

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

UNITED STATES SECTION

JOHN M. BERNAL
Commissioner
El Paso, Texas

ALTON L. GOFF
Chief
Yuma, Arizona Hydro Office

MEXICAN SECTION

J. ARTURO HERRERA SOLIS
Commissioner
Cd. Juarez, Chihuahua

FRANCISCO A. BERNAL
Area Subdirector
Mexicali, Baja California

WESTERN WATER BULLETIN 1996

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

COLORADO RIVER

TIJUANA RIVER

SANTA CRUZ RIVER

SAN PEDRO RIVER

WHITEWATER DRAW

1996

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FOREWORD

This bulletin is the thirty-seventh annual compilation of stream discharges and other hydrographic data relating to international aspects of the Colorado River below Imperial Dam, the Tijuana River, and other streams crossing the western land boundary of the United States and Mexico. The compilation was prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission, solely for the purpose of presenting statistical data relating to stream flow and kindred subjects for the Colorado River from Imperial Dam to the Gulf of California, the Tijuana River and its important tributaries in the United States and Mexico, and other streams, including the Alamo and New Rivers which cross the California-Baja California boundary, and the Santa Cruz River and Whitewater Draw which cross the Arizona-Sonora boundary. This bulletin contains information for the year 1996.

Stream gaging on the Colorado River below Imperial Dam began in 1902 when the station at Yuma, Arizona was established. Stage records were obtained at this station from January 1878 until December 1973, when it was discontinued. 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 16 kilometers to the mouth of the Gila River, thence westward 18 kilometers to Pilot Knob Mountain, and south 1.6 kilometers 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 35 kilometers 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 145 kilometers 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 28,200 square kilometers along the river from Hoover Dam to the mouth of the Gila River. In addition, flows ranging from usually minor amounts to infrequent torrential floods may enter the lower Colorado River from the Bill Williams River, draining about 1,857 square kilometers below Alamo Dam and Lake, completed in 1963; and from the Gila River, draining about 18,900 square kilometers 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 scheduled deliveries of waters of the Colorado River, which in 1996 amounted to 1,850,234 thousand cubic meters, in accordance with Article 10 of the 1944 Water Treaty. No diversions were made to a substitute canal in 1996.

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, 1.8 kilometers 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, almost all Colorado River waters diverted by Mexico (except emergency deliveries to Tijuana from August 1972 to August 1980) have been diverted to the Alamo Canal at Morelos Dam.

TIJUANA RIVER BASIN

The total drainage area of the Tijuana River basin is 4,483 square kilometers, 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 Rio de las Palmas, which rises in Mexico. Cottonwood Creek crosses the international land boundary 34 kilometers from the Pacific Ocean to join the Rio de las Palmas in Mexico. From the confluence of these tributaries, the Tijuana River flows northwesterly 8 kilometers to cross the land boundary into the United States near San Ysidro, California and Tijuana, Baja California, and then flows westerly 10 kilometers to discharge into the Pacific Ocean 3 kilometers 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 Rio de las Palmas is partially controlled by Rodriguez 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 2,650 square kilometers. 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.

FOREWORD

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 1,919 square kilometers, of which 1,681 square kilometers are in Mexico.

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 returning 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 1,380 square kilometers. Of this amount, 901 square kilometers 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 National Weather Service, Department of Commerce; the Yuma County Water Users' Association; the Imperial Irrigation District; the city of San Diego, California; the Otay Municipal Water District; and the Ministry of Agriculture and Hydraulic Resources of Mexico. Specific notation is made of each of the above named agencies, where the data appear. The courtesy and cooperation of those who have made these contributions are acknowledged with appreciation.

UNITS OF MEASURE

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

METRIC TO ENGLISH CONVERSION CONSTANTS

METRIC UNITS			ENGLISH UNITS	
<u>LENGTH</u>				
1	Millimeter	x	0.03937	= Inch
1	Meter	x	3.28084	= Feet
1	Kilometer	x	0.62137	= Mile
<u>AREA</u>				
1	Square Meter	x	10.76391	= Square Feet
1	Hectare	x	2.47105	= Acre
1	Square Kilometer	x	0.38610	= Square Mile
<u>VOLUME</u>				
1	Cubic Meter	x	35.31467	= Cubic Feet
1,000	Cubic Meters	x	0.81071	= Acre-Feet
<u>WEIGHT</u>				
1	Kilogram	x	2.20462	= Pounds
1	Megagram	x	1.10231	= Tons (2,000 lbs.)
<u>TEMPERATURE</u>				
1	Degree Celsius	x	1.8 + 32	= Degree Fahrenheit

GENERAL HYDROLOGIC CONDITIONS FOR 1996

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 1996. In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation during 1996 measured at 3 index stations was 6 millimeters, compared to an average of 53 millimeters during the last 38 years (1959 to 1996).

The flow of the Colorado River reaching Imperial Dam was 7,481,491 thousand cubic meters, about 75% of the 62-year average (1935-1996) of 9,973,279 thousand cubic meters. At the Northerly International Boundary, the total flow of the river during 1996 was 1,710,798 thousand cubic meters, about 36% of the 1935-1996 average of 4,768,333 thousand cubic meters. At the Southerly International Boundary, there was no flow during 1996. The 1935-1996 average is 3,317,358 thousand cubic meters.

The total of all flows of the Colorado River entering Mexico in 1996 amounted to 1,995,411 thousand cubic meters, 38% of the 1935-1996 average of 5,367,976 thousand cubic meters, 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, 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, 5) in the Wellton-Mohawk Bypass Drain at the southerly land boundary near San Luis, Arizona, and 6) from the 242 Well Field near San Luis, Arizona.

During 1996, other waters arrived at the Mexican points of diversion and amounted to 6,575 thousand cubic meters. These waters consisted mainly of excess waters released from reservoirs on the Colorado River. A maximum instantaneous flow of 95.2 cubic meters per second occurred in the Colorado River at the Northerly International Boundary station on May 1, 1996.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 29,905.7 million cubic meters, 85% of the usable capacity of 35,263.2 million cubic meters. The greater part (27,274.7 million cubic meters) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1996 due to drought or accident to the irrigation system.

The total reported area irrigated from waters of the Colorado River below Imperial Dam in 1996 was 476,447 hectares; 278,447 hectares in the United States and 198,000 hectares in Mexico. An estimated 33% of the total area irrigated in Mexico is served by pumping from ground water.

TIJUANA RIVER BASIN

During 1996, the temperatures at Barrett Dam, California (elevation 533.40 meters) in the upper portion of the basin in the United States averaged 17.8 degrees Celsius, 1.3 degrees above the 66-year mean. In the extreme upper portion of the basin in Mexico at El Pinal, Baja California (elevation 1349.96 meters), the recorded temperatures during the year could not be determined due to incomplete records. At Rodriguez Dam, Baja California (elevation 139.90 meters), the recorded temperatures averaged 21 degrees Celsius, equal to the normal for many years.

At Barrett Dam, in the upper portion of the basin in the United States, the recorded precipitation was 349 millimeters, 77% of normal; and at Lower Otay Dam near the lower end of the basin, 254 millimeters, or 89% of normal. The recorded precipitation at El Pinal in the upper portion of the basin in Mexico could not be determined due to incomplete records. At Rodriguez Dam, in the lower portion of the basin in Mexico, the recorded precipitation was 161 millimeters, 70% of the 58-year average.

Runoff above Barrett and Rodriguez Reservoirs during 1996 was about 10% of normal. Above Morena Reservoir, the runoff was 4,870 thousand cubic meters, or about 37% of the 60-year 1937-1996 mean of 13,255 thousand cubic meters. Above Barrett Reservoir, the runoff was 2,644 thousand cubic meters, or about 15% of the 60-year 1937-1996 mean of 17,249 thousand cubic meters. At Rodriguez Reservoir, the runoff was 2,204 thousand cubic meters, or about 7% of the 59-year mean of 31,479 thousand cubic meters.

The flow of the Tijuana River at the international boundary was 10,358 thousand cubic meters during 1996.

WHITewater DRAW

During 1996, the average annual temperature over the watershed was 2.3 degrees Celsius above normal, while the annual precipitation was 74% of normal. Runoff for the year at the gaging station near Douglas, Arizona, was 2,154 thousand cubic meters, or about 32% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1996

SAN PEDRO RIVER

During 1996, the average annual temperature was 1.6 degree Celsius above normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 79% of the 1961-1996 mean of 528 millimeters. The stream flow at the international boundary was 10,814 thousand cubic meters, 41% of the 1951-1996 average.

SANTA CRUZ

During 1996, the average annual temperature over the watershed was normal, and the annual precipitation was about 62% of the 58-year 1939-1996 mean. Runoff measured at the Nogales gaging station, where the stream re-enters the United States, was 1,727 thousand cubic meters. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States, was 1,795 thousand cubic meters. Therefore, neglecting stream flow depletions in Mexico, the records indicate no contributions from the loop of the river lying in Mexico.

ALAMO AND NEW RIVERS

During 1996, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, was 24.2 degrees Celsius, 1.7 degree above normal; and over the drainage area of the New River as recorded at Mexicali, Baja California, it was 25 degrees Celsius, 3 degrees above the 71-year average.

At El Centro, the precipitation was 7 millimeters, about 10% of the 66-year average; and in Mexicali, the annual precipitation record was 16 millimeters, 19 % of the 71 year average. The total flow of the New River at the international boundary in 1996 was 146,398 thousand cubic meters, which was about 103% of the 1943-1996 average.

SALTON SEA

During 1996, the average annual temperature around the Salton Sea was 1.1 degree Celsius above the long-term average, while the annual precipitation recorded at Brawley, California was approximately 17% of the long-term mean of 70 millimeters. The water surface of the Salton Sea dropped slightly during the year. The maximum stage, 69.100 meters below mean sea level, was recorded on April 27 through May 18, 1996, inclusive. The minimum stage, 69.525 meters below mean sea level, was recorded on October 30 through December 13 and on December 22-26, inclusive.

09-5300.00 RESERVATION MAIN DRAIN NO. 4 (CALIFORNIA DRAIN)

DESCRIPTION: Water-stage recorder (digital) located 152 meters upstream from railroad culvert and 1.6 kilometers 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 61.0 meters downstream from the spillway structure, and thence into the Colorado River on the right bank, 305 meters upstream from Colorado River below Yuma Main Canal Wasteway, and 10.5 kilometers upstream from the northerly international boundary. Prior to October 1955, published as "California Drainage Canal near Yuma, Arizona."

RECORDS: Based on current meter measurements 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 1996.

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 15,789 TCM. Monthly and annual averages since 1937 are shown in the table below.

EXTREMES: Prior to 1937: Maximum annual flow 24,904 TCM, 1916; minimum annual flow 11,003 TCM, 1913.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.90	2.07	2.04	2.24	2.41	2.32	2.24	2.21	1.84	2.24	2.97	2.52
2	1.84	2.18	2.18	2.24	2.38	2.29	2.21	2.15	1.81	2.27	2.89	2.38
3	1.90	1.98	2.24	2.49	2.41	2.29	2.18	2.07	1.70	2.27	2.86	2.41
4	1.90	1.84	2.29	2.58	2.41	2.38	2.18	2.10	1.73	2.29	3.09	2.29
5	1.90	1.81	2.12	2.38	2.41	2.38	2.21	2.04	1.76	2.27	3.06	2.32
6	1.84	1.84	2.10	2.38	2.41	2.35	2.32	2.07	1.73	2.29	3.06	2.24
7	1.90	1.95	2.07	2.46	2.38	2.38	2.18	2.12	1.78	2.29	3.09	2.24
8	2.01	1.95	2.21	2.44	2.41	2.35	2.21	2.12	1.78	2.29	2.97	2.24
9	2.01	1.90	2.15	2.24	2.46	2.38	2.12	2.04	1.76	2.32	3.00	2.15
10	2.15	1.93	2.10	2.32	2.38	2.27	2.21	2.12	1.76	2.32	2.95	2.21
11	2.15	1.98	2.07	2.44	2.35	2.27	2.18	2.21	1.76	2.32	2.89	2.21
12	2.18	1.90	2.12	2.29	2.46	2.38	2.18	2.15	1.73	2.35	2.95	2.21
13	2.18	2.04	2.15	2.27	2.38	2.32	2.21	2.07	1.67	2.35	2.97	2.21
14	2.15	1.93	2.18	2.24	2.41	2.24	2.29	2.04	1.70	2.41	2.92	2.27
15	2.21	1.95	2.18	2.29	2.38	2.32	2.32	2.15	1.67	2.41	2.92	2.21
16	2.21	1.98	2.21	2.29	2.41	2.29	2.15	2.24	1.70	2.35	2.89	2.21
17	2.18	2.04	2.18	2.35	2.41	2.21	2.12	2.75	1.70	2.35	2.83	2.21
18	2.21	2.04	2.12	2.32	2.38	2.21	2.15	2.38	1.67	2.29	2.80	2.18
19	2.12	1.93	2.15	2.29	2.49	2.29	2.15	2.32	1.70	2.41	2.83	2.29
20	1.42	1.90	2.10	2.38	2.52	2.24	2.18	2.18	1.70	2.63	2.80	2.24
21	1.53	2.07	2.12	2.35	2.49	2.27	2.12	2.18	1.70	2.49	2.78	2.15
22	1.64	2.04	2.18	2.38	2.27	2.29	2.15	2.24	1.67	2.35	2.78	2.12
23	1.61	2.04	2.21	2.38	2.41	2.24	2.21	2.24	1.73	2.46	2.75	1.84
24	1.67	2.04	2.32	2.44	2.32	2.21	2.18	2.12	1.73	2.49	2.69	2.04
25	1.78	1.98	2.21	2.44	2.32	2.27	2.10	2.07	1.73	2.46	2.65	2.10
26	1.81	2.01	2.21	2.46	2.35	2.29	2.10	2.07	1.73	2.46	2.61	1.90
27	1.98	1.98	2.27	2.38	2.35	2.24	2.15	2.12	1.70	2.44	2.58	1.93
28	2.01	1.98	2.32	2.35	2.32	2.24	2.12	1.98	1.70	2.46	2.55	1.78
29	2.01	2.04	2.24	2.35	2.21	2.21	2.15	1.98	1.64	2.61	2.55	1.76
30	1.95		2.27	2.35	2.32	2.18	2.18	1.87	1.76	2.61	2.61	1.90
31	1.95		2.24		2.35		2.15	1.84		3.00		1.98
Sum	60.30	57.28	67.55	70.81	73.96	68.60	67.60	66.24	51.74	74.55	85.27	66.74

Current Year 1996

Period 1937-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			15	2.21	20	1.42	1.95	5,210	4,102	5,896	711
Feb.			2	2.18	5	1.81	1.98	4,949	3,805	5,493	456
Mar.			124	2.32	1	2.04	2.18	5,836	4,697	6,617	1,005
April			4	2.58	1	2.24	2.36	6,118	4,704	6,476	940
May			20	2.52	29	2.21	2.39	6,390	4,868	6,895	804
June			4	2.38	30	2.18	2.29	5,927	4,688	6,883	717
July			16	2.32	125	2.10	2.18	5,841	4,974	6,079	662
Aug.			17	2.75	31	1.84	2.14	5,723	4,969	8,400	698
Sept.			1	1.84	29	1.64	1.72	4,470	4,707	7,672	721
Oct.			31	3.00	1	2.24	2.40	6,441	4,937	7,080	843
Nov.			4	3.09	128	2.55	2.84	7,367	4,645	7,367	806
Dec.			1	2.52	29	1.76	2.15	5,766	4,427	6,241	783
Yearly				3.09		1.42	2.21	70,038	55,523	78,573	10,410

φ Mean daily

! And other days

09-5250.00 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, 501 meters upstream from the intake of the Colorado River siphon, and 5.1 kilometers downstream from the Siphon Drop Power Plant. This wasteway discharges into the Colorado River on the California side, 305 meters upstream from Colorado River below Yuma Main Canal Wasteway, and 10.5 kilometers 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. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through 1996.

REMARKS: The wasteway discharges to the river the flow in excess of irrigation water in the Yuma Main Canal.

EXTREMES: Prior to 1935, when storage began in Lake Mead: Average annual flow, 367,333 TCM; maximum annual flow, 1,127,040 TCM, 1932; minimum annual flow, 141,728 TCM, 1917. Since 1935: Maximum mean daily discharge, 57.2 CMS, December 24-25, 1948; minimum mean daily discharge, no flow on numerous occasions.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.0	0.96	1.13	0.74	1.47	0.42	0.54	0.62	17.3	3.37	1.76	7.16
2	14.5	1.44	1.08	.99	.51	.54	.65	.71	10.2	5.04	.57	6.06
3	15.0	3.34	1.36	1.47	.42	.60	.65	.76	16.1	3.77	1.53	5.72
4	14.8	5.30	2.21	.88	.59	.34	.45	.82	15.6	3.85	1.36	5.95
5	15.5	1.95	1.16	.88	.17	.34	.57	.79	11.8	2.86	2.18	6.97
6	14.1	1.08	1.02	.65	.42	.42	.74	.57	15.2	2.97	1.27	6.54
7	13.8	1.27	1.50	.37	.71	.40	.91	.68	12.8	3.60	1.76	6.49
8	15.7	1.05	1.27	.48	.85	.25	.65	.45	13.7	3.57	3.82	5.24
9	16.5	.82	1.30	.96	1.19	.06	.74	1.30	16.6	3.62	4.47	5.52
10	18.7	.88	1.39	1.22	.88	.40	.62	1.53	17.0	4.16	4.62	6.34
11	19.5	.82	1.84	1.42	.45	.31	.88	4.13	17.2	3.99	4.36	6.54
12	20.1	.31	2.10	1.25	.42	.34	.48	1.84	18.7	3.88	4.62	7.33
13	18.7	.96	1.70	1.33	.96	.25	1.02	.48	20.4	3.91	4.98	7.79
14	18.9	1.50	1.36	1.56	.82	.42	1.30	.28	20.3	3.74	5.21	7.76
15	24.8	1.13	1.30	1.10	1.36	.51	.85	.65	20.5	3.37	5.44	7.59
16	25.0	1.42	1.30	1.70	.74	.23	.71	3.26	20.4	1.39	6.32	7.67
17	25.1	1.30	1.08	1.84	.71	.51	.76	17.7	20.8	1.23	6.03	8.01
18	25.6	.65	.54	2.12	.93	.51	.76	14.6	21.0	1.05	6.32	7.70
19	21.6	.28	.57	1.53	1.39	.54	.96	12.0	20.4	2.29	6.49	7.14
20	.85	.85	.85	1.13	1.53	.48	.65	7.05	20.2	2.32	7.39	7.59
21	2.66	.79	1.27	.71	4.22	.62	2.83	13.2	20.8	1.05	7.65	7.50
22	2.63	.88	1.16	.93	1.42	.54	.82	16.3	20.5	1.16	7.56	5.35
23	1.59	.65	1.16	1.47	1.59	.74	1.61	15.6	20.2	1.33	7.99	2.95
24	.82	.93	1.10	2.15	2.35	.62	.74	16.0	20.6	.85	7.79	3.96
25	.96	1.05	1.30	1.73	2.69	.54	2.63	18.4	20.2	1.05	7.53	2.44
26	.71	.93	1.13	1.19	3.26	.40	1.33	19.9	20.5	1.61	7.53	1.90
27	2.04	.48	1.61	.82	2.15	.68	1.08	21.4	20.6	1.59	7.84	1.76
28	3.79	.96	1.73	1.08	2.18	.57	.28	20.7	21.2	1.78	7.56	1.59
29	3.62	1.10	1.02	.88	2.04	.62	.48	20.2	22.1	1.70	8.30	1.13
30	2.01		1.19	.57	2.29	.74	.37	19.9	19.6	2.32	9.86	2.04
31	1.16		.68		2.29		.65	20.1		2.44		3.34
Sum	374.74	35.08	39.41	35.15	43.00	13.74	27.91	271.92	552.5	80.88	160.11	171.07

Current Year 1996							Period 1935-1996				
Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day	φ Low	Average	Total	Average	Maximum	Minimum
Jan.			18	25.6	26	0.71	12.1	32,378	54,666	136,546	550
Feb.			4	3.50	19	.28	1.21	3,031	45,364	109,952	444
Mar.			4	2.21	18	.54	1.27	3,405	44,946	111,248	440
April			24	2.15	7	.37	1.17	3,037	44,837	106,795	402
May			21	4.22	5	.17	1.39	3,715	53,350	108,892	411
June			123	.74	9	.06	.46	1,187	46,914	107,263	422
July			21	2.83	28	.28	.90	2,411	43,799	112,518	455
Aug.			27	21.4	14	.28	8.77	23,494	46,559	110,878	455
Sept.			29	22.1	2	10.2	18.4	47,736	51,514	103,193	440
Oct.			2	5.04	24	.85	2.61	6,988	46,168	111,075	699
Nov.			30	9.86	2	.57	5.34	13,834	46,902	125,198	882
Dec.			17	8.01	29	1.13	5.52	14,780	54,089	134,203	570
Yearly				25.6		0.06	4.93	155,996	579,108	1,286,335	8,226

φ Mean daily ! And other days

09-5211.00 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, 305 meters downstream from the mouth of the Yuma Main Canal Wasteway, 1.0 kilometers downstream from the abandoned gaging station on the Colorado River at Yuma, 8.4 kilometers downstream from the mouth of the Gila River, 31.5 kilometers downstream from Imperial Dam, and 10.3 kilometers upstream from the northerly international boundary. Zero of the gage is 31.09 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements 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 1996. 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, power developments, transmountain diversions, reservoirs on the Gila River, irrigation diversions, and return flows modify the river flow at this station.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30.6	19.3	20.5	17.6	17.0	16.0	16.6	19.1	33.4	15.5	20.1	22.1
2	29.7	18.8	21.8	18.7	16.8	16.3	16.4	18.3	34.3	16.7	18.4	25.3
3	29.7	20.2	22.0	21.9	16.3	16.5	16.2	17.7	32.3	15.6	18.9	21.4
4	29.5	22.3	22.0	23.0	16.1	17.0	16.5	17.8	30.6	15.3	18.7	20.6
5	29.7	19.1	20.7	21.5	16.1	17.7	16.5	17.5	32.6	15.3	18.9	20.8
6	28.9	17.6	20.3	21.3	16.2	17.1	17.0	17.5	30.9	15.4	20.4	20.8
7	28.6	18.0	20.2	21.4	16.2	16.9	17.2	17.1	30.6	16.3	19.9	21.2
8	30.3	17.6	20.2	21.5	16.3	16.6	17.0	17.2	30.6	16.6	19.3	21.0
9	30.6	17.3	20.0	21.0	16.4	16.5	16.3	17.1	31.2	16.4	19.9	20.9
10	32.3	17.2	20.0	22.1	15.6	16.1	16.9	17.9	31.4	17.4	20.1	21.2
11	32.0	17.4	19.9	22.7	15.6	16.2	16.7	21.0	30.9	17.4	20.2	21.5
12	32.3	17.1	19.8	21.8	16.4	16.4	16.8	19.3	31.4	17.6	20.7	21.7
13	32.0	18.4	19.7	21.0	16.1	16.4	17.2	17.4	32.3	17.5	21.1	21.9
14	32.3	18.0	19.6	20.5	15.5	16.3	17.9	17.2	31.7	17.8	21.4	21.9
15	37.1	17.9	19.6	20.3	15.7	16.7	18.3	22.5	32.0	17.9	21.2	22.1
16	36.5	18.1	19.5	20.5	15.7	15.9	17.5	24.0	31.2	15.8	21.8	22.4
17	36.2	18.7	19.4	20.5	16.0	16.0	16.9	35.7	31.2	15.6	21.5	22.5
18	36.0	18.9	19.3	20.1	15.8	16.5	16.9	31.7	31.4	14.8	21.6	22.2
19	34.3	18.1	19.2	19.1	16.3	16.5	17.0	32.9	30.9	16.4	22.0	22.1
20	17.6	17.6	18.9	18.9	16.5	16.3	17.2	32.3	30.9	19.9	21.9	22.4
21	18.9	18.4	18.9	19.0	18.0	16.4	16.8	31.2	31.2	17.3	22.2	22.5
22	18.9	18.2	18.9	19.2	15.6	16.2	16.7	32.6	31.4	15.7	22.3	21.4
23	18.2	18.4	18.8	19.1	15.7	16.5	16.8	33.1	30.6	16.7	22.1	18.8
24	17.0	18.4	18.9	19.4	16.1	16.7	16.8	32.0	31.2	16.3	22.5	20.5
25	17.5	19.1	18.5	18.4	16.4	17.2	16.5	31.4	30.6	15.9	22.2	23.0
26	17.0	19.8	18.4	18.2	16.7	17.1	16.5	31.4	30.9	15.8	22.2	20.5
27	18.7	19.7	18.4	17.6	16.5	16.7	16.9	33.1	31.2	16.3	22.3	19.0
28	21.2	19.8	18.4	18.0	16.4	16.5	17.0	32.0	30.9	16.4	22.2	18.2
29	21.1	20.4	18.0	17.8	15.7	16.9	18.0	31.7	32.3	16.8	22.2	17.6
30	19.2		18.0	17.0	16.0	16.9	17.8	31.7	30.6	17.2	23.6	18.7
31	19.4		17.6		16.3		18.3	32.3		24.0		19.9
Sum	833.3	539.8	605.4	599.1	502.0	497.0	527.1	783.7	942.7	519.6	631.8	656.1

Current Year 1996

Period 1951-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			15	37.1	124	17.0	26.9	71,997	276,742	1,317,479	36,828
Feb.			4	22.3	12	17.1	18.6	46,639	219,695	1,228,424	41,083
Mar.			3	22.0	31	17.6	19.5	52,307	244,993	1,610,496	42,683
April			4	23.0	30	17.0	20.0	51,762	221,671	1,119,312	41,552
May			21	18.0	14	15.5	16.2	43,373	223,620	1,065,554	43,373
June			5	17.7	16	15.9	16.6	42,941	219,491	1,113,679	36,996
July			15	18.3	3	16.2	17.0	45,541	248,832	2,013,773	37,956
Aug.			17	35.7	1	17.1	25.3	67,712	252,770	2,073,958	41,457
Sept.			2	34.3	1	4	31.4	81,449	225,195	1,669,785	53,264
Oct.			31	24.0	18	14.8	16.8	44,893	193,404	1,789,911	43,129
Nov.			30	23.6	2	18.4	21.1	54,588	195,887	1,292,035	42,965
Dec.			2	25.3	29	17.6	21.2	56,687	227,681	1,374,775	40,733
Yearly				37.1		14.8	20.9	659,889	2,749,981	13,065,596	635,707

φ Mean daily

! And other days

09-5211.01 COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY
AT YUMA, ARIZONA - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.800	3.515	3.565	3.625	3.645	3.620	3.595	3.660	3.930	3.545	3.650	3.715
2	3.785	3.505	3.620	3.625	3.645	3.620	3.590	3.640	3.945	3.570	3.620	3.770
3	3.780	3.540	3.635	3.720	3.640	3.625	3.580	3.625	3.910	3.550	3.630	3.700
4	3.775	3.595	3.650	3.745	3.635	3.640	3.585	3.630	3.875	3.540	3.625	3.675
5	3.785	3.515	3.605	3.670	3.635	3.650	3.585	3.625	3.910	3.540	3.630	3.680
6	3.760	3.480	3.590	3.645	3.635	3.635	3.595	3.625	3.875	3.545	3.660	3.675
7	3.760	3.485	3.585	3.640	3.635	3.630	3.600	3.620	3.870	3.565	3.650	3.685
8	3.795	3.480	3.590	3.640	3.635	3.625	3.595	3.620	3.865	3.570	3.635	3.675
9	3.800	3.470	3.585	3.630	3.640	3.620	3.580	3.620	3.870	3.565	3.650	3.675
10	3.835	3.470	3.585	3.660	3.620	3.610	3.595	3.635	3.870	3.590	3.655	3.680
11	3.835	3.475	3.585	3.680	3.620	3.610	3.590	3.705	3.860	3.590	3.655	3.680
12	3.840	3.470	3.585	3.660	3.635	3.615	3.595	3.665	3.870	3.595	3.665	3.690
13	3.830	3.495	3.590	3.640	3.630	3.615	3.605	3.625	3.890	3.590	3.675	3.690
14	3.835	3.485	3.595	3.625	3.620	3.610	3.620	3.620	3.880	3.600	3.680	3.690
15	3.940	3.485	3.600	3.630	3.620	3.620	3.630	3.735	3.885	3.600	3.680	3.690
16	3.925	3.490	3.600	3.640	3.620	3.595	3.610	3.765	3.875	3.555	3.690	3.695
17	3.925	3.500	3.605	3.645	3.625	3.600	3.600	3.995	3.870	3.550	3.680	3.695
18	3.915	3.505	3.605	3.640	3.620	3.610	3.600	3.920	3.880	3.530	3.685	3.690
19	3.875	3.490	3.605	3.620	3.635	3.610	3.605	3.940	3.870	3.565	3.695	3.685
20	3.505	3.480	3.595	3.625	3.635	3.605	3.610	3.925	3.870	3.640	3.695	3.690
21	3.530	3.495	3.605	3.635	3.665	3.605	3.600	3.910	3.875	3.585	3.705	3.690
22	3.530	3.490	3.625	3.640	3.610	3.600	3.595	3.930	3.880	3.555	3.705	3.660
23	3.510	3.495	3.625	3.645	3.615	3.605	3.605	3.940	3.865	3.575	3.705	3.605
24	3.485	3.495	3.635	3.660	3.625	3.605	3.605	3.925	3.875	3.565	3.710	3.640
25	3.495	3.510	3.625	3.640	3.630	3.615	3.595	3.910	3.865	3.555	3.705	3.695
26	3.480	3.535	3.625	3.640	3.635	3.610	3.595	3.910	3.870	3.555	3.705	3.635
27	3.510	3.530	3.630	3.635	3.630	3.605	3.605	3.935	3.875	3.565	3.710	3.605
28	3.565	3.535	3.635	3.650	3.625	3.595	3.610	3.915	3.870	3.570	3.710	3.585
29	3.560	3.555	3.625	3.650	3.610	3.605	3.630	3.910	3.890	3.580	3.710	3.570
30	3.515		3.625	3.640	3.620	3.605	3.625	3.910	3.850	3.585	3.745	3.595
31	3.515		3.620		3.625		3.640	3.915		3.730		3.620
Avg.	3.710	3.500	3.610	3.650	3.630	3.615	3.600	3.785	3.880	3.575	3.675	3.670

