	122	63.2	23.7	12.0	55.1	43.4	66.4	86.9
9	194	225	148	69.6	120	57.6	24.7	11.7	54.4	41.7	66.7	86.2
10	193	227	136	68.5	119	51.2	25.4	11.7	54.7	40.3	67.1	85.5
11	192	229	124	67.1	118	44.8	24.4	11.3	54.7	38.5	67.1	85.5
12	191	231	111	65.7	117	42.7	23.3	11.3	55.1	37.1	67.1	80.5
13	190	233	98.9	64.6	116	41.0	22.2	10.9	55.1	35.3	67.5	75.6
14	189	236	97.1	63.2	114	38.8	20.8	10.9	55.8	33.9	69.2	71.0
15	188	222	94.6	62.2	113	37.1	19.8	10.6	55.8	36.7	71.0	66.0
16	190	207	92.9	60.7	112	35.3	18.7	10.6	56.2	39.9	72.4	60.7
17	192	194	90.8	59.3	112	33.2	17.7	10.2	56.2	42.7	74.5	56.2
18	194	179	88.6	58.3	109	32.1	18.0	10.2	56.5	45.2	76.3	57.2
19	196	165	86.5	56.9	106	30.7	18.4	9.9	57.2	48.0	78.0	57.9
20	198	151	84.8	56.9	103	29.3	18.7	9.9	57.9	51.2	77.3	58.6
21	200	147	82.3	56.9	100	28.3	18.7	9.5	59.3	54.0	77.0	59.7
22	202	143	80.5	57.2	97.5	27.2	19.1	9.5	60.0	55.4	76.3	60.7
23	203	139	79.5	57.2	94.6	25.8	19.4	10.9	60.7	56.5	75.6	61.4
24	204	135	78.4	57.2	89.0	24.4	19.8	12.0	58.6	57.9	74.9	61.8
25	206	131	77.3	57.6	83.0	23.3	19.1	13.4	56.5	59.0	74.2	61.8
26	207	127	76.3	57.6	80.5	22.6	18.4	14.8	54.4	60.4	73.8	62.2
27	208	131	75.9	62.2	77.7	21.5	17.7	15.9	52.3	61.4	73.1	62.5
28	210	136	75.6	67.1	75.2	20.5	17.0	17.3	50.1	62.9	74.9	62.9
29	211	141	75.2	71.7	72.0	19.8	16.6	18.4	48.0	63.2	76.6	62.9
30	212		74.9	76.6	69.6	19.1	15.9	19.8	45.9	63.6	78.8	63.2
31	213		74.5		68.2		15.2	26.1		63.9		61.1
Sum	6,236	5,471	3,377.6	1,952.3	3,135.9	1,266.7	616.1	401.4	1,609.7	1,509.2	2,132.8	2,201.3

Current Year 1968								Period 1960 - 1968		
Month	Extreme Gage Feet		ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			† 3	213	15	188	201	12,372	45,829	225,224	1,111
Feb.			14	236	26	127	189	10,855	23,069	55,735	3,351
Mar.			7	173	31	74.5	109	6,701	7,779	16,226	98.9
Apr.			30	76.6	† 19	56.9	65.0	3,872	5,008	9,978	269
May			6	124	31	68.2	101	6,221	11,357	31,886	128
June			5	82.3	30	19.1	42.4	2,512	2,633	6,600	0
July			10	25.4	31	15.2	19.8	1,222	1,529	4,096	0
Aug			31	26.1	† 21	9.5	13.1	796	2,137	5,553	0
Sept.			23	60.7	1	32.5	53.7	3,193	6,152	23,532	0
Oct.			31	63.9	14	33.9	48.7	2,994	14,204	57,672	1,549
Nov.			30	78.8	† 1	64.3	71.0	4,230	35,815	94,442	4,230
Dec.			5	87.6	17	56.2	71.0	4,366	28,351	97,155	2,174
Yearly				236		9.5	81.9	59,335	183,863	503,260	59,335

† And other days ø Mean daily

COLORADO RIVER AT EL MARITIMO IN MEXICO - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1968

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.42	15.58	15.68	15.55	15.42	15.06	14.63	14.47	14.30	14.21	14.24	14.73
2	15.42	15.58	15.72	15.49	15.42	15.06	14.63	14.47	14.27	14.21	14.30	14.73
3	15.42	15.62	15.68	15.45	15.39	15.06	14.63	14.40	14.27	14.21	14.30	14.73
4	15.42	15.58	15.65	15.45	15.42	15.03	14.63	14.37	14.24	14.21	14.30	14.73
5	15.42	15.58	15.68	15.52	15.39	14.99	14.60	14.37	14.24	14.21	14.30	14.76
6	15.42	15.62	15.68	15.45	15.35	14.99	14.60	14.34	14.24	14.17	14.30	14.76
7	15.45	15.62	15.68	15.45	15.39	14.96	14.60	14.34	14.24	14.17	14.30	14.76
8	15.45	15.62	15.68	15.45	15.35	14.96	14.60	14.37	14.27	14.21	14.34	14.76
9	15.49	15.68	15.68	15.39	15.32	14.96	14.60	14.37	14.27	14.21	14.37	14.83
10	15.49	15.68	15.62	15.39	15.32	14.93	14.57	14.34	14.27	14.21	14.44	14.83
11	15.49	15.68	15.55	15.45	15.32	14.93	14.57	14.34	14.27	14.21	14.44	14.83
12	15.45	15.68	15.62	15.52	15.29	14.93	14.60	14.37	14.27	14.21	14.44	14.86
13	15.45	15.72	15.68	15.49	15.29	14.93	14.60	14.34	14.27	14.21	14.44	14.86
14	15.49	15.72	15.65	15.45	15.29	14.90	14.57	14.34	14.27	14.21	14.47	14.90
15	15.49	15.72	15.62	15.45	15.26	14.90	14.50	14.34	14.27	14.21	14.50	14.90
16	15.55	15.72	15.62	15.42	15.26	14.86	14.53	14.34	14.24	14.17	14.50	14.90
17	15.55	15.72	15.62	15.42	15.22	14.83	14.53	14.34	14.24	14.17	14.53	14.90
18	15.52	15.72	15.58	15.35	15.19	14.83	14.53	14.34	14.21	14.14	14.60	14.86
19	15.52	15.72	15.55	15.42	15.22	14.83	14.53	14.34	14.21	14.17	14.60	14.86
20	15.52	15.72	15.52	15.39	15.22	14.80	14.53	14.30	14.21	14.17	14.63	14.86
21	15.55	15.72	15.52	15.39	15.19	14.80	14.57	14.34	14.24	14.17	14.63	14.83
22	15.55	15.72	15.55	15.35	15.16	14.80	14.53	14.30	14.21	14.17	14.63	14.83
23	15.52	15.72	15.55	15.32	15.16	14.76	14.53	14.30	14.24	14.17	14.63	14.83
24	15.55	15.72	15.55	15.32	15.12	14.76	14.50	14.34	14.24	14.17	14.63	14.83
25	15.58	15.72	15.58	15.35	15.16	14.76	14.50	14.30	14.24	14.17	14.70	14.83
26	15.65	15.72	15.58	15.39	15.12	14.73	14.50	14.27	14.24	14.21	14.63	14.80
27	15.65	15.72	15.55	15.39	15.12	14.73	14.50	14.24	14.24	14.21	14.67	14.83
28	15.58	15.68	15.55	15.35	15.12	14.67	14.47	14.27	14.24	14.21	14.63	14.83
29	15.58	15.65	15.55	15.35	15.12	14.63	14.47	14.30	14.24	14.24	14.63	14.83
30	15.58		15.55	15.35	15.09	14.63	14.47	14.30	14.24	14.24	14.70	14.86
31	15.58		15.55		15.09		14.44	14.30		14.27		14.83
Avg.	15.51	15.68	15.61	15.42	15.25	14.87	14.55	14.34	14.25	14.20	14.49	14.82

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)	
	1968	Average 1935-1968	1968	Average 1951-1968	1968	Average 1939-1968	1968	Estimated Average
Jan.	14,566.0	16,472.5	1,691.0	1,652.2	550.8	557.4	16,807.8	18,682.1
Feb.	14,614.0	16,144.2	1,642.0	1,677.7	541.3	561.1	16,797.3	18,383.0
Mar.	14,640.0	15,840.6	1,669.0	1,680.2	554.8	576.1	16,863.8	18,096.9
Apr.	14,780.0	16,020.9	1,694.0	1,696.8	597.4	604.5	17,071.4	18,322.2
May	14,887.0	17,218.1	1,762.0	1,741.1	606.0	601.1	17,255.0	19,560.3
June	14,996.0	18,869.0	1,652.0	1,614.2	611.6	605.0	17,259.6	21,088.2
July	15,052.0	19,092.0	1,554.0	1,479.2	585.3	593.4	17,191.3	21,164.6
Aug.	15,065.0	18,786.9	1,426.0	1,401.8	566.3	576.0	17,057.3	20,764.7
Sept.	15,018.0	18,394.2	1,393.0	1,397.3	556.4	571.7	16,967.4	20,363.2
Oct.	15,125.0	18,051.7	1,370.0	1,418.1	550.4	576.5	17,045.4	20,046.3
Nov.	15,292.0	17,730.1	1,407.0	1,505.9	539.3	564.1	17,238.3	19,800.1
Dec.	15,355.0	17,350.3	1,515.0	1,617.7	537.7	559.8	17,407.7	19,527.8
Avg.	14,949.2	17,497.5	1,564.6	1,573.5	566.4	578.9	17,080.2	19,649.9
Max.	15,355.0	27,780.0	1,762.0	1,808.0	611.6	688.7	17,407.7	28,235.0
Min.	14,566.0	* 10,727.0	1,370.0	1,186.0	537.7	76.9	16,797.3	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	1968							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 1956-1968

Jan.	148,093,000	4,500	5	0.0030	0.0034	0.0022	2.4	43.2	336	1.6
Feb.	105,471,000	4,800	4	.0045	.0067	.0014	2.6	19.1	116	1.6
Mar.	234,646,000	18,700	4	.0080	.0125	.0045	10.1	60.7	499	8.8
Apr.	269,203,000	28,200	4	.0105	.0148	.0045	15.3	56.3	434	9.4
May	98,226,000	6,700	5	.0068	.0460	.0042	3.6	21.0	201	2.7
June	148,929,000	9,200	4	.0062	.0077	.0040	5.0	20.0	92.6	5.0
July	246,292,000	16,700	6	.0068	.0137	.0047	9.0	27.9	89.3	7.4
Aug.	229,013,000	16,600	4	.0072	.0367	.0024	9.0	26.1	103	7.9
Sept.	103,152,000	5,900	4	.0057	.0083	.0029	3.2	11.8	43.6	2.9
Oct.	60,191,000	2,400	5	.0040	.0062	.0031	1.3	5.5	20.0	.8
Nov.	59,276,000	2,300	4	.0039	.0062	.0017	1.2	15.6	89.9	1.0
Dec.	100,298,000	3,500	4	.0035	.0051	.0021	1.9	30.2	174	.6
Yearly	1,802,790,000	119,500	53	0.0066	0.0460	0.0014	64.6	337	2,198	64.6

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

Intake Canal at Morelos Diversion Structure

Period 1952-1968

Jan.	147,478,000	7,248	4	0.0049	0.0079	0.0019	3.9	5.9	22.3	0.2
Feb.	105,106,000	5,604	4	.0053	.0060	.0016	3.0	6.3	19.4	.9
Mar.	234,090,000	35,208	6	.0150	.0379	.0036	19.1	52.6	154	11.1
Apr.	268,299,000	36,861	4	.0137	.0280	.0043	19.9	48.2	121	15.8
May	97,859,000	3,471	5	.0035	.0060	.0022	1.9	13.4	51.2	1.9
June	148,535,000	9,031	4	.0061	.0082	.0034	4.9	38.8	109	4.9
July	243,565,000	38,984	6	.0160	.0293	.0085	21.1	56.2	156	11.9
Aug.	227,937,000	14,205	5	.0062	.0083	.0028	7.7	51.6	135	7.7
Sept.	102,707,000	3,463	4	.0034	.0126	.0007	1.9	21.2	64.7	1.9
Oct.	60,116,000	1,236	4	.0021	.0602	.0014	.6	4.8	12.0	.3
Nov.	59,192,000	1,399	4	.0024	.0031	.0014	.7	2.4	9.3	.2
Dec.	100,026,000	3,348	4	.0033	.0066	.0022	1.8	4.9	14.8	1.1
Yearly	1,794,910,000	160,057	54	0.0068	0.0602	0.0007	86.4	306	696	86.4

Samples and Analyses by Mexican Section, Method B

SUSPENDED SILT

Month	1968						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 1946-1968

Jan.	15,055,000	1,200	5	0.0080	0.0148	0.0040	0.6			
Feb.	13,795,000	700	5	.0051	.0060	.0040	.4			
Mar.	4,360,000	300	2	.0069	.0090	.0046	.2			
Apr.	1,941,000	100	1	.0051	.0065	.0050	.1			
May	8,551,000	600	5	.0070	.0130	.0050	.3			
June	3,491,000	500	4	.0143	.0160	.0098	.3			
July	3,540,000	300	4	.0085	.0097	.0036	.2			
Aug.	852,000	60	2	.0070	.0098	.0042	0			
Sept.	8,048,000	700	4	.0087	.0163	.0042	.4			
Oct.	17,675,000	1,500	5	.0085	.0192	.0010	.8			
Nov.	19,090,000	2,100	3	.0110	.0123	.0094	1.1			
Dec.	17,475,000	1,800	3	.0103	.0120	.0081	1.0			
Yearly	113,873,000	9,860	43	0.0086	0.0192	0.0010	5.4			

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

Colorado River at Miguel C. Rodriguez Gaging Station

Period 1960-1968

Jan.	9,781,000	718	5	0.0073	0.0130	0.0048	0.4	31.2	251	0
Feb.	8,675,000	906	4	.0104	.0130	.0040	.5	4.5	13.9	0
Mar.	3,047,000	281	4	.0092	.0148	.0041	.2	.7	4.1	0
Apr.	302,000	36	5	.0120	.0229	.0050	0	.2	1.1	0
May	744,000	41	4	.0055	.0088	.0046	0	.5	1.5	0
June	902,000	52	3	.0057	.0080	.0042	0	0	.1	0
July	1,052,000	45	4	.0043	.0067	.0038	0	0	.2	0
Aug.	1,220,000	60	5	.0049	.0070	.0030	0	.1	.2	0
Sept.	1,556,000	116	5	.0074	.0116	.0037	.1	.6	4.5	0
Oct.	3,704,000	605	4	.0163	.0268	.0080	.3	3.2	20.8	.1
Nov.	8,250,000	942	4	.0114	.0178	.0090	.5	5.2	36.0	.3
Dec.	7,557,000	763	5	.0101	.0131	.0079	.4	5.0	13.0	0
Yearly	46,790,000	4,565	52	0.0087	0.0268	0.0030	2.4	51.3	289	2.4

Samples and Analyses by Mexican Section, Method C

CHEMICAL ANALYSES OF WATER SAMPLES

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 this 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 this 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; Mg, 12.16; Na, 23; (CO_3 plus HCO_3) expressed as CO_3, 30; SO_4, 48; Cl, 35.5; NO_3, 62. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as ECx10^6 at 25°C, is a relative measure of the total salt concentration.

Month	No. of Samples	Dissolved Solids		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.	5	1.65	180,000	1,965		7.8	53	42	5.46	3.73	10.28	3.27	8.07	8.11	
Feb.	4	1.62	126,000	2,002		7.9	52	43	5.70	3.79	10.45	3.37	8.07	8.49	
Mar.	4	1.64	283,000	1,954		7.9	52	43	5.57	3.66	10.10	3.07	7.95	8.32	
Apr.	5	1.57	311,000	1,959		7.9	51	42	5.70	3.77	9.96	3.13	8.08	8.22	
May	4	1.62	117,000	2,003		7.9	51	39	5.81	3.97	10.15	3.48	8.68	7.77	
June	4	1.73	189,000	2,159		7.9	53	43	6.02	4.07	11.27	3.36	8.85	9.15	
July	5	1.67	302,000	2,003		7.9	52	42	5.68	3.88	10.42	3.15	8.52	8.32	
Aug.	4	1.62	273,000	1,996		7.9	52	42	5.78	3.77	10.29	3.21	8.25	8.38	
Sept.	5	1.61	122,000	1,965		7.8	52	41	5.68	3.70	10.18	3.29	8.29	7.97	
Oct.	4	1.36	60,300	1,664		7.8	49	34	5.13	3.33	8.08	3.33	7.54	5.69	
Nov.	4	1.41	61,700	1,711		7.7	49	35	5.26	3.49	8.31	3.41	7.69	5.96	
Dec.	5	1.61	119,000	1,925		7.8	51	40	5.61	3.65	9.74	3.40	8.02	7.58	
Mean ⊕ Ø53		1.62	Ø2,144,000	1,976		7.9	52	41	5.66	3.77	10.14	3.25	8.22	8.12	
Period Avg.		1.80	2,788,000	2,190		7.8			6.40	4.02	11.53	3.27	8.60	10.07	
Tons of Constituents 1968									204,000	82,700	421,000	176,000	712,000	520,000	
Avg. Tons Period 1962-1968									269,000	103,000	559,000	205,000	866,000	758,000	
Intake Canal at Morelos Diversion Structure															
Jan.	30	1.67	182,000	1,975		7.9	50		5.56	4.03	9.59	2.61	7.83	8.73	
Feb.	29	1.69	130,000	1,952		7.9	50		5.61	3.99	8.52	2.73	7.76	8.56	
Mar.	31	1.79	309,000	2,072		7.9	52		5.80	4.06	10.83	3.28	8.02	9.33	
Apr.	30	1.69	334,000	1,922		7.9	51		5.62	3.77	9.89	3.30	7.77	8.18	
May	31	1.73	124,000	1,948		7.9	50		5.65	4.13	9.66	3.52	8.08	7.81	
June	30	1.86	203,000	2,117		7.9	52		5.79	4.19	10.98	3.48	8.41	9.07	
July	31	1.77	316,000	2,040		7.9	52		5.59	4.02	10.58	3.30	8.09	8.81	
Aug.	31	1.77	296,000	2,034		8.0	53		5.54	4.00	10.51	3.32	8.12	8.61	
Sept.	30	1.71	129,000	1,874		8.0	51		5.29	3.74	9.32	3.32	7.87	7.12	
Oct.	31	1.48	65,400	1,694		8.0	49		5.03	3.44	8.00	3.34	7.54	5.56	
Nov.	30	1.54	67,100	1,743		7.9	49		5.15	3.53	8.42	3.51	7.79	5.82	
Dec.	31	1.71	126,000	1,927		7.9	50		5.46	3.90	9.59	3.53	7.94	7.48	
Mean ⊕ Ø365		1.70	Ø2,281,500	1,942		7.9	51		5.51	3.90	9.66	3.27	7.94	7.92	
Period Avg.		1.84	2,655,000	2,153		8.1	51		5.92	4.59	10.83	3.33	8.12	9.91	
Tons of Constituents 1968									201,000	84,900	412,000	357,000	687,000	530,000	
Avg. Tons Period 1962-1968									225,000	106,000	427,000	374,000	745,000	666,000	