09-5302.00 YUMA MESA OUTLET DRAIN
TO COLORADO RIVER NEAR YUMA, ARIZONA

DESCRIPTION: Venturi meter with recorder 0.5 kilometer from outlet to Colorado River, 0.8 kilometer west of Joe Henry Memorial Park in Yuma, Arizona. Outlet is 2.7 kilometers downstream from the mouth of Yuma Main Canal Wasteway.
RECORDS: Records are furnished by U. S. Geological Survey. Records available: July 1970 through 1996. Prior to July 21, 1972, records furnished by U. S. Bureau of Reclamation.
REMARKS: Records show water pumped from wells on the Yuma Mesa and conveyed by underground conduit to Colorado River.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.79	0.79	0.79	0.79	0.99	1.08	1.08	1.08	1.08	1.02	1.08	1.16
2	.79	.79	.79	.79	2.41	2.46	1.08	1.08	1.08	1.02	1.08	1.16
3	.79	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.16
4	.59	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.13
5	.62	.79	.79	1.02	.96	1.08	1.08	1.08	1.08	1.08	1.02	1.16
6	.74	.79	.79	1.16	.96	1.08	1.08	1.08	1.08	1.08	1.22	1.16
7	.74	.79	.79	1.16	.96	1.08	1.08	1.08	1.08	1.02	1.39	1.16
8	.76	.79	.79	1.16	.96	1.08	1.08	1.08	1.08	.99	1.27	1.16
9	.79	.79	.79	1.16	.96	1.08	1.08	1.08	1.08	1.05	1.19	1.10
10	.79	.79	.79	1.16	.96	1.08	1.08	1.08	1.08	1.08	1.19	1.05
11	.79	.79	.79	1.16	.96	1.08	1.08	1.08	1.08	1.08	1.19	.99
12	.79	.79	.79	1.16	.96	1.08	1.08	1.08	1.02	1.08	1.19	.91
13	.79	.79	.79	1.16	.96	1.08	1.08	1.08	1.05	1.08	1.19	.99
14	.76	.79	.79	1.16	.88	.99	1.08	1.08	1.08	1.08	1.19	1.05
15	.71	.79	.79	1.16	.91	1.02	1.08	1.08	1.08	1.02	1.19	1.05
16	.74	.79	.79	1.16	.99	1.08	1.08	1.08	1.08	1.05	1.19	1.05
17	.79	.79	.79	1.02	1.08	1.08	1.08	1.08	1.08	1.08	1.19	1.05
18	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	1.05
19	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	1.02
20	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
21	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
22	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
23	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
24	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
25	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
26	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
27	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
28	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
29	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
30	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
31	.79	.79	.79	.96	1.08	1.08	1.08	1.08	1.08	1.08	1.19	.96
Sum	23.83	22.91	24.49	30.44	32.94	33.63	33.48	33.48	32.31	33.09	35.40	32.08

Current Year 1996

Period 1971-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			1	0.79	4	0.59	0.77	2,059	2,754	7,204	0
Feb.			1	.79	1	.79	.79	1,979	2,630	5,958	0
Mar.			1	.79	1	.79	.79	2,116	3,009	6,698	49.0
April			1	1.16	1	.79	1.01	2,630	2,894	6,315	299
May			2	2.41	14	.88	1.06	2,846	2,829	6,085	0
June			1	2.46	14	.99	1.12	2,906	2,587	5,955	0
July			1	1.08	1	1.08	1.08	2,893	2,837	6,796	613
Aug.			1	1.08	1	1.08	1.08	2,893	2,960	7,401	222
Sept.			1	1.08	1	1.08	1.08	2,792	2,960	7,253	0
Oct.			3	1.08	8	.99	1.07	2,859	2,973	6,611	194
Nov.			7	1.39	5	1.02	1.18	3,059	3,057	6,525	386
Dec.			1	1.16	12	.91	1.03	2,772	3,253	7,364	0
Yearly				2.46		0.59	1.01	31,804	34,743	72,381	2,162

φ Mean daily

! And other days

09-5305.00 DRAIN NO. 8-B (ARAZ DRAIN)

DESCRIPTION: This drain discharges into the Colorado River 6.4 kilometers downstream from Colorado River below Yuma Main Canal Wasteway, and 4.0 kilometers upstream from the northerly international boundary. Prior to October 1955, published as "Araz Drain."

RECORDS: Records are furnished by the U. S. Geological Survey from current meter measurements during the year. Records available: May 1948 through 1996.

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 975 meters upstream, is affected by backwater from the river during ordinary high stages.

EXTREMES: Mean daily discharge: Maximum, 0.76 CMS on November 12, 1992; minimum no flow several days in February 1966.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.23	0.24	0.28	0.37	0.40	0.31	0.27	0.37	0.37	0.40	0.54	0.31
2	.22	.24	.31	.37	.42	.31	.27	.28	.37	.40	.54	.31
3	.25	.23	.31	.34	.42	.31	.27	.28	.37	.37	.54	.31
4	.28	.23	.31	.34	.40	.31	.26	.28	.37	.34	.57	.34
5	.31	.23	.31	.34	.37	.28	.26	.28	.37	.34	.57	.37
6	.31	.24	.34	.31	.37	.25	.26	.28	.34	.37	.48	.34
7	.31	.25	.34	.31	.34	.25	.26	.28	.34	.37	.37	.34
8	.31	.26	.34	.31	.31	.25	.26	.28	.34	.37	.37	.34
9	.31	.27	.34	.28	.31	.26	.26	.28	.31	.37	.37	.34
10	.31	.28	.34	.28	.31	.26	.27	.31	.31	.37	.37	.31
11	.31	.28	.31	.28	.31	.27	.27	.31	.34	.37	.37	.31
12	.31	.31	.31	.28	.31	.27	.27	.31	.34	.37	.37	.31
13	.31	.31	.31	.28	.31	.27	.28	.31	.34	.37	.37	.31
14	.31	.34	.31	.28	.31	.28	.28	.31	.34	.40	.34	.28
15	.28	.31	.31	.28	.31	.28	.28	.31	.34	.40	.34	.28
16	.28	.31	.31	.28	.31	.28	.28	.31	.34	.40	.34	.28
17	.28	.31	.31	.28	.31	.28	.28	.31	.34	.40	.34	.28
18	.28	.31	.31	.28	.31	.28	.31	.31	.34	.40	.34	.28
19	.28	.31	.28	.28	.31	.28	.31	.31	.37	.40	.34	.28
20	.28	.31	.28	.28	.31	.28	.31	.31	.37	.40	.34	.28
21	.28	.31	.28	.28	.31	.28	.31	.31	.37	.40	.34	.27
22	.27	.28	.28	.28	.31	.28	.31	.31	.37	.42	.31	.27
23	.27	.28	.28	.28	.31	.28	.34	.31	.37	.42	.31	.27
24	.27	.28	.28	.31	.31	.28	.34	.34	.37	.42	.31	.27
25	.26	.28	.28	.31	.31	.28	.34	.34	.37	.42	.31	.27
26	.26	.28	.28	.34	.31	.27	.34	.34	.37	.45	.31	.27
27	.25	.28	.31	.34	.31	.27	.34	.34	.40	.45	.31	.27
28	.25	.27	.31	.37	.31	.27	.37	.34	.40	.48	.31	.27
29	.25	.28	.34	.37	.31	.27	.37	.34	.40	.48	.31	.26
30	.24	.24	.34	.40	.31	.27	.37	.34	.40	.51	.31	.26
31	.24		.34		.31		.37	.34		.51		.26
Sum	8.60	8.11	9.58	9.33	10.16	8.31	9.31	9.67	10.77	12.57	11.34	9.14

Month	Current Year 1996							Period 1948-1996			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			15	0.31	2	0.22	0.28	743	461	1,109	48.5
Feb.			14	.34	3	.23	.28	701	395	920	50.0
Mar.			16	.34	1	.28	.31	828	467	1,052	77.3
April			30	.40	9	.28	.31	806	473	1,233	82.4
May			3	.42	8	.31	.33	878	504	1,192	71.9
June			1	.31	6	.25	.28	718	512	1,270	83.1
July			128	.37	14	.26	.30	804	579	1,354	89.8
Aug.			1	.37	12	.28	.31	835	639	1,665	91.0
Sept.			127	.40	9	.31	.36	931	645	1,690	86.1
Oct.			130	.51	4	.34	.41	1,086	703	1,505	68.2
Nov.			14	.57	122	.31	.38	980	654	1,530	71.2
Dec.			5	.37	129	.26	.29	790	554	12,295	52.1
Yearly				0.57		0.22	0.32	10,100	6,586	15,331	955

φ Mean daily | And other days

09-5270.00 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, 33.5 kilometers downstream from the intake at Imperial Dam, 9.7 kilometers west of Yuma, about 1.6 kilometers north of the northerly international boundary and empties into the old Alamo Canal in the United States and thence into the Colorado River through Rockwood gates, about 1.6 kilometers upstream from the northerly international boundary. Water-stage recorder is located in forebay on right bank of the All-American Canal, 168 meters upstream from wasteway gates and 549 meters from the entrance to the power plant. Datum of gage is 45.72 meters above mean sea level. Tailrace gage is on left bank, 207 meters 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 45.07 meters, 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 1996. 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, 281 CMS on October 6, 1985; minimum daily discharge, no flow during long periods.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	42.8	59.2	54.9	49.0	68.8	51.8	37.4	0	0	0	0
2	0	43.9	55.8	53.8	50.7	68.8	49.8	35.4	0	0	0	0
3	0	43.3	54.7	50.7	51.8	63.7	51.0	36.0	0	0	0	0
4	0	39.6	57.8	47.3	52.4	60.6	51.0	36.5	0	0	0	0
5	0	47.0	61.2	51.0	52.4	59.2	51.0	34.0	0	0	0	0
6	0	49.8	61.2	53.8	54.7	59.2	50.1	34.0	0	0	0	0
7	0	50.7	57.5	52.4	53.8	59.8	49.6	34.6	0	0	0	0
8	0	50.1	59.5	53.8	52.1	59.8	47.3	37.7	0	0	0	0
9	0	48.7	61.7	53.8	52.1	59.8	48.4	37.7	0	0	0	0
10	0	48.7	61.5	53.5	53.0	60.3	49.6	37.7	0	0	0	0
11	0	48.7	62.6	50.4	52.4	63.2	49.6	33.1	0	0	0	0
12	0	48.4	62.9	52.4	51.3	62.0	49.6	28.0	0	0	0	0
13	0	49.0	63.2	53.8	54.9	62.6	49.6	28.3	0	0	0	0
14	0	45.6	62.6	53.8	57.2	63.2	49.0	31.2	0	0	0	0
15	0	46.2	62.6	57.8	58.1	63.2	44.7	26.5	0	0	0	0
16	0	49.8	64.6	58.6	58.3	65.1	45.0	22.7	0	0	0	0
17	0	49.3	62.9	56.9	57.8	70.8	45.9	0	0	0	0	0
18	0	49.3	62.6	60.6	57.2	70.8	45.9	0	0	0	0	0
19	0	53.0	61.5	59.2	57.8	70.8	46.7	0	0	0	0	0
20	25.0	53.8	61.2	60.6	64.9	68.8	45.9	0	0	0	0	0
21	23.9	53.2	61.2	60.0	62.9	69.1	45.9	0	0	0	0	0
22	28.3	52.1	60.3	60.9	66.3	72.5	43.0	0	0	0	0	0
23	30.3	51.3	62.0	57.2	66.3	71.9	42.8	0	0	0	0	0
24	31.2	50.7	61.7	56.9	66.8	68.8	42.8	0	0	0	0	0
25	32.9	50.7	62.9	57.8	66.8	68.8	42.8	0	0	0	0	0
26	32.9	52.7	64.0	58.1	66.8	68.0	44.5	0	0	0	0	0
27	32.6	52.7	64.0	59.5	66.8	67.4	44.5	0	0	0	0	0
28	29.5	53.8	63.2	57.8	66.8	66.8	44.5	0	0	0	0	0
29	35.7	54.4	64.9	58.3	66.8	64.0	40.5	0	0	0	0	0
30	38.2		64.9	56.1	70.8	59.8	40.8	0	0	0	0	0
31	38.5		62.3		73.3		40.8	0	0	0	0	0
Sum	379.0	1,429.3	1,908.2	1,671.7	1,832.3	1,957.6	1,444.4	530.8	0	0	0	0

Current Year 1996

Period 1944-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			31	38.5	1	0	12.2	32,746	101,949	643,620	0
Feb.			29	54.4	4	39.6	49.3	123,492	80,636	579,127	0
Mar.			29	64.9	3	54.7	61.6	164,868	142,340	501,939	0
April			22	60.9	4	47.3	55.7	144,435	153,782	447,015	0
May			31	73.3	1	49.0	59.1	158,311	72,965	454,461	0
June			22	72.5	5	59.2	65.3	169,137	115,331	501,523	0
July			1	51.8	29	40.5	46.6	124,796	164,682	512,385	0
Aug.			1	37.7	117	0	17.1	45,861	162,883	498,782	0
Sept.			1	0	1	0	0	0	93,026	591,679	0
Oct.			1	0	1	0	0	0	66,531	617,269	0
Nov.			1	0	1	0	0	0	64,292	609,196	0
Dec.			1	0	1	0	0	0	101,319	700,894	0
Yearly				73.3		0	30.5	963,646	1,319,734	6,000,505	0

φ Mean daily

! And other days

09-5220.00 COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank and cableway at the point where the northerly international land boundary (California-Baja California) intersects the Colorado River, about 10.3 kilometers downstream from Colorado River below Yuma Main Canal Westway, 8.0 kilometers west of Yuma, Arizona, 1.8 kilometers upstream from Morelos Diversion Structure, and about 1.6 kilometers downstream from Rockwood Gate. Zero of the gage is at mean sea level, U. S. C. & G. S. datum. On May 1, 1988, the gage was relocated 52 meters upstream of the old gage on the left bank. Zero of the new gage is at mean sea level, U. S. C. & G. S. datum. Elevation of the new gage is equal to that of the old gage. Station is operated by the United States Section of the Commission.

RECORDS: Based on 178 current meter measurements during the year, 101 by the United States Section, 76 by the Mexican Section of the Commission, 1 by the U. S. Geological Survey, and a continuous record of gage heights. Discharges are computed on the basis of a water-stage recorder 512 meters 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 1996; daily discharge records available January 1, 1950 through 1996.

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 1996 the flow at this point represented the total amount of the Colorado River water which crossed the northerly international boundary.

EXTREMES: Prior to January 1935: Maximum instantaneous discharge estimated about 7,080 CMS, January 22, 1916; minimum discharge, no flow several days during August and September 1934; average annual flow 16,581,806 TCM; maximum annual flow 31,429,325 TCM, 1907; minimum annual flow 1,448,117 TCM, 1934. Since January 1935: Maximum instantaneous discharge 1,150 CMS on August 20, 1983, minimum discharge, no flow during April 1935.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34.4	61.5	78.1	75.6	70.6	86.1	70.4	58.6	38.8	21.9	25.5	27.7
2	33.1	62.0	78.1	73.7	71.7	85.7	67.5	55.5	41.4	21.6	23.3	26.8
3	33.6	62.0	77.0	75.5	72.6	84.3	68.1	54.7	40.1	20.8	23.8	26.9
4	33.2	61.5	80.7	74.1	72.4	81.5	68.5	55.7	37.5	20.3	23.6	25.3
5	34.3	67.9	81.5	73.5	72.7	81.0	68.6	52.8	39.3	20.6	23.8	26.1
6	33.3	68.5	81.2	74.3	74.8	79.6	68.6	52.5	37.3	20.3	25.4	25.9
7	32.4	69.0	76.9	73.3	74.9	79.8	68.1	52.4	37.1	21.3	25.3	26.5
8	33.7	68.8	78.2	74.6	72.9	79.3	65.8	55.9	36.6	21.6	24.6	26.2
9	34.0	67.8	80.2	74.1	72.3	79.0	65.3	55.5	36.6	21.5	25.2	25.9
10	36.3	67.7	80.4	74.5	72.4	78.6	67.1	56.4	36.6	22.2	25.2	26.2
11	36.3	67.7	81.1	72.5	72.3	82.1	66.6	55.8	36.3	22.5	25.6	26.4
12	36.9	66.5	80.7	72.4	72.3	80.1	66.2	50.7	36.4	22.6	26.0	26.8
13	37.2	67.3	81.6	72.8	75.5	81.0	66.9	48.6	37.8	22.7	24.7	27.0
14	37.1	64.8	81.6	72.2	76.7	80.3	67.5	51.0	37.4	23.1	25.3	26.9
15	43.8	64.2	81.3	75.5	77.2	80.7	64.5	49.9	38.2	23.1	25.2	26.7
16	43.7	66.5	82.5	76.3	77.9	82.1	63.5	46.5	37.8	20.8	25.4	27.0
17	43.9	66.7	81.6	76.8	77.6	87.7	63.3	40.7	37.5	20.3	25.7	26.4
18	43.3	66.6	83.1	76.8	75.9	88.5	63.0	38.1	38.0	19.3	25.4	26.6
19	43.5	70.9	82.0	78.5	76.2	88.0	64.2	37.7	37.8	20.0	26.0	26.3
20	43.4	70.9	80.8	79.2	84.6	86.6	64.2	38.8	37.9	24.4	26.3	26.2
21	43.6	71.6	81.0	79.5	84.2	85.8	63.7	37.1	37.7	22.2	26.7	27.1
22	48.8	69.8	80.7	81.1	84.5	88.1	61.6	38.5	38.3	20.1	26.4	26.0
23	50.5	68.5	81.9	77.4	84.3	88.2	61.3	39.3	37.7	21.1	26.9	22.3
24	50.0	67.3	82.4	76.9	84.5	85.2	61.4	38.5	37.9	21.2	27.3	23.7
25	51.1	67.3	82.5	77.8	84.6	85.9	61.1	38.2	37.9	20.4	27.0	28.1
26	50.7	72.0	83.4	77.3	83.7	84.8	61.8	38.0	37.4	20.5	27.0	24.8
27	51.5	70.7	83.4	77.9	83.8	83.5	62.1	39.6	38.2	20.9	26.8	23.0
28	52.2	72.4	82.6	75.9	84.2	82.7	62.4	38.7	38.0	21.2	27.1	22.1
29	55.5	72.8	82.8	79.9	83.3	80.0	59.6	38.8	39.3	21.4	27.2	21.4
30	57.2		82.7	77.5	87.3	76.0	58.8	38.4	39.6	22.2	29.7	22.3
31	57.3		80.8		90.7		59.8	39.0		28.6		23.3
Sum	1,315.8	1,960.3	2,512.8	2,281.2	2,428.6	2,492.2	2,001.7	1,431.9	1,138.4	670.7	773.4	793.9

Month	Current Year 1996							Period 1935-1996			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	32.240	31.765	30	61.2	7	31.8	42.4	113,685	496,213	2,027,841	39,348
Feb.	32.320	32.195	26	75.4	1	57.6	67.6	169,370	420,295	1,705,506	74,502
Mar.	32.375	32.270	18	85.7	1	74.1	81.1	217,106	456,201	1,642,378	23,930
April	32.300	32.145	22	83.1	11	70.2	76.0	197,096	378,821	1,322,616	0
May	32.365	32.050	31	95.2	1	68.5	78.3	209,831	362,532	1,419,735	88,077
June	32.350	32.110	1	94.4	30	75.3	83.1	215,326	362,753	1,629,906	10,485
July	32.115	31.835	1	75.6	30	57.5	64.6	172,947	384,498	2,303,937	30,097
Aug.	31.895	31.510	1	64.6	20	35.6	46.2	123,716	394,051	2,485,718	54,026
Sept.	31.690	31.520	2	46.2	30	32.7	37.9	98,358	342,106	2,286,076	66,424
Oct.	31.525	31.295	31	32.8	19	18.6	21.6	57,948	334,359	2,417,702	52,985
Nov.	31.515	31.370	30	30.7	2	22.6	25.8	66,822	370,478	1,889,976	51,070
Dec.	31.505	31.370	25	29.8	129	21.3	25.6	68,593	466,026	2,259,735	51,806
Yearly	32.375	31.295		95.2		18.6	54.1	1,710,798	4,768,333	19,033,104	890,696

1 And other days

09-5220.01 COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.825	32.245	32.315	32.230	32.085	32.275	32.020	31.825	31.585	31.345	31.425	31.475
2	31.790	32.255	32.315	32.220	32.100	32.265	31.975	31.780	31.630	31.345	31.385	31.460
3	31.790	32.260	32.300	32.225	32.105	32.215	31.980	31.775	31.610	31.335	31.400	31.460
4	31.780	32.255	32.340	32.210	32.115	32.175	31.985	31.800	31.585	31.330	31.395	31.435
5	31.790	32.305	32.345	32.200	32.110	32.165	31.985	31.760	31.605	31.335	31.400	31.445
6	31.775	32.305	32.345	32.215	32.125	32.150	31.985	31.760	31.575	31.330	31.425	31.440
7	31.775	32.315	32.310	32.200	32.125	32.150	31.980	31.765	31.575	31.340	31.425	31.450
8	31.810	32.300	32.325	32.220	32.100	32.150	31.950	31.830	31.565	31.350	31.415	31.445
9	31.815	32.270	32.350	32.210	32.095	32.145	31.945	31.825	31.560	31.350	31.425	31.440
10	31.850	32.275	32.355	32.215	32.095	32.140	31.970	31.840	31.560	31.360	31.425	31.445
11	31.850	32.270	32.360	32.195	32.100	32.180	31.965	31.830	31.565	31.360	31.435	31.450
12	31.860	32.260	32.355	32.195	32.095	32.155	31.960	31.760	31.570	31.360	31.435	31.455
13	31.865	32.270	32.360	32.195	32.130	32.165	31.965	31.725	31.585	31.365	31.430	31.460
14	31.860	32.235	32.355	32.180	32.150	32.155	31.975	31.750	31.590	31.370	31.440	31.460
15	31.960	32.230	32.350	32.220	32.155	32.160	31.935	31.730	31.595	31.375	31.440	31.455
16	31.960	32.260	32.365	32.230	32.165	32.175	31.920	31.680	31.595	31.335	31.445	31.465
17	31.965	32.260	32.350	32.230	32.165	32.245	31.915	31.595	31.580	31.325	31.450	31.450
18	31.955	32.260	32.340	32.250	32.155	32.255	31.915	31.560	31.580	31.305	31.445	31.455
19	31.960	32.285	32.325	32.220	32.155	32.250	31.930	31.550	31.575	31.320	31.460	31.455
20	31.955	32.285	32.310	32.240	32.240	32.235	31.930	31.560	31.575	31.395	31.460	31.455
21	31.950	32.290	32.305	32.240	32.245	32.225	31.925	31.530	31.570	31.360	31.470	31.465
22	32.030	32.265	32.295	32.255	32.245	32.250	31.895	31.555	31.580	31.320	31.465	31.450
23	32.050	32.245	32.320	32.215	32.260	32.250	31.890	31.575	31.570	31.340	31.475	31.395
24	32.040	32.230	32.325	32.205	32.260	32.220	31.885	31.565	31.570	31.345	31.475	31.415
25	32.060	32.240	32.325	32.210	32.250	32.230	31.880	31.560	31.565	31.330	31.470	31.480
26	32.060	32.260	32.335	32.200	32.250	32.215	31.890	31.560	31.560	31.330	31.470	31.430
27	32.070	32.245	32.340	32.205	32.250	32.200	31.895	31.590	31.565	31.340	31.465	31.405
28	32.090	32.260	32.330	32.185	32.245	32.195	31.900	31.590	31.565	31.345	31.470	31.390
29	32.140	32.260	32.330	32.185	32.245	32.165	31.865	31.595	31.580	31.350	31.470	31.375
30	32.185		32.330	32.155	32.285	32.120	31.850	31.590	31.590	31.360	31.505	31.390
31	32.195		32.310		32.310		31.860	31.595		31.460		31.410
Avg.	31.935	32.265	32.335	32.210	32.175	32.195	31.935	31.675	31.580	31.350	31.445	31.440

09-5318.50 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 0.8 kilometer downstream from the northerly international boundary and 1.0 kilometer upstream from Morelos Diversion Dam. Prior to July 14, 1971, the wasteway was located 0.6 kilometer downstream from Morelos Diversion Dam. This wasteway discharges waste water from the Valley Division of the Yuma Project in the United States into the Colorado River. Since July 14, 1971, zero of the gage is 35.86 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge March 1950 through 1996 obtained by the United States Section; monthly discharge, January 1934 through 1950 by the Bureau of Reclamation.

EXTREMES: Prior to March 1950, maximum monthly discharge 1,127 TCM in January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 2.25 CMS on June 19, 1965, at a maximum gage height of 34.785 meters (old datum); minimum instantaneous discharge, zero during parts of most months.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0.05	0	0.07	0.06	0.01	0.01	0.01	0	0.08	0.03	0.06
2	0	.01	0	0	.05	0	.01	.01	0	0	.09	0
3	0	.01	0	.02	0	0	.01	.01	0	.06	.27	0
4	.01	.06	0	.01	.05	.04	.01	.01	0	.13	.08	0
5	0	.01	0	.01	.16	.08	.04	.01	0	.03	.12	0
6	.01	0	0	.08	.01	0	.02	.01	0	.04	0	.13
7	.19	0	0	.05	.01	0	.01	.02	0	.01	0	.53
8	.01	0	0	.02	.02	0	.04	.10	0	.02	.09	.05
9	.11	0	.08	.14	.07	0	.03	.05	0	0	.14	.27
10	.17	.20	.21	.08	.07	0	.01	.02	.08	0	.04	.22
11	.11	.06	.03	.14	.01	0	.03	.02	0	.03	.43	.15
12	.14	.10	.02	.02	.01	0	.01	.06	.02	.04	.83	.12
13	.11	.03	.03	.01	.01	0	.01	.02	.02	.17	.05	.28
14	.16	.05	.15	.01	0	.01	.01	.01	0	.02	.03	.40
15	.03	.04	.01	0	0	0	.01	.01	.04	.09	.07	.19
16	.03	0	0	0	.04	0	0	.01	0	.06	.11	.09
17	.14	.04	.05	0	.01	0	.01	.02	.01	.27	.03	.02
18	.01	.17	0	0	.01	0	.04	.17	0	.02	.09	.23
19	.03	.07	0	0	.03	0	.02	.01	0	.01	.12	.24
20	.06	.11	0	.08	0	0	.01	.01	0	.01	.12	.12
21	.05	.02	.05	.01	0	.03	.16	.06	0	.01	.10	.13
22	.04	.01	.05	.01	.01	0	.02	.08	.01	.01	.11	0
23	.04	.01	.03	.01	.05	.01	.01	.02	.01	.06	.26	.01
24	.01	.05	.05	.21	.32	0	.01	.09	.01	.18	.05	.04
25	.06	.03	.01	.08	.02	0	.01	.01	.01	.24	.11	.01
26	.07	.01	.15	.05	0	.08	.02	.01	.14	0	.12	0
27	.06	0	.29	.09	0	0	.02	.01	.07	.24	.06	0
28	.02	.08	.27	.11	0	0	.02	.01	.01	.12	.09	.20
29	0	0	0	.09	0	0	.01	.01	.01	.17	.06	.15
30	0	0	0	.05	0	0	.01	0	.13	.21	.10	.18
31	.03		.08		.01		.01	0		.11		.07
Sum	1.70	1.22	1.56	1.45	1.03	0.26	0.64	0.89	0.57	2.44	3.80	3.89

Current Year 1996

Period 1935-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.630	0	14	1.21	1	0	0.05	147	184	1,127	0
Feb.	.555	0	18	1.00	1	0	.04	105	165	493	7.4
Mar.	.680	0	24	1.36	1	0	.05	135	175	438	0
April	.700	0	24	1.41	2	0	.05	125	172	524	20.6
May	.455	0	19	.74	2	0	.03	89.0	172	543	39.1
June	.375	0	4	.54	1	0	.01	22.5	154	734	22.5
July	.570	0	21	1.03	16	0	.02	55.3	146	636	0
Aug.	.725	.010	24	1.49	2	0	.03	76.9	120	761	0
Sept.	.595	0	26	1.10	1	0	.02	49.2	127	570	0
Oct.	.660	0	17	1.29	2	0	.08	211	165	604	0
Nov.	.805	0	12	1.74	2	0	.13	328	184	570	11.1
Dec.	.815	0	19	1.77	1	0	.13	336	205	730	16.9
Yearly	0.815	0		1.77		0	0.05	1,680	1,969	5,551	787

! And other days

09-5220.21 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, 1.8 kilometers downstream from the northerly international boundary, and about 12.1 kilometers downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.05 meter below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage height records November 8, 1950 to June 3, 1951; a continuous record of gage heights June 4, 1951 through 1996.

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

EXTREMES: Since November 8, 1950: Maximum mean daily elevation above mean sea level, 34.97 meters on March 5, 1993; minimum mean daily elevation above mean sea level, 30.94 meters on February 17, 1957.

MEAN DAILY GAGE HEIGHT IN METERS 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.120	31.600	31.720	31.650	31.610	31.830	31.640	31.380	31.120	30.880	31.020	30.800
2	31.070	31.620	31.720	31.640	31.610	31.820	31.570	31.300	31.220	30.760	30.840	30.820
3	31.080	31.630	31.700	31.660	31.620	31.780	31.550	31.280	31.210	30.750	30.770	30.770
4	31.060	31.620	31.720	31.630	31.620	31.750	31.550	31.300	31.160	30.730	30.750	30.740
5	31.090	31.660	31.740	31.620	31.630	31.740	31.550	31.260	31.170	30.740	30.740	30.710
6	31.080	31.670	31.730	31.630	31.640	31.710	31.540	31.250	31.110	30.690	30.720	30.700
7	31.100	31.680	31.700	31.620	31.630	31.710	31.540	31.240	31.060	30.750	30.700	30.700
8	31.170	31.680	31.710	31.640	31.620	31.700	31.520	31.300	31.030	30.770	30.670	30.710
9	31.170	31.650	31.740	31.640	31.610	31.690	31.510	31.310	31.040	30.780	30.660	30.720
10	31.200	31.640	31.750	31.640	31.620	31.690	31.530	31.360	31.040	30.840	30.670	30.720
11	31.230	31.640	31.780	31.590	31.630	31.720	31.520	31.380	31.020	30.920	30.720	30.720
12	31.250	31.630	31.780	31.560	31.620	31.700	31.520	31.310	31.030	30.950	30.710	30.730
13	31.280	31.630	31.780	31.560	31.650	31.720	31.520	31.250	31.080	30.950	30.750	30.730
14	31.240	31.610	31.780	31.560	31.670	31.720	31.530	31.250	31.170	30.960	30.740	30.780
15	31.320	31.590	31.780	31.620	31.670	31.730	31.500	31.240	31.200	30.930	30.740	30.860
16	31.330	31.620	31.780	31.660	31.680	31.760	31.470	31.210	31.180	30.870	30.850	30.960
17	31.340	31.620	31.760	31.670	31.670	31.840	31.460	31.120	31.160	30.760	30.880	30.930
18	31.310	31.640	31.750	31.710	31.660	31.870	31.460	31.040	31.150	30.690	30.950	30.950
19	31.310	31.670	31.730	31.690	31.660	31.840	31.470	31.020	31.160	30.650	30.950	30.920
20	31.280	31.690	31.710	31.710	31.740	31.810	31.480	31.050	31.170	30.780	30.940	30.830
21	31.280	31.700	31.700	31.730	31.730	31.790	31.480	31.020	31.130	30.840	30.970	30.830
22	31.370	31.680	31.700	31.760	31.750	31.800	31.460	31.040	31.150	30.890	30.960	30.830
23	31.390	31.660	31.720	31.720	31.750	31.800	31.450	31.100	31.140	30.890	30.960	30.750
24	31.390	31.640	31.730	31.710	31.760	31.780	31.440	31.110	31.140	30.910	30.980	30.720
25	31.410	31.640	31.740	31.720	31.780	31.780	31.430	31.120	31.100	30.890	30.950	30.930
26	31.400	31.660	31.750	31.720	31.790	31.770	31.440	31.130	31.070	30.790	30.890	30.910
27	31.390	31.650	31.760	31.720	31.780	31.760	31.440	31.190	31.060	30.760	30.820	30.830
28	31.400	31.670	31.740	31.700	31.780	31.760	31.440	31.200	31.010	30.760	30.810	30.720
29	31.460	31.660	31.730	31.720	31.770	31.730	31.420	31.170	31.030	30.760	30.760	30.660
30	31.520		31.730	31.690	31.820	31.710	31.390	31.140	31.140	30.770	30.800	30.660
31	31.530		31.720		31.870		31.410	31.110		30.900		30.650
Avg.	31.275	31.645	31.740	31.665	31.690	31.760	31.490	31.200	31.115	30.815	30.820	30.785

09-5220.30 INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 61 meters downstream from the intake at Morelos Dam, 410 meters upstream from the point where it joins the old Alamo Canal, 3.5 kilometers upstream from Matamoros Check, and about 1.6 kilometers south of the northerly international boundary. The zero of the gage is 0.05 meter below mean sea level, U. S. C. & G. S. datum.

RECORDS: The records are deduced from the flows arriving in the limnithope 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 1996. 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. Under conditions set forth in the 1944 Water Treaty, water for use in Mexico may 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. No diversions of this nature have been made during the years 1951 through 1996, and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years. Mexico occasionally pumps water from the Colorado River at other points below Morelos Dam when water is available in the channel.

EXTREMES: Maximum mean daily discharge, 187 CMS, July 12 and 14, 1983; maximum mean daily gage height, 32.96 meters October 30, 1993 and other days. Minimum daily discharge, no flow on various occasions.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	34.4	61.6	78.1	75.7	70.7	86.1	70.4	58.6	38.8	22.0	25.5	27.8	
2	33.1	62.0	77.1	73.7	71.8	85.7	67.5	55.5	41.4	21.6	23.4	26.8	
3	33.6	62.0	78.0	75.5	72.6	84.3	68.1	54.7	40.1	20.9	24.1	26.9	
4	33.2	61.6	80.7	74.1	72.4	81.5	68.5	55.7	37.5	20.4	23.7	25.3	
5	34.3	67.9	81.5	73.5	72.9	81.1	68.6	52.8	39.3	20.6	23.9	26.1	
6	33.3	68.5	81.2	74.4	74.8	79.6	68.6	52.5	37.3	20.3	25.4	26.0	
7	32.6	69.0	76.9	73.4	74.9	79.8	68.1	52.4	37.1	21.3	25.3	27.0	
8	33.7	68.8	78.2	74.6	72.9	79.5	69.8	56.0	36.6	21.6	24.7	26.2	
9	34.1	67.8	80.3	74.2	72.4	79.0	65.3	55.6	36.6	21.5	25.3	26.2	
10	36.5	67.9	80.6	74.6	72.5	78.6	67.1	56.4	36.7	22.2	25.2	26.4	
11	36.4	67.8	81.1	72.6	72.3	82.1	66.6	55.8	36.3	22.5	26.0	26.6	
12	37.0	66.6	80.7	72.4	72.3	80.1	66.2	50.8	36.4	22.6	26.8	26.9	
13	37.3	67.3	81.6	72.8	75.5	81.0	66.9	48.6	37.8	22.9	24.8	27.3	
14	37.3	64.8	81.6	72.2	76.7	80.3	67.5	51.0	37.4	23.1	25.3	27.3	
15	43.8	64.2	81.3	75.5	77.2	80.7	64.5	49.9	38.2	23.2	25.3	26.9	
16	43.7	66.5	82.5	76.3	77.9	82.1	65.5	46.5	37.8	20.9	25.5	27.1	
17	44.0	66.7	81.6	76.8	77.6	87.7	63.3	40.7	37.5	20.6	25.7	26.4	
18	43.3	66.8	83.1	80.6	75.9	88.5	63.2	38.3	38.0	19.3	25.5	26.8	
19	43.5	70.1	82.0	78.5	76.2	88.0	64.2	37.7	37.8	20.0	26.1	26.5	
20	43.5	71.0	80.8	79.3	84.6	86.6	64.2	38.8	37.9	24.4	26.4	26.3	
21	43.7	71.6	81.0	79.5	84.2	85.8	63.9	37.2	37.7	22.2	26.8	27.2	
22	48.8	69.8	80.8	81.1	84.5	88.1	61.6	38.6	38.3	20.1	26.5	26.0	
23	50.5	68.5	81.9	77.4	84.4	88.2	61.3	39.3	37.7	21.2	27.2	22.3	
24	50.0	67.4	82.4	77.1	84.8	85.2	61.4	38.6	37.9	21.4	27.4	23.7	
25	51.2	67.3	82.5	77.9	84.6	85.9	61.1	38.2	37.9	20.6	27.1	28.1	
26	50.8	72.0	83.6	77.4	83.7	84.9	61.8	38.0	37.5	20.5	27.1	24.8	
27	51.6	70.7	83.7	78.0	83.8	83.5	62.1	39.6	38.3	21.1	26.9	23.0	
28	52.2	72.5	82.9	76.0	84.2	82.7	62.4	38.7	38.0	21.3	27.2	22.3	
29	55.5	72.8	82.8	80.0	83.3	80.0	59.6	38.8	39.3	21.6	27.3	21.6	
30	57.2		82.7	77.6	87.3	76.0	58.8	38.4	39.7	22.4	29.8	22.5	
31	57.3		80.9		90.7		59.8	39.0		28.7		23.4	
Sum		1,961.5		2,282.7		2,492.4		1,432.7		1,138.8		673.0	797.7
	1,317.4		2,514.3		2,429.6		2,001.9		1,438.8		777.2		

Current Year 1996							Period 1950-1996					
Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum	
Jan.			31	57.3	7	32.6	42.5	113,823	110,938	275,305	1,192	
Feb.			29	72.8	1	61.6	67.6	169,474	115,639	251,580	11,367	
Mar.			27	83.7	7	76.9	81.1	217,236	232,727	435,370	120,761	
April			22	81.1	14	72.2	76.1	197,225	255,383	404,698	189,700	
May			31	90.7	1	70.7	78.4	209,917	142,754	286,174	81,665	
June			18	88.5	30	76.0	83.1	215,343	196,576	332,588	117,400	
July			1	70.4	30	58.8	64.6	172,964	264,362	439,171	155,105	
Aug.			1	58.6	21	37.2	46.2	123,785	256,412	420,673	113,219	
Sept.			2	41.4	11	36.3	38.0	98,392	156,185	336,960	66,156	
Oct.			31	28.7	18	19.3	21.7	58,147	88,444	280,817	12,894	
Nov.			30	29.8	2	23.4	25.9	67,150	79,695	258,388	9,271	
Dec.			25	28.1	29	21.6	25.7	68,921	112,635	247,899	10,886	
Yearly					90.7		19.3	54.2	1,712,377	2,015,932	3,451,533	1,569,404

☐ Mean daily ! And other days

09-5220.31 INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.080	31.550	31.670	31.610	31.540	31.810	31.600	31.330	31.090	30.820	30.960	30.750
2	31.030	31.570	31.700	31.580	31.580	31.790	31.520	31.260	31.190	30.720	30.790	30.770
3	31.040	31.570	31.680	31.600	31.590	31.750	31.510	31.240	31.180	30.700	30.730	30.690
4	31.030	31.560	31.710	31.580	31.580	31.720	31.510	31.260	31.110	30.680	30.710	30.690
5	31.050	31.600	31.740	31.570	31.590	31.700	31.510	31.220	31.130	30.690	30.710	30.660
6	31.050	31.620	31.740	31.570	31.610	31.660	31.510	31.210	31.060	30.650	30.680	30.650
7	31.070	31.640	31.700	31.570	31.600	31.660	31.500	31.200	31.020	30.710	30.660	30.650
8	31.130	31.630	31.700	31.590	31.590	31.640	31.470	31.260	31.000	30.720	30.630	30.660
9	31.130	31.600	31.720	31.590	31.590	31.630	31.460	31.270	30.990	30.740	30.630	30.660
10	31.160	31.580	31.740	31.590	31.610	31.620	31.480	31.310	31.000	30.800	30.630	30.660
11	31.190	31.580	31.770	31.560	31.620	31.650	31.470	31.330	30.980	30.890	30.680	30.670
12	31.210	31.560	31.760	31.560	31.620	31.640	31.470	31.270	31.000	30.910	30.680	30.670
13	31.230	31.560	31.760	31.560	31.640	31.660	31.470	31.210	31.060	30.920	30.700	30.720
14	31.180	31.540	31.760	31.560	31.650	31.660	31.480	31.220	31.140	30.910	30.710	30.740
15	31.270	31.520	31.750	31.600	31.650	31.670	31.450	31.190	31.160	30.880	30.710	30.800
16	31.300	31.540	31.750	31.640	31.660	31.700	31.440	31.160	31.140	30.820	30.820	30.910
17	31.300	31.550	31.750	31.670	31.660	31.790	31.420	31.070	31.120	30.710	30.840	30.890
18	31.270	31.570	31.710	31.710	31.640	31.830	31.420	30.990	31.120	30.630	30.920	30.910
19	31.270	31.600	31.680	31.680	31.640	31.800	31.430	30.970	31.130	30.590	30.910	30.870
20	31.240	31.620	31.660	31.710	31.710	31.760	31.440	31.020	31.140	30.720	30.910	30.790
21	31.240	31.630	31.650	31.720	31.710	31.730	31.440	30.990	31.090	30.780	30.940	30.800
22	31.320	31.610	31.650	31.750	31.720	31.750	31.420	31.020	31.120	30.820	30.930	30.790
23	31.360	31.600	31.670	31.700	31.720	31.750	31.410	31.070	31.100	30.820	30.930	30.710
24	31.360	31.570	31.690	31.690	31.740	31.720	31.410	31.080	31.100	30.860	30.950	30.680
25	31.390	31.570	31.710	31.700	31.760	31.730	31.390	31.090	31.060	30.840	30.920	30.900
26	31.370	31.600	31.730	31.700	31.770	31.720	31.400	31.100	31.040	30.730	30.850	30.880
27	31.360	31.600	31.730	31.700	31.760	31.710	31.410	31.160	31.020	30.720	30.780	30.790
28	31.380	31.620	31.720	31.680	31.760	31.710	31.410	31.170	30.990	30.710	30.760	30.680
29	31.430	31.610	31.710	31.690	31.750	31.690	31.380	31.150	30.990	30.700	30.710	30.620
30	31.480	31.700	31.700	31.650	31.800	31.670	31.360	31.110	31.090	30.710	30.750	30.610
31	31.490	31.670	31.670	31.670	31.850	31.850	31.370	31.080	31.080	30.860	30.710	30.610
Avg.	31.240	31.585	31.710	31.635	31.670	31.710	31.450	31.160	31.080	30.765	30.785	30.740

09-5220.41 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, 1.8 kilometers downstream from the northerly international boundary, and about 12.1 kilometers downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.05 meter below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; continuous record of gage heights June 7, 1966 through 1996.

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

EXTREMES: Maximum mean daily gage height, 34.74 meters on August 18, 1993; minimum mean gage height, 29.06 meters from October 3 to December 31, 1996.

MEAN DAILY GAGE HEIGHT IN METERS 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	29.290	29.500	29.590	29.540	29.440	29.640	29.470	29.290	29.230	29.080	29.060	29.060
2	29.290	29.520	29.600	29.530	29.450	29.630	29.410	29.240	29.260	29.070	29.060	29.060
3	29.290	29.530	29.590	29.550	29.460	29.600	29.400	29.230	29.260	29.060	29.060	29.060
4	29.290	29.520	29.610	29.520	29.460	29.570	29.400	29.240	29.290	29.060	29.060	29.060
5	29.290	29.540	29.630	29.520	29.460	29.560	29.400	29.220	29.290	29.060	29.060	29.060
6	29.290	29.560	29.630	29.520	29.470	29.530	29.400	29.220	29.320	29.060	29.060	29.060
7	29.290	29.570	29.600	29.510	29.460	29.530	29.390	29.210	29.360	29.060	29.060	29.060
8	29.290	29.570	29.600	29.520	29.440	29.520	29.360	29.240	29.200	29.060	29.060	29.060
9	29.290	29.540	29.620	29.520	29.440	29.520	29.350	29.240	29.160	29.060	29.060	29.060
10	29.290	29.540	29.630	29.520	29.460	29.510	29.370	29.250	29.200	29.060	29.060	29.060
11	29.290	29.540	29.650	29.470	29.470	29.530	29.370	29.270	29.190	29.060	29.060	29.060
12	29.290	29.530	29.650	29.440	29.460	29.520	29.370	29.240	29.200	29.060	29.060	29.060
13	29.290	29.530	29.650	29.440	29.490	29.530	29.370	29.200	29.220	29.060	29.060	29.060
14	29.300	29.510	29.650	29.440	29.490	29.530	29.370	29.200	29.230	29.060	29.060	29.060
15	29.300	29.500	29.650	29.480	29.500	29.540	29.350	29.200	29.250	29.060	29.060	29.060
16	29.310	29.520	29.650	29.500	29.510	29.560	29.340	29.200	29.270	29.060	29.060	29.060
17	29.310	29.520	29.640	29.520	29.510	29.630	29.330	29.180	29.270	29.060	29.060	29.060
18	29.310	29.530	29.620	29.550	29.490	29.660	29.330	29.160	29.280	29.060	29.060	29.060
19	29.310	29.560	29.600	29.530	29.490	29.640	29.340	29.150	29.320	29.060	29.060	29.060
20	29.310	29.560	29.580	29.550	29.560	29.610	29.350	29.150	29.390	29.060	29.060	29.060
21	29.310	29.570	29.580	29.560	29.550	29.590	29.340	29.150	29.410	29.060	29.060	29.060
22	29.330	29.560	29.580	29.580	29.560	29.610	29.320	29.160	29.420	29.060	29.060	29.060
23	29.350	29.540	29.590	29.550	29.560	29.610	29.320	29.150	29.420	29.060	29.060	29.060
24	29.350	29.520	29.600	29.540	29.580	29.590	29.320	29.170	29.430	29.060	29.060	29.060
25	29.360	29.520	29.620	29.550	29.590	29.590	29.310	29.160	29.270	29.060	29.060	29.060
26	29.360	29.540	29.630	29.550	29.600	29.580	29.320	29.170	29.120	29.060	29.060	29.060
27	29.350	29.520	29.630	29.550	29.600	29.570	29.320	29.180	29.110	29.060	29.060	29.060
28	29.360	29.540	29.610	29.530	29.600	29.570	29.330	29.200	29.100	29.060	29.060	29.060
29	29.410	29.540	29.610	29.540	29.590	29.550	29.310	29.220	29.090	29.060	29.060	29.060
30	29.450		29.610	29.510	29.630	29.530	29.300	29.240	29.090	29.060	29.060	29.060
31	29.460		29.600		29.670		29.310	29.220		29.060		29.060
Avg.	29.325	29.535	29.615	29.520	29.515	29.570	29.355	29.205	29.255	29.060	29.060	29.060

09-5319.00 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, 1.8 kilometers downstream from the northerly international boundary. The elevation of the zero of the gage has not been determined.

RECORDS: Based on 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 1996.

REMARKS: Pursuant to Minute 219 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 19.3 kilometers, and placed in operation on November 16, 1965. Drainage flows may be discharged on an emergency basis 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, 3.1 kilometers upstream from Morelos Dam; and directly to the Colorado River immediately below Morelos Dam at this station, Main Outlet Drain Extension No. 3. On July 14, 1972, Minute No. 241 of the Commission became effective. The Minute called for discharge of all Wellton-Mohawk drainage waters to be made below Morelos Dam. On August 30, 1973, Minute No. 242 of the Commission became effective. The Minute called for construction of a concrete-lined bypass drain from Morelos Dam to the Santa Clara Slough in Mexico. On June 23, 1977, the first flow was recorded in the bypass drain. Drainage flows through Main Outlet Extension No. 3 will be only on an emergency basis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

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

Current Year 1996

Period 1966-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0	0	! 1	0	! 1	0	0	0	7,820	23,088	0
Feb.	0	0	! 1	0	! 1	0	0	0	6,012	20,959	0
Mar.	0	0	! 1	0	! 1	0	0	0	4,242	22,827	0
April	0	0	! 1	0	! 1	0	0	0	3,800	22,944	0
May	0	0	! 1	0	! 1	0	0	0	5,727	23,548	0
June	0	0	! 1	0	! 1	0	0	0	4,508	23,135	0
July	0	0	! 1	0	! 1	0	0	0	4,139	23,370	0
Aug.	0	0	! 1	0	! 1	0	0	0	4,209	23,668	0
Sept.	0	0	! 1	0	! 1	0	0	0	5,915	22,787	0
Oct.	0	0	! 1	0	! 1	0	0	0	8,324	23,683	0
Nov.	0	0	! 1	0	! 1	0	0	0	7,892	22,792	0
Dec.	0	0	! 1	0	! 1	0	0	0	7,258	23,585	0
Yearly	0	0		0		0	0	0	69,846	264,928	0

! And other days

09-5325.00 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, 6.9 kilometers downstream from the northerly international boundary and 5.1 kilometers 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. Since June 1986, zero of the gage is 34.05 meters above mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was mean sea level, U. S. C. & G. S. datum.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1996, obtained by the United States Section; monthly discharge, January 1924 through 1950 by Bureau of Reclamation.

EXTREMES: Prior to January 1951, maximum monthly discharge, 12,014 TCM in August 1940; minimum monthly discharge, zero in April 1941. Since January 1, 1951, maximum instantaneous discharge, 22.7 CMS on December 3, 1961, at a maximum gage height of 35.845 meters; minimum instantaneous discharge, zero during parts of most years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.01	0.01	0.01	0.01	0.01	0	0.01	0.01	0.07	0.01	0.01	0.06
2	.04	.04	.01	.01	.01	0	.01	0	.07	.11	.01	.20
3	.01	.02	.07	.01	.01	0	.01	0	.01	.15	.01	.01
4	.02	.01	.07	.01	.01	0	0	0	.01	.01	.01	.01
5	.01	.01	.01	.01	.01	0	.01	.01	.01	.01	.01	.01
6	.01	.01	.03	.01	.01	0	.01	.01	.01	.01	.01	.01
7	.05	.01	.02	.01	0	0	.01	.01	.01	.01	.01	.01
8	.09	.02	.08	.01	0	0	0	.01	.01	.02	.01	.01
9	.01	.03	.23	.01	0	.01	0	.01	.03	.01	.01	.01
10	.01	.02	.45	.01	0	0	0	.01	.01	.02	.01	.02
11	.01	.01	.02	.01	0	.01	0	.07	0	.02	.01	.01
12	.01	.03	.01	.01	0	.01	0	.02	0	.01	.01	.01
13	.01	.01	.01	.01	0	.01	0	.01	0	.01	.01	.01
14	.01	.03	.05	.01	0	.01	0	.01	0	.01	.02	.01
15	.01	.01	.01	.01	0	0	0	.01	0	.21	.01	.03
16	.02	.24	.01	.01	0	0	0	.01	0	.01	.01	.01
17	.01	.01	.01	.01	0	.01	0	.01	0	.01	.01	.01
18	.01	.01	.01	.02	0	.01	0	.01	0	.01	.01	.01
19	.01	.01	.01	.02	.01	.01	.04	.01	0	.16	.01	.01
20	.02	.01	.01	.02	.01	.01	.02	0	0	.02	.01	.01
21	.01	.01	.01	.01	.01	.01	0	0	0	.02	.01	.01
22	.05	.01	.01	.01	.01	.01	.01	0	0	.01	.01	.01
23	.01	.01	.01	.01	.01	.01	0	0	0	.01	.01	.01
24	.01	.01	.01	.01	.01	.01	0	0	0	.01	.01	.25
25	.01	.01	.03	.01	.02	.01	0	.01	0	.27	.01	.01
26	.01	.01	.01	.01	.04	.01	.19	.01	.01	.01	.02	.01
27	.01	.02	.01	.01	.01	.01	0	.01	.01	.01	.01	.03
28	.01	.02	.01	.01	.01	.01	0	.01	.51	.01	.09	.02
29	.01	.02	.02	.03	.28	.01	0	.01	.01	.01	.13	.01
30	.01	.01	.22	.01	.01	.01	0	.01	.19	.29	.01	.02
31	.01	.01	.02	.01	0	0	0	.01	.01	.01	.01	.01
Sum	0.53	0.67	1.49	0.35	0.49	0.19	0.32	0.30	0.97	1.49	0.52	0.86

Current Year 1996

Period 1935-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Low	Total		Average	Maximum	Minimum	
											Day
Jan.	0.150	0.005	7	0.33	14	0	0.02	45.8	2,711	11,804	0
Feb.	.435	.010	16	2.01	11	.01	.02	57.9	2,220	10,398	17.9
Mar.	1.220	.010	10	7.61	11	.01	.05	129	2,092	7,685	51.8
April	.075	.010	29	.10	11	0	.01	30.2	1,926	7,771	0
May	.995	0	29	5.52	6	0	.02	42.3	2,271	11,496	10.2
June	.045	0	9	.04	11	0	.01	16.4	2,154	9,177	13.0
July	.735	0	26	3.45	3	0	.01	27.6	2,185	10,265	11.2
Aug.	.105	.005	11	.17	11	0	.01	25.9	1,887	12,014	18.1
Sept.	.630	.005	28	2.68	3	0	.03	85.8	1,364	7,574	7.4
Oct.	.925	.005	15	4.92	11	.01	.05	129	1,874	7,006	14.7
Nov.	.215	.010	28	.89	11	.01	.02	44.9	2,280	10,139	23.2
Dec.	.430	.005	2	2.00	11	.01	.03	74.3	2,959	11,632	51.8
Yearly	1.220	0		7.61		0	0.02	707	25,923	102,255	707

And other days

09-5221.00 COLORADO RIVER AT ELEVEN MILE GAGE - STAGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, 6.9 kilometers downstream from northerly international boundary, 5.1 kilometers downstream from Morelos Dam, about 15 meters downstream from the mouth of Eleven Mile Wasteway of the Yuma Project, and 17.7 kilometers downstream from Yuma, Arizona, along the river levee. The zero of the gage is at mean sea level, U. S. C. & G. S. datum. On April 1, 1988, the gage was relocated 399 meters downstream of the old gage on the left bank. Zero of the new gage is at mean sea level, U. S. C. & G. S. datum. Elevation of the new gage is 0.12 meter lower than the old gage. On August 1, 1993, the gage was relocated 81.0 meters upstream of the original 1947 gage. The datum is equal to the 1947 gage.

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through 1996; 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, 33.155 meters on June 28, 1983; minimum mean daily gage height, 28.645 meters on September 13, 1988 and other days since that time.