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

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1968

The following tables show electrical conductivity, expressed in mhos per centimeter cube x 10^6 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 this Commission and conductivity determinations were made by the United States Geological Survey. Samples for the Intake Canal at Morelos Dam, Sánchez Mejorada Canal, Miguel C. Rodríguez Gaging Station, and El Marítimo 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	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C

Colorado River at Northerly International Boundary

Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C
January		February		April		May		July		August		October		November	
1	1,990	15	1,950	1	1,860	18	2,030	2	2,160	17	2,040	2	1,580	17	1,660
2	1,960	16	1,810	2	1,800	19	2,050	3	2,150	18	1,950	3	1,650	18	1,720
3	1,790	17	1,800	3	1,830	20	2,050	4	2,230	19	1,950	4	1,580	19	1,730
4	1,890	18	2,110	4	1,940	21	2,000	5	2,200	20	1,920	5	1,630	20	1,730
5	1,950	19	2,030	5	1,880	22	2,090	6	2,170	21	1,920	6	1,700	21	1,810
6	2,170	20	2,050	6	1,800	23	2,030	7	2,080	22	1,990	7	1,660	22	1,680
7	2,210	21	2,100	7	1,750	24	1,980	8	1,830	23	2,090	8	1,670	23	1,830
8	1,900	22	2,030	8	1,800	25	1,920	9	1,300	24	2,090	9	1,650	24	1,740
9	1,980	23	2,050	9	1,790	26	2,010	10	2,040	25	2,060	10	1,660	25	1,790
10	1,930	24	2,000	10	1,780	27	2,010	11	2,190	26	2,100	11	1,620	26	1,790
11	1,950	25	1,980	11	1,920	28	2,000	12	2,170	27	2,030	12	1,640	27	1,660
12	1,910	26	2,040	12	1,920	29	2,030	13	2,140	28	2,020	13	1,650	28	1,820
13	2,300	27	2,070	13	1,850	30	1,980	14	2,090	29	2,080	14	1,690	29	1,830
14	2,250	28	2,010	14	1,920	31	2,060	15	2,080	30	2,040	15	1,740	30	1,810
15	2,050	29	1,960	15	2,020	June		16	2,030	31	2,060	16	1,670	December	
16	2,020	March		16	2,060	1	2,020	17	2,040	September		17	1,660	1	1,760
17	2,000	1	2,060	17	2,020	2	2,030	18	2,050	1	2,160	18	1,680	2	1,750
18	1,970	2	2,140	18	2,050	3	2,050	19	1,980	2	2,120	19	1,620	3	1,770
19	2,000	3	2,140	19	2,060	4	2,020	20	2,060	3	2,170	20	1,660	4	1,760
20	2,220	4	1,980	20	1,910	5	2,100	21	1,980	4	2,120	21	1,660	5	1,770
21	2,140	5	2,130	21	1,890	6	2,040	22	2,060	5	2,060	22	1,650	6	1,750
22	2,010	6	2,160	22	2,080	7	2,000	23	2,090	6	2,070	23	1,670	7	1,720
23	2,020	7	2,090	23	2,130	8	1,980	24	2,060	7	2,070	24	1,620	8	1,770
24	2,000	8	2,150	24	2,170	9	2,060	25	2,060	8	2,020	25	1,660	9	1,740
25	1,980	9	2,140	25	2,230	10	2,080	26	2,030	9	2,090	26	1,650	10	1,780
26	2,020	10	2,000	26	2,000	11	2,040	27	2,070	10	2,120	27	1,700	11	1,880
27	2,130	11	2,020	27	1,920	12	2,100	28	1,980	11	2,090	28	1,660	12	2,080
28	2,120	12	2,170	28	2,060	13	2,080	29	2,010	12	1,960	29	1,660	13	2,020
29	1,820	13	2,170	29	2,130	14	2,080	30	2,040	13	1,920	30	1,740	14	1,990
30	1,840	14	2,300	30	2,010	15	2,080	31	1,960	14	1,890	31	1,630	15	1,970
31	1,910	15	2,170	May		16	2,120	August		15	1,890	November		16	2,000
February		16	2,100	1	1,980	17	2,250	1	2,060	16	1,590	1	1,740	17	2,100
1	1,980	17	2,440	2	2,000	18	2,260	2	1,990	17	1,640	2	1,670	18	2,080
2	2,010	18	2,000	3	1,990	19	2,240	3	1,890	18	1,700	3	1,660	19	2,030
3	1,940	19	1,880	4	1,820	20	2,210	4	2,060	19	1,670	4	1,660	20	2,080
4	1,910	20	1,950	5	1,880	21	2,130	5	1,950	20	1,660	5	1,710	21	1,970
5	1,960	21	1,900	6	1,880	22	2,000	6	1,960	21	1,660	6	1,680	22	2,090
6	1,940	22	1,940	7	1,940	23	2,170	7	2,010	22	1,650	7	1,680	23	2,030
7	1,880	23	1,930	8	1,890	24	2,180	8	2,000	23	1,650	8	1,660	24	1,960
8	2,100	24	1,950	9	1,910	25	2,120	9	1,850	24	1,680	9	1,670	25	2,040
9	1,920	25	1,900	10	1,950	26	2,150	10	1,880	25	1,680	10	1,670	26	2,060
10	1,900	26	1,930	11	1,930	27	2,170	11	1,930	26	1,630	11	1,710	27	2,080
11	1,850	27	1,860	13	2,080	28	2,180	12	1,990	27	1,600	12	1,670	28	2,070
12	1,890	28	1,810	14	2,030	29	2,030	13	1,880	29	1,600	13	1,610	29	2,060
13	1,970	29	1,860	15	2,020	30	2,080	14	1,860	30	1,640	14	1,690	30	2,020
14	2,060	30	1,810	16	2,010	July		15	1,910	October		15	1,810	31	2,130
		31	1,870	17	2,060	1	2,070	16	1,900	1	1,610	16	1,700		

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1968

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

Intake Canal at Morelos Diversion Structure

January		February		April		May		July		August		October		November	
1	2,100	16	1,800	1	1,900	16	1,900	1	2,100	16	1,950	1	1,700	16	1,675
2	1,900	17	1,900	2	1,900	17	2,000	2	2,100	17	2,000	2	1,700	17	1,750
3	1,800	18	2,250	3	1,900	18	2,000	3	2,100	18	1,950	3	1,700	18	1,725
4	1,850	19	2,100	4	1,850	19	2,000	4	2,175	19	2,000	4	1,600	19	1,725
5	2,000	20	2,050	5	1,900	20	2,050	5	2,200	20	2,000	5	1,700	20	1,825
6	2,000	21	2,050	6	1,750	21	2,000	6	2,150	21	1,900	6	1,800	21	1,800
7	2,100	22	2,050	7	1,800	22	2,050	7	2,100	22	2,050	7	1,700	22	1,800
8	1,950	23	2,050	8	1,900	23	2,000	8	1,850	23	2,150	8	1,700	23	1,800
9	1,950	24	2,100	9	1,750	24	2,000	9	1,300	24	2,100	9	1,700	24	1,800
10	1,900	25	2,000	10	1,700	25	2,000	10	1,950	25	2,150	10	1,650	25	1,800
11	1,950	26	2,050	11	1,900	26	2,000	11	2,150	26	2,100	11	1,625	26	1,800
12	1,950	27	2,000	12	1,850	27	2,000	12	2,150	27	2,000	12	1,700	27	1,675
13	1,950	28	2,000	13	1,900	28	2,000	13	2,150	28	2,100	13	1,725	28	1,750
14	* 1,975	29	2,000	14	1,950	29	2,000	14	2,050	29	2,100	14	1,650	29	1,850
15	2,000	March		15	1,900	30	2,000	15	2,100	30	2,050	15	1,700	30	1,750
16	2,000	1	2,050	16	2,000	31	2,000	16	2,050	31	2,150	16	1,700	December	
17	2,050	2	2,100	17	2,050	June		17	2,000	September		17	1,700	1	1,750
18	2,100	3	2,100	18	2,000	1	2,000	18	2,050	1	2,100	18	1,700	2	1,750
19	2,000	4	2,050	19	1,950	2	2,000	19	2,000	2	2,150	19	1,700	3	1,775
20	2,050	5	2,200	20	1,950	3	2,000	20	2,050	3	2,100	20	1,700	4	1,775
21	2,050	6	2,200	21	1,950	4	2,000	21	2,000	4	2,100	21	1,700	5	1,725
22	2,000	7	2,150	22	2,000	5	2,100	22	2,000	5	2,150	22	1,725	6	1,700
23	2,000	8	2,250	23	2,000	6	2,050	23	2,050	6	2,100	23	1,725	7	1,725
24	1,950	9	2,050	24	2,100	7	2,050	24	2,050	7	2,150	24	1,675	8	1,775
25	2,000	10	2,050	25	2,100	8	2,050	25	2,000	8	2,100	25	1,675	9	1,775
26	2,000	11	2,050	26	1,900	9	2,150	26	2,000	9	2,100	26	1,675	10	1,775
27	2,100	12	2,200	27	1,900	10	2,050	27	2,000	10	2,100	27	1,700	11	2,000
28	2,100	13	2,300	28	2,000	11	2,000	28	2,300	11	2,100	28	1,675	12	2,025
29	1,800	14	2,300	29	2,000	12	2,150	29	2,000	12	1,950	29	1,700	13	2,000
30	1,800	15	2,250	30	1,900	13	2,050	30	2,050	13	1,950	30	1,750	14	2,000
31	1,850	16	2,200	May		14	2,050	31	2,000	14	1,950	31	1,675	15	2,000
February		17	2,250	1	1,900	15	2,225	August		15	1,950	November		16	2,000
1	1,900	18	2,050	2	1,900	16	2,150	1	2,050	16	1,650	1	1,750	17	2,050
2	1,900	19	1,950	3	1,950	17	2,200	2	2,050	17	1,700	2	1,700	18	2,000
3	1,850	20	2,000	4	1,900	18	2,300	3	2,000	18	1,650	3	1,700	19	2,000
4	1,850	21	2,000	5	1,850	19	2,300	4	2,100	19	1,700	4	1,650	20	2,100
5	1,900	22	2,100	6	1,800	20	2,200	5	2,050	20	1,700	5	1,725	21	1,900
6	1,900	23	2,000	7	1,850	21	2,150	6	2,050	21	1,700	6	1,675	22	2,000
7	1,800	24	1,900	8	1,850	22	2,150	7	2,050	22	1,700	7	1,675	23	1,925
8	1,900	25	2,025	9	1,800	23	2,250	8	2,100	23	1,700	8	1,700	24	1,950
9	1,850	26	2,000	10	1,850	24	2,150	9	1,900	24	1,700	9	1,725	25	2,050
10	1,800	27	2,000	11	1,900	25	2,150	10	1,900	25	1,700	10	1,725	26	2,000
11	1,850	28	1,900	12	1,900	26	2,100	11	1,950	26	1,650	11	1,700	27	2,050
12	1,900	29	1,950	13	2,000	27	2,150	12	2,000	27	1,650	12	1,725	28	2,050
13	1,900	30	1,900	14	1,980	28	2,175	13	2,000	28	1,625	13	1,650	29	2,000
14	2,000	31	1,700	15	1,950	29	2,050	14	1,950	29	1,650	14	1,800	30	2,000
15	1,900					30	2,100	15	2,150	30	1,700	15	1,875	31	2,100

* Interpolated

Colorado River at Southerly International Boundary

October		December							
31	7,520	31	7,310						

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1968

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

Sánchez Mejorada Canal

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		June		July		August		October		November	
11	2,500	21	2,500	4	2,300	6	2,800	17	2,200	31	2,500	9	2,500	21	2,600
16	2,600	27	2,600	25	2,400	12	2,600	25	2,700	September		16	2,400	27	2,500
27	2,300	March		29	2,500	18	2,500	31	2,500	6	2,400	23	2,400	December	
30	2,500	4	2,400	May		28	2,400	August		12	2,400	31	2,600	5	2,400
February		12	2,200	11	2,500	July		8	2,500	20	2,400	November		11	2,600
8	2,400	18	2,200	15	2,300	1	2,300	16	2,600	25	2,600	7	2,550	19	2,600
15	2,400	25	2,400	22	2,600	10	2,400	22	2,500	October		13	2,700	26	2,550
				29	2,500					2	2,400				

Colorado River at Miguel C. Rodríguez Gaging Station

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		February		April		May		July		August		October		November	
3	7,000	15	4,500	4	3,200	23	3,200	1	3,200	22	3,200	8	3,100	19	6,500
10	6,400	21	3,400	8	3,200	30	3,400	10	3,200	31	3,100	14	5,000	27	7,000
16	7,500	27	5,000	19	3,100	June		17	3,200	September		21	6,600	December	
23	7,000	March		25	3,100	6	3,600	24	3,500	5	3,050	28	7,000	5	7,000
30	7,000	4	4,700	29	3,100	11	3,200	August		9	2,800	November		11	6,750
February		12	3,800	May		17	3,200	1	3,100	18	3,000	7	6,750	17	6,250
8	7,000	18	3,400	11	3,100	25	3,200	6	3,200	23	3,100	13	7,000	23	6,500
		25	3,200	16	3,100			15	3,200	30	3,100			30	6,500

Colorado River at El Marítimo Gaging Station

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C
January		January		February		February		March		April		May		June	
2	9,250	15	9,500	7	7,500	20	6,000	7	10,000	8	12,000	6	10,000	4	10,500
9	8,100	22	7,600	14	7,250	26	7,500	13	7,500	19	12,500	17	10,000	10	11,000
		29	7,500					22	11,000			24	9,500		

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 this Commission. For location, elevation, period of record, and the observer, see alphabetical listings of these stations on page 52 in this bulletin.

In United States

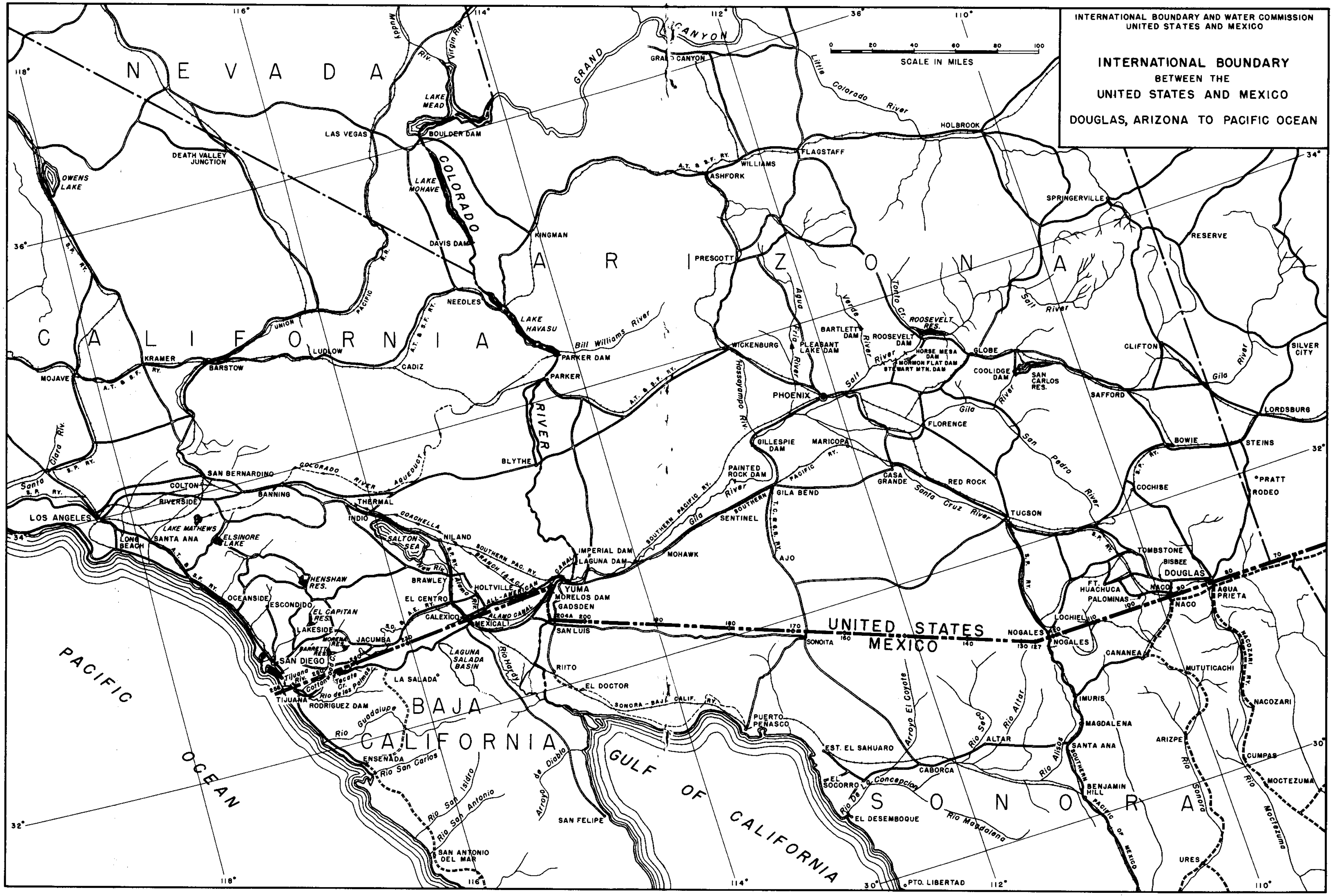
Month	Brawley, California		El Centro, California		Blythe, California		Davis Dam No. 2, Arizona		Yuma Citrus Station, Arizona	
	1968	Average 1931-1968	1968	Average 1931-1968	1968	Average 1931-1968	1968	Average 1955-1968	1968	Average 1931-1968
Jan.	T	0.30	0	0.35	T	0.45	0	0.37	0	0.38
Feb.	.01	.30	0	.35	.05	.40	.83	.45	.44	.34
Mar.	.65	.15	.50	.19	.32	.38	.33	.30	.26	.20
Apr.	T	.08	0	.11	0	.16	T	.38	0	.12
May	0	.01	0	0	0	.02	.02	.09	0	.01
June	0	.01	0	.01	0	.03	.02	0	0	.02
July	1.14	.05	1.05	.11	.54	.19	.74	.24	.86	.18
Aug.	T	.31	0	.32	T	.76	0	.52	0	.42
Sept.	0	.32	0	.27	0	.33	0	.29	T	.38
Oct.	T	.22	0	.23	.11	.28	.02	.32	0	.39
Nov.	T	.14	0	.14	.01	.26	.20	.48	T	.17
Dec.	.05	.45	0	.47	.17	.57	.01	.55	.07	.41
Yearly	1.85	2.34	1.55	2.55	1.20	3.83	2.17	3.99	1.63	3.02