MEAN DAILY GAGE HEIGHT IN METERS 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	29.520	29.525	29.535	29.570	29.555	29.635	29.530	29.385	29.540	29.575	29.825	29.925
2	29.545	29.565	29.550	29.545	29.525	29.610	29.505	29.380	29.515	29.610	29.830	29.925
3	29.515	29.545	29.570	29.535	29.525	29.605	29.495	29.380	29.445	29.620	29.835	29.905
4	29.530	29.535	29.575	29.545	29.520	29.585	29.485	29.375	29.450	29.575	29.840	29.910
5	29.515	29.540	29.570	29.530	29.520	29.575	29.475	29.355	29.465	29.585	29.840	29.910
6	29.515	29.565	29.585	29.530	29.520	29.565	29.470	29.365	29.485	29.625	29.855	29.925
7	29.520	29.570	29.580	29.535	29.520	29.570	29.470	29.370	29.505	29.695	29.860	29.920
8	29.565	29.575	29.575	29.530	29.520	29.560	29.495	29.370	29.530	29.710	29.860	29.920
9	29.505	29.570	29.610	29.545	29.510	29.560	29.460	29.375	29.530	29.725	29.855	29.925
10	29.505	29.555	29.645	29.545	29.510	29.555	29.435	29.380	29.480	29.740	29.865	29.925
11	29.500	29.540	29.575	29.540	29.515	29.545	29.420	29.455	29.470	29.750	29.875	29.930
12	29.500	29.550	29.585	29.515	29.520	29.545	29.405	29.410	29.520	29.750	29.880	29.930
13	29.495	29.545	29.585	29.510	29.520	29.545	29.405	29.395	29.455	29.750	29.885	29.935
14	29.500	29.550	29.595	29.500	29.530	29.545	29.410	29.400	29.455	29.750	29.890	29.945
15	29.505	29.515	29.585	29.500	29.535	29.540	29.420	29.400	29.460	29.755	29.895	29.955
16	29.515	29.555	29.585	29.515	29.535	29.550	29.405	29.400	29.470	29.720	29.890	29.960
17	29.500	29.515	29.595	29.525	29.540	29.570	29.435	29.400	29.475	29.750	29.895	29.970
18	29.495	29.510	29.585	29.545	29.545	29.615	29.470	29.400	29.490	29.760	29.890	29.970
19	29.490	29.515	29.575	29.560	29.540	29.620	29.455	29.400	29.520	29.715	29.895	29.975
20	29.490	29.530	29.560	29.565	29.545	29.610	29.450	29.415	29.520	29.730	29.900	29.975
21	29.485	29.535	29.555	29.570	29.560	29.585	29.425	29.410	29.520	29.765	29.900	29.980
22	29.510	29.540	29.555	29.580	29.560	29.575	29.420	29.395	29.520	29.770	29.905	29.970
23	29.485	29.530	29.550	29.585	29.565	29.580	29.440	29.390	29.520	29.770	29.905	29.965
24	29.485	29.515	29.560	29.575	29.575	29.585	29.435	29.390	29.535	29.770	29.905	29.980
25	29.505	29.510	29.580	29.580	29.590	29.580	29.405	29.405	29.540	29.820	29.915	29.980
26	29.500	29.505	29.580	29.575	29.610	29.575	29.480	29.420	29.540	29.780	29.920	29.965
27	29.500	29.525	29.585	29.575	29.605	29.570	29.340	29.395	29.560	29.790	29.915	29.975
28	29.505	29.520	29.585	29.575	29.595	29.570	29.335	29.415	29.685	29.810	29.925	29.975
29	29.500	29.525	29.580	29.580	29.650	29.560	29.360	29.430	29.625	29.825	29.920	29.975
30	29.505		29.615	29.570	29.580	29.540	29.415	29.445	29.640	29.845	29.910	29.975
31	29.515		29.585		29.570		29.375	29.470		29.805		29.975
Avg.	29.505	29.535	29.580	29.550	29.550	29.575	29.435	29.400	29.515	29.730	29.885	29.950

09-5330.00 TWENTY-ONE MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway from West Main Canal to Colorado River. Located on east side of levee at site used prior to May 1, 1971. The site used May 1, 1971 to September 20, 1977 was located 61 meters downstream from present site on west side of levee. This wasteway is located in Arizona, 29.8 kilometers downstream from the northerly international boundary, 28.0 kilometers downstream from Morelos Diversion Dam, and 3.5 kilometers upstream from the southerly international boundary. It is the farthest downstream of the two wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River. The elevation of the zero of the gage at the new location has not been determined.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1996, obtained by the United States Section; monthly discharge, March 1939 through 1950, by Bureau of Reclamation.

REMARKS: This wasteway was completed and flow began March 14, 1939. Since May 13, 1944, waste water from the West Main Canal which previously discharged across the southerly land boundary has been returned to the Colorado River through this wasteway. The West Main Canal Wasteway was completed in February of 1971, and the waste water from the West Main Canal is normally discharged across the southerly land boundary.

EXTREMES: Prior to January 1951, maximum monthly discharge 3,528 TCM in January 1946; minimum monthly discharge, 150 TCM in September 1950. Since January 1, 1951, maximum instantaneous discharge, 2.89 CMS on January 24, 1954, at a maximum gage height of 29.095 meters (old datum); minimum instantaneous discharge, zero during a part of most months.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0.05	0	0	0	0	0	0	0	0	0.50	0.11
2	0	.37	0	0	0	0	0	0	0	0	.40	.05
3	0	.12	0	0	0	0	0	0	0	0	.34	0
4	0	0	0	0	0	0	0	0	0	0	.19	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	.01	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	.16	0
14	0	0	0	0	0	0	0	.02	0	0	0	0
15	0	0	0	0	0	0	0	.02	0	0	0	0
16	0	0	0	0	0	0	0	.04	0	0	0	0
17	0	0	0	0	0	0	0	.01	0	0	.08	0
18	0	0	0	0	0	0	0	.01	0	0	0	0
19	0	0	0	0	0	0	0	.01	0	0	0	0
20	0	0	0	0	0	0	0	.01	0	0	.09	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	.05	0	0
24	0	0	0	0	0	0	0	0	0	.34	0	0
25	0	0	0	0	0	0	0	0	0	.67	0	0
26	0	0	0	0	0	0	0	0	0	.22	0	0
27	0	0	0	0	0	0	0	0	0	.62	0	0
28	0	0	0	0	0	0	0	0	0	.42	0	0
29	0	0	0	0	0	0	0	0	0	.21	0	0
30	0	0	0	0	0	0	0	0	0	.27	0	0
31	0	0	0	0	0	0	0	0	0	.18	0	0
Sum	0	0.54	0	0.01	0	0	0	0.12	0	2.98	1.76	0.14

Current Year 1996

Period 1939-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0	0	1	0	1	0	0	0	663	3,528	0
Feb.	.425	0	3	.77	1	0	.02	46.7	569	3,096	0
Mar.	0	0	1	0	1	0	0	0	518	2,048	0
April	.125	0	12	.11	1	0	0	.9	554	2,393	0
May	0	0	1	0	1	0	0	0	670	3,047	0
June	0	0	1	0	1	0	0	0	590	2,899	0
July	0	0	1	0	1	0	0	0	512	2,405	0
Aug.	.115	0	16	.09	1	0	0	10.4	534	3,121	0
Sept.	.010	0	2	.01	1	0	0	0	476	2,689	0
Oct.	.550	0	29	1.17	1	0	.10	257	597	2,590	0
Nov.	.505	0	1	1.02	4	0	.06	152	716	2,936	0
Dec.	.385	0	2	.66	1	0	0	12.1	754	3,306	0
Yearly	0.550	0		1.17		0	0.02	479	7,153	30,060	0

! And other days

09-5345.00 EAST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir located about 91 meters north of the international boundary near San Luis, Arizona and 2.4 kilometers east of the Colorado River. From September 28, 1977 to April 6, 1978, recorder was moved west 31 meters to a temporary bypass channel. On April 7, 1978, recorder was moved back to original site. On August 17, 1992, flow ceased through the wasteway due to construction upstream of the gage. The gage was relocated 20 meters west of the original site providing continuous record since December 21, 1992.

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 1996. Records of monthly discharges also are available for the periods January 1924 through June 1928, January 1932 through 1933, and April 1935 through September 1946.

REMARKS: Wasteway discharges from the East Main Canal comprise regulatory waste and drainage waters from the eastern half of the Valley Division of the Yuma Project and are considered as part of the volumes arriving at the land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.77	0.45	0.35	0.51	0.39	0.51	0.11	0.01	0.16	0.34	0.15	0.22
2	.55	.56	.38	.43	.11	.36	.09	.11	.34	.15	.08	.46
3	.31	.41	.07	.46	.58	.08	.45	.46	.46	.26	.06	.30
4	.44	.37	.10	.29	.34	.21	.22	.20	.24	.21	.06	.28
5	.61	.09	.33	.21	.01	.13	.33	.24	.31	.12	.01	.15
6	.33	.21	.21	.55	.11	.05	.22	.24	.25	.04	.49	.07
7	.46	.14	.18	.42	.58	.01	.31	.30	.16	.21	.07	.10
8	.53	.31	.41	.25	.41	.04	.17	.09	.41	.49	.23	.31
9	.23	.25	.15	.06	.32	.03	.16	.24	.31	.23	.31	.30
10	.20	.51	.28	.23	.47	0	.42	.33	.39	.45	.90	.20
11	.29	.22	.30	.15	.39	.01	.08	.11	.22	.29	.40	.38
12	.08	.37	.38	.15	.03	.22	.10	.12	.34	.29	.15	.34
13	.60	.52	.22	.33	.71	.02	.41	.26	.37	.50	.31	.30
14	.20	.40	.40	.18	.54	.01	.30	.26	.22	.40	.16	.52
15	.28	.48	.22	.20	.26	.16	.32	.42	.23	.27	.15	.48
16	.16	.49	.27	.19	.08	.64	.36	.49	.48	.19	.21	.32
17	.03	.47	.21	.21	.40	.18	.30	.35	.33	.32	.40	.52
18	.41	.44	.22	.24	.23	.37	.51	.44	.60	.34	.20	.55
19	.61	.28	.16	.52	.09	.26	.17	.35	.51	.42	.08	.31
20	.36	.38	.13	.31	.17	.21	.15	.30	.28	.33	.18	.27
21	.61	.51	.15	.51	.52	.24	.18	.15	.50	.60	.62	.17
22	.26	.13	.25	.30	.22	.14	.14	.33	.22	.34	.44	.51
23	.49	.52	.32	.50	.08	.37	.08	.13	.41	.20	.70	.55
24	.53	.65	.22	.35	.29	.10	.06	.54	.57	.51	.46	.16
25	.20	.72	.16	.51	.23	.32	.10	.40	.65	.16	.26	.44
26	.12	.64	.24	.27	.12	.59	.29	.37	.63	.28	.05	.51
27	.14	.39	.29	.59	.36	.30	.36	.48	.12	.07	.46	.42
28	.08	.18	.53	.33	.63	.18	.21	.57	.49	.02	.31	.18
29	.34	.17	.46	.21	.52	.72	.14	.03	.58	.45	.35	.11
30	.41	.25	.06	.46	.46	.57	.14	.30	.24	.15	.06	.29
31	.21		.29	.28	.28		.08	.16		.36		.43
Sum	10.84	11.26	8.13	9.52	9.93	7.03	6.96	8.78	11.02	8.99	8.31	10.13

Current Year 1996

Period 1935-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High		Low		Total	Average	Maximum	Minimum
				Day	Low						
Jan.	0.335	0	1	0.86	117	0	0.35	937	1,137	4,144	111
Feb.	.335	0	26	.98	5	0	.39	973	952	3,910	164
Mar.	.295	0	12	.73	3	0	.26	702	1,082	3,602	175
April	.320	0.010	1	.60	19	0	.32	823	1,054	3,910	165
May	.335	0	13	.86	5	0	.32	858	1,192	3,750	281
June	.325	0	125	.83	17	0	.23	607	988	4,515	157
July	.320	0	26	.82	11	0	.22	601	1,061	4,428	210
Aug.	.305	.005	118	.75	11	0	.28	759	1,097	4,855	196
Sept.	.325	.010	24	.83	127	.01	.37	952	1,041	3,910	0
Oct.	.340	.005	21	.88	11	0	.29	777	1,086	4,046	0
Nov.	.375	.005	10	1.02	5	0	.28	718	1,183	4,404	0
Dec.	.335	.005	2	.86	16	0	.33	875	1,161	3,799	51.0
Yearly	0.375	0		1.02		0	0.30	9,582	13,034	47,255	3,733

! And other days

09-5340.00 YUMA MAIN DRAIN (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorders located in the forebay and afterbay, with flow meters in the four discharge pipes at the Boundary Pumping Plant on the Main Drain about 61 meters north of the international boundary near San Luis, Arizona, 2.1 kilometers east of the Colorado River.

RECORDS: Main Drain discharges are lifted 3.05 to 3.66 meters at the pumping plant. Prior to April 1, 1969, discharges were computed from pump ratings and the differential head measured by the two gages. Beginning April 1, 1969 discharges were computed from flow meter charts. Pump ratings and flow meter discharges are checked by current meter measurements. Records obtained and computed by the United States Section of the Commission. Records available: Monthly discharges, June 1919 through 1951; daily discharges January 1952 through 1996.

REMARKS: Flows in the Main Drain are principally drainage waters from the Valley Division of the Yuma Project. The Main Drain, the East Main Canal Wasteway, West Main Canal Wasteway, and 242 Lateral 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 land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.37	3.29	3.62	4.82	4.45	4.20	3.56	3.10	3.15	3.11	3.22	4.49
2	3.22	3.10	3.50	4.39	4.34	4.68	3.41	3.19	3.03	3.43	5.17	4.19
3	3.47	3.18	3.81	4.20	4.35	4.46	3.46	2.98	3.03	3.65	4.87	3.57
4	3.49	2.94	3.66	4.40	4.95	4.09	3.39	3.21	3.14	3.69	4.67	3.45
5	3.48	2.99	3.44	4.70	5.27	3.75	3.35	3.19	3.10	4.16	4.44	3.62
6	3.69	3.12	3.61	4.64	4.68	4.27	3.09	3.04	3.06	4.18	4.50	3.89
7	3.59	3.12	3.54	4.73	4.26	4.07	3.40	3.30	3.31	4.36	4.80	3.94
8	3.40	2.91	3.70	4.19	4.36	4.11	3.22	3.09	3.39	3.79	4.40	3.95
9	3.27	3.21	3.87	* 4.10	4.26	4.11	3.09	3.41	3.20	3.47	4.69	3.58
10	3.32	3.09	4.10	4.04	4.35	4.00	3.03	3.59	2.68	3.86	4.91	3.58
11	3.41	3.06	4.18	3.89	4.47	* 3.75	3.02	3.31	3.00	4.10	4.55	3.50
12	3.27	3.13	4.02	3.52	4.77	3.91	3.03	3.36	3.75	3.87	* 4.37	3.70
13	3.65	* 3.43	3.92	3.49	5.09	3.97	3.22	2.95	3.74	4.24	4.38	3.62
14	3.48	3.31	3.89	3.82	* 4.46	3.69	3.33	2.95	3.04	3.84	4.55	3.91
15	3.19	3.35	3.86	3.74	4.29	3.86	3.35	2.96	3.32	4.15	4.66	3.68
16	* 3.21	3.50	3.94	3.89	4.31	3.88	3.38	3.06	3.22	4.15	4.18	3.84
17	3.18	4.07	3.92	4.14	4.68	3.63	3.32	3.13	* 3.19	4.30	4.69	3.80
18	3.06	3.94	4.45	3.98	4.92	3.79	3.25	3.22	3.44	4.42	4.49	3.65
19	3.45	* 3.70	3.99	4.42	4.93	4.00	3.21	3.22	3.61	4.46	4.34	3.96
20	3.31	3.50	3.88	4.82	4.27	3.79	3.27	* 3.15	3.22	4.57	4.20	4.35
21	3.44	3.43	3.75	4.96	4.34	3.77	3.38	3.10	3.37	3.99	4.42	3.90
22	3.35	3.49	3.78	4.74	3.95	3.66	3.05	3.09	4.02	4.02	4.39	3.92
23	3.02	3.44	3.97	4.64	3.91	4.01	3.15	3.00	3.52	4.09	4.32	3.49
24	3.08	3.24	4.09	4.53	4.08	3.72	2.94	2.97	3.77	4.50	4.40	3.61
25	3.21	3.61	4.33	4.47	4.52	3.79	2.77	3.07	3.32	4.39	4.59	3.63
26	3.39	4.01	4.22	4.79	3.93	3.44	2.77	3.06	3.49	4.60	4.16	3.44
27	3.34	3.46	4.27	4.76	3.85	3.45	2.99	2.92	3.53	4.54	3.87	3.25
28	3.52	3.29	4.10	4.74	3.77	3.39	3.26	3.18	3.09	4.32	4.18	3.63
29	3.38	3.43	4.02	4.85	3.81	3.47	2.84	2.87	3.27	4.48	3.91	3.45
30	3.11		4.28	4.64	3.64	3.72	2.93	2.89	3.46	4.38	4.17	3.32
31	3.00		4.54		3.62		3.02	3.20		4.48		3.53
Sum		97.34	122.25	131.04	134.88	116.43	98.48	96.76	99.46	127.59	132.49	115.44

Current Year 1996

Period 1935-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day	φ Low	Average	Total	Average	Maximum	Minimum
Jan.			6	3.69	31	3.00	3.33	8,929	9,329	13,819	2,146
Feb.			17	4.07	8	2.91	3.36	8,410	8,997	14,787	2,023
Mar.			31	4.54	5	3.44	3.94	10,562	10,333	15,332	2,393
April			21	4.96	13	3.49	4.37	11,322	10,244	14,666	2,368
May			5	5.27	31	3.62	4.35	11,654	10,515	16,208	2,405
June			2	4.68	28	3.39	3.88	10,060	9,689	14,851	2,825
July			1	3.56	125	2.77	3.18	8,509	9,592	14,715	3,121
Aug.			10	3.59	29	2.87	3.12	8,360	9,588	14,752	3,158
Sept.			23	4.02	10	2.68	3.32	8,593	9,654	14,269	2,812
Oct.			26	4.60	1	3.11	4.12	11,024	11,144	15,277	3,626
Nov.			2	5.17	1	3.22	4.42	11,447	10,659	14,814	3,454
Dec.			1	4.49	27	3.25	3.72	9,974	10,048	14,160	3,022
Yearly				5.27		2.68	3.76	118,844	119,792	171,922	33,353

φ Mean daily

! And other days

WESTERN BOUNDARY WATER BULLETIN - 1996 - INTERNATIONAL BOUNDARY AND WATER COMMISSION

09-5343.00 WEST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder located about 0.5 kilometer upstream from outlet to Yuma Main Drain, which is 53 meters upstream from East Main Canal Wasteway outlet and 0.6 kilometer west of San Luis, Arizona. Prior to August 1, 1975, the recorder was located about 46 meters upstream from outlet to Yuma Main Drain.

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning February 23, 1971, from water-stage recorder and ratings as determined by current meter measurements. Records available: February 23, 1971 through 1996.

REMARKS: Wasteway discharges from West Main Canal Wasteway comprise regulatory waste from the West Main Canal and this water is considered as part of the volumes arriving at the land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.56	0.30	0.13	0.13	0.16	0.11	* 0.36	0.07	0.05	0.42	0	0.35
2	.30	.01	.31	.23	.20	.16	.28	.34	.35	.51	0.05	.31
3	.15	.13	.31	.25	.10	.21	.13	.16	.24	.42	0	.09
4	.27	.31	.22	.13	.10	.25	.05	.20	.18	.09	.12	.01
5	.26	.55	.45	.18	.04	.02	.01	.46	.13	.50	.05	.15
6	.23	.12	.41	.32	.13	.11	.05	* .29	.08	.36	.06	.05
7	.57	.16	.46	.20	.38	.14	.02	.33	.07	.20	.44	.12
8	.39	.09	.05	.38	.24	.07	.02	.19	.19	.08	.44	.28
9	.13	.05	.24	* .23	.08	.14	.02	.24	.18	.12	.19	.41
10	.08	.21	.14	.05	.03	.20	.17	.03	.18	.42	.11	.43
11	.10	.25	.24	.24	.39	0	.03	.05	.11	.33	.58	.29
12	.28	.24	.03	.14	.14	.05	.16	.12	.06	.36	.46	.19
13	.28	* .06	0	.30	.11	.19	.10	.04	.30	.36	.49	.08
14	.28	.09	.11	.43	.04	.38	.06	.07	.10	0	.32	.06
15	.28	.06	.01	.36	.10	.26	.11	.01	.09	0	.22	.40
16	* .28	.07	.06	.13	.37	.43	.03	.31	.05	.05	.31	.27
17	.48	.40	.23	.01	.22	.26	.10	.06	.32	* .46	.44	* .25
18	.24	.47	.19	.20	.35	.09	.40	.17	.29	.33	.21	.06
19	.10	.31	* .30	.11	.16	.22	.51	.09	.52	.56	* .32	.03
20	.47	.09	.37	.23	.30	.18	.40	.13	.57	.51	.34	.09
21	.07	.04	.26	.34	* .24	.21	.15	.18	.28	* .54	.21	.02
22	.12	.13	.25	.26	.25	.32	.02	.03	.18	.59	.25	.01
23	.20	.01	.07	.12	.46	.08	.07	0	.16	.75	.08	.18
24	.13	.04	.26	.27	.19	.29	.05	0	.12	.62	.26	.50
25	.12	.80	.44	.18	.54	.18	.06	0	.37	.13	.15	.76
26	.23	.52	.10	.01	.50	.13	.27	.08	.44	.06	.47	.51
27	.25	.50	.12	.16	.49	.18	.07	.05	.15	0	.24	.34
28	.42	.01	.02	.24	.17	.26	.17	0	.10	.29	.29	.19
29	.19	.12	0	.30	.28	.26	.20	.01	.08	.73	.23	.08
30	.21	0	0	.20	.20	.13	.21	.09	.11	0	.10	.15
31	.04	0	.03	0	.15	0	.19	.16	0	0	0	.17
Sum	7.71	6.14	5.81	6.33	7.11	5.51	4.47	3.96	6.05	9.79	7.43	6.83

Month	Current Year 1996							Period 1971-1996			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.750	0.005	20	1.10	23	0	0.25	666	564	1,376	48.7
Feb.	.820	.010	25	1.35	12	0	.21	530	520	840	196
Mar.	.760	.005	12	1.13	12	0	.19	502	556	1,158	250
April	.700	.010	13	.94	11	0	.21	547	505	1,280	202
May	.790	.015	25	1.24	9	0	.23	614	447	725	183
June	.705	0	16	.96	11	0	.18	476	409	699	55.8
July	.680	0	18	.84	5	0	.14	386	424	763	77.3
Aug.	.720	0	16	1.00	3	0	.13	342	470	950	121
Sept.	.735	.005	26	1.05	12	0	.20	523	498	947	234
Oct.	.820	0	23	1.34	4	0	.32	846	502	898	164
Nov.	.765	0	7	1.16	1	0	.25	642	459	845	32.3
Dec.	.780	0	15	1.20	3	0	.22	590	548	1,204	43.5
Yearly	0.820	0		1.35		0	0.21	6,664	5,902	8,934	3,179

! And other days

09-5345.50 242 WELL FIELD NEAR SAN LUIS, ARIZONA

DESCRIPTION: Water-stage recorder and 3.7-meter Parshall flume located 31 meters upstream from confluence of East Main Canal Wasteway, 3/4 meters north of the southerly land boundary, and 2.3 kilometers east of the Colorado River.
 RECORDS: Based on current meter measurements and a continuous record of gage heights. The station is operated by the United States Section of the Commission. Records available: October 18, 1978 through 1996.
 REMARKS: Records show the pumping of ground water from the 242 well field east of San Luis, Arizona. This water is considered as part of the volumes arriving at the land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.76	0	0.39	0.91	0.01	0	0	0.43	1.07	0	0	0
2	.36	0	.01	.34	0	0	0	.99	1.07	.34	0	0
3	0	0	0	.01	0	0	0	1.02	1.07	.74	0	0
4	0	0	0	0	0	0	0	1.02	1.07	.36	0	0
5	0	0	0	0	0	.02	0	1.02	1.07	0	0	0
6	0	0	.14	0	0	.04	0	1.01	1.07	0	0	0
7	0	.11	.59	0	0	0	0	1.01	1.08	0	0	0
8	0	.32	.60	0	0	0	0	.99	1.07	0	0	0
9	0	.33	.61	0	0	0	0	.99	.99	0	0	.08
10	0	.33	.61	0	0	0	0	.99	.66	0	0	.22
11	0	.34	.60	0	0	0	0	.99	1.07	0	0	.22
12	0	.34	.60	0	0	.03	0	1.01	1.07	0	0	.22
13	0	.35	.60	0	0	0	0	1.01	1.07	0	0	.21
14	0	.35	.60	0	0	0	0	1.01	1.07	0	0	.20
15	0	.35	.59	0	0	0	0	1.00	1.07	0	0	.20
16	0	.31	.58	0	0	0	0	1.03	1.00	0	0	.19
17	0	.20	.58	.17	0	0	0	1.03	.72	0	0	.20
18	0	.20	.30	.63	0	0	0	1.02	.69	0	0	.21
19	0	.19	.17	.64	0	0	0	1.03	.74	0	0	.22
20	0	.19	.59	.65	0	0	0	1.09	.31	0	0	.21
21	0	.34	.60	.65	0	0	0	1.14	0	0	0	.20
22	0	.59	.60	.65	0	0	0	1.13	0	0	0	.20
23	0	.61	.60	.66	0	0	0	1.13	0	0	0	.20
24	0	.61	.60	.66	0	0	0	1.13	0	0	0	.20
25	0	.62	.61	.66	0	0	0	1.12	0	0	0	.20
26	0	.63	.60	.66	0	0	0	1.12	0	0	0	.20
27	0	.63	.60	.66	0	0	0	1.13	0	0	0	.20
28	0	.63	.78	.66	0	0	0	1.11	0	0	0	.20
29	0	.63	1.07	.66	0	0	0	1.08	0	0	0	.20
30	0		1.07	.68	0	0	0	1.07	0	0	0	.12
31	0		1.07		0	0	0	1.07		0	0	0
Sum	1.12	9.20	16.36	9.75	0.01	0.09	0	31.92	19.03	1.44	0	4.30

Month	Current Year 1996							Period 1979-1996			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.225	0	1	0.76	12	0	0.04	96.8	907	3,406	0
Feb.	.220	0	28	.81	11	0	.32	795	1,377	3,677	0
Mar.	.280	0	31	1.18	13	0	.53	1,414	1,386	4,717	0
April	.265	0	1	1.08	13	0	.33	842	1,551	4,285	0
May	.020	0	1	.02	11	0	0	.9	1,474	4,269	0
June	.080	0	6	.18	11	0	0	7.8	1,423	4,272	7.8
July	0	0	11	0	11	0	0	0	1,649	5,868	0
Aug.	.340	0	27	1.55	1	0	1.03	2,758	1,677	4,988	0
Sept.	.325	0	16	1.44	120	0	.63	1,644	1,411	3,397	0
Oct.	.217	0	12	.75	11	0	.05	124	962	3,344	0
Nov.	0	0	11	0	11	0	0	0	404	2,101	0
Dec.	.135	0	13	.37	11	0	.14	372	895	3,654	0
Yearly	0.340	0		1.55		0	0.25	8,055	15,116	38,461	201

! And other days

09-5348.00 TOTAL FLOWS CROSSING INTERNATIONAL BOUNDARY INTO MEXICO NEAR SAN LUIS, SONORA

DESCRIPTION: The tabulated data below are the combined flows of the East Main Canal Wasteway, West Main Canal Wasteway, 242 Lateral, and the Yuma Main Drain and represent the total water crossing the international land boundary into the Sanchez Mejerada Canal near San Luis, Arizona. The mean daily discharges are combined and rounded and the monthly volumes are obtained by adding the volumes of the four stations.

RECORDS: Records obtained and computed by the United States Section of the Commission. Records available: February 23, 1971 through 1996; 242 Lateral from November 1978 through 1996.

REMARKS: Descriptions and flows of the individual stations, East Main Canal Wasteway, West Main Canal Wasteway, the Yuma Main Drain, and 242 Lateral are published separately on preceding pages of this bulletin.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.46	4.04	4.49	6.37	5.01	4.82	4.03	3.61	4.43	3.87	3.37	5.06
2	4.43	3.75	4.20	5.39	4.65	5.20	3.78	4.63	4.79	4.43	5.30	4.94
3	3.93	3.64	4.19	4.92	5.03	4.75	4.04	4.62	4.80	5.07	4.93	3.96
4	4.20	3.62	3.98	4.82	5.39	4.55	3.66	4.63	4.63	4.35	4.85	3.74
5	4.35	3.63	4.22	5.09	5.32	3.92	3.69	4.91	4.61	4.78	4.50	3.92
6	4.25	3.45	4.37	5.51	4.92	4.47	3.36	4.58	4.46	4.58	5.05	4.01
7	4.62	3.53	4.77	5.35	5.22	4.22	3.73	4.94	4.62	4.77	5.31	4.16
8	4.32	3.63	4.76	4.82	5.01	4.22	3.41	4.36	5.06	4.36	5.07	4.54
9	3.63	3.84	4.87	4.39	4.66	4.28	3.27	4.88	4.68	3.82	5.19	4.37
10	3.60	4.14	5.13	4.32	4.85	4.20	3.62	4.94	3.91	4.73	5.92	4.43
11	3.80	3.87	5.32	4.28	5.25	3.76	3.13	4.46	4.40	4.72	5.53	4.39
12	3.63	4.08	5.03	3.81	4.94	4.21	3.29	4.61	5.22	4.52	4.98	4.45
13	4.53	4.36	4.74	4.12	5.91	4.18	3.73	4.26	5.48	5.10	5.18	4.21
14	3.96	4.15	5.00	4.43	5.04	4.08	3.69	4.29	4.43	4.24	5.03	4.69
15	3.75	4.24	4.68	4.30	4.65	4.28	3.78	4.39	4.71	4.42	5.03	4.76
16	3.65	4.37	4.85	4.21	4.76	4.95	3.77	4.89	4.75	4.39	4.70	4.62
17	3.69	5.14	4.94	4.53	5.30	4.07	3.72	4.57	4.56	5.08	5.53	4.77
18	3.71	5.05	5.15	5.05	5.50	4.25	4.16	4.85	5.02	5.09	4.90	4.47
19	4.16	4.48	4.62	5.69	5.18	4.48	3.89	4.69	5.38	5.44	4.74	4.52
20	4.14	4.16	4.97	6.01	4.74	4.18	3.82	4.67	4.38	5.41	4.72	4.92
21	4.12	4.32	4.76	6.46	5.10	4.22	3.71	4.57	4.15	5.13	5.25	4.29
22	3.73	4.34	4.88	5.95	4.42	4.12	3.21	4.58	4.42	4.95	5.08	4.64
23	3.71	4.58	4.96	5.92	4.45	4.46	3.30	4.26	4.09	5.04	5.10	4.42
24	3.74	4.54	5.17	5.81	4.56	4.11	3.05	4.64	4.46	5.63	5.12	4.47
25	3.53	5.75	5.54	5.82	5.29	4.29	2.93	4.59	4.34	4.68	5.00	5.03
26	3.74	5.80	5.16	5.73	4.55	4.16	3.33	4.63	4.56	4.94	4.68	4.66
27	3.73	4.98	5.28	6.17	4.70	3.93	3.42	4.58	3.80	4.61	4.57	4.21
28	4.02	4.11	5.43	5.97	4.57	3.83	3.64	4.86	3.68	4.63	4.78	4.20
29	3.91	4.35	5.55	6.02	4.61	4.45	3.18	3.99	3.93	5.66	4.49	3.84
30	3.73		5.60	5.38	4.30	4.42	3.28	4.35	3.81	4.53	4.33	3.88
31	3.25		5.93		4.05		3.29	4.59		4.84		4.13
Sum	123.02	123.94	152.55	156.64	151.93	129.06	109.91	141.42	135.56	147.81	148.23	136.70

Current Year 1996								Period 1935-1996			
Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day	φ Low	Average	Total	Average	Maximum	Minimum
Jan.			1	5.46	31	3.25	3.97	10,629	11,937	14,963	2,619
Feb.			26	5.80	6	3.45	4.27	10,708	11,846	15,998	2,495
Mar.			31	5.93	4	3.98	4.92	13,180	13,357	16,904	2,864
April			21	6.46	12	3.81	5.22	13,534	13,354	16,013	2,611
May			13	5.91	31	4.05	4.90	13,127	13,628	17,145	3,050
June			2	5.20	11	3.76	4.30	11,151	12,509	15,505	3,115
July			18	4.16	25	2.93	3.55	9,496	12,726	15,320	3,610
Aug.			7	4.94	1	3.61	4.56	12,219	12,832	15,612	3,687
Sept.			13	5.48	28	3.68	4.52	11,712	12,604	15,357	3,210
Oct.			29	5.66	9	3.82	4.77	12,771	13,694	17,143	4,248
Nov.			10	5.92	1	3.37	4.94	12,807	12,705	15,680	4,202
Dec.			1	5.06	4	3.74	4.41	11,811	12,652	14,863	3,562
Yearly				6.46		2.93	4.53	143,145	153,844	183,801	39,274

φ Mean daily

! And other days

WESTERN BOUNDARY WATER BULLETIN - 1996 - INTERNATIONAL BOUNDARY AND WATER COMMISSION

09-5222.00 COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder was located in Mexico on the right bank of the river about 305 meters upstream from the southerly international boundary, 3.2 kilometers west of San Luis, Arizona, and 35 kilometers downstream from Morelos Dam. The zero of the gage was at mean sea level, U. S. C. & G. S. datum. This gage was destroyed on January 19, 1983. Between January 19, 1983 and December 10, 1985, temporary gages were installed on the United States side and levels were established to ensure continuous record. On December 10, 1985 a permanent water-stage recorder was relocated on the left bank of the river about 24 meters upstream from the southerly international boundary.

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 1996; continuous record of gage heights, January 1947 through 1993. During 1993, from January 1 to February 4 and May 1, 1993 to December 31, 1996, the gage was inoperable.

Records of gage height and discharge were estimated from instantaneous observations and discharge measurements. Monthly flows of the Colorado River at the northerly international boundary combined with the measured flows from the wasteways discharging into the boundary section of the river from the Yuma Project in Arizona.

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

EXTREMES: Since January 1950: Maximum instantaneous discharge, 937 CMS on August 19, 1983; maximum gage height, 25.860 meters on November 29, 1957. Minimum discharge, no flow on several occasions since September 1, 1956.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

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

Current Year 1996

Period 1935-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	21.840	21.840	1 1	0	1 1	0	0	417,190	2,062,379	0	
Feb.	21.840	21.840	1 1	0	1 1	0	0	341,682	1,708,370	0	
Mar.	21.840	21.840	1 1	0	1 1	0	0	289,987	1,458,432	0	
April	21.840	21.840	1 1	0	1 1	0	0	192,341	947,722	0	
May	21.840	21.840	1 1	0	1 1	0	0	259,241	1,430,837	0	
June	21.840	21.840	1 1	0	1 1	0	0	221,523	1,455,506	0	
July	21.840	21.840	1 1	0	1 1	0	0	190,647	1,821,962	0	
Aug.	21.840	21.840	1 1	0	1 1	0	0	204,260	2,103,318	0	
Sept.	21.840	21.840	1 1	0	1 1	0	0	228,620	1,956,768	0	
Oct.	21.840	21.840	1 1	0	1 1	0	0	271,644	2,144,909	0	
Nov.	21.840	21.840	1 1	0	1 1	0	0	314,826	1,761,409	0	
Dec.	21.840	21.840	1 1	0	1 1	0	0	385,397	2,268,370	0	
Yearly	21.840	21.840		0		0	0	3,317,358	15,656,495	0	

! And other days

09-5333.00 WELTON-MOHAWK BYPASS DRAIN AT SOUTHERLY INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and Parshall flume located 24 meters upstream from the southerly land boundary, 168 meters east of the Colorado River, and 2.9 kilometers west of San Luis, Arizona. The zero of the gage has not been determined.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Station is operated by United States Section of the Commission. Records available: June 23, 1977 through 1996.

REMARKS: Pursuant to Minute No. 242 of the Commission, a bypass drain of the Wellton-Mohawk extension channel was constructed from Morelos Dam to the Santa Clara Slough in Mexico along the left bank of the Colorado River.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.97	6.54	5.93	5.87	5.36	4.66	2.52	3.20	2.96	4.73	3.68	2.98
2	5.88	6.52	5.91	5.86	4.98	4.98	2.42	3.27	3.00	4.62	3.86	2.64
3	5.99	6.44	5.78	5.87	4.91	4.86	2.25	3.23	2.89	4.63	3.74	2.52
4	5.98	6.38	5.81	5.84	4.93	4.80	2.27	3.00	3.05	4.71	3.72	2.56
5	6.06	6.42	5.39	5.83	4.93	4.78	2.29	3.05	3.18	4.70	3.79	2.69
6	6.29	6.32	5.25	5.90	4.99	4.88	2.44	3.06	3.01	4.78	3.95	2.83
7	6.40	6.47	5.25	5.93	5.04	4.84	2.71	2.95	3.19	4.80	3.87	2.89
8	6.29	6.14	5.26	5.95	5.00	4.89	2.77	1.67	3.10	4.76	3.67	3.04
9	6.27	6.25	5.22	6.05	4.83	4.94	2.78	1.28	3.07	4.67	4.12	3.38
10	6.13	6.40	5.40	6.03	4.85	5.00	2.89	.97	2.89	4.50	4.10	3.47
11	6.01	6.52	5.42	5.98	4.86	4.97	2.95	.91	2.88	4.55	3.98	3.33
12	6.12	6.62	5.48	5.91	4.81	4.77	2.92	.82	2.90	4.39	4.00	3.07
13	6.22	6.66	5.90	5.96	4.83	4.42	3.01	.85	3.80	4.30	4.07	3.30
14	6.23	6.42	5.84	5.75	4.72	4.57	2.96	.84	3.95	4.28	3.99	3.31
15	6.28	6.24	5.59	5.61	4.78	4.81	2.96	.83	4.57	4.11	4.11	3.53
16	6.34	6.21	5.54	5.60	4.86	4.81	2.97	.71	4.62	4.54	3.93	3.34
17	6.23	6.30	5.88	5.76	4.81	4.77	3.00	.78	4.62	4.68	4.02	2.99
18	6.24	6.20	5.91	5.82	4.81	4.77	2.68	.68	4.64	4.66	4.07	2.93
19	6.32	6.06	5.90	5.61	4.84	4.87	2.67	.96	4.70	4.66	4.10	2.96
20	6.35	6.00	6.09	5.70	4.87	3.93	2.83	.67	4.63	4.64	4.02	3.19
21	6.34	6.04	5.88	5.81	4.88	2.83	2.80	.77	4.59	4.52	3.94	3.13
22	6.30	6.12	5.81	5.77	4.83	2.69	2.87	.53	4.57	4.42	3.90	2.95
23	6.24	6.10	5.84	5.71	4.87	2.91	3.13	.26	4.41	4.57	3.65	2.87
24	6.11	6.17	5.80	5.56	4.82	2.94	3.31	.89	4.44	4.55	3.66	2.72
25	6.29	6.14	5.76	5.53	4.96	2.88	3.34	.83	4.48	4.49	3.49	2.90
26	6.17	6.05	5.80	5.64	5.12	2.93	3.40	.78	4.61	4.44	3.40	2.75
27	6.26	6.02	5.94	5.73	5.03	3.07	3.47	1.12	4.51	4.51	3.37	2.89
28	6.19	5.90	6.04	5.63	4.76	2.89	3.48	2.99	4.59	4.54	3.41	2.90
29	6.19	5.96	5.92	5.44	4.71	2.83	3.51	3.09	4.72	4.34	3.09	2.96
30	6.38		6.04	5.48	4.59	2.62	3.23	3.10	4.62	3.93	3.06	2.90
31	6.49		5.87		4.58		3.21	2.96		3.78		2.77
Sum	192.56	181.61	177.45	173.13	151.16	123.91	90.04	51.25	117.19	139.80	113.76	92.69

Month	Current Year 1996							Period 1977-1996			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.610	0.555	31	6.55	2	5.83	6.21	16,637	14,573	21,638	7,412
Feb.	.620	.565	13	6.76	28	5.81	6.26	15,691	14,020	18,374	8,506
Mar.	.590	.525	20	6.18	6	5.14	5.72	15,332	15,411	21,496	11,420
April	.590	.525	9	6.20	28	5.18	5.77	14,958	14,235	20,613	3,465
May	.555	.495	1	5.64	130	4.56	4.88	13,060	14,347	20,732	5,215
June	.530	.340	11	5.06	22	2.52	4.13	10,706	12,940	19,842	2,227
July	.445	.315	29	3.88	12	2.24	2.90	7,779	13,644	22,235	3,718
Aug.	.495	.065	28	4.62	23	.16	1.65	4,428	13,696	22,444	3,656
Sept.	.510	.355	29	4.90	12	2.66	3.91	10,125	12,985	23,538	51.4
Oct.	.510	.420	8	4.91	31	3.59	4.51	12,079	13,609	23,600	23.9
Nov.	.465	.365	9	4.27	29	2.90	3.79	9,829	12,408	20,944	59.2
Dec.	.425	.330	15	3.68	3	2.45	2.99	8,008	13,017	22,518	138
Yearly	0.620	0.065		6.76		0.16	4.38	138,632	164,885	222,488	75,784

! And other days

09-5350.00 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, 1.0 kilometer downstream from the wasteway gates on the Central Feeder Canal on the right bank of the Colorado River, 27 kilometers downstream from Morelos Dam, and 250 meters south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District 14 of the National Water Commission and furnished by the Mexican Section of the Commission. Records shown in table below are waste returns to the Colorado River. Records available: April 1956 through 1996.

REMARKS: The Colorado River Irrigation District 14 transports water for irrigation of land on the left bank of the Colorado River by the Central Feeder Canal 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 Sanchez Mejorada Siphon, which was placed in operation on June 28, 1963. As part of the rehabilitation works, started in 1968, of the Colorado River Irrigation District, the Canal de Conexión was enlarged and lined, and is now known as the Central Feeder Canal.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1956 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	0	11,251	85,761	0
February	0	5,627	50,898	0
March	0	8,150	72,049	0
April	0	13,902	85,372	0
May	1,951	13,464	99,576	0
June	0	11,902	61,705	0
July	0	12,352	56,912	0
August	0	18,085	132,183	0
September	0	14,246	83,943	0
October	0	12,908	136,198	0
November	0	12,797	122,170	0
December	0	11,199	86,607	0
Yearly	1,951	143,864	628,347	0

09-5365.00 WASTEWAY TO COLORADO RIVER AT KILOMETER 38 IN MEXICO

DESCRIPTION: Wasteway to the Colorado River on the left bank of new Barrote Canal at old dam and bridge at Kilometer 18+251 (old Kilometer 38+000). The wasteway is located in the Colonia Bojorquez 1.3 kilometers upstream from the Sonora-Baja California railroad bridge, 5.9 kilometers downstream from the Miguel C. Rodriguez gaging station, and 45 kilometers downstream from the southerly international boundary.

RECORDS: The records are computed by the National Water Commission and are based upon gate openings. Records available: January 1964 through 1996.

REMARKS: The wasteway structure on the left bank of the Colorado River has two manually operated radial gates 3.0 meters wide. It discharges into a dirt canal 200 meters long with a total capacity of 13.0 CMS which discharges to the river.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1964 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	0	1,889	10,541	0
February	0	1,412	12,035	0
March	0	737	5,932	0
April	51.8	382	5,555	0
May	95.0	1,413	14,246	0
June	0	839	8,585	0
July	0	703	9,114	0
August	0	1,141	17,765	0
September	0	2,217	16,855	0
October	0	4,551	28,669	0
November	0	2,835	25,263	0
December	0	2,349	13,380	0
Yearly	146.8	19,339	103,228	0

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 million cubic meters. 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 MILLION CUBIC METERS

Month	LAKE MEAD (Capacity 32,267)		LAKE MOHAVE (Capacity 2,233)		HAVASU LAKE (Capacity 764)		TOTAL IN UNITED STATES RESERVOIRS (Capacity 35,263)	
	1996	Average 1935-1996	1996	Average 1951-1996	1996	Average 1939-1996	1996	Estimated Average
Jan.	27,111.9	22,976.5	2,012.8	2,052.4	701.2	683.3	29,825.9	25,712.2
Feb.	27,174.8	22,830.9	2,055.0	2,066.0	702.8	685.7	29,932.6	25,582.6
Mar.	27,174.8	22,551.5	2,013.7	2,069.2	650.0	702.5	29,838.5	25,323.2
April	26,991.0	22,577.5	2,105.6	2,055.1	716.4	738.2	29,813.0	25,370.8
May	26,732.0	23,312.7	2,139.3	2,126.5	752.2	744.4	29,623.5	26,183.6
June	26,590.1	24,433.2	2,079.2	2,019.6	732.9	740.5	29,402.2	27,193.3
July	26,560.5	24,586.1	2,034.6	1,878.0	717.1	726.4	29,312.2	27,190.5
Aug.	26,519.8	24,379.5	2,030.7	1,827.0	733.6	710.2	29,284.1	26,916.7
Sept.	26,660.4	24,156.1	1,946.9	1,786.7	736.0	702.9	29,343.3	26,645.7
Oct.	26,783.8	23,919.2	1,847.0	1,789.6	715.7	699.7	29,346.5	26,408.5
Nov.	26,983.6	23,754.0	1,883.4	1,866.1	695.6	688.2	29,562.6	26,308.3
Dec.	27,274.7	23,576.4	1,946.2	1,975.7	684.8	686.8	29,905.7	26,236.9
Avg.	26,879.8	23,587.8	2,007.9	1,959.3	711.5	709.1	29,599.2	26,256.2
Max.	27,274.7	24,586.1	2,139.3	2,126.5	752.2	744.4	29,932.6	27,193.3
Min.	26,519.8	22,551.5	1,847.0	1,786.7	650.0	683.3	29,284.1	25,323.2

SUSPENDED SILT - 1996

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.

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

Date	Time	Stream-flow, Momentary	Gravimetric Percent	Date	Time	Stream-flow, Momentary	Gravimetric Percent	Date	Time	Stream-flow, Momentary	Gravimetric Percent
Jan. 04	0850	34.3	0.0095	May 09	0810	71.3	0.0061	Sep. 12	0730	36.3	0.0058
11	1015	36.3	0.0150	16	0845	77.3	0.0095	19	0720	37.6	0.0072
18	0950	43.5	0.0154	23	0820	85.2	0.0077	25	0805	38.5	0.0085
25	0950	51.0	0.0157	30	0825	90.0	0.0064	Oct. 03	0705	21.5	0.0053
Feb. 01	0840	62.0	0.0214	Jun. 06	0800	78.5	0.0061	10	0840	22.6	0.0053
08	0910	69.4	0.0143	13	0830	81.9	0.0060	17	0725	21.2	0.0031
15	0845	64.2	0.0063	20	0815	86.7	0.0076	24	0955	21.2	0.0028
22	1010	69.7	0.0186	27	0915	81.9	0.0047	31	0825	24.4	0.0083
29	0900	72.9	0.0075	Jul. 03	0750	68.8	0.0044	Nov. 07	0825	26.0	0.0058
Mar. 07	0745	78.1	0.0041	11	0725	67.0	0.0043	14	0730	25.3	0.0046
14	0805	82.1	0.0279	18	0825	63.7	0.0058	21	0900	27.5	0.0026
21	0815	81.1	0.0156	25	0910	61.1	0.0050	27	0800	26.6	0.0056
28	0810	83.4	0.0193	Aug. 01	0740	58.3	0.0044	Dec. 05	0810	27.0	0.0067
Apr. 04	0745	74.1	0.0084	08	0855	57.3	0.0046	12	0830	26.9	0.0045
11	0920	73.2	0.0083	15	0855	46.5	0.0058	19	0920	26.9	0.0049
18	0850	77.8	0.0417	22	0810	38.0	0.0470	26	0830	25.8	0.0079
25	0835	77.8	0.0459	29	0850	39.1	0.0056				
May 01	0815	71.1	0.0052	Sep. 05	0855	38.2	0.0077				

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

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

Month	Monthly Weight Megagrams		Number of Samples	Gravimetric Percentages			* Silt Volume - Thousand Cubic Meters	Period 1952 - 1996			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Total 1996	Average	Maximum	Minimum
Jan.	113,823,000	9,304	5	0.0082	0.0155	0.0009	6.8	12.3	62.2	0.30	
Feb.	169,474,000	12,922	4	0.0076	0.0095	0.0053	9.5	13.8	127.8	1.10	
Mar.	217,236,000	53,761	3	0.0247	0.0528	0.0070	39.5	57.5	605.2	3.32	
April	197,225,000	18,384	3	0.0093	0.0169	0.0030	13.5	61.9	856.8	4.49	
May	209,883,000	11,991	4	0.0057	0.0100	0.0030	8.8	20.3	318.2	1.36	
June	215,343,000	10,201	4	0.0056	0.0322	0.0010	8.9	34.2	256.6	2.53	
July	172,964,000	2,203	5	0.0125	0.0510	0.0019	16.2	45.6	192.3	4.14	
Aug.	123,785,000	422	4	0.0034	0.0072	0.0019	3.1	39.5	166.9	4.02	
Sept.	98,392,000	352	4	0.0036	0.0052	0.0014	2.6	18.3	79.8	1.78	
Oct.	58,147,000	107	5	0.0018	0.0052	0.0005	0.7	9.6	124.0	0.40	
Nov.	67,150,000	160	4	0.0024	0.0051	0.0005	1.2	9.7	165.2	0.30	
Dec.	68,921,000	271	4	0.0045	0.0058	0.0024	2.0	9.7	54.4	0.84	
Year	1,712,343,000	120,078	49	0.0074	0.0528	0.0005	112.8	332.4	2,706.5	40.2	

* Volume calculated at 1.362 megagrams per cubic meter

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

Date	Time	Stream-flow, Momentary	Gravimetric Percent	Date	Time	Stream-flow, Momentary	Gravimetric Percent	Date	Time	Stream-flow, Momentary	Gravimetric Percent
	Std.	CMS			Std.	CMS			Std.	CMS	
*											

* - No samples were collected in 1996.

CHEMICAL ANALYSES OF WATER SAMPLES
 1996

The tables below are based on chemical analyses of samples from the Colorado River taken at the Northerly International Boundary by the United States Section of the Commission and analyzed under a contract with the U. S. Bureau of Reclamation.

Colorado River at Northerly International Boundary

1996	Time	Streamflow	Specific		Hardness,	Hardness,	Calcium	Magnesium
Date	Standard	Momentary	Conductance	pH	Total	Noncarbonate	ion (Ca),	ion (Mg),
		CMS	Microsiemens/ cm	Units	(as CaCO ₃) mg/L	(CaCO ₃) mg/L	Dissolved mg/L	Dissolved mg/L
Jan. 2	0800	34.2	1690	8.2	423.94	238.94	103.0	40.1
16	0800	NR	1560	8.3	400.50	225.50	97.1	38.0
Feb. 5	0830	66.9	1510	8.2	395.20	226.20	95.3	37.8
20	0900	69.4	1380	8.3	357.15	202.15	85.4	34.6
Mar. 4	0900	79.7	1400	8.2	375.45	217.45	90.9	35.7
18	0830	82.2	1320	8.2	357.89	205.89	85.7	34.6
April 1	0800	73.6	1330	8.3	358.80	208.80	85.9	34.7
15	0830	77.5	1320	8.3	335.05	184.05	87.1	28.2
May 6	0800	78.0	1320	8.4	325.01	171.01	83.1	28.2
20	0915	86.4	1330	8.4	331.60	176.60	84.9	28.7
June 3	0730	84.0	1320	8.3	341.54	187.54	86.9	29.9
17	0900	88.3	1290	8.3	344.19	193.19	87.8	30.0
July 1	0815	NR	1290	8.3	389.14	237.14	101.0	32.9
15	0800	66.3	1330	8.3	327.38	173.38	84.2	28.1
Aug. 5	0830	54.8	1380	8.3	326.51	168.51	82.7	28.8
19	0800	36.7	1480	8.3	338.57	169.57	86.7	29.3
Sept. 3	0915	40.0	1470	8.3	340.13	176.13	86.0	30.1
16	1030	39.0	1460	8.3	381.02	214.02	91.1	36.9
Oct. 7	0700	21.4	1620	8.2	404.29	226.29	97.6	38.6
21	0730	22.6	1720	7.6	415.65	258.65	100.0	39.9
Nov. 4	0900	24.0	1790	8.1	431.86	241.86	104.0	41.4
18	0930	26.8	1690	8.2	417.74	230.74	101.0	39.8
Dec. 2	0800	27.0	1730	8.2	404.85	214.85	100.0	37.3
16	0900	27.0	1720	8.2	396.49	210.49	102.0	34.1

N.R. - None Reported

1996	Sodium	Potassium	Sulfate	Chloride	Carbonate	Bicarbonate	Nitrate	Total
Date	ion (Na), Dissolved mg/L	ion (K) Dissolved mg/L	ion (SO ₄) Dissolved mg/L	ion (Cl), Dissolved mg/L	(as CO ₃) mg/L	(as HCO ₃) mg/L	(as NO ₃) mg/L	Solids Dissolved (Calculated) mg/L
Jan. 2	199	9.8	383	207	N.D.	226	1.9	1,070
16	173	5.1	346	187	0.6	212	1.9	964
Feb. 5	166	5.3	350	175	N.D.	206	1.7	943
20	157	7.0	340	152	N.D.	189	1.6	882
Mar. 4	151	5.6	331	149	N.D.	193	1.7	870
18	145	6.5	321	140	N.D.	185	1.6	836
April 1	146	5.0	322	148	N.D.	183	1.6	844
15	138	4.8	293	140	N.D.	184	1.6	793
May 6	129	4.6	280	145	1.0	186	1.6	773
20	132	5.0	287	147	0.8	187	1.5	789
June 3	133	5.2	294	137	0.5	187	1.4	790
17	128	5.0	289	131	0.4	183	1.1	772
July 1	139	5.2	315	129	0.5	186	0.9	823
15	139	4.7	289	134	0.7	186	1.1	783
Aug. 5	121	4.5	272	151	N.D.	193	1.4	768
19	135	5.6	281	168	0.1	206	1.9	823
Sept. 3	129	4.7	279	178	N.D.	200	1.4	820
16	159	4.9	343	168	N.D.	204	1.2	918
Oct. 7	181	5.0	363	205	N.D.	217	2.0	1,010
21	197	4.9	374	222	N.D.	192	2.3	1,050
Nov. 4	201	5.0	383	233	N.D.	232	1.9	1,100
18	194	5.1	373	226	N.D.	228	2.5	1,070
Dec. 2	196	4.7	361	231	N.D.	232	2.2	1,060
16	203	4.8	363	227	N.D.	227	2.3	1,050

N.D. - Not Detected

SPECIFIC CONDUCTANCE OF WATER SAMPLES

The following table shows specific conductance of individual water samples taken at the Colorado River station and in Mexican canals. Samples were taken at the Northerly International Boundary and at the Southerly International Boundary by the United States Section of the Commission. Determinations for the Northerly International Boundary were made by the Bureau of Reclamation and the United States Section of the Commission (jointly); and for the Southerly International Boundary, by the United States Section of the Commission. Samples for the Intake Canal at Morelos Dam were taken by the Mexican Section of the Commission, and determinations were made by the Ministry of Agriculture and Hydraulic Resources of Mexico.