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
	1968	Average 1948-1968	1968	Average 1926-1968	1968	Average 1948-1968	1968	Average 1949-1968	1968	Average 1948-1968
Jan.	0.04	0.43	T	0.35	T	0.35	T	0.28	T	0.39
Feb.	.35	.20	.08	.31	0	.04	1.65	.20	.24	.08
Mar.	.08	.08	.43	.20	.16	.04	.98	.12	.24	.08
Apr.	0	.08	0	.08	0	.08	0	0	0	.04
May	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0
July	.71	.08	1.26	.12	.35	0	1.85	.24	.04	.04
Aug.	0	.20	T	.31	0	.12	.16	.39	0	.16
Sept.	0	.20	0	.35	0	.04	0	.16	0	.16
Oct.	0	.31	T	.24	0	.20	0	.16	T	.16
Nov.	0	.12	T	.16	T	.12	0	.63	T	.08
Dec.	.08	.31	.04	.83	T	.20	.08	.59	T	.31
Yearly	1.26	1.97	1.81	2.99	0.51	1.18	4.72	1.69	0.51	1.42

Month	Kilometer 50, Baja California		Riito, Sonora		El Mayor, Baja California		San Felipe, Baja California			
	1968	Average 1952-1968	1968	Average 1959-1968	1968	Average 1949-1968	1968	Average 1948-1968		
Jan.	0	0.63	T	0.24	0	0.20	0	0.24		
Feb.	.20	.24	.28	.08	.04	.12	.12	.08		
Mar.	.43	.28	.35	.04	.04	.12	.51	.20		
Apr.	0	.16	0	0	0	.04	0	.08		
May	0	.04	0	0	0	0	0	0		
June	0	0	0	0	0	0	0	.08		
July	.55	.16	.83	.12	.43	.08	.59	.16		
Aug.	0	.35	T	.08	T	.31	0	.31		
Sept.	0	.24	0	.55	0	.59	0	.43		
Oct.	0	.39	T	.04	T	.24	0	.31		
Nov.	0	.20	T	.24	T	.08	0	.08		
Dec.	.08	.35	0	.47	T	.31	0	.39		
Yearly	1.26	1.81	1.46	1.85	0.51	2.13	1.22	2.40		

T Trace


INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
INTERNATIONAL BOUNDARY
BETWEEN THE
UNITED STATES AND MEXICO
DOUGLAS, ARIZONA TO PACIFIC OCEAN
0 20 40 60 80 100
SCALE IN MILES
NEVADA
CALIFORNIA
ARIZONA
BAJA CALIFORNIA
SONORA
UNITED STATES
MEXICO
PACIFIC OCEAN
GULF OF CALIFORNIA
GRAND CANYON
COLORADO
LAKE MEAD
BOULDER DAM
LAS VEGAS
DEATH VALLEY JUNCTION
OWENS LAKE
LAKE MOHAVE
DAVIS DAM
KINGMAN
NEEDLES
LAKE HAVASU
PARKER DAM
PARKER
BLYTHE
RIVER
Bill Williams River
PRESCOTT
WILLIAMS
ASHFORK
FLAGSTAFF
HOLBROOK
Little Colorado River
SPRINGERVILLE
RESERVE
Salt River
ROOSEVELT RES.
ROOSEVELT DAM
HORSE MESA DAM
MORMON FLAT DAM
STEWART MTN. DAM
BARTLETT DAM
PLEASANT LAKE DAM
WICKENBURG
Hassayampa Riv.
Agua Fria River
Verde River
Tonto Cr.
GLOBE
COOLIDGE DAM
SAN CARLOS RES.
CLIFTON
SILVER CITY
Gila River
SAFFORD
LORDSBURG
PHOENIX
FLORENCE
GILLESPIE DAM
MARICOPA
PAINTED ROCK DAM
CASA GRANDE
RED ROCK
BOWIE
STEINS
San Pedro River
COCHISE
PRATT
RODEO
TUCSON
Santa Cruz River
GILA BEND
SENTINEL
AJO
MOHAWK
TOMBSTONE
BISBEE
DOUGLAS
AGUA PRIETA
NACO
FT. HUACHUCA
PALOMINAS
LOCHIEL
NOGALES
CANANEA
MUTUTICACHI
NACOZARI
IMURIS
MAGDALENA
ARIZPE
SANTA ANA
CUMPAS
MOCTEZUMA
BENJAMIN HILL
URES
Rio Sonora
Rio Moctezuma
Rio Altar
Rio Seco
ALTAR
CABORCA
Arroyo El Coyote
SONOITA
EST. EL SAHUARO
EL SOCORRO
EL DESEMBOQUE
Rio de La Concepcion
Rio Magdalena
PTO. LIBERTAD
PUERTO PEÑASCO
SONORA - BAJA CALIF. RY.
EL DOCTOR
RIITO
SAN LUIS
YUMA
MORELOS DAM
GADSDEN
IMPERIAL DAM
LAGUNA DAM
ALL-AMERICAN CANAL
ALAMO CANAL
HOLTVILLE
EL CENTRO
BRAWLEY
CALEXICO
MEXICALI
Rio Hardy
LAGUNA SALADA BASIN
LA SALADA
SAN FELIPE
Arroyo de Diablo
NILAND
SALTON SEA
New Riv.
Alamo Riv.
COACHELLA
INDIO
THERMAL
BANNING
COLORADO RIVER AQUEDUCT
SAN BERNARDINO
COLTON
RIVERSIDE
LOS ANGELES
LONG BEACH
SANTA ANA
LAKE MATHEWS
ELSINORE LAKE
HENSHAW RES.
OCEANSIDE
ESCONDIDO
EL CAPITAN RES.
LAKESIDE
MORENA RES.
BARRETT RES.
JACUMBA
SAN DIEGO
TIJUANA
Tijuana Riv.
Cottonwood Cr.
Tecate Cr.
Rio de las Palmas
RODRIGUEZ DAM
Rio Guadalupe
ENSENADA
Rio San Carlos
Rio San Isidro
Rio San Antonio
SAN ANTONIO DEL MAR
CADIZ
LUDLOW
BARSTOW
KRAMER
MOJAVE
Santa Clara Riv.
Muddy Riv.
Virgin Riv.
UNION PACIFIC R.R.
A.T. & S.F. RY.
S.P. RY.
SOUTHERN PACIFIC RY.
T.C. & G.B. RY.
SOUTHERN PACIFIC OF MEXICO
118°
116°
114°
112°
110°
36°
34°
32°
30°

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 1968.

In United States

NAME OF STATION	LATITUDE	LONGITUDE	ð 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	LATITUDE	LONGITUDE	ð 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 ð 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 eight 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 52 in this bulletin.

In United States

Month	Davis Dam No. 2, Arizona		Yuma Citrus Station, Arizona	
	1968	Average 1955-1968	1968	Average 1931-1968
Jan.	9.10	7.60	4.09	3.90
Feb.	7.20	7.70	4.45	4.93
Mar.	# 9.90	10.25	# 7.95	θ 7.88
Apr.	13.37	13.47	# 10.11	10.29
May		θ 17.08	12.71	13.40
June	# 17.24	19.76	# 14.36	14.62
July	# 16.34	20.32	13.76	15.82
Aug.	17.50	18.42	13.08	13.95
Sept.	# 17.04	15.04	10.85	11.08
Oct.	12.46	12.36	7.56	8.02
Nov.	9.53	8.78	5.15	5.09
Dec.	5.72	8.04	3.67	3.70
Total		θ 158.90	107.74	θ 112.68

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora	
	1968	Av. 1949-55 1961-1968	1968	Average 1926-1968	1968	Average 1963-1968	1968	Average 1953-1968
Jan.	4.72	4.21	2.32	2.60	3.46	3.94	2.80	3.39
Feb.	4.37	5.24	3.27	3.50	5.91	5.35	3.50	4.02
Mar.	7.64	7.13	5.55	5.83	6.06	7.32	6.06	6.22
Apr.	10.83	9.65	7.40	7.87	9.88	9.17	8.54	8.46
May	13.23	12.32	10.39	10.51	12.64	11.97	11.26	10.94
June	13.74	12.76	11.93	11.50	12.87	12.09	12.28	12.56
July	12.76	12.80	10.94	11.69	12.13	12.36	11.69	14.25
Aug.	12.05	11.65	9.84	10.04	11.65	9.96	11.61	12.99
Sept.	10.24	9.53	7.91	8.11	10.20	9.02	9.13	10.20
Oct.	7.48	7.76	5.28	5.59	8.58	6.14	6.06	6.81
Nov.	5.83	4.76	3.74	3.39	5.35	5.08	4.21	4.45
Dec.	3.90	3.98	2.36	2.44	3.46	3.62	2.72	3.31
Total	106.77	103.31	80.94	83.07	102.20	96.14	89.88	100.08

Month	Delta, Baja California		Riito, Sonora		El Mayor, Baja California		San Felipe, Baja California	
	1968	Average 1959-1968	1968	Average 1963-1968	1968	Average 1953-1968	1968	Average 1952-1968
Jan.	3.58	3.31	3.27	3.35	3.39	3.66	7.01	5.16
Feb.	4.33	4.29	3.78	4.41	4.17	4.37	6.65	6.06
Mar.	6.26	6.30	5.12	6.06	6.02	6.22	6.89	6.89
Apr.	9.17	8.15	8.23	7.17	8.35	8.19	8.58	8.54
May	10.98	10.24	10.24	9.25	10.67	10.08	10.24	10.63
June	12.13	11.06	13.27	10.63	9.45	11.18	11.18	11.02
July	11.02	11.02	12.40	11.57	9.69	12.64	11.42	11.61
Aug.	10.51	9.57	10.24	8.82	9.49	11.85	10.98	10.91
Sept.	9.45	7.83	8.86	7.28	9.76	10.43	10.39	10.04
Oct.	6.02	5.83	5.98	5.20	5.91	7.99	9.02	8.62
Nov.	4.96	3.66	4.41	3.39	3.31	4.65	6.77	6.26
Dec.	3.35	3.03	2.83	2.95	2.72	3.82	4.37	5.16
Total	91.77	84.53	88.62	85.24	82.91	94.41	103.50	101.22

Adjusted to a full month θ 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 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 52 in this bulletin.

In United States

Month	Blythe, California				Davis Dam No. 2, Arizona				Yuma Citrus Station, Arizona			
	1968			Average 1931-68	1968			Average 1955-68	1968			Average 1931-68
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	52.9	76	29	52.5	52.9	70	33	52.7	52.3	77	28	52.9
Feb.	63.0	89	39	57.2	61.8	84	43	56.7	61.9	89	34	57.0
Mar.	65.0	94	40	63.1	63.4	93	45	62.3	63.0	93	37	
Apr.	68.4	98	43	70.4	67.6	93	45	69.7	66.7	98	37	69.0
May	77.9	109	48	77.4	78.1	109	54	78.5	75.2	109	45	76.0
June	85.8	114	57	84.8	89.3	116	59	88.2	83.1	115	50	83.4
July	91.7	113	67	92.0	93.7	115	71	94.7	88.3	115	60	91.2
Aug.	88.0	109	58	91.0	89.4	108	64	93.2	85.5	109	52	90.6
Sept.	84.2	112	54	85.1	86.0	111	56	86.0	81.8	115	44	85.2
Oct.	73.0	96	47	73.4	73.4	94	53	75.1	71.8	97	44	74.0
Nov.	61.9	86	36	60.3	62.3	84	45	61.8	60.6	87	30	61.6
Dec.	48.5	72	24	53.4	48.8	69	28	54.4	49.2	76	23	54.8
Yearly	71.7	114	24	71.7	72.2	116	28	72.8	70.0	115	23	

Month	Brawley, California				El Centro, California							
	1968			Average 1931-68	1968			Average 1931-68				
	Mean	Max.	Min.		Mean	Max.	Min.					
Jan.	53.4	79	30	53.6	53.5	79	30	53.5				
Feb.	63.0	95	38	58.1	62.5	91	37	57.8				
Mar.	63.3	92	39	63.5	63.5	94	38	63.2				
Apr.	64.9	96	41	70.7	66.7	98	39	70.1				
May	75.7	108	48	77.9	76.3	109	47	77.4				
June	83.6	114	51	85.2	84.7	118	54	84.8				
July	89.1	114	67	92.3	90.7	115	67	91.9				
Aug.	86.9	107	59	91.8	87.7	110	57	91.1				
Sept.	83.6	112	53	86.7	84.6	114	52	85.8				
Oct.	73.2	98	46	75.6	74.7	99	47	75.0				
Nov.	63.6	88	35	62.7	63.2	88	36	62.2				
Dec.	49.9	74	25	55.3	50.2	74	23	54.8				
Yearly	70.9	114	25	72.8	71.5	118	23	72.3				

In Mexico

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1968		1948-1968		1968		1926-1968		1968		1948-1968	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	77	36	86	23	70	30	93	19	86	32	113	19
Feb.	90	41	95	28	88	39	93	23	91	45	99	21
Mar.	95	45	100	32	91	41	100	32	97	39	113	25
Apr.	97	45	109	37	97	43	106	34	102	41	118	16
May	108	54	117	43	109	50	117	43	111	46	124	34
June	115	59	126	52	115	54	120	50	120	54	135	43
July	113	70	118	61	113	66	118	55	120	64	133	45
Aug.	115	61	120	61	109	59	118	54	120	59	129	46
Sept.	111	54	122	54	111	54	122	48	115	50	135	39
Oct.	100	50	111	32	102	48	109	39	99	46	118	41
Nov.	99	39	100	27	88	36	99	28	90	36	115	32
Dec.	73	28	88	28	73	23	90	23	75	28	97	25
Yearly	115	28	126	23	115	23	122	19	120	28	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			
	1968		1949-1968		1968		1948-1968		1968		1950-59, 1961-68	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	75	25	100	19	79	32	104	30	68	32	91	19
Feb.	88	37	109	27	95	45	108	28	79	37	97	21
Mar.	90	39	108	32	97	41	113	28	75	36	99	28
Apr.	97	43	115	37	100	43	118	32	86	36	106	30
May	108	50	115	41	111	50	129	32	102	45	117	36
June	115	55	126	45	118	57	133	36	111	48	117	39
July	111	68	126	59	117	66	135	45	108	63	120	45
Aug.	108	55	122	55	111	61	140	52	106	50	118	50
Sept.	111	50	118	50	115	57	135	39	104	39	115	39
Oct.	97	46	118	43	109	48	117	36	91	43	108	36
Nov.	86	34	113	30	91	36	120	32	81	30	104	25
Dec.	75	25	102	23	79	32	104	27	68	28	95	19
Yearly	115	25	126	19	118	32	140	27	111	28	120	19

Month	Riito, Sonora				El Mayor, Baja California				San Felipe, Baja California			
	1968		1949-1968		1968		1949-1968		1968		1948-1968	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	75	30	91	19	75	32	108	23	79	34	99	32
Feb.	88	37	95	21	91	39	93	27	82	43	102	32
Mar.	93	39	100	25	91	41	100	34	82	46	104	32
Apr.	97	39	109	37	93	39	108	36	90	43	113	37
May	108	48	115	43	106	48	113	37	93	50	120	41
June	113	52	124	45	115	50	122	37	104	57	124	50
July	113	64	140	52	117	64	122	39	104	63	124	50
Aug.	109	57	122	46	108	57	122	41	97	64	135	41
Sept.	113	50	118	39	113	54	120	34	106	59	126	37
Oct.	95	46	115	34	99	46	120	37	90	54	117	41
Nov.	86	30	118	27	90	41	120	34	81	43	118	21
Dec.	79	23	86	21	82	32	106	19	81	28	97	28
Yearly	113	23	140	19	117	32	122	19	106	28	135	21

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM

1968

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	44,042
Reservation Division	11,353
Yuma Mesa	16,786
Yuma Aux. Project Unit "B" (Yuma Mesa)	3,221
South Gila Valley	10,239
North Gila Valley	5,882
Wellton-Mohawk	60,758
Coachella Valley	52,282
Imperial Valley	441,155
Warren Act	80
Non-Project lands adjacent to Colorado River	7,050
Total in United States	652,848
IN MEXICO:	
Morelos Dam	
Mexicali Valley	* 437,814
Total in United States and Mexico	1,090,662

* 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. 1968 records excellent. Records available: June 1942 through December 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.55	2.00	2.44	2.21	2.21	1.58	1.58	1.39	1.89	1.89	1.68	2.00
2	2.44	2.00	2.44	2.21	2.21	1.58	1.58	1.39	1.89	2.00	1.68	2.00
3	2.55	2.00	2.44	2.79	2.21	1.58	2.10	1.39	1.89	2.00	1.68	2.00
4	2.44	2.21	2.44	2.21	2.21	1.79	2.10	1.39	1.39	2.00	1.68	2.00
5	2.21	2.21	2.44	2.21	2.21	1.58	2.10	1.39	1.39	2.00	2.00	2.00
6	2.44	2.21	2.21	2.44	2.21	1.58	2.67	1.39	1.39	2.00	2.00	2.00
7	2.44	2.00	2.21	2.44	2.21	1.58	2.32	1.39	1.39	1.89	2.00	2.00
8	2.55	2.00	2.21	2.21	1.68	1.58	2.32	1.39	1.39	2.00	2.00	2.00
9	2.55	2.00	2.21	2.21	1.79	1.58	2.21	1.39	1.39	2.00	1.79	2.00
10	2.32	2.21	2.21	2.21	1.79	1.58	2.21	1.39	1.58	2.00	1.79	2.00
11	2.21	2.21	2.10	2.10	2.10	2.21	1.89	1.39	1.68	1.89	2.00	1.79
12	2.44	2.00	2.21	2.21	1.89	2.00	2.10	1.39	1.68	2.00	1.89	1.79
13	2.44	2.10	2.00	2.10	1.89	2.00	2.21	1.39	1.58	2.00	2.00	1.89
14	2.21	2.44	2.10	2.00	2.10	2.10	1.89	1.68	1.58	2.00	2.00	1.89
15	2.21	2.32	2.21	2.00	2.21	2.00	1.89	1.68	1.58	1.89	1.79	1.79
16	2.21	2.21	2.21	2.00	2.21	2.00	1.89	1.68	1.58	2.00	2.00	1.79
17	2.21	2.21	2.21	2.44	2.21	2.00	2.21	1.68	1.58	2.00	2.00	1.79
18	2.21	2.21	2.21	2.44	2.21	1.79	2.21	1.68	2.00	2.00	2.00	3.15
19	2.21	2.21	2.21	2.21	2.21	1.68	2.21	1.68	2.00	2.00	3.41	3.03
20	2.21	2.21	2.10	2.21	2.21	1.68	2.21	1.68	2.00	2.00	2.21	2.91
21	2.21	1.68	2.10	2.21	2.21	1.68	2.21	2.00	2.00	2.00	2.44	3.03
22	2.21	1.68	2.10	2.21	2.00	1.68	2.21	1.89	2.00	2.00	2.21	3.03
23	2.21	2.21	2.10	2.21	2.00	1.68	2.21	2.00	2.00	2.00	2.44	2.91
24	2.21	2.21	2.21	2.21	2.00	1.58	1.39	1.79	2.00	2.21	2.21	2.91
25	2.21	2.44	2.21	2.21	2.21	1.79	1.39	1.89	1.89	2.21	2.21	2.32
26	2.21	2.44	2.10	2.21	2.21	1.39	1.39	1.89	1.89	2.21	2.21	2.32
27	2.21	2.44	2.10	2.21	2.21	1.39	1.39	1.89	1.89	2.21	2.00	2.32
28	2.00	2.44	2.10	2.21	2.21	1.39	1.39	1.89	1.89	2.21	2.00	2.32
29	2.00	2.44	2.21	2.21	1.58	1.58	1.39	1.89	2.00	2.21	2.00	2.32
30	2.21		2.21	2.21	1.58	1.58	1.39	1.89	2.00	1.68	2.00	2.32
31	2.00		2.21		1.58		1.39	1.89		1.68		2.32
Sum	70.73	62.94	68.46	66.95	63.76	51.21	59.65	50.74	52.41	62.18	61.32	69.94