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,670*	1,480	1,310	1,310	1,320	1,300*	1,290	1,320	1,460*	1,650	1,740	1,740*
2	1,690	1,470	1,330*	1,310	1,340	1,310*	1,260	1,350	1,460*	1,640	1,750*	1,730
3	1,640	1,480*	1,380*	1,330	1,310	1,320	1,270	1,360*	1,470	1,630	1,760*	1,750
4	1,630	1,500*	1,400	1,310	1,310*	1,280	1,280*	1,370*	1,480	1,610	1,790	1,780
5	1,600	1,510	1,380	1,330	1,320*	1,280	1,290	1,380	1,470	1,610*	1,780	1,750
6	1,620*	1,460	1,350	1,330*	1,320	1,290	1,290*	1,420	1,460	1,610*	1,770	1,780
7	1,640*	1,440	1,340	1,330*	1,320	1,290	1,280*	1,340	1,480*	1,620	1,750	1,780*
8	1,650	1,440	1,350	1,330	1,330	1,280*	1,280	1,350	1,500*	1,650	1,780	1,780*
9	1,670*	1,390	1,340*	1,330	1,300	1,280*	1,300	1,340	1,510	1,640	1,780*	1,780
10	1,580	1,410*	1,320*	1,310	1,310	1,270	1,280	1,350*	1,500	1,660	1,770*	1,750
11	1,600	1,420*	1,310	1,320	1,320*	1,270	1,290	1,350*	1,470	1,640	1,770*	1,730
12	1,560	1,440	1,310	1,310	1,330*	1,280	1,320	1,360	1,460	1,630*	1,770	1,740
13	1,560*	1,450	1,300	1,310*	1,340	1,300	1,320*	1,380	1,440	1,620*	1,760	1,730
14	1,560*	1,440	1,300	1,320*	1,330	1,270	1,330*	1,330	1,450*	1,600*	1,740	1,730*
15	1,560*	1,460	1,300	1,320	1,330	1,280*	1,330	1,340	1,450*	1,590	1,760	1,720*
16	1,560	1,460	1,310*	1,310	1,300	1,280*	1,320	1,360	1,460	1,710	1,750*	1,720
17	1,530	1,440*	1,310*	1,280	1,300	1,290	1,320	1,400*	1,450	1,730	1,730*	1,720
18	1,530	1,420*	1,320	1,290	1,310*	1,260	1,310	1,440*	1,430	1,740	1,690	1,710
19	1,520	1,400*	1,300	1,310	1,320*	1,260	1,320	1,480	1,470	1,730*	1,710	1,710
20	1,520*	1,380	1,300	1,300*	1,330	1,260	1,320*	1,440	1,450	1,720*	1,690	1,730
21	1,520*	1,410	1,300	1,300*	1,300	1,270	1,320*	1,420	1,460*	1,720	1,740	1,760*
22	1,520	1,370	1,320	1,290	1,280	1,260*	1,320	1,440	1,460*	1,770	1,690	1,780*
23	1,500	1,380	1,320*	1,340	1,290	1,260*	1,330	1,460	1,470	1,830	1,700*	1,810
24	1,500	1,370*	1,320*	1,290	1,300	1,250	1,320	1,470*	1,460	1,860	1,710*	1,820
25	1,480	1,360*	1,320	1,300	1,300*	1,240	1,290	1,480*	1,460	1,830	1,720	1,800*
26	1,460	1,350	1,320	1,300	1,300*	1,220	1,270	1,490	1,460	1,830*	1,780	1,780
27	1,480*	1,350	1,340	1,300*	1,300*	1,240	1,290*	1,470	1,460	1,820*	1,760	1,750
28	1,490*	1,310	1,290	1,290*	1,300	1,250	1,310*	1,470	1,450*	1,820	1,760*	1,820*
29	1,510	1,370	1,300	1,290	1,290	1,260*	1,320	1,430	1,440*	1,840	1,760	1,880*
30	1,510		1,300*	1,290	1,290	1,280*	1,300	1,450	1,430	1,820	1,750*	1,950
31	1,500		1,310*		1,290		1,330	1,450*		1,810		1,960

* - ESTIMATED

WESTERN BOUNDARY WATER BULLETIN - 1996 - INTERNATIONAL BOUNDARY AND WATER COMMISSION

SPECIFIC CONDUCTANCE OF WATER SAMPLES

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,680	1,390	1,350	1,310	1,320	1,310	1,330	1,380	1,560	1,710	1,860	1,850
2	1,620	1,510	1,330	1,300	1,340	1,350	1,310	1,370	1,530	1,720	1,870	1,830
3	1,630	1,510	1,400	1,330	1,360	1,350	1,320	1,370	1,510	1,740	1,840	1,830
4	1,610	1,500	1,350	1,340	1,360	1,320	1,290	1,370	1,510	1,730	1,830	1,900
5	1,620	1,500	1,360	1,300	1,360	1,310	1,290	1,380	1,490	1,700	1,840	1,830
6	1,660	1,510	1,340	1,300	1,350	1,320	1,300	1,390	1,500	1,700	1,830	1,850
7	1,620	1,490	1,350	1,300	1,360	1,310	1,330	1,360	1,510	1,690	1,820	1,870
8	1,640	1,490	1,340	1,340	1,370	1,300	1,340	1,360	1,530	1,690	1,850	1,830
9	1,670	1,480	1,330	1,340	1,310	1,320	1,320	1,360	1,550	1,710	1,860	1,880
10	1,610	1,510	1,330	1,350	1,320	1,330	1,300	1,360	1,540	1,700	1,850	1,830
11	1,600	1,310	1,320	1,360	1,320	1,320	1,310	1,380	1,510	1,720	1,820	1,790
12	1,590	1,320	1,320	1,380	1,340	1,340	1,300	1,380	1,510	1,700	1,820	1,820
13	1,580	1,330	1,320	1,360	1,360	1,320	1,340	1,390	1,500	1,740	1,830	1,810
14	1,610	1,320	1,320	1,350	1,380	1,320	1,330	1,360	1,490	1,780	1,860	1,790
15	1,600	1,320	1,320	1,370	1,360	1,310	1,340	1,350	1,500	1,780	1,890	1,850
16	1,590	1,360	1,270	1,330	1,320	1,300	1,360	1,390	1,500	1,790	1,860	1,820
17	1,570	1,360	1,300	1,340	1,340	1,290	1,350	1,430	1,510	1,860	1,830	1,820
18	1,580	1,330	1,300	1,330	1,350	1,290	1,340	1,450	1,490	1,930	1,860	1,800
19	1,590	1,390	1,270	1,320	1,400	1,300	1,340	1,490	1,500	1,890	1,830	1,780
20	1,580	1,430	1,280	1,310	1,410	1,310	1,330	1,400	1,520	1,850	1,830	1,860
21	1,580	1,390	1,250	1,300	1,410	1,310	1,340	1,490	1,500	1,820	1,830	1,830
22	1,580	1,400	1,310	1,300	1,380	1,290	1,310	1,500	1,530	1,850	1,830	1,860
23	1,570	1,410	1,320	1,350	1,380	1,300	1,310	1,520	1,530	1,940	1,860	1,940
24	1,570	1,380	1,330	1,360	1,360	1,290	1,320	1,530	1,540	1,890	1,840	1,940
25	1,580	1,390	1,300	1,340	1,360	1,270	1,300	1,510	1,500	1,910	1,830	1,840
26	1,610	1,360	1,300	1,370	1,340	1,290	1,310	1,520	1,490	1,950	1,820	1,850
27	1,580	1,360	1,300	1,370	1,320	1,310	1,320	1,520	1,480	1,900	1,820	1,830
28	1,570	1,360	1,310	1,360	1,340	1,300	1,330	1,520	1,510	1,860	1,810	1,890
29	1,560	1,360	1,320	1,350	1,360	1,330	1,350	1,520	1,520	1,840	1,890	2,200
30	1,580		1,320	1,310	1,320	1,320	1,340	1,520	1,560		1,850	2,200
31	1,590		1,320		1,320		1,360	1,510				2,100

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1996

January		March		May		July		September		November	
16	4,460	1	4,360	1	4,500	1	4,450	3	4,270	4	4,120
23	4,400	4	4,410	7	4,460	8	4,800	17	4,230	12	4,060
		12	4,550	14	4,400	15	4,420	25	4,110	19	4,070
		19	4,360								
		27	4,390								
February		April		June		August		October		December	
1	4,440	1	4,430	3	4,400	2	4,460	1	4,070	3	3,920
5	4,400	9	4,480	18	4,540	13	4,030	15	4,290	17	3,910
13	4,430	16	4,340	27	4,630	20	3,740				
20	4,430										
27	4,370										

RAINFALL ON THE COLORADO RIVER WATERSHED
IN MILLIMETERS

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

IN THE UNITED STATES

Month	Brawley, California		El Centro, California		Blythe, California		Yuma Citrus Station, Arizona		Bullhead City, Arizona	
	1996	Average 1931-1996	1996	Average 1931-1996	1996	Average 1931-1996	1996	Average 1931-1996	1996	Average 1978-1996
Jan.	0	10	0	11	3	12	0	11	0	30
Feb.	1	9	4	9	10	11	4	9	18	26
Mar.	T	7	0	6	6	10	1	7	3	30
April	0	2	0	2	0	3	0	3	0	5
May	0	1	0	0	5	1	0	1	0	3
June	0	0	0	0	0	1	0	1	0	0
July	8	2	2	2	0	5	0	6	3	10
Aug.	1	9	1	9	0	19	6	14	0	21
Sept.	0	8	0	7	37	10	1	9	0	10
Oct.	0	6	0	7	0	7	0	9	8	11
Nov.	1	5	0	5	0	7	0	5	26	14
Dec.	1	11	0	11	0	14	0	11	5	18
Yearly	12	70	7	69	61	100	12	86	63	178

IN MEXICO

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		El Centinela, Baja California		Delta, Baja California	
	1996	Average 1948-1996	1996	Averages 1926-1996	1996	Averages 1948-1996	1996	Averages 1975-1996	1996	Averages 1948-1996
Jan.	0	9	0	9	#	10	0	5	0	8
Feb.	0	5	7	8	#	6	3	5	3	6
Mar.	0	4	0	6	#	5	T	3	0	5
April	0	2	0	2	#	2	0	2	0	1
May	0	T	T	T	#	T	T	0	0	T
June	0	T	0	T	0	T	3	T	0	T
July	0	2	1	3	0	1	0	T	0	1
Aug.	3	9	7	10	0	6	0	5	11	7
Sept.	0	3	T	9	0	4	0	1	0	5
Oct.	0	6	0	9	0	6	0	6	0	7
Nov.	0	4	T	4	0	3	0	T	0	3
Dec.	0	9	1	18	0	7	0	8	0	11
Yearly	3	57	16	83		49	6	11	14	53

Month	San Felipe, Baja California		Riito, Sonora					
	1996	Average 1948-1996	1996	Averages 1949-1996				
Jan.	0	7	0	6				
Feb.	32	5	0	5				
Mar.	0	3	0	4				
April	0	1	0	1				
May	2	1	0	T				
June	3	1	0	T				
July	0	3	0	2				
Aug.	0	10	0	6				
Sept.	0	9	0	10				
Oct.	0	5	0	8				
Nov.	0	5	0	4				
Dec.	0	10	0	10				
Yearly	37	62	0	62				

T Trace

Missing Record

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 1996.

IN THE UNITED STATES

NAME OF STATION	LATITUDE	LONGITUDE	φ ELEV. (Meters)	RECORD BEGAN	OBSERVER
* Blythe, California	33° 37'	114° 36'	81.69	1909	State Division of Forestry
Brawley, California	32° 57'	115° 33'	30.48	1908	Agricultural Research Service
Bullhead City, Arizona	35° 07'	114° 36'	176.78	1980	Bullhead City Fire Department
El Centro, California	32° 46'	115° 34'	9.14	1930	El Centro Water Department
Yuma Citrus Station, Arizona	32° 37'	114° 39'	58.22	1923	University of Arizona Experimental Farm

IN MEXICO

NAME OF STATION	LATITUDE	LONGITUDE	φ ELEV. (Meters)	RECORD BEGAN	OBSERVER
Bataques, Baja California	32° 34'	115° 00'	**20.12	1948	# S. A. R. H.
Delta, Baja California	32° 21'	115° 11'	**11.89	1948	S. A. R. H.
El Centinela, Baja California	32° 35'	115° 45'	49.99	1978	S. A. R. H.
Los Algodones, Baja California	32° 42'	114° 44'	35.05	1948	S. A. R. H.
Mexicali, Baja California	32° 40'	115° 28'	3.96	1926	S. A. R. H.
Riito, Sonora	32° 13'	115° 01'	13.11	1959	S. A. R. H.
San Felipe, Baja California	31° 01'	114° 51'	21.95	1969	S. A. R. H.

* Not shown on rainfall map

φ Elevation above mean sea level except Brawley and El Centro, which are elevations below mean sea level

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

Ministry of Agriculture and Hydraulic Resources

WESTERN BOUNDARY WATER BULLETIN - 1996 - INTERNATIONAL BOUNDARY AND WATER COMMISSION

EVAPORATION IN THE COLORADO RIVER BASIN
IN MILLIMETERS

Tabulated below are records of evaporation observed at one station in Arizona, at five stations in Baja California, and at one station in Sonora. The station in the United States is operated by the University of Arizona Experimental Farm. The stations in Mexico are operated by the Ministry of Agriculture and Hydraulic Resources. The type of pan used at all these stations was the National Weather Service standard pan of 1.22 meters diameter. For specific location of these stations, refer to data opposite the same station name shown in "Location of Rainfall Stations," in this bulletin.

IN THE UNITED STATES

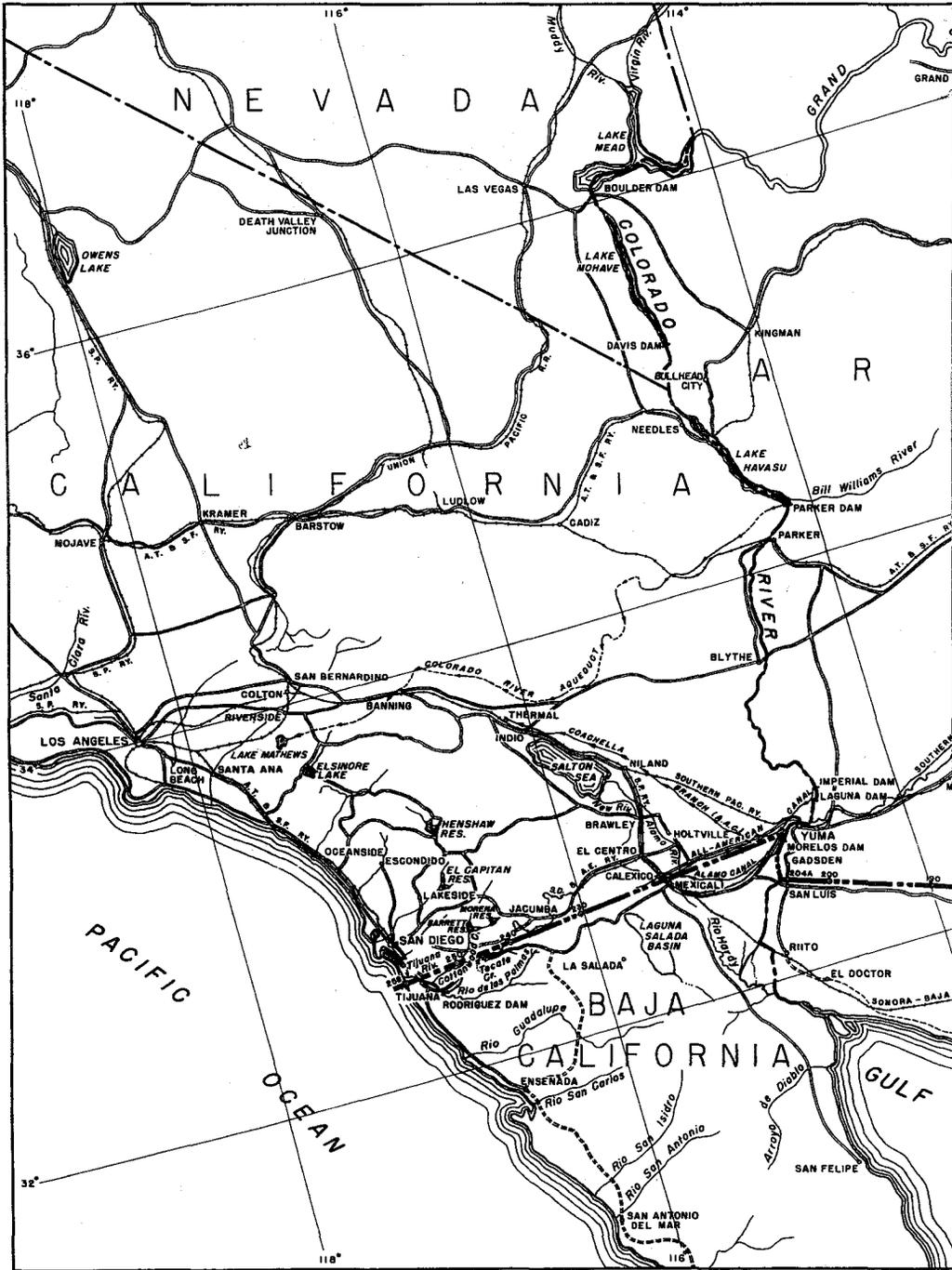
Month	Yuma Citrus Station, Arizona	
	1996	Average 1931-1996
Jan.	124	99
Feb.	113	120
Mar.	203	184
April	272	253
May	251	324
June	361	359
July	404	384
Aug.	324	338
Sept.	268	266
Oct.	212	190
Nov.	136	124
Dec.	119	93
Yearly	2,787	2,734

IN MEXICO

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		Riito, Sonora		San Felipe, Baja California	
	1996	Average 1949-1996	1996	Average 1926-1996	1996	Average 1959-1996	1996	Average 1962-1996	1996	Average 1952-1996
Jan.	94	107	77	65	#	83	#	76	#	120
Feb.	103	130	90	134	#	101	#	98	#	139
Mar.	190	183	141	148	#	150	#	146	#	169
April	250	253	195	198	#	205	#	187	#	196
May	314	316	302	268	#	269	#	256	#	240
June	113	343	305	293	#	305	#	286	#	256
July	#	353	296	294	#	290	#	315	#	285
Aug.	#	316	261	257	#	251	#	266	#	270
Sept.	#	360	184	205	#	206	#	215	#	237
Oct.	#	205	173	146	#	147	#	153	#	206
Nov.	#	134	86	86	#	109	#	95	#	152
Dec.	#	108	61	60	#	78	#	77	#	122
Yearly		2,683	2,171	2,126	#	2,226	#	2,246	#	2,538

Month	Delta, Baja California								
	1996	Average 1959-1996							
Jan.	92	86							
Feb.	97	109							
Mar.	175	154							
April	254	200							
May	312	255							
June	315	277							
July	345	288							
Aug.	296	261							
Sept.	244	222							
Oct.	218	155							
Nov.	53	103							
Dec.	38	161							
Yearly	2,439	2,030							

Missing record



TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES CELSIUS

The maximum, minimum, and monthly mean temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located approximately one meter 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," in this bulletin.

IN THE UNITED STATES

Month	Blythe, California				Yuma Citrus Station, Arizona				Brawley, California			
	1996				1996				1996			
	Mean	Max.	Min.	Average 1931-96	Mean	Max.	Min.	Average 1931-96	Mean	Max.	Min.	Average 1931-96
Jan.	13.3	28.9	-0.6	11.5	13.7	26.7	0.0	11.9	13.7	28.3	-1.1	12.3
Feb.	17.3	31.1	-2.8	14.2	16.6	30.0	0.6	14.1	17.0	32.2	0.6	14.7
Mar.	19.0	33.3	5.0	17.3	18.0	33.9	4.4	16.8	18.3	34.4	3.9	17.4
April	24.9	46.1	8.3	21.4	21.8	39.4	7.2	20.5	22.2	38.9	6.7	21.1
May	27.7	43.9	11.7	25.5	26.5	43.3	12.8	24.4	26.1	42.8	12.8	25.0
June	31.3	45.6	15.0	29.9	30.1	43.9	15.0	28.8	30.3	45.0	15.6	29.4
July	35.7	47.8	21.1	33.6	34.4	46.1	21.7	32.7	34.5	46.7	23.9	33.1
Aug.	34.7	47.2	20.0	32.9	34.2	47.2	20.0	32.4	34.7	47.8	20.0	32.9
Sept.	29.3	41.7	13.9	29.4	29.4	40.6	15.0	29.4	30.2	42.2	15.6	30.0
Oct.	22.7	41.1	3.9	22.9	23.7	41.1	4.4	23.1	24.4	41.7	5.6	23.9
Nov.	17.2	30.6	5.6	15.7	17.9	31.1	4.4	16.3	18.1	32.2	5.0	16.9
Dec.	13.7	25.6	-1.7	11.7	13.6	25.6	1.1	12.5	13.6	26.1	-1.7	12.8
Yearly	23.9	47.8	-2.8	22.2	23.3	47.2	0	21.9	23.6	47.8	-1.7	22.5

Month	El Centro, California				Bullhead City, Arizona							
	1996				1996							
	Mean	Max.	Min.	Average 1931-96	Mean	Max.	Min.	Average 1978-96				
Jan.	14.9	27.2	1.7	12.4	13.8	25.0	-0.6	12.1				
Feb.	17.8	31.7	2.8	14.7	17.7	31.1	0.6	14.9				
Mar.	19.2	33.9	5.6	17.4	19.9	33.9	5.6	17.8				
April	23.3	39.4	11.1	21.1	24.2	40.6	10.0	22.4				
May	27.8	42.8	14.4	25.1	29.0	46.1	13.3	27.1				
June	30.8	42.8	17.2	29.6	33.2	47.8	18.3	32.4				
July	34.6	47.8	23.9	33.2	37.7	49.4	25.6	35.2				
Aug.	34.2	45.0	21.1	32.8	36.7	50.0	22.2	34.6				
Sept.	29.9	41.7	18.3	29.9	30.3	44.4	16.1	30.5				
Oct.	24.6	42.2	7.8	23.8	24.8	42.8	5.0	23.9				
Nov.	18.6	31.7	3.3	16.9	17.8	29.4	7.2	16.6				
Dec.	14.3	26.1	0.6	12.7	10.6	23.3	0.6	11.8				
Yearly	24.2	47.8	0.6	22.5	24.6	50.0	-0.6	23.3				

Missing Data

IN MEXICO

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1996		1948-1996		1996		1926-1996		1996		1948-1996	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	29	1	31	-5	27	3	34	-7	#	#	45	-9
Feb.	33	2	35	-2	32	5	34	-5	#	#	37	-6
Mar.	35	5	38	0	34	8	38	-1	#	#	45	-4
April	40	9	43	3	41	12	41	1	#	#	48	-9
May	43	12	47	6	46	11	47	6	#	#	51	1
June	46	16	52	11	46	15	49	9	47	10	57	6
July	47	18	50	13	49	23	48	13	47	13	56	7
Aug.	47	21	49	16	48	19	49	12	48	14	54	8
Sept.	43	16	50	10	44	19	50	8	47	6	57	4
Oct.	45	4	44	0	41	8	44	0	40	1	48	0
Nov.	33	8	38	-3	30	7	40	-2	33	1	46	0
Dec.	28	1	32	-5	25	2	32	-5	28	0	36	-4
Yearly	47	9	52	-5	49	2	50	-7			57	-9

Missing Data

TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES CELSIUS

IN MEXICO

Month	Riito, Sonora				San Felipe, Baja California				El Centinela, Baja California			
	1996		1949-1996		1996		1969-1996		1996		1975-1996	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	30	2	33	-7	23	8	37	-1	28	5	30	1
Feb.	31	2	35	-6	25	12	39	0	32	3	35	-4
Mar.	36	4	38	-7	29	14	40	0	36	10	38	4
April	41	8	43	2	30	15	45	1	42	13	46	8
May	44	9	46	5	34	12	49	5	46	13	45	11
June	45	13	51	7	39	18	51	10	48	17	48	10
July	46	24	60	11	41	27	51	10	49	24	52	20
Aug.	47	21	50	8	44	23	57	5	47	22	49	18
Sept.	45	19	48	4	42	16	52	3	45	19	50	11
Oct.	40	6	46	-1	39	9	47	-5	44	6	46	3
Nov.	32	7	48	-3	34	11	48	-6	33	6	40	3
Dec.	28	3	30	-6	29	3	36	-2	28	1	29	-3
Yearly	47	2	60	-7	44	3	57	-6	49	1	52	-4

Month	Delta, Baja California											
	1996		1948-1996									
	Max.	Min.	Max.	Min.								
Jan.	31	-1	40	-4								
Feb.	34	0	40	-2								
Mar.	37	4	45	-2								
April	43	6	48	0								
May	46	10	54	0								
June	48	11	56	2								
July	51	14	57	7								
Aug.	49	17	60	16								
Sept.	44	13	57	4								
Oct.	46	2	47	1								
Nov.	35	4	50	0								
Dec.	29	-3	40	-3								
Yearly	51	-3	60	-4								

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM

1996

The total drainage area within the Colorado River basin is about 637,100 square kilometers, of which 478,100 square kilometers lie above Imperial Dam and about 159,000 square kilometers, are below the dam. Of the area below Imperial Dam, 153,800 square kilometers are in the United States and about 5,180 square kilometers are in Mexico. The area below Imperial Dam includes the Gila River watershed with a total area of about 150,700 square kilometers, of which about 2,850 square kilometers 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 U. S. Bureau of Reclamation; and 3) those within the Imperial Valley, California, the data for which are furnished by the U. S. Bureau of Reclamation. 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 Agriculture and 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 Hectares
IN THE UNITED STATES:	
Imperial Dam	
Yuma Valley Division	18,387
Reservation Division	5,317
Yuma Mesa	6,838
Yuma Aux. Project Unit "B" (Yuma Mesa)	890
South Gila Valley	3,902
North Gila Valley	2,544
Wellton-Mohawk	23,481
Coachella Valley	25,007
Imperial Valley	186,607
Warren Act	391
Non-Project lands adjacent to Colorado River	5,083
Total in United States	278,447
IN MEXICO:	
San Luis Valley, R. C., Sonora	24,300
Mexicali Valley	173,700
Total in Mexico	198,000
Total in United States and Mexico	476,447

10-2545.80 ALAMO RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Staff gage located on the right bank of the river, about 11.3 kilometers east of Calexico, California, immediately downstream from the international land boundary between the United States and Mexico and approximately three meters upstream from a 1.22-meter Cipolletti weir in the throat of a twin-tube concrete culvert which carries the river flow under the All-American Canal. On November 18, 1992 continuous gage height recording equipment was installed at the site.

RECORDS: From June 1942 through November 18, 1992 flows 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. A continuous gage height record and mean daily discharge records are available November 19, 1992 through 1996. Records obtained and furnished by Imperial Irrigation District.

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. On September 28, 1995 the National Water Commission of Mexico completed the construction of a weir immediately upstream of the international boundary. The result is that all the Alamo River flow, or a portion thereof, is being diverted into the New River via the interconnected agricultural drainage system in Mexico. After September 28, 1995 the recorded flow at the gage is affected by this diversion.

EXTREMES: Maximum mean daily discharge, 7.31 CMS (estimated), April 13, 1946; minimum discharge, no flow July 22-23, 29-30, 1949 and numerous days after September 28, 1995. 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 CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0.32	0	0.28	0.07	0.07	0.10
2	0	0	0	0	0	0	.27	0	.28	.07		.09
3	0	0	0	0	0	0	.28	0	.20	.07	.11	.09
4	0	0	0	0	0	0	.21	.03	.17	.07	.11	.09
5	0	0	0	0	0	0	.16	.03	.09	.07	.18	.09
6	0	0	0	0	0	0	.12	.03	.09	.10	.11	.09
7	0	0	0	0	0	0	.12	.06	.09	.10	.07	.09
8	0	0	0	0	0	0	.10	.02	.08	.09	.07	.09
9	0	0	0	0	0	0	.10	.02	.08	.10	.07	.09
10	0	0	0	0	0	0	.09	.02	.08	.10	.07	.09
11	0	0	0	0	0	0	0	.04	.10	.07	.07	.09
12	0	0	0	0	0	0	0	.04	.10	.07	.07	.10
13	0	0	0	0	0	0	0	.08	.09	.07	.09	.09
14	0	0	0	0	0	0	0	.10	.09	.07	.09	.09
15	0	0	0	0	0	0	0	.08	.09	.07	.09	.11
16	0	0	0	0	0	0	0	.08	.04	.07	.09	.10
17	0	0	0	0	0	0	0	.08	.04	.07	.15	.09
18	0	0	0	0	0	0	0	.08	.04	.07	.14	.11
19	0	0	0	0	0	0	0	.12	.04	.07	.21	.09
20	0	0	0	0	0	0	0	.14	.04	.09	.13	.09
21	0	0	0	0	0	0	0	.13	.04	.10	.12	.09
22	0	0	0	0	0	0	0	.12	.08	.10	.09	.09
23	0	0	0	0	0	0	0	.11	.08	.10	.09	.09
24	0	0	0	0	0	0	0	.10	.08	.11	.09	.09
25	0	0	0	0	0	0	0	.11	.09	.07	.09	.09
26	0	0	0	0	0	0	0	.10	.07	.07	.09	.09
27	0	0	0	0	0	0	0	.10	.07	.07	.09	.12
28	0	0	0	0	0	0	0	.09	.07	.07	.11	.12
29	0	0	0	0	0	0	0	.04	.07	.07	.12	.12
30	0	0	0	0	0	0	0	.08	.07	.07	.11	.12
31	0	0	0	0	0	0	0	.09				.12
Sum	0	0	0	0	0	0	1.77	2.12	2.83	2.46	3.06	3.01

Current Year 1996

Period 1943-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.	0	0	1	1	1	0	0	341	3,441	0	
Feb.	0	0	1	1	1	0	0	312	3,481	0	
Mar.	0	0	1	1	1	0	0	357	3,890	0	
April	0	0	1	1	1	0	0	374	2,741	0	
May	0	0	1	1	1	0	0	301	2,219	0	
June	0	0	1	1	1	0	0	290	2,080	0	
July	.355	0	1	1	1	0	.06	153	272	2,112	72.8
Aug.	.200	0	20	.14	1	0	.07	183	315	2,062	81.0
Sept.	.310	.090	1	.28	1	.04	.09	245	292	1,734	103
Oct.	.170	.120	25	.11	1	.07	.08	213	306	2,276	0
Nov.	.250	.120	5	.18	1	.07	.10	264	319	2,566	6.0
Dec.	.185	.150	127	.12	1	.09	.10	260	307	2,080	0
Yearly	0.355	0		0.32		0	0.04	1,318	3,786	27,317	1,318

φ Mean daily

! And other days

10-2549.70 NEW RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder located on the left (west) bank of the river in the limits of the City of Calexico, California, 427 meters downstream (north) from 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 current meter measurements by the Imperial Irrigation District. Records computed and furnished by the District. Records available: June 1942 through 1996.

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 43,172 TCM during any successive five-year period under the provisions of Minute No. 197 of the Commission.