Month	Current Year 1968						Period 1943-1968		
	Ø Extreme Gage Feet		Ø Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.	0.33	0.28	† 1	2.55	†28	2.00	2.28	140	416	2,790	99
Feb.	.32	.25	†14	2.44	†21	1.68	2.17	125	377	2,822	100
Mar.	.32	.28	† 1	2.44	13	2.00	2.21	136	424	3,154	111
Apr.	.35	.28	3	2.79	†14	2.00	2.23	133	458	2,222	97
May	.30	.24	† 1	2.21	†29	1.58	2.06	126	350	1,799	73
June	.30	.22	11	2.21	†26	1.39	1.71	102	348	1,686	61
July	.34	.22	6	2.67	†24	1.39	1.92	118	317	1,712	59
Aug	.28	.22	†21	2.00	† 1	1.39	1.64	101	382	1,672	83
Sept.	.28	.22	†18	2.00	† 4	1.39	1.75	104	359	1,406	91
Oct.	.30	.25	†24	2.21	†30	1.68	2.06	123	390	1,845	102
Nov.	.40	.25	19	3.41	† 1	1.68	2.04	122	397	2,080	86
Dec.	.38	.26	18	3.15	†11	1.79	2.26	139	365	1,686	80
Yearly	0.40	0.22		3.41		1.39	2.02	1,469	4,583	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. 1968 records good. Records available: June 1942 through December 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	137	151	156	162	200	139	100	116	140	133	131	108
2	140	145	154	162	194	133	99	120	138	134	132	109
3	141	146	154	159	193	130	103	122	141	137	133	111
4	145	149	160	158	195	131	110	127	146	137	136	110
5	151	151	164	162	195	128	133	133	147	139	133	109
6	154	149	168	163	184	126	141	137	146	141	130	112
7	154	147	166	165	184	128	145	146	145	141	133	114
8	158	146	172	167	181	123	161	147	144	142	127	116
9	171	146	168	168	184	121	165	147	144	141	127	116
10	182	145	169	166	177	126	163	147	151	141	125	112
11	182	141	170	163	166	123	156	147	158	139	125	109
12	182	145	169	162	161	117	151	151	153	138	128	110
13	178	148	167	163	162	116	142	148	151	139	130	120
14	177	154	162	165	164	116	137	148	149	138	127	124
15	176	158	159	172	166	116	137	153	147	135	125	122
16	174	163	156	175	169	115	140	158	147	134	124	122
17	169	166	153	173	175	116	141	160	143	136	123	124
18	169	168	155	176	182	126	141	163	140	141	122	115
19	169	175	154	179	182	133	134	161	138	143	118	113
20	169	172	152	186	181	131	133	154	137	145	116	112
21	165	168	145	189	169	129	137	149	136	145	119	112
22	166	165	139	190	159	130	152	150	135	144	118	112
23	166	160	137	209	158	127	152	150	138	143	120	115
24	167	158	131	223	152	120	144	151	129	143	122	124
25	167	158	121	227	158	117	139	155	124	142	125	126
26	169	158	144	221	160	116	134	157	124	139	113	130
27	167	158	169	214	166	112	126	151	128	136	108	130
28	162	158	169	213	166	109	116	147	130	135	108	129
29	163	157	169	213	163	100	109	145	129	133	108	129
30	162		162	209	153	99	104	145	132	128	108	132
31	158		161		146		108	143		128		127
Sum	5,090	4,505	4,875	5,454	5,345	3,653	4,153	4,528	4,210	4,290	3,694	3,654

Month	Current Year 1968 Ø Extreme Gage ** Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1943-1968 Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	41.02	41.46	†10	182	1	137	164	10,096	6,890	20,160	1,751
Feb.	41.17	41.41	19	175	11	141	155	8,936	5,661	17,845	1,258
Mar.	41.10	41.32	8	172	25	121	157	9,669	6,059	12,960	1,008
Apr.	40.66	41.23	25	227	4	158	182	10,818	6,253	14,489	1,390
May	40.84	41.44	1	200	31	146	172	10,602	5,481	10,618	629
June	41.51	42.00	1	139	30	99	122	7,246	4,836	9,689	1,087
July	41.24	42.03	9	165	2	99	134	8,237	4,659	9,086	817
Aug	41.19	41.67	18	163	1	116	146	8,981	5,680	10,921	1,139
Sept.	41.32	41.61	11	158	†25	124	140	8,350	6,113	12,688	1,795
Oct.	41.50	41.63	†20	145	†30	128	138	8,509	6,416	11,710	2,081
Nov.	41.58	41.83	4	136	†27	108	123	7,327	6,133	12,323	2,483
Dec.	41.63	41.84	30	132	1	108	118	7,248	6,844	21,205	1,763
Yearly	40.66	42.03		227		99	146	106,019	71,025	138,906	24,573

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

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 48 double current meter measurements made during the year by wading. Data obtained and furnished by the Mexican Section of the Commission. Data available: January through December 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	u 3.5	3.5	2.1	4.9	2.5	3.9	3.9	3.9	8.8	3.9	3.9	3.2
2	u 3.5	3.5	2.1	4.6	2.1	3.9	3.9	3.9	10.2	3.9	3.5	3.2
3	u 3.5	3.5	2.1	4.6	1.8	3.9	4.2	4.2	11.7	3.9	3.5	2.8
4	u 3.5	3.5	1.8	4.2	2.1	3.5	4.2	4.2	12.7	4.2	3.5	2.8
5	u 3.5	3.9	1.8	3.9	2.5	3.5	4.6	4.2	11.7	4.2	3.5	2.8
6	u 3.5	3.9	1.8	3.9	2.8	3.5	4.6	4.6	10.9	3.9	3.5	2.5
7	u 3.5	3.9	1.8	3.5	2.8	3.5	4.9	4.6	9.9	3.9	3.5	2.5
8	u 3.5	3.9	1.8	3.2	3.9	3.5	4.9	4.6	8.8	3.5	3.5	2.5
9	u 3.5	4.2	1.8	3.2	4.9	3.5	5.3	4.6	7.8	3.5	3.5	2.8
10	u 3.5	4.2	1.8	2.8	6.0	3.9	5.3	4.6	7.1	3.2	3.5	2.8
11	u 3.5	3.9	1.8	2.8	7.1	3.9	5.7	4.2	6.0	3.2	3.2	3.2
12	u 3.5	3.5	1.8	3.2	8.1	4.2	5.3	4.2	4.9	3.2	3.2	3.2
13	3.5	3.2	1.8	3.2	9.2	4.2	4.9	4.2	3.9	3.2	3.2	3.5
14	3.5	2.8	2.1	3.5	8.1	3.9	4.6	3.9	4.2	3.2	3.2	3.5
15	3.2	2.5	2.1	3.5	7.4	3.5	4.2	3.9	4.6	3.5	2.8	3.9
16	3.2	2.1	2.1	3.9	6.4	3.2	4.2	3.9	4.9	3.5	2.8	3.9
17	2.8	1.8	1.8	3.9	5.7	2.8	3.9	3.9	5.7	3.5	2.8	3.5
18	2.8	1.8	1.8	4.2	4.9	2.5	3.5	4.2	6.0	3.5	3.2	3.5
19	2.8	1.8	1.4	4.2	3.9	2.8	3.2	4.2	6.4	3.5	3.2	3.5
20	2.8	1.8	1.8	4.6	3.2	2.8	3.2	4.2	6.7	3.5	3.5	3.2
21	2.8	1.4	1.8	4.6	3.2	2.8	3.2	4.6	7.1	3.5	3.5	2.8
22	2.8	1.4	1.8	4.9	3.5	2.8	3.2	4.6	6.4	3.5	3.9	2.8
23	2.8	1.4	2.1	4.9	3.5	2.8	3.5	4.6	5.7	3.9	3.9	2.8
24	2.8	1.8	2.1	4.9	3.9	3.2	3.5	4.9	4.9	3.9	3.9	2.5
25	2.8	1.8	2.1	4.6	3.9	3.2	3.5	4.9	4.2	3.9	3.9	2.5
26	2.8	1.8	2.5	4.2	3.9	3.2	3.5	4.9	3.5	3.9	3.5	2.8
27	2.8	2.1	2.5	3.9	4.2	3.2	3.5	4.9	3.5	3.9	3.5	2.8
28	2.8	2.1	2.8	3.5	4.2	3.2	3.5	4.9	3.9	3.9	3.5	2.8
29	2.8	2.1	3.5	3.2	4.2	3.5	3.5	5.3	3.9	3.9	3.5	2.8
30	3.2		3.9	2.8	4.2	3.5	3.9	6.4	3.9	3.9	3.5	3.2
31	3.2		4.6		3.9		3.9	7.8		3.9		3.2
Sum	98.2	79.1	67.1	117.3	138.0	101.8	127.2	142.0	199.9	114.0	103.1	93.8

Current Year 1968

Month	Extreme Gage Feet		ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			† 1	u 3.5	† 17	2.8	3.2	196			
Feb.			† 9	4.2	† 21	1.4	2.8	157			
Mar.			31	4.6	19	1.4	2.1	132			
Apr.			† 1	4.9	† 10	2.8	3.9	233			
May			13	9.2	3	1.8	4.6	274			
June			† 12	4.2	18	2.5	3.5	203			
July			11	5.7	† 19	3.2	4.2	253			
Aug			31	7.8	† 1	3.9	4.6	282			
Sept.			4	12.7	† 26	3.5	6.7	396			
Oct.			† 4	4.2	† 10	3.2	3.5	226			
Nov.			† 1	3.9	† 15	2.8	3.5	205			
Dec.			† 15	3.9	† 6	2.5	3.2	186			
Yearly				12.7		1.4	3.9	2,745			

† And other days ø Mean daily u Estimated

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 47 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 1968. 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	2.1	0.7	0.7	0	1.8	0.4	0.4
2	0	0	0	0	0	1.8	.7	.7	0	1.8	.4	.4
3	0	0	0	0	0	1.4	.7	.7	0	1.8	.4	.4
4	0	0	0	0	.7	1.4	.7	.7	0	1.8	.4	.4
5	0	0	0	0	1.4	1.1	1.1	.7	0	1.4	.4	.4
6	0	0	0	0	2.1	1.1	1.1	.7	.4	1.4	.4	.4
7	0	0	0	0	2.8	.7	1.1	.7	.4	1.1	.4	.4
8	0	0	0	0	3.2	.7	1.1	.7	.7	1.1	.4	.4
9	0	0	0	0	3.2	.7	1.4	.7	.7	.7	.4	.4
10	0	0	0	0	3.5	.4	1.4	.7	1.1	.7	.4	.4
11	0	0	0	0	3.9	.4	1.4	.7	1.1	.4	.4	.4
12	0	0	0	0	3.9	.4	1.4	.7	1.4	.4	.4	.4
13	0	0	0	0	4.2	.4	1.4	.4	1.4	.4	.4	0
14	0	0	0	0	4.2	.4	1.4	.4	1.4	.4	.4	0
15	0	0	0	0	3.9	.4	1.4	.4	1.4	.4	.4	0
16	0	0	0	0	3.9	.4	1.1	.4	1.4	.4	.4	0
17	0	0	0	0	3.9	.4	1.1	.4	1.4	.4	.4	0
18	0	0	0	0	3.9	.4	1.1	.4	1.1	.4	.4	0
19	0	0	0	0	3.5	.4	1.1	.4	1.1	.4	.4	0
20	0	0	0	0	3.5	.4	1.1	0	1.1	.4	.4	0
21	0	0	0	0	3.5	.4	1.1	0	1.1	.4	.4	0
22	0	0	0	0	3.5	.4	1.1	0	1.1	.4	.4	0
23	0	0	0	0	3.2	.4	1.4	0	1.4	.4	.4	0
24	0	0	0	0	3.2	.4	1.4	0	1.4	.4	.4	0
25	0	0	0	0	3.2	.4	1.4	0	1.8	.4	.4	0
26	0	0	0	0	2.8	.4	1.4	0	1.8	.4	.4	0
27	0	0	0	0	2.8	.4	1.4	0	1.8	.4	.4	0
28	0	0	0	0	2.8	.4	1.1	0	1.8	.4	.4	0
29	0	0	0	0	2.5	.4	1.1	0	1.8	.4	.4	0
30	0		0	0	2.5	.4	.7	0	1.8	.4	.4	0
31	0		0		2.1		.7	0		.4		0
Sum	0	0	0	0	87.8	19.4	35.3	11.2	31.9	22.0	12.0	4.8

Current Year 1968 — **Period 1951-1968**

Month	Extreme Gage Feet		ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.				0		0	0	0	1,918	8,735	0
Feb.				0		0	0	0	1,191	7,218	0
Mar.				0		0	0	0	882	2,568	0
Apr.				0		0	0	0	855	4,433	0
May			† 13	4.2	† 1	0	2.8	174	602	1,892	0
June			1	2.1	† 10	.4	.7	36.4	354	1,450	0
July			† 9	1.4	† 1	.7	1.1	69.3	279	2,040	0
Aug			† 1	.7	† 20	0	.4	21.7	541	1,926	0
Sept.			† 25	1.8	† 1	0	1.1	62.3	751	2,915	21.0
Oct.			† 1	1.8	† 11	.4	.7	41.3	1,026	2,993	8.4
Nov.			† 1	.4	† 1	.4	.4	21.0	1,143	3,768	0
Dec.			† 1	.4	† 13	0	0	8.4	1,685	8,669	0
Yearly				4.2		0	0.7	435	11,227	27,083	399

ø Mean daily † And other days

WISTERIA DRAIN TO NEW RIVER IN MEXICO

DESCRIPTION: Wisteria Drain discharges into the stilling basin above the weir of Wisteria Wasteway immediately downstream from the spillway structure of Cerro Prieto and West Main Canals through a 20-inch pipe and thence into New River. The pipe outlet is located in the right bank of the basin in Colonia Wisteria, 4.3 miles upstream from the international boundary, and about 1.9 miles east of the Tijuana highway from the Tijuana-San Felipe junction.

RECORDS: Based on weekly readings of water surface elevation, discharges are computed from horizontal pipe formula. Data furnished by the Mexican Section of the Commission. Records available: January 1957 through 1968.

EXTREMES: Maximum mean daily discharge, 2.1 second-feet, January 23, 1964 and January 13, 1968; minimum, no flow on various occasions. Maximum monthly volume, 63.7 acre-feet, January 1968; minimum monthly volume, zero on various occasions.

Mean Daily Discharge in Second Feet 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0.7	0.7	0.7	0.4	0.4	0	0	0	0	0	0
2	0	.7	.7	.7	.4	0	0	0	0	0	0	0
3	0	.7	.4	.7	0	0	0	0	0	0	0	0
4	0	.7	.4	.7	.4	0	0	0	0	0	0	0
5	0	.7	.4	.4	.4	0	0	0	0	0	0	0
6	0	.7	.4	.4	.4	0	0	0	0	0	0	0
7	.4	.7	.4	.4	.7	0	0	0	0	0	0	0
8	.7	.7	.4	.4	.7	0	0	0	0	0	0	0
9	.7	.7	.4	.4	.7	0	0	0	0	0	0	0
10	1.1	.7	.4	0	.4	0	0	0	0	0	0	0
11	1.4	.7	.4	.4	.4	0	0	0	0	0	0	0
12	1.8	.7	.4	.4	.4	0	0	0	0	0	0	0
13	2.1	.7	.4	.4	.4	0	0	0	0	0	0	0
14	1.8	.7	.4	.4	.4	0	0	0	0	0	0	0
15	1.8	.7	.4	.4	.4	0	0	0	0	0	0	0
16	1.8	.7	.4	.4	.4	0	0	0	0	0	0	0
17	1.8	.7	0	.4	.4	0	0	0	0	0	0	0
18	1.8	.7	0	.4	.4	0	0	0	0	0	0	0
19	1.8	.7	0	.4	.4	0	0	0	0	0	0	0
20	1.4	.7	0	.4	.4	0	0	0	0	0	0	0
21	1.4	.7	0	.4	.4	0	0	0	0	0	0	0
22	1.4	.7	0	.7	.4	0	0	0	0	0	0	0
23	1.4	.7	.4	.7	.4	0	0	0	0	0	0	0
24	1.4	.7	.4	.7	.4	0	0	0	0	0	0	0
25	1.1	.7	.4	.4	.4	0	0	0	0	0	0	0
26	1.1	.7	.4	.4	.4	0	0	0	0	0	0	0
27	1.1	.7	.4	.4	.4	0	0	0	0	0	0	0
28	1.1	.7	.4	.4	.4	0	0	0	0	0	0	0
29	.7	.7	.4	.4	.4	0	0	0	0	0	0	0
30	.7		.7	.4	.4	0	0	0	0	0	0	0
31	.7		.7		.4		0	0		0		0
Sum	32.5	20.3	11.2	13.7	12.9	0.4	0	0	0	0	0	0

Month	Current Year 1968								Period 1957-1968		
	Extreme Gage Feet		ϕ Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Normal	Maximum	Minimum
	High	Low	Day		Day						
Jan.			13	2.1	† 1	0	1.1	63.7	30.4	63.7	7.0
Feb.			† 1	.7	† 1	.7	.7	40.6	23.0	40.6	12.2
Mar.			† 1	.7	† 17	0	.4	20.3	24.8	52.5	8.4
Apr.			† 1	.7	10	0	.4	25.2	28.9	47.7	8.4
May			† 7	.7	3	0	.4	23.1	16.7	28.7	2.1
June			1	.4	† 2	0	0	.7	14.4	27.6	.7
July				0		0	0	0	14.3	35.7	0
Aug				0		0	0	0	16.1	55.9	0
Sept.				0		0	0	0	12.1	31.5	0
Oct.				0		0	0	0	11.3	26.6	0
Nov.				0		0	0	0	15.2	46.2	0
Dec.				0		0	0	0	20.1	49.0	0
Yearly				2.1		0	0.4	174	228	357	124

† And other days ϕ Mean daily

WASTE WATERS FROM MEXICAN SYSTEM OF CANALS ENTERING THE UNITED STATES

DESCRIPTION: During 1968, 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 1968; Sifón Wasteway, January 1952 through April 1964; Pueblo Wasteway, January 1956 through 1965, and the Potable Water Plant, January through December 1968.

REMARKS: Mean daily discharges for Wisteria Wasteway and the Potable Water Plant are shown on pages 60 and 59, 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 1968	Period 1956 - 1968		
		Average	Maximum	Minimum
January	* 196	1,895	8,758	15.4
February	157	1,266	7,281	19.6
March	132	717	2,610	21.7
April	233	545	2,843	16.1
May	448	347	1,141	9.1
June	238	247	1,477	0
July	322	145	348	0
August	303	380	1,413	0
September	458	470	2,081	21.0
October	268	653	2,024	8.4
November	226	966	3,784	0
December	195	1,784	8,691	0
Yearly	3,177	9,415	27,430	399

* Partly Estimated

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 1968. 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 resurveys 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 - 1968

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

Month	Current Year 1968 Ø Extreme Elev. Feet		Period 1935-1968 Elevation Feet		
	High	Low	# Average	# Maximum	‡ Minimum
Jan.	232.3	232.6	239.18	232.05	249.3
Feb.	231.9	232.3	238.86	231.79	248.8
Mar.	231.7	232.0	238.60	231.57	248.6
Apr.	231.7	231.8	238.40	231.39	248.7
May	231.7	231.9	238.40	231.54	248.5
June	231.9	232.1	238.57	231.71	248.8
July	232.0	232.2	238.73	231.92	249.1
Aug.	232.2	232.5	238.93	232.17	249.4
Sept.	232.5	232.7	239.12	232.49	249.4
Oct.	232.7	232.8	239.19	232.49	249.8
Nov.	232.7	232.7	239.18	232.30	250.0
Dec.	232.6	232.8	239.01	232.23	249.6
Yearly	231.7	232.8	238.85	232.06	250.0

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

Area and Capacity Table		
Elevation Feet below M. S. L.	Area Acres	Capacity Acre-feet
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

CHEMICAL ANALYSES OF WATER SAMPLES

1968

The tables below are based on five 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 December 1968.

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

Alamo River

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	ECx10^6 @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	1	4.26		4,602	1.14	8.0	60	51	10.43	9.46	30.01	5.29	18.84	25.07	0.06
Feb.															
Mar.	1	4.31		4,684	1.08	7.7	60	49	10.23	9.46	29.58	5.33	19.92	24.65	.07
Apr.															
May	1	3.00		3,390	.9	8.4	57	46	7.98	6.41	19.23	4.49	13.78	15.45	.04
June															
July															
Aug.															
Sept.	1	2.52		2,762	.8	7.6	56	46	6.94	5.67	16.53	4.03	12.01	13.62	.03
Oct.															
Nov.															
Dec.	1	2.20		2,400	.72	7.7	56	41	6.19	4.77	13.92	3.88	11.07	10.43	.03
Total	5														

New River

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	ECx10^6 @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	1	5.91		6,892	1.55	7.4	71	75	11.53	8.72	48.94	4.36	13.43	52.11	0.27
Feb.															
Mar.	1	7.00		8,183	1.7	7.2	71	76	13.32	10.20	56.90	4.44	15.16	62.66	.19
Apr.															
May	1	7.27		8,810	2.4	7.9	71	75	12.82	11.18	57.85	4.72	16.70	63.45	.10
June															
July															
Aug.															
Sept.	1	5.45		6,293	1.6	7.1	69	69	10.98	8.63	43.50	4.03	15.80	44.55	.09
Oct.															
Nov.															
Dec.	1	6.46		7,380	1.7	8.2	71	75	11.23	8.30	54.55	6.16	13.31	57.11	.02
Total	5														

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

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1968

The following tables show electrical conductivity expressed in mhos per centimeter cube x 10^6 at 25°C of individual water samples from the New River in Mexico at the international boundary and from the wasteway canal at the Potable Water Plant in Mexicali, Baja California. Samples from the New River and from the Potable Water Plant 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.

Mexicali Potable Water Plant to New River

January		February		April		May		July		August		September		November	
13	1,900	22	2,200	1	1,800	20	2,000	1	2,100	16	1,750	26	1,850	9	1,850
19	2,000	March		10	1,700	28	2,300	11	1,350	23	1,900	October		16	1,800
27	1,900	1	2,200	23	1,800	June		19	1,850	29	1,900	4	1,700	23	1,900
31	2,300	5	2,000	May		7	2,250	26	1,900	September		11	1,850	29	1,900
February		16	2,100	3	1,800	13	1,900	31	1,900	4	2,150	19	1,800	December	
10	2,000	19	2,150	7	1,950	18	2,100	August		13	2,100	25	1,850	7	2,000
17	2,100	27	1,750	13	1,850	28	1,950	8	1,850	21	1,700			16	2,000
														24	2,200

New River at International Boundary

January		February		March		May		June		August		September		November	
6	6,600	17	8,500	27	7,000	13	8,250	28	7,600	8	8,500	26	6,500	16	6,250
13	6,600	22	7,500	April		20	7,500	July		16	7,500	October		23	7,250
19	7,000	March		1	7,500	28	8,200	2	8,400	23	7,400	4	6,500	29	7,500
27	7,500	1	8,250	10	9,250	June		11	9,000	September		11	6,600	December	
31	8,000	5	7,500	23	8,000	7	9,500	19	9,000	4	7,600	19	6,500	7	7,500
February		16	7,500	May		13	8,600	26	9,000	13	6,500	25	6,250	16	7,000
10	7,500	19	7,500	3	7,250	18	8,500	31	9,000	21	6,600	November		24	7,500
				7	8,000							9	6,250		


UNITED STATES
CALIFORNIA
San Diego
PACIFIC OCEAN
Chula Vista
Nestor
San Ysidro
Tijuana
Dulzura Conduit
SAVAGE DAM
Marron Valley
BARRETT DAM
MORENA DAM
Pine Valley Creek
Sowday Ranch
Tijuana River
Rio Alamar
Potrero
Tecate
Tecate Creek
Campo
Campo Creek
Jacumba
Arroyo Matanuca
Arroyo Floride
RODRIGUEZ DAM
Rio de las Palmas
Valle de las Palmas
Arroyo Seco
La Rumorosa
Arroyo de la Cienaga
Arroyo de los Calabozos
El Pinal
San Juan de Dios
MEXICO
BAJA CALIFORNIA
STREAM GAGING STATION
RESERVOIR GAGE
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
WESTERN INTERNATIONAL BOUNDARY
TIJUANA RIVER DRAINAGE BASIN
0 10 20 30 MILES
0 10 20 30 40 KILOMETERS

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. Records available: April 1911 through 1968.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1968 computed on basis of area-capacity curves determined from 1948 resurvey. 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 1968	Period 1937-1968		
		Average	Maximum	Minimum
January	33.4	478	3,520	4.8
February	33.7	1,145	16,700	8
March	52.1	1,767	13,220	19.3
April	32.2	1,139	11,490	3.3
May	24.7	401	3,550	0
June	2.1	207	1,660	0
July	7.9	147	1,010	0
August	7.3	105	1,260	0
September	2.0	72.9	1,070	0
October	3.0	85.2	1,270	0
November	9.6	157	1,380	0
December	34.9	518	3,590	4.4
Yearly	243	6,222	39,439	121

Note: For months when inflow to the reservoir was small and other quantities were large, discordant figures of inflow may appear. This arises primarily from the difficulty of computing inflow as the residual of several larger quantities, which are not susceptible to measurement with a precision necessary to produce a final answer within desirable limits of accuracy.

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. Records available: January 1911 through 1968.

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 1968	Period 1937-1968		
		Average	Maximum	Minimum
January	2.5	136	1,700	1
February	2.3	369	4,260	1.5
March	2.5	255	1,490	1.7
April	2.4	944	12,950	1
May	3.2	257	3,040	1
June	2.5	353	7,360	0
July	1.8	201	2,340	.6
August	1.7	167	1,550	.6
September	1.7	328	5,880	0
October	1.7	98.1	529	0
November	2.4	131	1,260	0
December	2.5	365	5,350	1
Yearly	27.2	3,604	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 1968. 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 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 1968	Period 1937-1968		
		Average	Maximum	Minimum
January	73.7	590	3,430	5.2
February	56.2	1,608	26,790	7.6
March	89.3	2,770	18,860	14.1
April	65.4	1,911	21,630	10.2
May	14.5	578	5,130	0
June	2.8	241	1,730	0
July	3.7	157	1,010	0
August	.2	93.3	579	0
September	0	106	759	0
October	4.2	66.7	645	.1
November	10.1	138	1,200	0
December	15.4	524	3,380	5.5
Yearly	336	8,783	59,387	129

Note: For months when inflow to the reservoir was small and other quantities were large, discordant figures of inflow may appear. This arises primarily from the difficulty of computing inflow as the residual of several larger quantities, which are not susceptible to measurement with a precision necessary to produce a final answer within desirable limits of accuracy.

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 at present location are good. Records available: January 1909 through 1968.

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 discharge, 55 second-feet on March 15, 1954; minimum discharge, no flow for long periods on many occasions.

Mean Daily Discharge in Second Feet 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.6	0	0	0	0	0	0	0	0	0	0	0
2	15.7	0	0	0	0	0	0	0	0	0	0	0
3	17.6	0	0	0	0	0	0	0	0	0	0	0
4	16.7	0	0	0	0	0	0	0	0	0	0	0
5	15.3	0	0	0	0	0	0	0	0	0	0	0
6	13.9	0	0	0	0	0	0	0	0	0	0	0
7	12.6	0	0	0	0	0	0	0	0	0	0	0
8	11.6	0	0	0	0	0	0	0	0	0	0	0
9	10.5	0	0	0	0	0	0	0	0	0	0	0
10	9.5	0	0	0	0	0	0	0	0	0	0	0
11	8.6	0	0	0	0	0	0	0	0	0	0	0
12	7.7	0	0	0	0	0	0	0	0	0	0	0
13	6.5	0	0	0	0	0	0	0	0	0	0	0
14	5.5	0	0	0	0	0	0	0	0	0	0	0
15	3.4	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	8.2	0	0	0	0	0	0	0	0	0
21	0	0	11.1	0	0	0	0	0	0	0	0	0
22	0	0	10.3	0	0	0	0	0	0	0	0	0
23	0	0	10.0	0	0	0	0	0	0	0	0	0
24	0	0	11.0	0	0	0	0	0	0	0	0	0
25	0	0	9.5	0	0	0	0	0	0	0	0	0
26	0	0	6.9	0	0	0	0	0	0	0	0	0
27	0	0	5.3	0	0	0	0	0	0	0	0	0
28	0	0	4.2	0	0	0	0	0	0	0	0	0
29	0	0	3.7	0	0	0	0	0	0	0	0	0
30	0		2.6	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	168.7	0	82.8	0	0	0	0	0	0	0	0	0

Month	Current Year 1968								Period 1937-1968		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			3	17.6	† 16	0	5.4	335	444	2,350	0
Feb.				0		0	0	0	446	2,130	0
Mar.			21	11.1	† 1	0	2.7	164	586	2,330	0
Apr.				0		0	0	0	856	2,860	0
May				0		0	0	0	970	3,040	0
June				0		0	0	0	994	2,920	0
July				0		0	0	0	828	2,920	0
Aug				0		0	0	0	745	2,820	0
Sept.				0		0	0	0	517	2,320	0
Oct.				0		0	0	0	395	2,450	0
Nov.				0		0	0	0	545	2,760	0
Dec.				0		0	0	0	504	2,305	0
Yearly				17.6		0	0.7	499	7,830	27,170	0

† And other days Ø Mean daily

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 1968. 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, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1968	Period 1937 - 1968		
		Average	Maximum	Minimum
January	0.1	18.8	590	0
February	.1	32.1	990	0
March	.1	865	13,390	0
April	.1	1,270	33,400	0
May	0	288	7,520	0
June	0	40.4	890	0
July	0	2.2	21	0
August	0	2.0	21	0
September	0	1.6	21	0
October	0	1.4	21	0
November	0	1.0	15	0
December	0	1.7	21	0
Yearly	0.4	2,524	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 1968.

REMARKS: Flow is largely controlled by Barrett and Morena Reservoirs, 10 and 18 miles, respectively, upstream from this station. During 1968 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	0.20	0.10	0.10	0	0	0	0	0	0	0	0
2	1.3	.10	.10	2.0	0	0	0	0	0	0	0	0
3	1.1	.10	.10	1.0	0	0	0	0	0	0	0	0
4	.70	.10	0	.30	0	0	0	0	0	0	0	0
5	.60	.10	0	.20	0	0	0	0	0	0	0	0
6	.50	.10	0	.20	0	0	0	0	0	0	0	0
7	.40	.10	.10	.10	0	0	0	0	0	0	0	0
8	.30	.10	16	.10	0	0	0	0	0	0	0	0
9	.30	.10	8.3	0	0	0	0	0	0	0	0	0
10	.30	.20	2.8	0	0	0	0	0	0	0	0	0
11	.30	.20	1.7	0	0	0	0	0	0	0	0	0
12	.30	.20	1.1	0	0	0	0	0	0	0	0	0
13	.20	.60	.80	0	0	0	0	0	0	0	0	0
14	.20	.70	.80	0	0	0	0	0	0	0	0	0
15	.20	.20	.70	0	0	0	0	0	0	0	0	0
16	.20	.20	.60	0	0	0	0	0	0	0	0	0
17	.20	.20	.60	.10	0	0	0	0	0	0	0	0
18	.10	.20	.70	.20	0	0	0	0	0	0	0	0
19	.10	.20	1.2	.10	0	0	0	0	0	0	0	0
20	.10	.20	.50	.10	0	0	0	0	0	0	0	0
21	.10	.20	.30	.10	0	0	0	0	0	0	0	0
22	.10	.20	.30	.10	0	0	0	0	0	0	0	0
23	.10	.20	.20	0	0	0	0	0	0	0	0	0
24	.10	.10	.20	0	0	0	0	0	0	0	0	0
25	.10	.10	.20	0	0	0	0	0	0	0	0	0
26	.10	.10	.20	0	0	0	0	0	0	0	0	0
27	.20	.10	.20	0	0	0	0	0	0	0	0	0
28	.30	.20	.10	0	0	0	0	0	0	0	0	0
29	.20	.10	.10	0	0	0	0	0	0	0	0	0
30	.20		.10	0	0	0	0	0	0	0	0	0
31	.20		.10		0		0	0		0		0
Sum	10.60	5.40	38.20	4.70	0	0	0	0	0	0	0	0

Month	Current Year 1968								Period 1937-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Ø Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			1	Ø 1.5	†18	0.10	0.34	21.0	206	1,190	0
Feb.			14	Ø .70	† 2	.10	.19	10.7	625	9,940	0
Mar.	3.10		8	117	† 4	0	1.23	75.8	1,808	20,880	0
Apr.			2	Ø 2.0	† 9	0	.16	9.3	1,756	40,240	0
May				0		0	0	0	408	10,040	0
June				0		0	0	0	78.5	1,590	0
July				0		0	0	0	8.8	206	0
Aug				0		0	0	0	.5	7.7	0
Sept.				0		0	0	0	2.4	72	0
Oct.				0		0	0	0	4.6	101	0
Nov.				0		0	0	0	24.9	440	0
Dec.				0		0	0	0	158	1,316	0
Yearly				117		0	0.16	117	5,081	66,700	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 1968.

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. There has been no flow since May 14, 1967.