EXTREMES: Maximum mean daily discharge, 29.2 CMS on December 9, 1982; minimum mean daily discharge, 0.06 CMS 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 CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.92	4.96	6.43	5.55	8.72	5.98	4.42	3.54	4.59	4.30	3.17	2.21
2	5.92	4.90	6.40	5.52	8.89	5.66	4.47	3.46	4.56	4.25	2.97	2.35
3	6.15	4.81	6.26	5.95	8.52	5.64	4.50	3.34	4.73	4.13	2.89	2.44
4	6.34	4.67	6.40	5.61	8.61	5.52	4.84	3.12	4.76	4.13	3.00	2.66
5	6.00	4.73	6.63	5.35	8.72	5.47	4.84	3.12	4.73	3.96	3.06	2.75
6	5.78	5.01	6.71	5.32	8.72	5.35	4.84	3.14	5.35	3.77	3.00	2.83
7	5.15	5.24	6.68	5.30	8.84	5.21	4.56	3.29	5.41	3.46	2.86	2.69
8	4.76	5.18	6.88	5.35	8.50	4.96	4.25	3.51	5.32	3.46	2.69	2.58
9	4.64	5.41	6.97	5.27	7.90	4.90	4.33	3.60	4.96	3.65	2.72	2.49
10	4.70	5.15	6.85	5.35	7.73	4.79	4.28	3.62	4.98	3.74	2.52	2.46
11	4.84	4.93	6.88	4.96	7.76	5.13	4.11	3.91	4.90	3.71	2.78	2.44
12	4.73	5.72	6.94	4.76	7.39	4.76	3.94	3.88	4.79	3.51	2.92	2.52
13	4.59	5.55	7.19	4.73	7.48	4.64	4.56	3.79	4.73	3.60	2.72	2.75
14	4.45	5.98	7.22	4.93	8.04	4.45	4.33	3.65	4.53	3.79	2.80	2.66
15	4.42	6.71	7.05	5.10	8.04	4.39	4.33	4.25	4.39	3.99	2.86	2.52
16	4.45	6.77	6.83	5.07	7.45	4.36	4.33	4.02	4.42	3.54	2.86	2.55
17	4.25	6.74	6.74	5.04	6.68	4.33	3.94	4.13	4.73	2.97	2.95	2.83
18	4.13	6.51	6.77	5.07	6.00	4.53	3.51	3.82	4.84	2.95	2.86	2.63
19	4.08	6.71	6.77	4.96	5.72	4.56	3.26	4.08	4.81	2.63	2.66	2.44
20	4.08	6.74	6.80	4.79	5.81	4.42	3.29	3.96	5.13	2.75	2.46	2.49
21	3.88	6.68	6.32	4.64	5.69	4.16	3.26	3.82	5.01	2.86	2.38	2.55
22	4.02	6.29	5.86	4.73	5.92	4.42	3.20	3.71	4.76	3.12	2.18	2.86
23	4.19	6.20	5.41	5.21	6.37	4.59	3.34	3.71	4.67	3.23	2.12	2.69
24	4.33	6.12	5.27	5.92	5.69	5.04	3.43	3.62	4.67	3.00	2.21	2.69
25	4.47	6.20	5.41	7.39	6.09	4.98	3.37	3.51	4.73	2.80	2.29	2.80
26	4.25	6.34	5.49	7.08	6.43	4.70	3.23	3.85	4.64	2.66	2.27	2.78
27	4.22	6.17	5.52	6.40	5.92	4.45	3.46	3.96	4.64	2.79	2.18	3.14
28	4.16	6.26	5.52	6.60	6.34	4.36	3.34	4.11	4.87	2.95	2.15	2.97
29	4.22	6.34	5.35	7.14	6.43	4.42	3.37	4.33	4.64	3.29	2.15	2.69
30	4.59		5.27	8.44	6.66	4.42	3.40	4.42	4.42	3.12	2.21	
31	4.76		5.10		6.15		3.57	4.33		3.26		2.38
Sum	146.47	169.02	195.92	167.53	223.21	144.59	121.90	116.60	143.71	105.33	78.89	81.25

Current Year 1996

Period 1943-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	# High	Day	# Low		Total	Average	Maximum	Minimum
Jan.	12.465	12.730	4	6.34	21	3.88	4.72	12,655	12,908	27,387	2,160
Feb.	12.420	12.645	16	6.77	4	4.67	5.83	14,603	11,449	26,416	1,552
Mar.	12.370	12.595	14	7.22	31	5.10	6.32	16,927	12,981	31,213	1,243
April	12.645	12.245	25	7.39	21	4.64	5.58	14,475	13,190	34,066	1,715
May	12.200	12.535	2	8.89	121	5.69	7.20	19,285	12,182	29,740	776
June	12.505	12.700	1	5.98	21	4.16	4.82	12,493	10,153	25,024	1,341
July	12.625	12.800	1	4.84	22	3.20	3.93	10,532	10,622	28,368	1,008
Aug.	12.670	12.810	30	4.42	14	3.12	3.76	10,074	12,146	34,066	1,405
Sept.	12.565	12.675	7	5.41	15	4.39	4.79	12,417	11,428	29,251	2,214
Oct.	12.685	12.865	1	4.30	19	2.63	3.40	9,101	11,317	28,072	2,567
Nov.	12.805	12.915	1	3.17	23	2.12	2.63	6,816	10,645	25,310	3,063
Dec.	12.810	12.910	27	3.14	1	2.21	2.62	7,020	12,520	28,104	2,175
Yearly	12.200	12.915		8.89		2.12	4.63	146,398	141,541	330,444	30,310

φ Mean daily

! And other days

10-2549.60 WASTES FROM MEXICALI POTABLE WATER PLANT TO NEW RIVER IN MEXICO

DESCRIPTION: A 3.5-meter Parshall flume, installed by the State Commission of Public Services of Mexicali, is located 2.0 kilometers upstream of the pumping plant on the supply canal. Excess water discharges into an open channel, thence into a 91 centimeter diameter pipe that empties into Rivera Drain (Drain 134), which is 2.0 kilometers below the plant and 2.0 kilometers south of the international boundary. From this point the waste is carried by a closed concrete box conduit into New River.

RECORDS: During 1996 the mean daily flows were computed from the total inflow to the potable water plant as measured at the Parshall flume, less the water pumped to the city and the water used in the maintenance of the plant. The records are obtained and furnished by the State Commission of Public Services of Mexicali. Records available: January 1968 through December 1996.

REMARKS: The plant began operation on September 28, 1963 by the State Commission of Public Services of Mexicali. Before 1968 the flow was small and infrequent. The potable water plant obtains water from the West Main Canal, which is a part of Mexico's system of canals in the Colorado Irrigation System. Excess water discharges into a closed conduit that empties into New River 1.4 kilometers upstream of the international boundary.

EXTREMES: Maximum instantaneous discharge, 2.32 CMS on March 26, 1969; minimum instantaneous discharge, zero during several days in the years 1977 through 1996.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.01	0.02	0.02	0.01	0.02	0	0.03	0.02	0.02	0.02	0.02	0.01
2	.01	.01	.02	.01	.02	.02	.02	.02	.01	.02	.02	.01
3	.01	.01	.01	.01	.02	.02	.02	.02	.03	.03	.03	.02
4	.02	.02	.01	.01	.02	.02	.02	.02	.03	.03	.02	.04
5	.02	.02	.02	.01	.01	.04	.02	.02	.02	.01	.02	.02
6	.01	.01	.01	.01	.03	.02	.03	.03	.02	.01	.01	.01
7	.02	.02	.01	.01	.02	.02	.02	.04	.02	.02	.02	.01
8	.01	.02	.01	.01	.02	.01	.03	.02	.02	.02	.02	0
9	.01	.02	.02	.02	.02	.02	.02	.02	.02	.03	.02	0
10	.02	.01	.02	.01	.02	.02	.03	.02	.03	.03	.02	.01
11	.01	.02	.01	.01	.03	.02	.02	.02	.02	.03	.01	.01
12	.01	.03	.02	.01	.04	0	.03	.03	.02	.03	.02	.02
13	.01	.03	.02	.01	.02	.02	.03	.02	.03	.01	.02	.02
14	.01	.01	.02	.01	.03	.02	.04	.02	.03	.03	.02	.03
15	.01	.02	.01	.01	.03	.02	.03	.04	.02	.03	.02	.02
16	.02	.01	0	.01	.02	.03	.03	.03	.03	.02	.02	.02
17	.01	.01	.02	.02	.01	.02	.02	.02	.03	.02	.02	.02
18	.01	.02	.02	.01	.01	.05	.02	.02	.03	.02	.03	.02
19	.01	.01	.01	.02	.02	.04	.02	.02	.02	.02	.03	.03
20	.01	.01	.02	.02	.02	.02	.02	.01	.03	.02	.02	.02
21	.01	.02	.02	.02	.03	.02	.02	.02	.02	.02	.03	0
22	.01	.02	.02	.02	.03	.03	.02	.02	.02	.02	.02	0
23	.01	.02	.03	.02	.02	.02	.02	.02	.02	.02	.02	.01
24	.02	.01	.02	.02	.02	.04	.02	.02	.03	.03	.02	.01
25	.02	.01	.02	.02	0	.05	.02	.02	.03	.02	.02	.01
26	.02	0	.03	.02	.02	.04	.02	.02	.02	.02	.03	.01
27	.01	0	.02	.02	.03	.02	.02	.02	.02	.01	.01	.01
28	.01	0	.02	.02	.03	.02	.02	.02	.03	.02	.02	.01
29	.02	0	.02	.04	.02	.04	.02	.03	.03	.02	.02	.01
30	.02	.02	.02	.02	.02	.02	.02	.03	.02	.01	.01	.01
31	.01	.02	.03	.02	.02	.02	.02	0	.02	.02	.01	.01
Sum	0.41	0.41	0.55	0.46	0.70	0.71	0.72	0.68	0.72	0.66	0.61	0.43

Current Year 1996

Period 1968-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	φ Low	Average	Total	Average	Maximum	Minimum	
											Day
Jan.			14	0.02	11	0.01	0.01	35.4	159	641	0
Feb.			112	.03	126	0	.01	35.4	105	384	0
Mar.			123	.03	16	0	.02	47.5	198	1,074	0
April			29	.04	11	.01	.02	39.7	190	532	0
May			15	.04	25	0	.02	60.5	205	537	53.6
June			18	.05	11	0	.02	61.3	189	504	25.9
July			14	.04	12	.02	.02	62.2	231	651	0
Aug.			17	.04	31	0	.02	58.8	250	735	48.4
Sept.			13	.03	2	.01	.02	62.2	235	677	44.1
Oct.			13	.03	15	.01	.02	57.0	220	625	46.7
Nov.			13	.03	16	.01	.02	52.7	194	622	32.8
Dec.			4	.04	18	0	.01	37.2	179	737	8.6
Yearly				0.05		0	0.02	610	2,355	6,610	550

φ Mean daily

! And other days

10-2549.65 WASTE WATERS FROM MEXICAN SYSTEM OF CANALS
ENTERING THE UNITED STATES

DESCRIPTION: During 1996 the flow to the New River in Mexico included waste from the City of Mexicali Potable Water Plant, which discharges into Rivera Drain and then to New River, and drainage water coming from the Colorado River District system of canals that enter the New River below Laguna Xochimilco, and starting January 1988, the north irrigation district watershed is included.

RECORDS: Records of the Potable Water Plant are based on flows measured on a Parshall flume less pumping to the city. Records obtained and furnished by the State Commission of Public Services of Mexicali. Records available: Wisteria Wasteway, January 1951 through 1975; Sifon Wasteway, January 1952 to April 30, 1964; Pueblo Nuevo Wasteway, January 1956 through 1965; and the Potable Water Plant, January 1968 through December 1996.

REMARKS: To obtain data for Sifon and Pueblo Nuevo Wasteways, see bulletins 1 to 6 (1960-1965); and for Wisteria Wasteway, bulletins 1 to 16 (1960-1975). For data on wastes from Potable Water Plant, see previous page of this bulletin.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1956 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	57.0	1,060	10,803	7.8
February	78.3	794	8,981	7.8
March	158	653	5,506	26.8
April	456	565	3,940	19.9
May	60.5	435	3,174	11.2
June	61.3	467	6,994	0
July	62.2	652	12,644	0
August	58.8	652	5,103	0
September	62.2	526	3,966	25.9
October	55.3	606	4,285	10.4
November	52.7	609	4,668	0
December	37.2	625	10,720	0
Yearly	1,200	8,113	34,953	492

10-2540.05 SALTON SEA - ELEVATIONS OF WATER SURFACE

DESCRIPTION: Water-stage recorder and staff gage located on the western shore of the Salton Sea, 24.9 kilometers northwest of Westmorland, Imperial County, California. The Salton Sea is the sink of a closed basin which has a drainage area of 21,652 square kilometers. Zero of the gage is 76.2 meters below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through 1996. From January 1925 to October 22, 1951, once monthly records of elevations were collected by Imperial Irrigation District from a bench mark at Figtree John's Spring, about 35.4 kilometers 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 Westmorland, California." The elevation of the old station is at a datum of 0.30 meter higher than that of the present station. All records reported below and the area and capacity table are adjusted to the datum of the present station.

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 and New River channels. The bottom of the sea is 84.6 meters below mean sea level, U. S. C. & G. S. datum.

EXTREMES: Maximum elevation during 1996 was 69.10 meters below mean sea level. Minimum elevation during 1996 was 69.53 meters below mean sea level. Extremes for period of record: maximum elevation 59.7 meters below mean sea level February 10 to March 29, 1907; minimum elevation since 1906, 76.7 meters below mean sea level in November 1924.

MEAN DAILY WATER SURFACE ELEVATIONS IN METERS BELOW MEAN SEA LEVEL - 1996

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	69.310	69.280	69.220	69.130	69.100	69.160	69.220	69.250	69.340	69.435	69.525	69.525
2	69.310	69.250	69.220	69.130	69.100	69.160	69.220	69.250	69.340	69.435	69.525	69.525
3	69.310	69.250	69.220	69.130	69.100	69.160	69.220	69.250	69.340	69.435	69.525	69.525
4	69.310	69.250	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
5	69.310	69.250	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
6	69.310	69.250	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
7	69.310	69.250	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
8	69.310	69.250	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
9	69.310	69.250	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
10	69.310	69.250	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
11	69.310	69.250	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
12	69.310	69.220	69.190	69.130	69.100	69.160	69.220	69.280	69.340	69.435	69.525	69.525
13	69.310	69.220	69.190	69.130	69.100	69.160	69.220	69.280	69.370	69.435	69.525	69.525
14	69.310	69.220	69.190	69.130	69.100	69.160	69.220	69.280	69.370	69.435	69.525	69.495
15	69.310	69.220	69.160	69.130	69.100	69.160	69.220	69.280	69.370	69.435	69.525	69.495
16	69.310	69.220	69.160	69.130	69.100	69.160	69.220	69.280	69.370	69.435	69.525	69.495
17	69.310	69.220	69.160	69.130	69.100	69.160	69.250	69.280	69.405	69.435	69.525	69.495
18	69.310	69.220	69.160	69.130	69.100	69.160	69.250	69.310	69.405	69.435	69.525	69.495
19	69.310	69.220	69.160	69.130	69.130	69.190	69.250	69.310	69.405	69.435	69.525	69.495
20	69.280	69.220	69.160	69.130	69.130	69.190	69.250	69.310	69.405	69.465	69.525	69.495
21	69.280	69.220	69.160	69.130	69.130	69.190	69.250	69.310	69.405	69.465	69.525	69.495
22	69.280	69.190	69.130	69.130	69.130	69.190	69.250	69.310	69.405	69.465	69.525	69.525
23	69.280	69.190	69.130	69.130	69.130	69.190	69.250	69.310	69.405	69.465	69.525	69.525
24	69.280	69.190	69.130	69.130	69.130	69.190	69.250	69.310	69.405	69.465	69.525	69.525
25	69.280	69.220	69.130	69.130	69.160	69.190	69.250	69.310	69.405	69.465	69.525	69.525
26	69.280	69.220	69.130	69.130	69.160	69.220	69.250	69.310	69.405	69.465	69.525	69.525
27	69.280	69.220	69.130	69.100	69.160	69.220	69.250	69.310	69.405	69.465	69.495	69.495
28	69.280	69.220	69.130	69.100	69.160	69.220	69.250	69.310	69.435	69.495	69.495	69.495
29	69.280	69.220	69.130	69.100	69.160	69.220	69.250	69.310	69.435	69.495	69.495	69.495
30	69.280	69.130	69.130	69.100	69.160	69.220	69.250	69.310	69.435	69.495	69.495	69.495
31	69.280	69.130	69.130	69.100	69.160	69.220	69.250	69.340	69.435	69.525	69.495	69.495
Avg.	69.300	69.230	69.165	69.125	69.120	69.175	69.235	69.290	69.375	69.450	69.520	69.510

Month	Current Year 1996		Period 1935-1996		
	φ Extreme Elevation Meters		Elevation Meters		
	High	Low	# Average	# Maximum	! Minimum
Jan.	69.280	69.310	71.525	69.310	75.990
Feb.	69.190	69.280	71.430	69.220	75.830
Mar.	69.130	69.220	71.350	69.190	75.770
April	69.100	69.130	71.295	69.160	75.800
May	69.100	69.160	71.290	69.130	75.740
June	69.160	69.220	71.335	69.190	75.830
July	69.220	69.250	71.385	69.220	75.930
Aug.	69.250	69.340	71.445	69.250	76.020
Sept.	69.340	69.435	71.505	69.280	76.020
Oct.	69.435	69.525	71.530	69.310	76.140
Nov.	69.495	69.525	71.540	69.340	76.200
Dec.	69.495	69.525	71.505	69.340	76.080
Yearly	69.100	69.525	71.430	69.130	76.200

Area and Capacity Table		
Elevation	Area	Capacity
Meters Below M.S.L.	Hectares	Million Cubic Meters
84.640	0	0
83.520	8,337	31.7
82.300	25,455	232.8
81.080	38,284	629.8
79.250	49,615	1,443.2
78.030	54,512	2,077.2
76.810	60,218	2,775.3
76.020	72,723	4,393.7
73.150	79,683	5,322.5
71.630	89,760	6,611.5
70.100	95,426	8,022.6
67.060	106,029	11,092.7
64.010	116,753	14,481.1
60.960	127,680	18,206.2

φ Mean daily

! Reading near first day of month

Mean monthly

CHEMICAL ANALYSIS OF WATER SAMPLES

The tables below are based on samples collected and analyzed by the California Regional Water Quality Control Board - Colorado River Basin, Region-7. New River Samples prior to 1985 were collected and analyzed by the U.S. Geological Survey. Samples from the New River are taken from the right bank at the road bridge, 137 meters north of the international boundary.

NEW RIVER AT INTERNATIONAL BOUNDARY

1996	Time	*Streamflow Momentary	Water Temperature	PH	Oxygen Dissolved (DO)	Specific Conductance	Turbidity
Date	Std.	CMS	Deg C	Units	mg/L	Microsiemens/cm	NTU
Jan. 9	0700	4.53	13.9	7.6	2.3	3,690	24
Feb. 6	0700	4.87	17.7	7.8	1.5	4,970	13
Mar. 12	0700	6.82	18.3	7.4	1.9	4,650	8
Apr. 9	0700	5.24	21.4	6.8	1.2	4,850	9
May 14	0700	7.99	27.4	7.5	0.7	3,950	8
June 11	0700	5.18	28.0	7.7	0.6	5,440	10
July 9	0700	4.30	30.1	7.6	0.7	4,680	17
Aug. 20	0700	3.91	31.7	7.5	0.0	4,860	12
Sept. 10	0700	4.96	30.9	7.6	0.0	3,880	14
Oct. 16	0700	3.43	26.1	7.7	0.0	4,260	23
Nov. 5	0700	2.97	19.5	7.6	0.0	5,090	38
Dec. 4	0700	2.24	13.7	7.8	1.4	4,720	20

* Flow provided by the California Regional Water Quality Control Board

NEW RIVER AT INTERNATIONAL BOUNDARY

SAMPLE TYPE	COMPOSITE	COMPOSITE	COMPOSITE	COMPOSITE	
DATE	Jan. 9, 1996	Feb. 6, 1996	Mar. 12, 1996	Apr. 9, 1996	
PARAMETER	CONCENTRATION	CONCENTRATION	CONCENTRATION	CONCENTRATION	DETECTION LIMIT
Arsenic	N.D.	4.00 ug/L	5.00 ug/L	6.00 ug/L	2.0 ug/L
Boron	N.D.	N.D.	N.D.	N.D.	0.1 mg/L
Cadmium	N.D.	1.50 ug/L	N.D.	N.D.	1.0 ug/L
Chromium	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Copper	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Lead	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Phenol	0.015 mg/L	0.010 mg/L	0.003 mg/L	0.007 mg/L	0.002 mg/L
MBAS	1.77 mg/L	3.67 mg/L	0.55 mg/L	2.36 mg/L	0.025 mg/L
Zinc	N.D.	N.D.	N.D.	N.D.	50.0 ug/L
Total Cyanide	0.01 mg/L	N.D.	N.D.	0.01 mg/L	0.01 mg/L
Total Phosphate(P04-P)	2.04 mg/L	1.99 mg/L	1.44 mg/L	2.22 mg/L	0.01 mg/L
Nitrate (NO3-N)	0.4 mg/L	0.6 mg/L	0.40 mg/L	N.D.	0.20 mg/L
Nitrite (NO2-N)	N.D.	0.08 mg/L	0.10 mg/L	N.D.	0.03 mg/L
Ammonia (NH3-NH4-N)	8.40 mg/L	8.20 mg/L	6.00 mg/L	6.40 mg/L	0.05 mg/L
Total Dissolved Solids	2,016 mg/L	3,130 mg/L	2,980 mg/L	3,340 mg/L	10.0 mg/L
Total Suspended Solids	137.0 mg/L	25.0 mg/L	20.0 mg/L	20.0 mg/L	10.0 mg/L
Volatile Suspended Solids	N.A.	N.A.	N.A.	N.A.	

SAMPLE TYPE	COMPOSITE	COMPOSITE	COMPOSITE	COMPOSITE	
DATE	May 14, 1996	June 11, 1996	July 9, 1996	Aug. 20, 1996	
PARAMETER	CONCENTRATION	CONCENTRATION	CONCENTRATION	CONCENTRATION	DETECTION LIMIT
Arsenic	8.00 ug/L	9.00 ug/L	6.00 ug/L	6.00 mg/L	2.0 ug/L
Boron	N.D.	N.D.	N.D.	N.D.	0.1 mg/L
Cadmium	N.D.	N.D.	N.D.	N.D.	1.0 ug/L
Chromium	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Copper	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Lead	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Phenol	0.003 mg/L	0.002 mg/L	N.D.	N.D.	0.002 mg/L
MBAS	0.88 mg/L	1.39 mg/L	1.63 mg/L	1.68 mg/L	0.025 mg/L
Zinc	N.D.	56 ug/L	N.D.	57 ug/L	50.0 ug/L
Total Cyanide	N.D.	N.D.	N.D.	0.02 mg/L	0.01 mg/L
Total Phosphate(P04-P)	1.28 mg/L	1.94 mg/L	1.13 mg/L	1.82 mg/L	0.01 mg/L
Nitrate (NO3-N)	N.D.	0.3 mg/L	N.D.	0.80 mg/L	0.20 mg/L
Nitrite (NO2-N)	N.D.	N.D.	N.D.	N.D.	0.03 mg/L
Ammonia (NH3-NH4-N)	4.30 mg/L	5.40 mg/L	4.70 mg/L	6.00 mg/L	0.05 mg/L
Total Dissolved Solids	2,440 mg/L	2,840 mg/L	3,010 mg/L	2,920 mg/L	10.0 mg/L
Total Suspended Solids	18.0 mg/L	16.0 mg/L	36.0 mg/L	25.0 mg/L	10.0 mg/L
Volatile Suspended Solids	N.A.	N.A.	N.A.	N.A.	

N.A. - Not Analyzed
N.D. - Not Detected

CHEMICAL ANALYSES OF WATER SAMPLES

The tables below are based on samples collected and analyzed by the United States Section of the Commission.

Samples from the Alamo River are taken north of the international boundary upstream of the box culvert under the All-American Canal. Flow at this point includes drainage flows across international boundary and flows from drain interceptors along the toe of the south bank of the All-American Canal. Samples from the New River are taken from the right bank at the road bridge, 137 meters north of the international boundary. Records of the sampling extend from April 1951 through 1996.

ALAMO RIVER

1996 Date	Time Std.	Water Temperature Deg C	pH Units	Oxygen Dissolved (DO) mg/L	Conductance Microsiemens/cm	Coliform Fecal Colonies/100 mL	Flow CMS
Jan. 29	NST						
Feb. 26	NST						
Mar. 25	NST						
Apr. 24	NST						
May 29	NST						
June 25	NST						
July 29	1110	30.8	8.1	7.6	5,660	700	0.01
Aug. 27	0750	30.3	7.9	5.0	4,610	#	0.03
Sep. 24	0835	26.2	7.7	5.5	5,480	80	0.08
Oct. 21	0945	19.2	7.6	5.3	5,240	867	0.11
Nov. 20	0900	14.9	7.4	7.8	4,710	4,400	0.10
Dec. 23	0915	11.7	7.5	8.9	4,860	733	0.14

#-Missing data
NST-No Sample Taken

NEW RIVER

1996 Date	Time Std.	**Streamflow Momentary CMS	Water Temperature Deg C	pH Units	Oxygen Dissolved (DO) mg/L	Specific Conductance Microsiemens/cm	Fecal Coliform Colonies/100 mL
Jan. 17	0800	4.27	14.0	7.6	2.5	5,000	620,000
Jan. 29	0815	4.19	13.0	7.4	2.4	4,800	560,000
Feb. 14	0750	5.95	17.0	7.6	2.0	5,200	790,000
Feb. 26	0920	6.03	12.0	7.7	3.3	4,900	380,000
Mar. 14	0800	7.42	17.0	7.4	2.8	4,450	200,000
Mar. 25	0845	5.18	18.0	7.5	2.6	5,400	220,000
Apr. 10	0850	5.18	20.0	7.5	1.4	5,300	770,000
Apr. 24	0830	5.24	23.0	7.4	1.4	5,600	330,000
May 08	0855	8.38	24.2	7.4	1.0	3,740	185,000
May 29	0915	6.32	24.5	7.5	0.7	4,630	750,000
June 12	0840	4.87	27.0	7.6	0.9	4,640	1,000,000
June 25	0815	5.13	26.8	7.5	1.5	4,420	1,000,000
July 10	0830	5.98	29.1	7.6	0.3	4,820	2,200,000
July 29	1150	6.03	32.2	7.6	1.4	5,300	2,100,000
Aug. 14	0830	3.48	31.0	7.4	0.1	5,140	2,300,000
Aug. 27	0820	3.96	31.4	7.4	0.1	5,030	2,100,000
Sep. 11	0850	4.62	30.2	7.4	0.9	4,510	2,550,000
Sep. 24	0920	4.53	27.8	7.6	0.1	4,400	2,100,000
Oct. 09	0820	3.34	26.2	7.3	0.1	4,710	2,100,000
Oct. 21	1030	2.75	20.4	7.7	0.1	4,830	2,250,000
Nov. 07	0815	2.83	17.3	7.4	0.2	5,270	3,350,000
Nov. 20	1000	2.41	17.9	7.5	0.6	5,470	1,700,000
Dec. 12	0755	2.55	16.3	7.5	0.4	5,580	3,800,000
Dec. 23	1030	2.69	13.4	7.5	1.9	5,620	2,600,000

Note: Temperature, pH, D.O., and Specific Conductance - Data collected in field
** Flow reported by Imperial Irrigation District

CHEMICAL ANALYSIS OF WATER SAMPLES

The tables below are based on samples collected and analyzed by the California Regional Water Quality Control Board - Colorado River Basin, Region-7. New River Samples prior to 1985 were collected and analyzed by the U.S. Geological Survey. Samples from the New River are taken from the right bank at the road bridge, 137 meters north of the international boundary.

* SAMPLE TYPE	COMPOSITE	COMPOSITE	COMPOSITE	COMPOSITE	
DATE	Sep. 10, 1996	Oct. 16, 1996	Nov. 5, 1996	Dec. 4, 1996	
PARAMETER	CONCENTRATION	CONCENTRATION	CONCENTRATION	CONCENTRATION	DETECTION LIMIT
Arsenic	6.00 mg/L	5.00 ug/L	3.00 ug/L	5.00 ug/L	2.0 ug/L
Boron	N.D.	N.D.	N.D.	N.D.	0.1 mg/L
Cadmium	N.D.	N.D.	N.D.	N.D.	1.0 ug/L
Chromium	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Copper	N.D.	N.D.	N.D.	15.0 ug/L	10.0 ug/L
Lead	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Phenol	N.D.	0.006 mg/L	0.013 mg/L	0.012 mg/L	0.002 mg/L
MBAS	1.62 mg/L	3.52 mg/L	2.23 mg/L	3.00 mg/L	0.025 mg/L
Zinc	N.D.	N.D.	N.D.	80.0 ug/L	50.0 ug/L
Total Cyanide	0.02 mg/L	N.D.	N.D.	0.01 mg/L	0.01 mg/L
Total Phosphate(P04-P)	2.25 mg/L	3.20 mg/L	3.30 mg/L	2.90 mg/L	0.01 mg/L
Nitrate (NO3-N)	N.D.	N.D.	N.D.	0.40 mg/L	0.20 mg/L
Nitrite (NO2-N)	N.D.	N.D.	N.D.	N.D.	0.03 mg/L
Ammonia (NH3-NH4-N)	6.10 mg/L	7.50 mg/L	10.80 mg/L	11.2 mg/L	0.05 mg/L
Total Dissolved Solids	2,770 mg/L	2,740 mg/L	3,080 mg/L	3,170 mg/L	10.0 mg/L
Total Suspended Solids	33.0 mg/L	38.0 mg/L	51.0 mg/L	35.0 mg/L	10.0 mg/L
Volatile Suspended Solids	N.A.	N.A.	N.A.	N.A.	