EXTREMES: 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 1968 — 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
31	0		0		0		0	0		0		0
Sum	0	0	0	0	0	0	0	0	0	0	0	0

Month	Current Year 1968								Period 1937-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.								0	146	906	0
Feb.								0	258	1,730	0
Mar.								0	368	2,360	0
Apr.								0	258	3,250	0
May								0	118	1,540	0
June								0	46.0	719	0
July								0	18.5	361	0
Aug								0	13.4	321	0
Sept.								0	12.7	264	0
Oct.								0	22.8	543	0
Nov.								0	42.0	542	0
Dec.								0	117	808	0
Yearly								0	1,420	11,141	0

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 Dulzura, 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. 1968 records good. Records available: October 1936 through 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	1.2	0.50	0.90	0.30	0.20	0.10	0.10	0.10	0.20	0.20	0
2	1.4	1.1	.50	4.8	.30	.20	.10	.10	.10	.20	.10	0
3	1.4	1.1	.50	3.6	.30	.20	.10	.10	.10	.20	.20	0
4	1.5	1.0	.50	2.1	.30	.20	.10	.10	.10	.20	.30	.10
5	1.5	.90	.40	1.8	.30	.20	.10	.10	.10	.10	.30	.10
6	1.3	.90	.40	1.7	.20	.20	.10	.10	.10	.10	.20	.10
7	1.2	.90	.40	1.7	.20	.20	.10	.10	.10	.10	.20	.10
8	1.2	1.0	364	1.5	.20	.20	.10	.10	.10	.10	.20	.10
9	1.2	1.1	47	1.2	.20	.20	.10	.10	.10	.20	.10	.10
10	1.2	1.3	9.0	.90	.20	.20	.10	.10	.10	.20	.20	.10
11	1.2	1.4	5.1	.70	.20	.20	.10	.10	.10	.20	.10	.10
12	1.2	1.3	3.6	.60	.20	.20	.10	.10	.10	.20	.10	.10
13	1.1	2.4	3.0	.50	.20	.20	.10	.10	.10	.20	.10	.10
14	1.1	3.8	2.7	.50	.20	.20	.10	.10	.10	.10	.20	.10
15	1.1	2.1	2.2	.50	.20	.20	.10	.10	.10	.10	.20	.10
16	1.0	1.7	2.1	.50	.20	.20	.10	.10	.10	.20	.20	.10
17	1.0	1.3	2.4	.50	.20	.20	.10	.10	.10	.10	.10	.10
18	1.0	1.4	2.4	.60	.20	.20	.10	.10	.10	.10	.10	.10
19	.90	1.3	2.9	.60	.20	.10	.10	.10	.10	.20	.10	.10
20	.90	1.2	2.1	.60	.20	.10	.10	.10	.10	.10	0	.20
21	1.0	1.3	1.7	.50	.20	.10	.10	.10	.10	.10	0	.20
22	.90	1.4	1.2	.50	.20	.10	.10	.10	.10	.10	.10	.20
23	.70	1.2	1.1	.40	.20	.10	.10	.10	.10	.10	.10	.10
24	.60	1.0	1.1	.40	.20	.10	.10	.10	.10	.20	0	.10
25	.80	.80	1.0	.40	.20	.10	.10	.10	.10	.20	0	.10
26	.90	.70	.90	.40	.20	.10	.10	.10	.10	.20	0	.20
27	1.2	.60	.90	.30	.20	.10	.10	.10	.10	.10	0	.10
28	1.4	.80	.90	.30	.20	.10	.10	.10	.10	.10	0	.10
29	1.3	.70	.90	.20	.20	.10	.10	.10	.10	.10	0	.10
30	1.2		.90	.20	.20	.10	.10	.10	.10	.10		.10
31	1.2		.90		.20		.10	.10		.10		
Sum	35.00	36.90	463.20	29.40	6.70	4.80	3.10	3.10	3.00	4.50	3.40	3.20

Month	Current Year 1968							Period 1937-1968		
	Extreme Gage Feet		Extreme Second Feet			Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low			Average	Maximum	Minimum
	High	Low	Day		Day					
Jan.			† 4	Ø 1.5	24	0.60	1.13	69.4	443	2,750	0
Feb.			14	Ø 3.8	27	.60	1.27	73.2	1,134	13,680	0
Mar.	5.83		8	2,130	† 5	.40	14.9	919	2,891	27,140	0
Apr.			2	Ø 4.8	†29	.20	.98	58.3	2,397	51,060	0
May			† 1	Ø .30	† 6	.20	.22	13.3	606	14,110	0
June			† 1	Ø .20	†19	.10	.16	9.5	124	2,630	0
July			† 1	Ø .10	† 1	.10	.10	6.1	19.7	312	0
Aug			† 1	Ø .10	† 1	.10	.10	6.1	7.0	171	0
Sept.			† 1	Ø .10	† 1	.10	.10	6.0	9.8	152	0
Oct.			† 1	Ø .20	† 5	.10	.14	8.9	25.1	705	0
Nov.			† 4	Ø .30	†20	0	.11	6.7	63.6	839	0
Dec.			†20	Ø .20	† 1	0	.10	6.3	388	3,330	0
Yearly				2,130		0	1.63	1,183	8,108	97,900	0

Ø 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 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 1968. 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 1968	Period 1938-1968		
		Average	Maximum	Minimum
January	112	913	6,569	0
February	108	2,425	41,295	5.8
March	105	6,464	68,321	4.2
April	66.9	3,387	77,790	0
May	82.7	424	9,962	0
June	65.3	80.3	891	0
July	55.9	82.7	326	0
August	6.1	54.0	770	0
September	3.4	51.0	466	0
October	32.1	65.4	344	0
November	21.5	168	1,940	0
December	38.6	1,012	15,686	12.8
Yearly	696	15,126	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 1968.

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 1968, 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 1968	Period 1938 - 1968		
		Average	Maximum	Minimum
January	151	258	782	2.3
February	141	285	1,132	1.9
March	139	346	1,223	0
April	143	496	1,602	0
May	85.9	681	1,676	1.8
June	75.6	789	1,857	1.9
July	47.5	835	1,963	1.9
August	48.2	713	1,859	0
September	55.3	574	1,420	1.9
October	112	496	1,187	1.9
November	66.6	380	1,037	2.3
December	58.4	335	981	0
Yearly	1,123	6,190	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 2 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 1968.

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 1968 — 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	1.3	0	0	0	0	0	0	0	0
3	0	0	0	.1	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	62.2	0	0	0	0	0	0	0	0	0
9	0	0	16.3	0	0	0	0	0	0	0	0	0
10	0	0	19.4	0	0	0	0	0	0	0	0	0
11	0	0	1.8	0	0	0	0	0	0	0	0	0
12	0	0	.5	0	0	0	0	0	0	0	0	0
13	0	* 1.9	.1	0	0	0	0	0	0	0	0	0
14	0	.5	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
31	0		0		0		0	0		0		0
Sum	0	2.4	100.3	1.4	0	0	0	0	0	0	0	0

Month	Current Year 1968								Period 1947-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.				0		0	0	0	446	4,603	0
Feb.	‼46.95	46.15	13	17.0	† 1	0	.1	4.8	163	1,496	0
Mar.	48.55	46.15	8	272	† 1	0	3.2	199	879	13,309	0
Apr.	46.62	46.15	2	3.8	† 1	0	.1	2.8	283	2,926	0
May				0		0	0	0	46.3	312	0
June				0		0	0	0	30.4	309	0
July				0		0	0	0	23.9	239	0
Aug				0		0	0	0	20.8	193	0
Sept.				0		0	0	0	27.0	216	0
Oct.				0		0	0	0	40.0	305	0
Nov.				0		0	0	0	117	1,084	0
Dec.				0		0	0	0	315	2,725	0
Yearly	48.55	46.15		272		0	0.3	207	2,391	19,882	0

‼ Estimated † And other days * Partly estimated

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 1968. (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 Rodríguez 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 1968 — 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	13	0	0	0	0	0	0	0	0	0
9	0	0	7.5	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
31	0		0		0		0			0		0
Sum	0	0	20.5	0	0	0	0	0	0	0	0	0

Month	Current Year 1968								Period 1937-1968		
	Extreme Gage Feet		ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.				0		0	0	0	803	4,070	0
Feb.				0		0	0	0	4,355	66,920	0
Mar.			8	13	† 1	0	.66	40.7	7,712	107,000	0
Apr.				0		0	0	0	6,626	181,900	0
May				0		0	0	0	740	18,340	0
June				0		0	0	0	125	3,060	0
July				0		0	0	0	24.8	523	0
Aug				0		0	0	0	17.7	242	0
Sept.				0		0	0	0	26.0	234	0
Oct.				0		0	0	0	88.6	1,340	0
Nov.				0		0	0	0	150	1,490	0
Dec.				0		0	0	0	812	7,930	0
Yearly				13		0	0.06	40.7	21,480	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)	
	1968	Average 1937-1968	1968	Average 1937-1968	1968	Average 1937-1968	1968	Average 1937-1968
Jan.	1,352	17,376	844	12,186	1,203	35,080	3,399	64,642
Feb.	1,373	18,051	892	13,587	1,111	35,734	3,376	67,372
Mar.	1,383	19,408	806	15,065	1,006	39,040	3,195	73,513
Apr.	1,373	19,386	852	15,692	856	39,029	3,081	74,107
May	1,321	19,216	841	15,015	777	39,012	2,939	73,243
June	1,259	18,688	813	14,273	692	37,842	2,764	70,803
July	1,200	18,195	783	13,477	625	36,604	2,608	68,276
Aug.	1,142	17,739	748	12,699	513	35,486	2,403	65,924
Sept.	1,076	17,169	720	12,389	400	34,535	2,196	64,093
Oct.	1,043	16,922	707	12,004	266	33,732	2,016	62,658
Nov.	1,029	16,803	706	11,607	173	33,185	1,908	61,595
Dec.	1,049	16,858	717	11,919	106	33,555	1,872	62,332
Average	1,217	17,984	786	13,326	644	36,069	2,647	67,379
Maximum	1,383	# 61,670	892	θ 45,920	1,203	109,608	3,399	213,600
Minimum	1,029	10	706	106	106	0	1,872	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 this 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	
	1968	Average 1906-1968	1968	Average 1907-1968	1968	Average 1951-1968	1968	Average 1914-1968
Jan.	0.44	3.77	0.31	3.30	0.26	2.48	0.56	3.36
Feb.	.73	3.84	.69	3.40	.82	1.83	.87	3.73
Mar.	1.88	3.41	2.03	2.90	2.30	2.19	2.61	2.94
Apr.	1.16	1.84	1.42	1.64	.82	1.54	.96	1.89
May	.43	.64	.51	.58	.22	.44	.34	.67
June	.05	.13	.04	.06	0	.04	.06	.09
July	.66	.39	.27	.10	.18	.03	.44	.20
Aug.	.19	.52	0	.19	0	.13	0	.18
Sept.	0	.35	0	.26	0	.22	T	.26
Oct.	.08	.88	.09	.70	.05	.30	.10	.72
Nov.	1.01	1.55	.79	1.32	1.09	1.64	.92	1.46
Dec.	2.07	3.35	2.18	2.96	1.58	2.35	1.92	3.25
Yearly	8.70	20.67	8.33	17.41	7.32	13.19	8.78	18.75

Month	Sawday Ranch, California		Campo, California		Chula Vista, California			
	1968	Average 1950-1968	1968	Average 1900-1968	1968	Average 1930-1968		
Jan.	0.39	2.85	0.58	2.98	0.40	1.81		
Feb.	.70	2.14	.73	3.35	.56	1.74		
Mar.	1.73	2.69	2.19	2.76	3.15	1.48		
Apr.	1.56	1.96	.85	1.53	.46	.91		
May	.41	.46	.28	.55	.02	.24		
June	0	.05	.03	.07	.04	.05		
July	.44	.49	1.88	.55	.16	.02		
Aug.	.64	.81	.06	.49	0	.07		
Sept.	0	.40	0	.33	0	.17		
Oct.	0	.38	.05	.63	.03	.41		
Nov.	.93	1.83	.72	1.36	.21	1.05		
Dec.	2.21	2.44	1.66	2.63	.86	1.78		
Yearly	9.01	16.50	9.03	17.23	5.89	9.73		

In Mexico

Month	La Rumorosa, Baja California		Tecate, Baja California		Tijuana, Baja California		Rodríguez Dam, Baja California	
	1968	Average 1945-1968	1968	Av. 1946-59 & 1961-1968	1968	Av. 1948-59 & 1961-1968	1968	Average 1938-1968
Jan.	0	0.71	0.79	2.17	0.51	1.73	0.24	1.46
Feb.	0	.35	1.26	1.14	.59	1.10	.67	1.22
Mar.	.94	.51	3.58	1.85	2.28	1.18	1.02	1.34
Apr.	0	.39	1.02	1.26	.39	.71	.67	.83
May	T	.08	.20	.31	.08	.24	.08	.12
June	T	.04	.08	.08	.04	.04	T	0
July	2.95	.31	.16	.08	.31	.04	.04	0
Aug.	.04	.67	0	.12	0	.04	T	.08
Sept.	0	.28	0	.12	0	.16	T	.24
Oct.	0	.35	.08	.31	.04	.28	.04	.28
Nov.	0	.31	1.02	1.22	.20	1.06	.39	.87
Dec.	T	.71	1.73	2.13	.79	1.34	.63	1.69
Yearly	3.94	4.69	9.92	11.46	5.24	8.50	3.78	8.03

T Trace

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		Sierra Juárez, Baja California	
	1968	Average 1948-1968	1968	Average 1964-1968	1968	Average 1956-1968	1968	Average 1961-1968
Jan.	0.08	1.54	0.67	1.10	0.39	1.81	0.12	1.14
Feb.	0	.91	.51	1.30	.28	1.73	.08	1.18
Mar.	.35	1.06	1.89	1.65	.94	1.61	.63	1.50
Apr.	.63	.63	1.50	2.83	.79	1.54	.12	1.06
May	0	.12	.31	.16	.16	.28	0	.16
June	0	0	0	0	0	.24	0	.04
July	0	.04	2.64	1.26	3.78	1.06	1.69	.63
Aug.	0	.04	0	.87	.08	.67	.20	.91
Sept.	0	.16	0	.67	0	.47	.08	.67
Oct.	0	.16	0	.12	0	.55	.20	.51
Nov.	0	.75	.59	2.13	.79	1.38	.16	1.38
Dec.	.87	1.02	2.60	4.76	1.89	2.05	.47	1.73
Yearly	1.93	6.69	10.71	17.56	9.09	15.67	3.74	10.43

LOCATION OF RAINFALL STATIONS

In United States

NAME OF STATION	LATITUDE	LONGITUDE	ð 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	LATITUDE	LONGITUDE	ð ELEV. (FT.)	RECORD BEGAN	OBSERVER
El Pinal, Baja California	ᵘ 32° 12'	ᵘ 116° 17'	ᵘ 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'	ᵘ 3,280	1956	Hydraulic Resources
Sierra Juárez, Baja California	32° 05'	116° 05'	ᵘ 4,265	1961	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

ð Elevation above mean sea level ᵘ 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 four 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 81 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 1968, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

2. Chula Vista: September 1918 through 1968, 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 1968, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

5. All stations in Mexico: U. S. Weather Bureau 4-foot diameter pan.

In United States

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Chula Vista, California	
	1968	Average 1916-68	1968	Average 1921-68	1968	Average 1951-68	1968	Average 1919-68
Jan.	1.74	2.28	1.79	1.88	2.67	2.75	3.20	2.82
Feb.	1.88	2.34	2.08	2.24	2.30	3.22	2.82	3.33
Mar.	3.43	3.63	3.04	3.60	3.42	3.99	5.35	4.99
Apr.	4.67	4.90	4.74	4.88	5.58	5.44	7.05	5.88
May	6.65	6.92	5.98	7.01	7.08	6.80	7.10	6.89
June	6.70	8.84	7.52	8.58	8.24	8.15	6.68	6.98
July	6.91	10.30	8.16	10.26	8.76	9.75	7.56	7.62
Aug.	7.92	9.62	8.70	9.65	9.07	9.33	# 7.97	7.31
Sept.	6.64	7.79	7.20	7.88	7.98	8.10	6.72	6.09
Oct.	4.36	5.51	4.50	5.58	5.96	6.62	4.90	4.88
Nov.	2.51	3.62	2.85	3.50	4.11	4.45	3.48	3.62
Dec.	1.34	2.59	1.64	2.16	3.32	3.14	3.05	2.75
Total	54.75	68.34	58.20	67.22	68.49	71.74	65.88	63.16

In Mexico

Month	Tecate, Baja California		Tijuana, Baja California		Rodríguez Dam, Baja California		Valle de las Palmas, Baja California	
	1968	Average 1961-68	1968	Av. 1952-59 1961-68	1968	Av. 1939-42 1946-68	1968	Average 1952-68
Jan.	3.86	3.35	3.43	2.87	3.39	3.82	5.51	3.82
Feb.	3.70	3.46	2.83	3.31	2.95	3.90	4.33	3.78
Mar.	4.88	4.13	4.45	4.02	4.76	5.04	6.50	5.28
Apr.	3.90	5.16	4.45	4.69	6.30	5.83	7.40	6.77
May	5.59	6.34	5.51	5.83	7.09	7.36	7.64	7.56
June	5.39	5.98	θ	5.71	7.56	8.03	9.96	9.53
July	4.41	8.62	7.01	6.69	8.31	9.06	7.32	11.06
Aug.	5.00	7.24	7.40	7.01	7.76	8.31	5.47	10.28
Sept.	6.46	6.85	7.01	6.02	6.57	7.09	9.96	8.86
Oct.	6.50	6.61	θ	4.69	5.08	6.02	5.67	6.54
Nov.	4.41	3.70	θ	3.27	3.23	5.04	4.06	4.57
Dec.	3.82	3.62	3.43	2.99	3.35	4.25	θ	4.21
Total	57.91	67.64		55.51	66.34	74.13		81.10

Adjusted to full month θ Record incomplete

TEMPERATURE IN THE TIJUANA 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 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 81 in this bulletin.

In United States

Month	Barrett Dam, California				Chula Vista, California				Campo, California			
	1968			Average 1931-68	1968			Average 1931-68	1968			Average 1951-68
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	47.6	77	22	48.5	53.9	80	36	52.4	46.3	73	19	46.6
Feb.	55.1	84	29	50.4	57.1	73	43	53.7	53.4	84	25	48.0
Mar.	53.4	84	31	53.3	56.7	77	42	55.2	50.9	81	25	49.3
Apr.	55.8	85	30	57.9	58.4	88	42	57.9	53.0	85	22	ð53.5
May	62.3	99	36	62.8	60.0	74	46	60.6	59.2	97	29	58.0
June	67.8	103	43	68.0	62.6	# 70	53	62.9	65.1	100	38	64.4
July	75.3	101	46	76.0	67.3	80	52		73.4	100	42	73.2
Aug.	72.5	100	41	76.1	68.0	80	54		69.8	99	37	73.3
Sept.	70.9	103	41	72.3	68.1	86	52		67.4	100	34	69.0
Oct.	62.2	97	34	64.3	62.4	81	45	62.9	60.2	91	29	61.4
Nov.	55.1	85	27	56.0	58.5	76	38		53.5	83	24	52.7
Dec.	45.4	78	20	50.6	51.2	71	31	54.3	45.4	76	15	
Yearly	60.3	103	20	61.3	60.4	88	31		58.1	100	15	

In Mexico

Month	La Rumorosa, Baja California				Tecate, Baja California				Tijuana, Baja California			
	1968		1946-1968		1968		1946-59 & 1961-68		1968		1948-59 & 1961-68	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	79	19	81	5	77	27	100	21	82	36	91	27
Feb.	77	23	82	10	82	36	100	21	84	43	102	32
Mar.	73	28	88	16	82	36	93	27	86	43	90	34
Apr.	77	28	91	23	84	36	99	32	91	45	97	34
May	90	37	97	28	97	36	100	34	77	46	97	43
June	99	41	113	34	102	36	104	36	79	50	99	41
July	95	54	104	50	102	36	115	36	97	54	120	46
Aug.	93	50	102	46	95	39	113	34	86	55	106	52
Sept.	97	45	104	34	102	36	115	37	95	54	120	46
Oct.	82	41	93	25	95	36	106	34	θ	θ	117	43
Nov.	82	32	88	14	86	36	97	27	86	43	108	32
Dec.	68	21	81	10	79	25	90	23	77	28	99	25
Yearly	99	19	113	5	102	25	115	21	95	28	120	25

Month	Rodríguez Dam, Baja California				Valle de las Palmas, Baja California				El Pinal, Baja California			
	1968		1938-1968		1968		1948-1968		1968		1964-1968	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	82	32	88	27	82	34	88	12	64	34	72	12
Feb.	82	43	91	32	88	34	99	23	72	36	75	21
Mar.	84	37	88	32	88	34	100	28	77	34	77	23
Apr.	84	41	93	36	97	34	104	32	82	28	82	18
May	90	43	99	37	108	36	108	36	81	39	81	27
June	93	48	108	43	118	46	118	43	88	37	91	30
July	100	48	104	50	113	45	120	45	97	45	97	39
Aug.	99	52	104	52	111	48	111	48	90	39	102	39
Sept.	100	50	108	48	115	45	117	43	93	43	102	39
Oct.	100	46	108	43	108	43	108	34	82	36	95	34
Nov.	90	36	99	30	100	36	100	19	72	34	84	28
Dec.	79	30	93	27	64	21	91	21	79	25	79	25
Yearly	100	30	108	27	118	21	120	12	97	25	102	12

Some days missing ð 1956 missing θ Record incomplete

TEMPERATURE IN THE TIJUANA RIVER BASIN IN DEGREES FAHRENHEIT

In Mexico

Month	San Juan de Dios, Baja California											
	1968		1956-1968									
	Max.	Min.	Max.	Min.								
Jan.	72	21	88	7								
Feb.	66	28	84	16								
Mar.	68	23	84	18								
Apr.	72	21	102	19								
May	77	28	91	21								
June	95	36	106	28								
July	93	45	120	36								
Aug.	93	34	106	32								
Sept.	95	41	100	25								
Oct.	100	30	100	19								
Nov.	84	27	99	12								
Dec.	70	25	88	14								
Yearly	100	21	120	7								

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

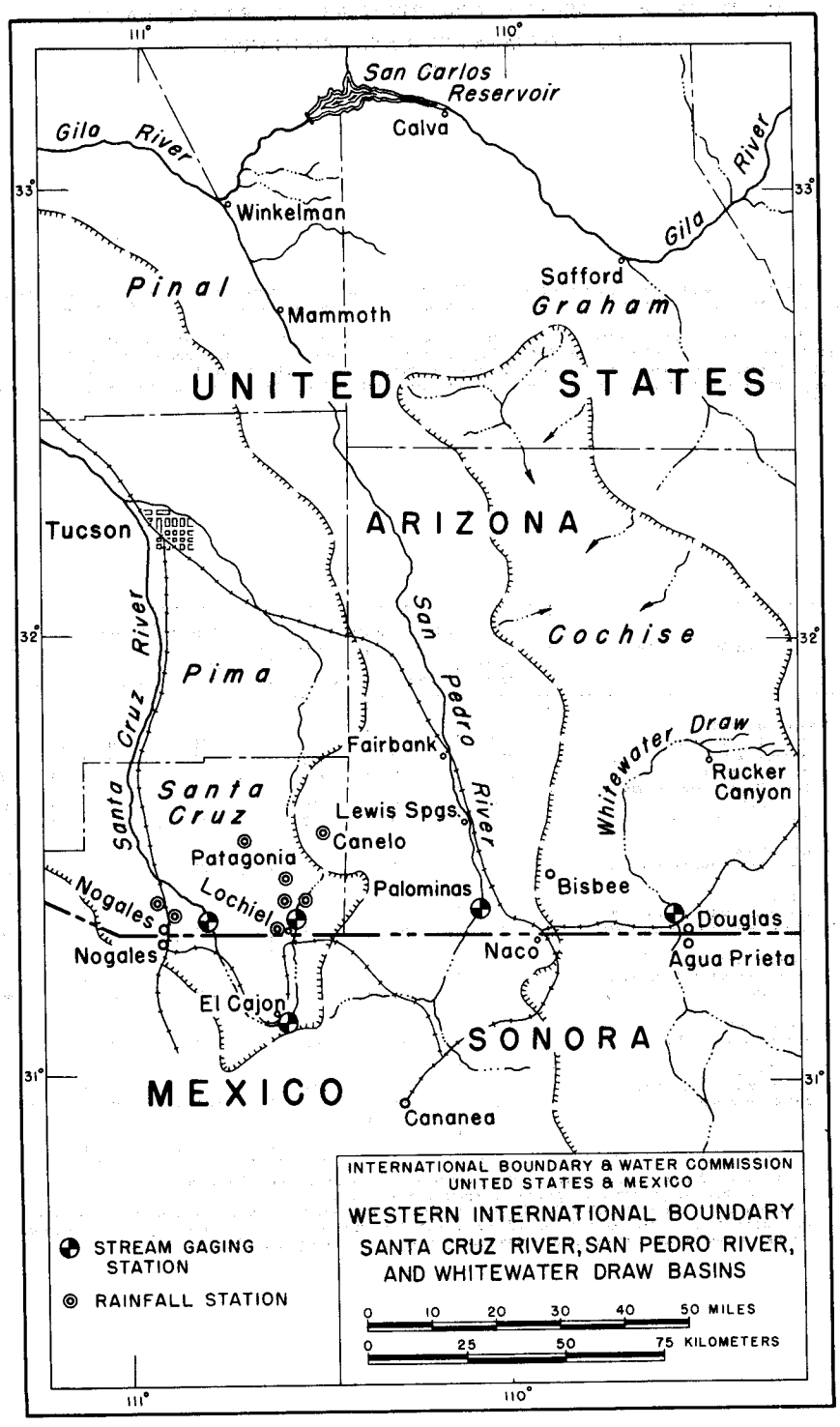
1968

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 1968 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	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) 350	3,350

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 1968 in the Tijuana Irrigation District, Tijuana Valley, Baja California, Mexico, from the Rodríguez Reservoir, but an estimated area of about 350 acres was irrigated by pumping from ground water. Depending upon the availability of water this acreage varies considerably from year to year.


111°
110°
San Carlos Reservoir
Calva
Gila River
Winkelman
33°
Pinal
Mammoth
Safford
Graham
Gila River
UNITED STATES
ARIZONA
Tucson
Santa Cruz River
32°
Pima
Cochise
San Pedro River
Fairbank
Whitewater Draw
Rucker Canyon
Santa Cruz
Lewis Spgs.
Canelo
Patagonia
Santa Cruz
Nogales
Lochiel
Palominas
Bisbee
Douglas
Nogales
Naco
Agua Prieta
El Cajon
SONORA
31°
MEXICO
Cananea
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
WESTERN INTERNATIONAL BOUNDARY
SANTA CRUZ RIVER, SAN PEDRO RIVER,
AND WHITEWATER DRAW BASINS
STREAM GAGING STATION
RAINFALL STATION
0 10 20 30 40 50 MILES
0 25 50 75 KILOMETERS

WHITEWATER 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 1968 (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 14.93 feet July 27, 1959; minimum daily discharge, no flow at times during most years.

Mean Daily Discharge in Second Feet 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.43	0.17	0.21	0.31	0.12	0.01	0	50	415	0.30	0.03	0.06
2	.41	.16	.28	.20	.11	.01	0	100	7.5	.30	.03	.07
3	.31	.17	.24	.20	.12	.01	0	20	5.7	.30	.04	.07
4	.27	.15	.14	.22	.10	0	0	10	3.4	.30	.03	.07
5	.38	.15	.15	.26	.09	0	5.0	5.0	2.3	.25	.04	.07
6	.38	.13	.21	.24	.07	0	20	20	1.8	.11	.04	.07
7	.41	.13	.22	.20	.05	0	3.0	5.0	1.6	.09	.04	.06
8	.37	.14	.31	.22	.05	0	.40	15	1.5	.07	.04	.05
9	.35	.26	.25	.21	.08	0	.20	10	1.4	.07	.04	.06
10	.33	.30	1.7	.20	.09	0	.10	5.0	1.0	.06	.05	.06
11	.32	.24	.37	.23	.08	0	.20	3.0	1.0	.05	.05	.05
12	.32	.29	.29	.32	.06	0	.20	2.0	.80	.05	.05	.04
13	.29	.45	.29	.31	.04	0	.20	5.0	.60	.05	.06	.04
14	.29	.32	.32	.22	.03	0	.20	2.0	3.0	.04	3.8	.04
15	.27	.19	.29	.20	.04	0	.20	1.0	.80	.04	.46	.03
16	.26	.18	.29	.20	.03	0	.20	1.0	.70	.01	.25	.03
17	.26	.15	.28	.18	.02	0	.20	1.0	.60	.02	.11	.03
18	.24	.15	.28	.13	.03	0	.10	1.0	.60	.03	.09	.03
19	.23	.14	.29	.18	.04	0	.10	2.0	.50	.04	.09	.02
20	.23	.17	.26	.17	.03	0	.10	30	.50	.04	.09	.02
21	.21	.17	.25	.16	.03	0	.10	10	.50	.04	.09	.03
22	.20	.16	.27	.19	.01	0	.20	5.0	.50	.03	.09	.02
23	.20	.14	.29	.17	0	0	90	3.8	.50	.03	.08	.01
24	.23	.17	.31	.16	0	0	49	2.5	.40	.03	.08	.01
25	.23	.16	.32	.17	0	0	59	2.1	.40	.03	.08	.01
26	.23	.15	.30	.14	0	0	27	1.1	.30	.04	.07	.03
27	.23	.14	.27	.14	.03	0	15	.72	.30	.03	.07	.04
28	.23	.15	.31	.14	.03	0	10	.57	.30	.03	.07	.01
29	.25	.15	.28	.13	.04	0	5.0	.32	.30	.04	.05	.01
30	.25		.27	.13	.03	0	3.0	.83	.30	.04	.07	.01
31	.23		.25		.01		10	43		.03		.01
Sum	8.84	5.43	9.79	5.93	1.46	0.03	298.70	357.94	454.10	2.59	6.18	1.16

Month	Current Year 1968								Period 1936-1968		
	Extreme Gage Feet		ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			1	0.43	†22	0.20	0.29	17.5	48.6	451	1.0
Feb.			13	.45	† 6	.13	.19	10.8	25.9	132	0
Mar.			10	1.7	4	.14	.32	19.4	28.2	130	0
Apr.			12	.32	†18	.13	.20	11.8	25.8	173	0
May			† 1	.12	†23	0	.047	2.9	18.8	138	0
June			† 1	.01	† 4	0	.001	.1	164	1,590	0
July			23	90	† 1	0	9.64	592	# 2,233	8,110	39
Aug			2	100	29	.32	11.5	710	# 3,454	14,480	.3
Sept.			1	415	†26	.30	15.1	901	# 802	3,170	.8
Oct.			† 1	.30	16	.01	.084	5.1	165	2,210	.4
Nov.			14	3.8	† 1	.03	.21	12.3	47.3	352	.2
Dec.			† 2	.07	†23	.01	.037	2.3	156	2,363	.4
Yearly				415		0	3.73	2,285		22,321	900

ø Mean daily † And other days #1947 Records not available

SEWAGE EFFLUENT, DOUGLAS, ARIZONA AND AGUA PRIETA, SONORA INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Flume in influent line at treatment plant, equipped with stilling well and staff gage, for measuring combined flows of Douglas, Arizona and Agua Prieta, Sonora, and Parshall flume with recording flow meter for measuring flows from the city of Douglas. Flows from Mexico are deduced from total flows and city of Douglas flows. Beginning April 8, 1968, all sewage flows from Agua Prieta, Sonora were diverted to sewage lagoons located in Mexico.

RECORDS: Combined discharges are computed from daily 11:00 a.m. readings of the staff gages by applying an 11:00 a.m. index determined from 7 days of hourly measurements during which the relationship between mean daily readings and 11:00 a.m. readings was developed. Records available: Continuous monthly records since March 1948; daily records March 18, 1948 through December 1950 and January 1952 through 1968.

REMARKS: 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 and is located in the United States adjacent to the international boundary about one mile west of the Douglas-Agua Prieta Port of Entry. The effluent from the plant is treated in oxidation ponds in Mexico.

Month	Total Monthly Flows Millions of Gallons			Mean Daily Flows-Millions of Gallons Per Day					
				Current Year 1968			Period 1952-1968		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	30.538	16.068	46.606	1.618	1.427	1.503	1.618	0.619	1.070
Feb.	28.681	13.613	42.294	1.548	1.358	1.458	1.784	.584	1.071
Mar.	30.988	14.456	45.444	1.583	1.387	1.466	1.598	.590	1.072
Apr.	29.108	3.592	32.700	1.536	.876	1.090	1.536	.619	1.069
May	29.703	0	29.703	1.042	.839	.958	1.595	.619	1.074
June	30.412	0	30.412	1.110	.869	1.014	1.784	.626	1.136
July	31.878	0	31.878	1.098	.932	1.028	3.209	.619	1.196
Aug.	31.746	0	31.746	1.176	.945	1.024	1.985	.619	1.211
Sept.	30.000	0	30.000	1.150	.826	1.000	1.884	.626	1.194
Oct.	29.876	0	29.876	1.010	.920	.964	1.667	.626	1.131
Nov.	27.810	0	27.810	1.008	.824	.927	1.586	.619	1.090
Dec.	29.464	0	29.464	1.050	.860	.950	1.736	.619	1.094
Yearly	360.204	47.729	407.933	1.618	0.824	1.115	3.209	0.584	1.117

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 1968. 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-feet on August 14, 1940 (gage height, 16.16 feet present datum), from rating curve extended above 5,600 second-feet 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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20	20	20	10	1.0	0.50	0	6.1	18	0	0	0.10
2	20	20	20	9.0	1.0	.50	0	11	15	0	0	.10
3	20	15	20	9.0	1.0	.40	0	3.5	11	0	0	.10
4	20	15	20	8.0	1.0	.40	0	4.7	8.2	0	0	.10
5	20	15	20	6.0	1.0	.40	0	5.4	6.1	0	0	.10
6	15	15	20	6.0	.90	.40	0	3.5	4.1	0	0	.10
7	20	15	15	5.0	.90	.40	0	2.8	1.6	0	0	.10
8	20	20	20	6.0	.90	.40	0	2.8	1.6	0	0	.10
9	20	30	20	7.0	.90	.40	0	5.1	.70	0	0	.20
10	20	30	40	7.0	.90	.30	0	4.5	.60	0	0	.20
11	20	40	130	6.0	.80	.30	0	3.5	.50	0	0	.20
12	20	40	130	6.0	.80	.30	0	3.5	.20	0	0	.20
13	20	50	90	6.0	.80	.30	0	3.5	.20	0	0	.20
14	20	40	70	6.0	.80	.30	0	3.5	.40	0	0	.20
15	15	40	50	4.0	.80	.30	0	3.5	.60	0	0	.20
16	15	40	40	4.0	.70	.30	0	3.5	.40	0	0	.20
17	15	40	40	3.0	.70	.30	0	3.5	.30	0	0	.30
18	15	40	30	3.0	.70	.30	0	3.5	.30	0	0	.30
19	15	40	30	3.0	.70	.30	0	3.5	.10	0	0	.30
20	15	30	30	3.0	.70	.30	0	24	0	0	0	.30
21	15	30	20	2.0	.70	.30	1.7	5.4	0	0	0	.30
22	15	30	20	2.0	.60	.30	.10	4.7	0	0	0	.40
23	10	20	20	1.5	.60	.20	.10	4.7	0	0	0	.40
24	15	20	20	1.5	.60	.20	0	4.4	0	0	0	.40
25	15	20	20	1.0	.60	.20	0	4.4	0	0	0	.40
26	15	20	15	1.0	.60	.20	0	4.4	0	0	0	.50
27	15	20	15	1.0	.50	.10	0	4.4	0	0	0	.50
28	15	20	15	1.0	.50	.10	0	4.4	0	0	0	.60
29	15	20	10	1.0	.50	.10	0	4.6	0	0	.10	.60
30	20		10	1.0	.50	.10	66	136	0	0	.10	.60
31	20		10		.50		25	24		0		.70
Sum	535	795	1,030	130.0	23.20	8.90	92.90	306.3	69.90	0	0.20	9.00

Month	Current Year 1968 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	High	Low Day	Low	Average Second Feet	Total Acre Feet	Period 1951-1968 Acre Feet Average	Maximum	Minimum
Jan.			† 1	20	23	10	17.3	1,061	773	7,813	2.6
Feb.			13	50	† 3	15	27.4	1,577	408	1,577	3.0
Mar.			† 11	130	† 29	10	33.2	2,043	331	2,043	36.0
Apr.			1	10	† 25	1.0	4.33	258	96.2	330	5.2
May			† 1	1.0	† 27	.50	.75	46.0	20.8	68.8	0
June			† 1	.50	† 27	.10	.30	17.7	203	1,391	0
July			30	66	† 1	0	3.00	184	6,715	17,238	184
Aug			30	136	† 7	2.8	9.88	608	10,777	36,369	165
Sept.			1	18	† 20	0	2.33	139	1,799	16,344	28.4
Oct.				0		0	0	0	162	1,201	0
Nov.			† 29	.10	† 1	0	.01	.4	139	609	0
Dec.			31	.70	† 1	.10	.3	17.9	1,007	10,959	6.2
Yearly				136		0	8.2	5,952	22,431	55,364	4,400

ϕ 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 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 available: January 1949 through 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.0	2.8	2.4	1.6	1.0	0.64	0.16	0.83	1.3	0.04	0.11	0.32
2	2.5	2.8	2.7	1.6	1.0	.62	.14	2.2	1.3	.03	.13	.32
3	2.8	2.9	2.7	1.6	1.0	.61	.11	1.2	1.2	.05	.16	.32
4	2.9	2.8	2.3	1.6	1.1	.56	.09	1.6	1.2	.10	.20	.35
5	3.1	2.8	2.2	1.6	1.1	.58	.18	1.1	1.1	.17	.20	.36
6	3.0	2.9	2.2	1.6	1.1	.51	.07	1.1	1.0	.18	.25	.33
7	3.4	3.2	2.2	1.6	1.0	.47	.06	1.1	.98	.18	.26	.26
8	3.6	3.3	2.1	1.6	.99	.41	.03	1.1	.98	.14	.24	.22
9	3.3	4.3	2.4	1.6	.96	.40	.01	1.2	.99	.14	.20	.27
10	3.3	4.5	6.2	1.7	.89	.49	0	1.1	1.0	.18	.20	.29
11	3.2	4.0	6.2	2.0	.91	.46	0	1.1	1.0	.19	.24	.27
12	3.0	5.2	2.6	1.8	.88	.37	0	1.1	.96	.18	.25	.30
13	3.0	3.7	2.4	1.8	.93	.46	0	1.1	.97	.16	.22	.19
14	3.0	3.3	2.3	1.7	.77	.46	0	1.1	.97	.15	.31	.17
15	3.2	3.0	2.2	1.7	.73	.27	0	1.1	.81	.18	.26	.18
16	3.0	3.0	2.2	1.7	.72	.31	0	1.1	.78	.20	.27	.22
17	3.0	2.8	2.2	1.6	.71	.39	0	1.1	.77	.18	.29	.26
18	2.9	2.8	2.2	1.4	.70	.33	0	1.1	.70	.16	.23	.29
19	2.8	2.7	2.1	1.5	.73	.17	0	8.1	.71	.19	.24	.31
20	2.8	2.7	2.1	1.5	.75	.08	.05	2.2	.65	.12	.22	.32
21	2.8	2.7	2.0	1.4	.77	.02	22	1.0	.64	.14	.25	.37
22	2.7	2.7	2.0	1.5	.69	.10	1.6	1.0	.56	.16	.25	.34
23	2.7	2.4	2.0	1.4	.68	.29	1.3	.70	.48	.16	.26	.35
24	2.8	2.3	2.0	1.4	.63	.38	.91	.78	.40	.14	.26	.41
25	2.9	2.2	2.0	1.4	.59	.40	1.4	.80	.23	.10	.30	.44
26	3.0	2.3	1.8	1.4	.62	.35	.90	.98	.14	.12	.32	.80
27	3.2	2.3	1.7	1.1	.57	.37	.90	1.1	.13	.16	.32	.57
28	3.0	2.3	1.5	1.0	.57	.29	.83	1.2	.25	.16	.25	.51
29	2.8	2.3	1.4	1.0	.61	.26	.75	1.2	.14	.18	.26	.53
30	2.9		1.4	1.0	.61	.21	.79	1.3	.14	.14	.29	.54
31	2.9		1.6		.63		.79	3.2		.12		.54
Sum	91.5	87.0	73.3	45.4	24.94	11.26	33.07	44.89	22.48	4.50	7.24	10.95

Month	Current Year 1968								Period 1949-1968		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			8	3.6	1	2.0	2.95	181	48.6	226	1.3
Feb.			12	5.2	25	2.2	3.00	173	42.4	261	1.8
Mar.			†10	6.2	†29	1.4	2.36	145	36.7	250	.7
Apr.			11	2.0	†28	1.0	1.51	90.0	21.7	148	0
May			† 4	1.1	†27	.57	.80	49.5	8.2	49.5	0
June			1	.64	21	.02	.38	22.3	2.8	22.3	0
July			21	22	†10	0	1.07	65.6	558	4,270	1.6
Aug			19	8.1	23	.70	1.45	89.0	1,205	10,120	.08
Sept.			† 1	1.3	27	.13	.75	44.6	370	2,634	0
Oct.			16	.20	2	.03	.15	8.9	90.0	448	0
Nov.			†26	.32	1	.11	.24	14.4	40.3	182	0
Dec.			26	.80	14	.17	.35	21.7	75.0	693	0
Yearly				22		0	1.25	905	2,499	12,633	126

Ø 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. & G. 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 1967; February 8 to October 23 and December 13 through 31, 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	θ	θ	10.9	8.5	3.5	1.8	1.4	6.0	2.8	1.4	θ	θ
2			11.3	8.8	3.5	1.8	1.4	6.0	2.5	1.4		
3			10.6	8.8	4.6	2.1	1.8	7.1	3.5	1.4		
4			10.2	8.8	3.5	1.8	2.5	7.8	3.9	1.4		
5			10.2	8.1	4.6	1.8	2.8	7.1	3.5	2.1		
6			10.2	7.4	3.9	2.1	3.2	7.4	3.5	1.8		
7			10.2	6.4	5.3	2.1	2.8	7.4	3.2	1.8		
8		10.6	10.2	6.0	4.6	2.1	2.8	11.7	2.1	2.8		
9		12.0	11.7	4.9	4.2	2.1	2.5	43.8	1.1	3.9		
10		13.1	55.8	4.9	4.2	1.8	2.8	31.8	2.8	4.2		
11		12.4	48.4	6.0	4.2	2.1	2.8	1.4	3.9	4.6		
12		13.4	21.9	8.1	3.9	1.8	3.2	.7	3.2	4.9		
13		13.4	17.0	8.5	3.5	1.8	2.5	1.4	2.8	4.9		5.7
14		12.7	14.1	8.1	3.9	1.8	2.5	4.9	2.1	4.9		4.9
15		12.0	13.4	7.4	4.2	1.8	2.5	7.1	3.9	5.3		4.9
16		11.7	13.1	6.4	3.5	1.8	2.1	6.4	30.4	4.9		4.9
17		10.9	13.1	5.3	4.2	2.8	2.1	6.0	6.0	4.9		4.9
18		10.6	13.1	4.2	4.9	2.8	3.5	5.7	3.5	4.6		4.9
19		10.2	13.1	3.5	4.6	2.1	14.5	5.7	1.1	4.2		4.2
20		9.9	12.7	4.6	4.2	2.5	5.7	10.6	1.1	3.9		4.2
21		10.2	12.7	5.3	3.9	2.1	4.2	10.6	1.4	3.9		4.6
22		9.9	12.7	4.6	3.2	2.1	16.2	8.1	1.1	3.5		4.9
23		9.9	11.7	5.3	3.5	2.1	8.1	7.1	1.1	3.5		5.3
24		9.9	10.9	5.7	3.2	2.8	7.8	7.1	1.1	θ		5.3
25		9.5	10.6	6.0	2.8	3.2	7.8	7.1	1.4			4.9
26		9.5	10.9	3.5	2.1	2.5	8.1	6.7	1.4			5.7
27		8.8	9.9	3.2	2.1	1.8	8.1	6.7	1.4			8.5
28		9.2	9.2	3.5	1.8	1.1	8.1	8.5	1.4			7.8
29		9.5	9.2	4.6	.7	1.1	6.4	8.5	1.4			7.1
30			8.8	3.9	1.4	1.4	7.8	9.5	1.4			6.7
31			8.5		7.8		7.8	36.7				6.4
Sum			446.3	180.3	115.5	61.0	155.8	302.6	100.0			

Month	Current Year 1968								Period #1954-1968		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.									550	1,486	208
Feb.									451	1,598	98.1
Mar.	0.95	0.16	† 10	85.8	30	8.1	14.5	885	404	885	176
Apr.	.20	.07	12	9.5	30	2.8	6.0	358	236	528	74.9
May	.13		3	6.4	29	.7	3.5	218	197	512	101
June	.13		17	6.0	28	1.1	2.1	121	154	486	63.1
July	.75		19	61.1	† 1	1.4	4.9	309	683	1,227	83.5
Aug	1.35	0	9	142	12	0	9.9	600	4,209	32,608	229
Sept.	.89	0	16	77.7	22	0	3.5	199	929	3,000	106
Oct.									404	1,165	78.5
Nov.									392	838	134
Dec.									448	831	186
Yearly									11,565	38,895	2,317

† And other days # Some months and years missing θ Recorder inoperative

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 13 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. 1968 records good. 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 1968.

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 1968.

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 1968 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	59	32	34	28	13	0.70	0.40	9.4	8.9	0.40	0.90	6.1
2	58	32	39	28	12	.60	.40	12	3.8	.60	.90	6.1
3	54	31	36	31	11	.60	.50	13	3.0	.90	.70	5.3
4	54	32	34	26	9.4	.50	10	11	1.8	.60	.70	5.3
5	54	31	34	25	8.9	.50	5.7	12	1.1	.70	.90	6.6
6	50	31	36	25	8.3	.60	.30	12	.50	.60	.90	6.6
7	52	28	36	22	7.7	.60	.10	21	.20	.50	.90	6.1
8	63	28	36	22	7.7	.70	.10	16	.10	.50	.90	6.1
9	58	32	39	20	8.3	.50	.10	232	0	.60	1.1	6.6
10	54	36	647	18	7.1	.70	0	88	0	.60	1.6	6.1
11	50	36	575	22	7.7	.60	.10	63	0	.60	1.6	6.1
12	48	38	266	21	6.6	.30	0	34	0	.60	1.6	5.7
13	46	44	160	29	5.7	.20	0	23	0	.60	1.8	6.1
14	45	52	110	25	5.7	.20	0	17	0	.60	3.4	6.1
15	46	52	88	23	4.9	.40	0	15	41	.60	4.5	6.1
16	42	52	78	22	3.8	.50	0	11	5.7	.60	4.5	6.1
17	42	48	69	21	5.7	.40	0	8.3	.90	.60	4.2	4.2
18	39	44	63	17	4.9	.50	33	6.1	.50	.60	4.2	3.4
19	36	39	59	16	4.5	.60	105	5.7	.30	.60	4.2	3.4
20	36	38	54	16	4.5	.50	.50	25	.20	.60	4.2	3.0
21	34	36	52	15	4.9	.40	3.5	15	.10	.60	4.2	5.3
22	34	33	48	14	4.2	.60	316	9.4	.10	.70	3.8	4.5
23	36	32	48	14	4.2	.60	45	7.1	.10	.60	3.8	4.9
24	34	31	42	14	1.3	.60	14	8.9	.10	.70	3.4	5.7
25	36	29	39	12	1.1	.60	9.1	9.4	0	.70	2.6	6.6
26	38	29	40	15	1.6	.60	10	6.6	0	.70	3.4	8.9
27	40	32	39	15	2.2	.60	10	6.1	0	.70	4.2	13
28	42	31	38	15	1.3	.50	8.9	5.7	0	.70	4.5	10
29	36	31	36	14	.90	.40	12	5.3	0	.70	4.9	7.1
30	34		32	13	.70	.40	12	12	0	.70	5.3	6.6
31	33		28		.70		52	63		.90		7.7
Sum	1,383	1,040	2,935	598	170.50	15.50	648.70	783.0	68.40	19.70	83.80	191.4

Current Year 1968 — **Period 1936-1968**

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			8	63	31	33	44.6	2,743	1,284	16,710	62
Feb.			†14	52	† 7	28	35.9	2,063	924	11,129	59
Mar.			10	647	31	28	94.7	5,821	660	2,692	95
Apr.			3	31	25	12	19.9	1,186	224	1,186	19
May			1	13	†30	.70	5.50	338	71.7	338	2
June			† 1	.70	†13	.20	.52	30.7	74.3	1,020	0
July			22	316	†10	0	20.9	1,287	2,573	15,610	45
Aug			9	232	29	5.3	25.3	1,553	6,327	45,790	91
Sept.			15	41	† 9	0	2.28	136	1,309	7,507	17
Oct.			31	90	1	.40	.64	39.1	335	1,550	1.2
Nov.			30	5.3	† 3	.70	2.79	166	267	1,140	1.2
Dec.			27	13	20	3.0	6.17	380	2,007	28,559	27
Yearly				647		0	21.7	15,743	16,056	57,671	3,499

Ø Mean daily † And other days

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 1968.

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 Millions of Gallons			Mean Daily Flows-Millions of Gallons Per Day					
				Current Year 1968			Period 1952-1968		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	75.501	58.100	133.601	4.700	3.700	4.310	* 4.800	0.650	2.101
Feb.	80.228	52.700	132.928	4.802	4.300	4.584	* 6.130	.650	2.191
Mar.	72.230	52.600	124.830	4.610	3.500	4.027	4.610	.750	2.068
Apr.	69.728	48.000	117.728	4.301	3.700	3.924	4.301	.700	2.026
May	70.412	46.600	117.012	4.000	3.401	3.775	4.000	.550	1.932
June	56.400	45.200	101.600	3.800	2.900	3.390	3.800	.700	1.821
July	55.373	48.500	103.873	3.689	2.841	3.351	3.689	.700	1.851
Aug.	67.592	47.000	114.592	4.928	2.698	3.697	4.928	.750	2.172
Sept.	79.093	45.300	124.393	4.541	3.728	4.146	4.541	.800	2.441
Oct.	46.197	55.783	101.980	3.579	3.050	3.290	3.761	.700	2.301
Nov.	35.527	55.581	91.108	3.162	2.442	3.037	3.510	.800	2.081
Dec.	36.105	58.183	94.288	3.310	2.836	3.042	* 5.200	.350	2.130
Yearly	744.386	613.547	1,357.933	4.928	2.442	3.710	* 6.130	0.350	2.092

* 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, four 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 the United States

Month	Meigs Ranch, Arizona		Jones Ranch, Arizona		Greene Cattle Company, Arizona		Nogales Sanitation Plant 2N, Arizona	
	1968	Average 1952-1968	1968	Average 1952-1968	1968	Average 1953-1968	1968	Average 1953-1968
Jan.	0.82	# 0.89	0.85		0.20	0.84	0.68	1.04
Feb.	1.87	# .47	1.10		1.80	.58	.79	.56
Mar.	2.37	# .92	2.20		1.40	.73	1.26	.77
Apr.	.34	# .25	0	0.22	1.00	.17	.13	.15
May	0	.07	0	.03	.80	.14	0	.06
June	0	.50	0		.20	.50	0	.46
July	2.71	4.81	3.75	5.86	2.40	# 4.31	4.04	4.62
Aug.	4.53	4.77	3.50		1.60	# 3.32	.98	4.16
Sept.	.02	1.50	.80		.30	# 1.22	.05	1.29
Oct.	.10	.73	.40			# .95	.20	.88
Nov.	.35	.51	0			# .46	.28	.56
Dec.	1.05	1.29	1.00	1.37		# 1.06	.98	1.54
Yearly	14.16	# 16.71	13.60			# 14.28	9.39	16.09

Month	Nogales, Arizona		San Rafael Ranch, Arizona		Canelo, Arizona		Patagonia, Arizona	
	1968	Average 1914-1968	1968	# Average 1924-1968	1968	Average 1930-1968	1968	Average 1930-1968
Jan.	0.72	1.08	0.79	0.97	0.96	1.17	0.66	1.24
Feb.	.96	.83	1.43	.95	1.69	1.09	2.00	1.03
Mar.	1.34	.75	1.50	.87	1.69	.76	1.43	.81
Apr.	.15	.30		.39	.55	.38	.39	.34
May	T	.13		.11	0	.12	0	.16
June	T	.48		.76	0	.90	0	.47
July	3.98	4.14		4.59	4.06	4.28	3.29	4.49
Aug.	1.23	3.93		4.11	3.89	4.53	3.31	4.24
Sept.	.09	1.58		1.79	.04	1.68	.14	1.81
Oct.	.15	.72		.83	.12	.87	.23	.80
Nov.	.24	.70		.65	.62	.76	.50	.79
Dec.	1.05	1.34		1.26	1.24	1.47	1.09	1.47
Yearly	9.91	15.98		17.28	14.86	18.01	13.04	17.65

Some months missing T Trace

In Mexico

Month	San Lázaro, Sonora	
	1968	Average 1961 - 68
Jan.	0.75	0.87
Feb.	.31	.59
Mar.	1.93	.71
Apr.	.39	.67
May	0	.12
June	0	.55
July	5.94	4.65
Aug.	3.07	3.39
Sept.	0	1.69
Oct.	.08	.71
Nov.	.47	.59
Dec.	.71	1.85
Yearly	13.65	12.72

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 1968.

In the 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
Greene Cattle Co. (San Rafael, Arizona)	R	31° 22'	110° 35'	4,644	June 1952	I.B. & W.C.
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
San Rafael Ranch, Arizona	S	31° 21'	110° 37'	4,741	1924	San Rafael Cattle Co.

In Mexico

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	OBSERVER
San Lázaro, Sonora	S	31° 18' 54"	110° 38' 48"	4,199	Mar. 1954	I.B. & W. C. Mexican Section

S Standard 8" rain gage R Recording rain gage

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 95 of this bulletin.

In United States

Temperature - Degrees Fahrenheit

Month	Nogales Sanitation Plant - 2N		
	1968		
	Mean	Max.	Min.
Jan.	ò 45.7	73	19
Feb.	51.3	82	22
Mar.	51.0	82	25
Apr.	55.1	85	22
May	64.4	98	33
June	74.7	110	38
July	76.7	102	57
Aug.	73.6	96	46
Sept.	71.1	97	40
Oct.	63.6	92	31
Nov.	51.0	83	17
Dec.	43.9	78	14
Yearly	ò 60.2	110	14

Mean Relative Humidity - Percent

Month	Nogales Sanitation Plant - 2N	
	1968	
	Max.	Min.
Jan.	100	66
Feb.	100	86
Mar.	100	71
Apr.	96	67
May	84	55
June	94	64
July	100	69
Aug.	97	76
Sept.	97	70
Oct.	97	74
Nov.	100	72
Dec.	100	72
Yearly	100	55

Evaporation - Inches

Month	Nogales Sanitation Plant - 2N	
	1968	Average #1953-1968
Jan.	3.08	3.53
Feb.	3.90	4.68
Mar.	Ø 5.03	7.30
Apr.	Ø 7.84	9.86
May	Ø 12.31	12.60
June	Ø 14.11	13.81
July	Ø 10.19	9.83
Aug.	Ø 8.02	7.41
Sept.	Ø 8.84	7.53
Oct.	7.25	6.86
Nov.	3.86	4.31
Dec.	3.05	3.17
Yearly	87.48	90.89

Mean Wind Speed - Miles Per Hour

Month	Nogales Sanitation Plant - 2N	
	1968	Average 1953-1968
Jan.	1.3	2.0
Feb.	1.2	2.3
Mar.	1.6	2.6
Apr.	1.8	2.5
May	2.2	2.4
June	2.3	2.2
July	1.5	1.5
Aug.	1.4	.9
Sept.	1.3	1.0
Oct.	1.8	1.5
Nov.	1.9	1.4
Dec.	1.9	1.7
Yearly	1.7	1.8

In Mexico

Temperature - Degrees Fahrenheit

Month	San Lázaro, Sonora			
	1968		1961-1968	
	Max.	Min.	Max.	Min.
Jan.	72	23	93	14
Feb.	63	30	88	16
Mar.	79	25	99	23
Apr.	79	28	106	28
May	68	36	117	32
June	104	43	124	43
July	99	59	126	52
Aug.	90	52	117	52
Sept.	82	46	115	39
Oct.	91	37	111	34
Nov.	82	23	102	21
Dec.	68	14	95	14
Yearly	104	14	126	14

ò One or more days missing
Some months missing

Evaporation - Inches

Month	San Lázaro, Sonora	
	1968	Average 1961-1968
Jan.	3.03	3.58
Feb.	3.62	4.17
Mar.	5.59	6.97
Apr.	10.67	9.69
May	11.89	12.13
June	13.66	12.52
July	6.81	7.87
Aug.	6.77	7.09
Sept.	8.50	7.17
Oct.	8.07	7.01
Nov.	4.84	4.53
Dec.	3.62	3.43
Total	87.09	86.69

Ø Adjusted to full month

DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS ALONG SANTA CRUZ RIVER AND WHITEWATER DRAW

1968

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
Lochiel Station to Nogales Station	103	348	451	0	2,300	2,300
Above Nogales, Arizona Gaging Station	185	348	533	200	2,300	2,500
Whitewater Draw:						
Above Douglas, Arizona Gaging Station	1,023	0	1,023	31,200	0	31,200