N.D.- None Detected

* - Flow provided by the California Regional Water Quality Control Board

N.A.- Not Analyzed

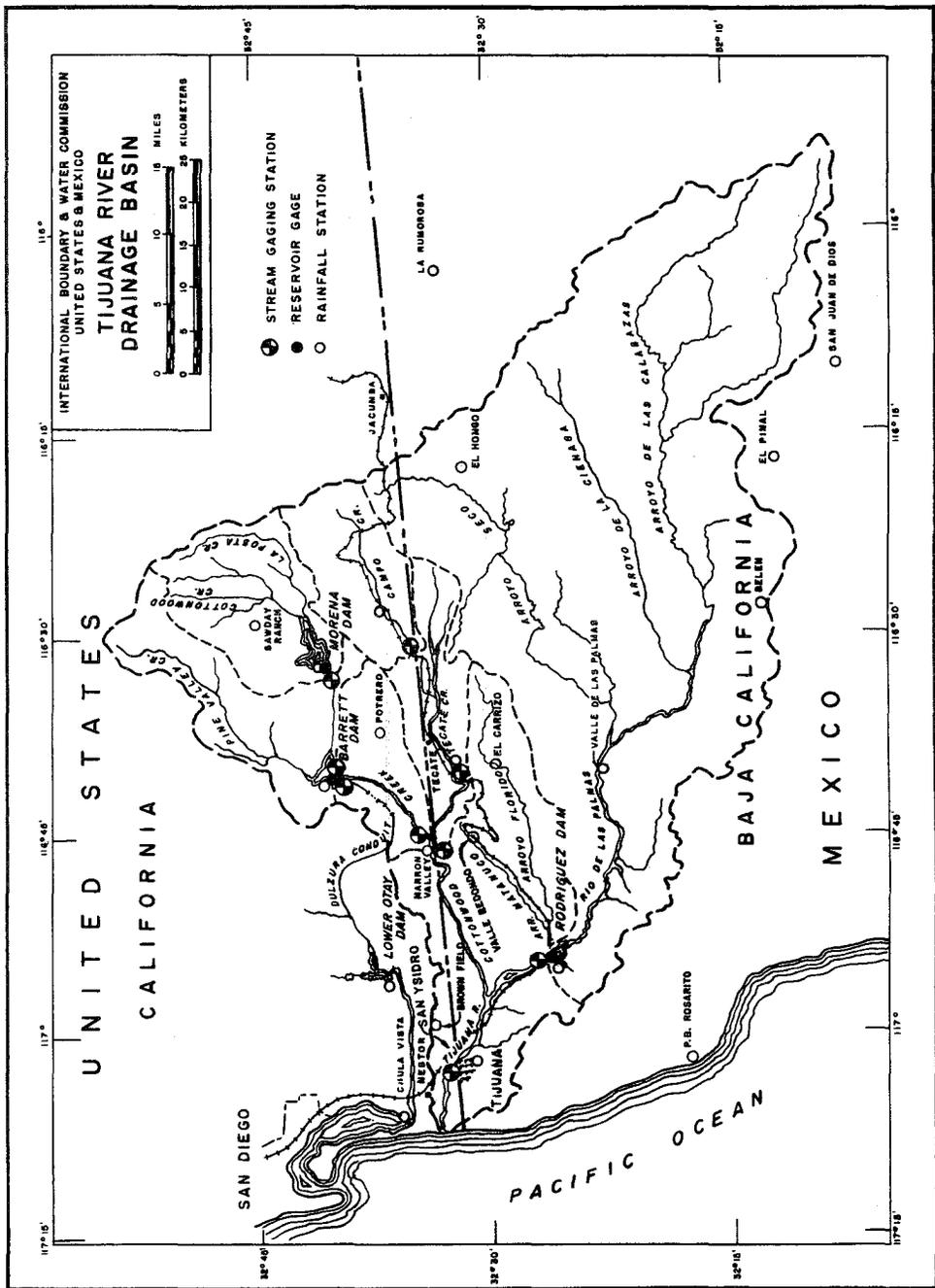
SPECIFIC CONDUCTANCE OF WATER SAMPLES

The following table shows specific conductance of individual water samples from the New River in Mexico at the international boundary. Samples were taken by the Mexican Section of the Commission, who also made the determinations.

NEW RIVER AT INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1996

January		March		May		July		September		November	
3	3,900	6	5,000	8	5,100	3	5,800	4	4,700	4	5,100
10	4,430	13	4,850	15	4,900	10	5,800	11	5,000	6	5,000
17	5,100	20	5,000	29	5,300	17	6,000	18	4,600	13	4,800
24	4,980	27	5,500			24	4,800	25	4,800	18	5,400
31	6,000					31	5,020			25	6,000
February		April		June		August		October		December	
7	5,100	3	5,800	5	6,100	7	7,100	2	5,000	23	5,900
14	4,890	10	6,000	12	5,900	14	6,500	9	5,100	30	5,900
21	4,790	17	5,900	19	5,500	21	5,400	16	5,200		
28	4,800	24	5,200	26	5,700	28	4,900	23	5,100		
		30	4,900					30	5,300		



11-0100.00 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 2.9 kilometers upstream from the mouth of Hauser Creek, 13.7 kilometers upstream from Barrett Dam, and about 32.2 kilometers upstream from the international boundary. The zero of the gage is 878.555 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Reservoir inflows shown below were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall, by the International Boundary and Water Commission, United States Section. They represent all water reaching Morena Reservoir, including rainfall on reservoir water surface. Basic data were furnished by the City of San Diego, California. Records April 1911 through 1996.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1996 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 the present crest of ungated spillway is 47.855 meters, gage datum. Reservoir capacity at spillway crest, 1948 survey, is 61,934 TCM. 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: Maximum monthly inflow since 1937, 55,845 TCM, March 1983. Prior to 1937, maximum monthly inflow, 45,886 TCM, January 1916; minimum no flow during parts of many years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1937 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	835	1,200	20,362	0
February	999	2,661	41,407	9.9
March	1,068	3,663	55,845	23.8
April	724	2,025	28,530	4.1
May	233	1,025	18,642	0
June	0	586	10,173	0
July	405	360	7,651	0
August	0	288	8,916	0
September	188	196	6,331	0
October	33.6	175	4,817	0
November	219	289	5,633	0
December	165	787	9,472	5.4
Yearly	4,870	13,255	177,579	149

11-0105.00 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 1.3 kilometers downstream from the dam. Discharge measurements made at the cableway include leakage, controlled releases, and spillway discharges.

RECORDS: Monthly records shown below represent the water available immediately below Morena Dam, consisting of spillway waste, draft, and leakage from the dam. They are computed by the International Boundary and Water Commission, United States Section, from basic data furnished by the City of San Diego, California. Records available: January 1911 through 1996.

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: Maximum monthly discharge since 1937, 55,615 TCM, March 1983. Prior to 1937, maximum monthly discharge, 26,397 TCM February 1916; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1937 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	821	296	2,583	0
February	769	1,056	19,644	0
March	821	2,076	55,615	0
April	795	1,565	28,159	0
May	821	861	18,100	0
June	795	647	9,260	0
July	821	390	6,236	0
August	821	373	7,937	0
September	795	419	7,253	0
October	821	257	4,639	0
November	795	290	5,071	0
December	821	535	9,099	0
Yearly	9,696	8,765	168,432	0

11-0110.00 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 13.7 kilometers downstream from Morena Dam, 1.6 kilometers downstream from the mouth of Pine Valley Creek, and about 19.3 kilometers upstream from the international boundary. Zero of gage is 440.775 meters 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 1996. 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, California. Capacity of reservoir at top of flash gates on spillway (gage height 51.475 meters) is 55,205 TCM. Capacity at spillway crest (gage height 49.043 meters) is 46,811 TCM. Dead storage, 887 TCM below lowest outlet (gage height 17.945 meters) 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: Maximum monthly discharge since 1937, 67,540 TCM, February 1980. Prior to 1937, maximum monthly discharge, 67,595 TCM February 1927; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1937 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	478	1,571	29,627	6.4
February	743	3,371	67,539	9.4
March	916	5,986	62,041	17.4
April	164	2,700	26,680	12.6
May	343	1,241	10,509	0
June	0	560	4,818	0
July	0	329	5,042	0
August	0	209	4,472	0
September	0	202	3,858	0
October	0	123	796	0
November	0	267	2,519	0
December	0	690	6,845	2.1
Yearly	2,644	17,249	141,024	159

11-0114.90 DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder 0.8 kilometer downstream from Barrett Dam on right bank of Dulzura Conduit 15.2 meters upstream from road crossing to Barrett Dam. Elevation of gage has not been determined.
RECORDS: Computed on basis of head on control section of flume, as measured by water-stage recorder, and rating curve determined from current meter measurements. Records obtained and furnished by the City of San Diego, California. Records available: January 1909 through 1996.
REMARKS: Barrett Dam was completed in 1921. Prior to this date the intake of Dulzura Conduit was located 2.4 kilometers 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 12.9 kilometers 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 loss in the reach from the reservoir to the gaging station.
EXTREMES: Since 1937: Maximum mean daily discharge, 4.66 CMS on March 8, 1995; minimum discharge, no flow for long periods on many occasions.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.02	0.11	0	0.66	0.95	0	0	0	0	0	0	0
2	1.02	.11	0	.66	.95	0	0	0	0	0	0	0
3	1.02	.11	0	.94	.95	0	0	0	0	0	0	0
4	1.02	.11	0	.94	.95	0	0	0	0	0	0	0
5	1.02	.11	0	.94	.95	0	0	0	0	0	0	0
6	1.02	.11	0	.94	.95	0	0	0	0	0	0	0
7	1.02	.11	0	.94	.95	0	0	0	0	0	0	0
8	1.02	.11	0	.94	.95	0	0	0	0	0	0	0
9	1.02	.11	0	.94	.95	0	0	0	0	0	0	0
10	1.02	.05	0	.94	.95	0	0	0	0	0	0	0
11	1.02	.05	0	.94	.95	0	0	0	0	0	0	0
12	1.02	.05	0	.94	.95	0	0	0	0	0	0	0
13	1.02	0	0	.94	.95	0	0	0	0	0	0	0
14	1.02	0	0	.94	.95	0	0	0	0	0	0	0
15	1.02	0	0	.94	.95	0	0	0	0	0	0	0
16	1.02	0	0	.95	.95	0	0	0	0	0	0	0
17	1.47	0	0	.95	.95	0	0	0	0	0	0	0
18	1.47	0	0	.95	.95	0	0	0	0	0	0	0
19	1.47	0	0	.95	.95	0	0	0	0	0	0	0
20	1.47	0	0	.95	.95	0	0	0	0	0	0	0
21	1.03	0	0	.95	.95	0	0	0	0	0	0	0
22	1.02	0	0	.95	.95	0	0	0	0	0	0	0
23	1.02	0	0	.95	.95	0	0	0	0	0	0	0
24	1.02	0	0	.95	.95	0	0	0	0	0	0	0
25	1.02	0	0	.95	.95	0	0	0	0	0	0	0
26	1.02	0	0	.95	.95	0	0	0	0	0	0	0
27	1.02	0	0	.95	.95	0	0	0	0	0	0	0
28	1.02	0	.23	.95	.95	0	0	0	0	0	0	0
29	1.02	0	.43	.95	0	0	0	0	0	0	0	0
30	1.02	0	.66	.95	0	0	0	0	0	0	0	0
31	1.02	0	.66	.95	0	0	0	0	0	0	0	0
Sum	33.43	1.14	1.98	27.79	26.60	0	0	0	0	0	0	0

Current Year 1996

Period 1937-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day	φ High		Day		φ Low	Total	Average	Maximum	Minimum
				Day	φ							
Jan.			117	1.47	11	1.02	1.08	2,888	509	2,899	0	
Feb.			111	.11	113	0	.04	98.5	534	2,883	0	
Mar.			130	.66	111	0	.06	171	774	7,639	0	
April			116	.95	111	.66	.93	2,401	1,027	5,016	0	
May			111	.95	129	0	.86	2,298	1,119	3,750	0	
June			111	0	111	0	0	0	1,171	4,611	0	
July			111	0	111	0	0	0	1,056	4,914	0	
Aug.			111	0	111	0	0	0	968	4,741	0	
Sept.			111	0	111	0	0	0	780	2,862	0	
Oct.			111	0	111	0	0	0	617	3,022	0	
Nov.			111	0	111	0	0	0	661	3,404	0	
Dec.			111	0	111	0	0	0	603	2,843	0	
Yearly				1.47		0	0.25	7,857	9,799	40,526	0	

φ Mean daily

! And other days

11-0111.00 COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located about 4.0 kilometers downstream from Barrett Dam and 0.8 kilometer 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 305 meters (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. Spillway discharges have occurred in May 1943, March, April 1979, January to May of 1980, April, December 1982, and the entire year of 1983, January to April 1993, and January to March 1995. 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 1996. 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: Maximum monthly discharge since 1937, 111,775 TCM March 1983. Prior to 1937, maximum monthly discharge 47,366 TCM February 1927; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1937 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	0	452	10,114	0
February	0	2,341	86,736	0
March	0	4,780	111,775	0
April	0	2,364	45,417	0
May	0	1,077	28,287	0
June	0	496	13,503	0
July	0	255	5,311	0
August	0	164	4,206	0
September	0	60.4	1,554	0
October	0	51.0	1,530	0
November	0	158	5,100	0
December	0	206	6,058	0
Yearly	0	12,404	254,099	0

WESTERN BOUNDARY WATER BULLETIN - 1996 - INTERNATIONAL BOUNDARY AND WATER COMMISSION

11-0120.00 COTTONWOOD CREEK ABOVE TECATE CREEK NEAR DULZURA, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located 2.6 kilometers upstream from the international land boundary between the United States and Mexico, 1.3 kilometers upstream from the confluence with Tecate Creek, and 8.2 kilometers 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 213 meters downstream from the gage. Zero of the gage is 173.55 meters 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. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1996.

REMARKS: Flow is largely controlled by Barrett and Morena Reservoirs, 16.1 kilometers and 29.0 kilometers, respectively, upstream from this station.

EXTREMES: Maximum discharge 331 CMS February 21, 1980 (gage height 3.400 meters). Minimum discharge, no flow during part of each year.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.01	0.25	0.07	0.07	0	0	0	0	0	0	0	0
2	.01	.17	.06	.07	0	0	0	0	0	0	0	0
3	.01	.08	.06	.06	0	0	0	0	0	0	0	0
4	.01	.06	.06	.06	0	0	0	0	0	0	0	0
5	.01	.05	.07	.05	0	0	0	0	0	0	0	0
6	.01	.05	.06	.04	0	0	0	0	0	0	0	0
7	.01	.05	.05	.03	0	0	0	0	0	0	0	0
8	.01	.05	.05	.03	0	0	0	0	0	0	0	0
9	.01	.05	.05	.03	0	0	0	0	0	0	0	.02
10	.01	.05	.05	.03	0	0	0	0	0	0	0	.07
11	.01	.05	.05	.03	0	0	0	0	0	0	0	0
12	.01	.05	.08	.03	0	0	0	0	0	0	0	0
13	.01	.05	.79	.03	0	0	0	0	0	0	0	0
14	.01	.05	.68	.03	0	0	0	0	0	0	0	0
15	.02	.06	.37	.02	0	0	0	0	0	0	0	0
16	.02	.06	.25	.02	0	0	0	0	0	0	0	0
17	.03	.06	.18	.02	0	0	0	0	0	0	0	0
18	.03	.06	.16	.03	0	0	0	0	0	0	0	0
19	.03	.06	.14	.03	0	0	0	0	0	0	0	0
20	.03	.06	.12	.02	0	0	0	0	0	0	0	0
21	.03	.06	.11	.02	0	0	0	0	0	0	0	0
22	.20	.07	.10	.02	0	0	0	0	0	0	0	.07
23	.14	.06	.10	.02	0	0	0	0	0	0	0	0
24	.08	.06	.09	.01	0	0	0	0	0	0	0	0
25	.06	.08	.08	.01	0	0	0	0	0	0	0	0
26	.07	.40	.08	.01	0	0	0	0	0	.03	0	0
27	.06	.18	.08	.01	0	0	0	0	0	0	0	0
28	.05	.12	.08	.01	0	0	0	0	0	0	0	0
29	.05	.09	.08	0	0	0	0	0	0	0	0	0
30	.05	.08	.08	0	0	0	0	0	0	0	0	0
31	.07	.07	.07	0	0	0	0	0	0	0	0	0
Sum	1.16	2.54	4.35	0.84	0	0	0	0	0	0.03	0.07	0.09

Current Year 1996

Period 1937-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum	
Jan.			22	0.20	1	1	0	0.04	100	1,503	45,897	0
Feb.			26	.40	1	5	.05	.09	219	3,709	85,134	0
Mar.			13	.79	1	7	.05	.14	376	5,591	109,418	0
April			1	.07	29	0	.03		72.6	2,669	49,635	0
May			1	0	1	1	0	0	0	991	22,439	0
June			1	0	1	1	0	0	0	349	7,301	0
July			1	0	1	1	0	0	0	113	3,599	0
Aug.			1	0	1	1	0	0	0	87.9	1,850	0
Sept.			1	0	1	1	0	0	0	85.8	4,209	0
Oct.			26	.03	1	1	0	0	2.6	97.1	291	0
Nov.			22	.07	1	1	0	0	6.0	58.3	1,378	0
Dec.			10	.07	1	1	0	0	7.8	189	3,169	0
Yearly				0.79		0		0.02	784	15,443	220,556	0

φ Mean daily

! And other days

11-0125.00 CAMPO CREEK NEAR CAMPO, CALIFORNIA

DESCRIPTION: Water-stage recorder and broad-crested weir on left bank, 0.8 kilometer upstream from the international land boundary between the United States and Mexico, just upstream from the bridge on California State Highway 94, 5.6 kilometers southwest of Campo, California. Zero of gage is 664.135 meters 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 from October 1956 through 1995.

REMARKS: Campo Creek originates in the United States and flows southwestward into Mexico where it joins Tecate Creek. The flow at this station was partially regulated by a small conservation reservoir, 1.6 kilometers upstream, from August 1956 to February 20, 1980, when it was destroyed by a flood.

EXTREMES: Maximum discharge, 25.3 CMS, March 24, 1983 (gage height 1.640 meters present datum), from rating curve extended above 3.12 CMS 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 CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.17	0.59	0.34	0.24	0.05	0.01	0.01	0	0	0	0.01	0.01
2	.16	.40	.31	.24	.05	.01	.01	0	0	0	.01	.01
3	.16	.24	.28	.24	.05	.01	.01	0	0	0	.01	.01
4	.17	.22	.28	.23	.05	.01	.01	0	0	0	.01	.01
5	.18	.22	.34	.23	.05	.01	.01	0	0	0	.01	.01
6	.17	.22	.34	.20	.04	.01	0	0	0	0	.01	.01
7	.16	.22	.31	.18	.04	.01	.01	0	0	0	0	.01
8	.16	.22	.26	.17	.04	.01	.01	0	0	0	0	.01
9	.17	.21	.23	.16	.04	.01	0	0	0	0	0	.01
10	.17	.22	.23	.17	.04	.01	.01	0	0	0	0	.01
11	.16	.22	.22	.18	.03	.01	.01	0	0	0	0	.03
12	.16	.21	.25	.17	.02	.01	.01	0	0	0	0	.05
13	.16	.22	1.56	.16	.02	.01	.01	0	0	0	0	.05
14	.17	.21	2.24	.14	.01	.01	.01	0	0	0	.01	.04
15	.17	.20	.93	.12	.01	.01	0	0	0	0	.01	.03
16	.17	.20	.59	.12	.01	.01	0	0	0	0	.01	.02
17	.19	.19	.45	.12	.02	.01	.01	0	0	0	.01	.03
18	.18	.19	.37	.16	.02	.01	0	0	0	0	.01	.03
19	.18	.20	.31	.16	.01	.01	0	0	0	0	.01	.02
20	.19	.20	.28	.13	.01	.01	0	0	0	0	.01	.02
21	.19	.20	.27	.12	.01	.01	0	0	0	0	.01	.02
22	.37	.22	.27	.11	.01	.01	0	0	0	0	.01	.03
23	.37	.19	.27	.10	.01	.01	0	0	0	0	.01	.07
24	.24	.18	.26	.09	.02	.01	0	0	0	0	.01	.07
25	.23	.42	.25	.08	.02	.01	0	0	0	0	.01	.06
26	.27	1.84	.25	.08	.01	.01	0	0	0	.01	.01	.06
27	.22	.71	.24	.07	.01	.01	0	0	0	0	.01	.06
28	.20	.42	.25	.07	.01	.01	0	0	0	0	.01	.07
29	.21	.37	.31	.06	.01	.01	0	0	0	0	.01	.08
30	.20	.28	.05	.01	.01	.01	0	0	0	.01	.01	.08
31	.23	.25	.25	.08	.02	.01	0	0	0	.01	.01	.08
Sum	6.13	9.35	13.02	4.35	0.75	0.30	0.13	0	0	0.03	0.23	1.10

Current Year 1996

Period 1937-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum	
Jan.			122	0.37	1	2	0.16	0.20	530	439	10,581	0
Feb.			26	1.84	24		.18	.32	808	547	5,288	0
Mar.			14	2.24	11		.22	.42	1,125	912	11,587	0
April			1	.24	30		.05	.15	376	549	8,886	0
May			1	.05	114		.01	.02	64.8	267	3,956	0
June			1	.01	1	1	.01	.01	25.9	134	2,234	0
July			1	.01	115		0	0	11.2	73.6	1,525	0
Aug.			1	0	1	1	0	0	0	68.7	2,008	0
Sept.			1	0	1	1	0	0	0	50.4	1,214	0
Oct.			1	.01	1	1	0	0	2.6	63.1	1,084	0
Nov.			1	.01	1	1	.01	.01	19.9	125	1,522	0
Dec.			129	.08	1	1	.01	.04	95.0	210	1,953	0
Yearly				2.24			0	0.10	3,058	3,439	38,639	0

φ Mean daily

! And other days

11-0131.00 INFLOWS TO RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Rodriguez Dam is located in Mexico on Rio de las Palmas, the principal tributary to the Tijuana River, about 9.0 kilometers upstream from its confluence with Cottonwood Creek, 17.0 kilometers upstream from the point where the Tijuana River crosses the international boundary between the United States and Mexico, and 16.0 kilometers 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 Agriculture and Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1996. Storage began in Rodriguez Reservoir on September 22, 1936.

REMARKS: Records of runoff represent all water reaching Rodriguez 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 115.85 meters above mean sea level; at top of spillway gates 125.00 meters above mean sea level. Reservoir capacity at spillway crest 92,370 TCM; at top of spillway gates 138 TCM.

EXTREMES: Maximum monthly inflow, 194,216 TCM, February 1980; minimum, no flow during part of most years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1938 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	0	4,767	131,649	0
February	620	7,711	194,216	7.2
March	1,580	12,767	172,556	5.2
April	4.0	3,785	95,953	0
May	0	739	14,136	0
June	0	220	5,749	0
July	0	117	1,806	0
August	0	69	950	0
September	0	70	575	0
October	0	88	432	0
November	0	182	2,393	0
December	0	963	19,348	0
Yearly	2,204	31,479	381,515	313

11-0132.00 DIVERSIONS FROM RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Sparling flow meter located immediately below the dam in the pipeline which carries water from Rodriguez Reservoir to Gate No. 1 (Poblado Presa) and to Gate No. 2 (City Aqueduct). Formerly, water for irrigation was also diverted to the North and South Canals.

RECORDS: Direct recording by Sparling flow meter. Records through May 1961 were obtained by the Ministry of Agriculture and Hydraulic Resources; from June 1961 to March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana; and from April 1966 through 1991 by the State of Baja California Commission of Public Services for Tijuana. Since 1992, the data have been obtained by the Baja California Regional Office of the National Water Commission. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1996.

REMARKS: Beginning in January 1937, diversions for irrigation began from both sides for the Tijuana Valley and for domestic use at the village by Rodriguez Dam and the City of Tijuana. Since February 1960, no water has been released for irrigation of farmlands.

EXTREMES: Maximum monthly diversion, 36,018 TCM, March 1996; minimum, no flow on several occasions since March 1941.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 1996	PERIOD 1938 - 1996		
		AVERAGE	MAXIMUM	MINIMUM
January	6,183	639	6,183	0
February	6,028	630	6,028	0
March	6,352	1,229	36,018	0
April	6,142	798	6,142	0
May	6,578	966	6,578	0
June	5,893	1,086	5,893	0
July	4,523	1,157	5,681	0
August	5,745	1,128	5,931	0
September	4,337	1,001	6,158	0
October	4,978	937	6,054	0
November	5,340	834	5,873	0
December	4,955	794	6,212	0
Yearly	67,054	11,199	94,980	0

11-0133.00 TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on top of north levee about 1.1 kilometers downstream (north) from boundary, 1.8 kilometers upstream from the new Dairy Mart Road Bridge, and 2.3 kilometers west of the international gate at San Ysidro, California. Zero of the gage is at mean sea level, U. S. C. & G. S. datum.
 RECORDS: Based on current meter measurements, staff gage readings and record of gage heights. Records obtained and furnished by the United States Section of the Commission. Records available: May 1947 through 1996.
 EXTREMES: Since May 1947: Maximum instantaneous discharge, 937 CMS, February 21, 1980; minimum discharge, no flow during many years since 1951.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.07	3.31	0.96	0.64	0	0.03	0	0.03	0.11	0	0.27	0.06
2	.11	1.98	.94	.76	0	.10	0	.09	0	.06	.21	0
3	.06	1.07	.89	.64	0	0	0	.13	0	.10	.10	0
4	.02	.87	.81	.56	.05	.06	0	.11	.12	.07	0	0
5	0	.75	.91	.59	.13	0	.07	0	.12	.09	0	0
6	0	.71	.92	.57	0	.13	0	.08	0	.09	0	1.45
7	0	.70	.81	.56	0	.27	0	.18	0	.09	0	1.02
8	0	.66	.79	.50	0	.27	0	.15	0	.09	0	.70
9	.06	.61	.74	.48	0	.27	0	.15	0	.09	.19	1.09
10	0	.57	.55	.50	0	.16	0	.14	0	.17	0	1.24
11	0	.59	.62	.44	0	0	0	.12	0	.12	.02	1.23
12	.01	.61	1.24	.42	0	0	.01	0	0	.06	0	1.09
13	.04	.63	4.14	.38	.05	0	0	.05	0	.13	0	1.02
14	.07	.59	4.47	.36	.11	0	0	.20	0	.02	0	.90
15	.18	.56	3.08	.37	0	0	0	.21	0	.19	0	.67
16	.16	.51	2.05	.25	0	0	0	.18	0	.14	0	.50
17	.72	.49	1.41	.14	0	0	0	.19	0	0	0	.56
18	.48	.49	1.11	.60	0	.04	0	.13	0	0	0	.58
19	.29	.53	.96	.36	0	0	0	0	0	0	0	.49
20	0	.55	.90	.40	0	0	0	.05	0	.01	0	.05
21	.66	.60	.94	.33	0	0	0	.02	0	.16	0	.14
22	1.82	.55	.86	.35	0	0	0	0	0	.15	1.84	.35
23	.99	.58	.81	0	0	.02	0	0	0	0	1.55	.65
24	.81	.27	.79	0	0	.12	0	0	0	.07	.99	.14
25	.73	.73	.75	0	0	0	0	0	0	0	.87	.47
26	.72	1.60	.74	0	0	0	0	0	.16	2.06	.70	.36
27	.65	1.35	.74	.06	0	0	0	0	.19	.47	.51	.39
28	.61	1.15	.70	.12	.10	0	0	0	.27	.40	.21	.11
29	.59	1.10	.66	.03	.13	0	0	0	.27	.16	.18	.07
30	.61	.49	.54	0	0	0	0	0	.19	1.78	.40	.36
31	1.15	.54	.49	0	0	0	.09	.06		.35		.07
Sum	11.61	24.71	36.32	10.41	0.57	1.47	0.17	2.27	1.43	7.12	8.04	15.76

Current Year 1996

Period 1947-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum	
												Day
Jan.	12.200	11.565	121	3.78	1	1	0	0.37	1,003	9,578	297,879	0
Feb.	12.395	11.855	26	6.43	122	0	0	.85	2,135	15,102	388,951	0
Mar.	12.550	11.940	13	9.05	30	.37	0	1.17	3,138	18,038	362,019	0
April	12.050	11,500	18	2.68	123	0	0	.35	899	4,122	77,633	0
May	11.925	11,500	14	.28	1	1	0	.02	49.2	2,203	52,545	0
June	11.920	11,500	1	.27	1	1	0	.05	127	748	11,960	0
July	11.930	11,500	31	.28	1	1	0	.01	14.7	546	11,400	0
Aug.	11.945	11,500	6	.43	1	1	0	.07	196	672	21,083	0
Sept.	11.930	11,500	26	.28	1	1	0	.05	124	293	5,142	0
Oct.	12.320	11,500	26	8.47	1	1	0	.23	615	410	6,859	0
Nov.	12.280	11,500	22	4.66	1	2	0	.27	695	580	5,399	0
Dec.	12.250	11,500	9	4.24	1	1	0	.51	1,362	1,055	8,270	0
Yearly	12.550	11.500		9.05			0	0.33	10,358	53,347	734,832	0

1 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 thousand cubic meters. The reservoir capacities indicated are total capacities at the top of the spillway gates in closed position on the controlled spillways of Barrett and Rodriguez Dams, 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 Rodriguez Reservoirs are based on the capacities as determined by the following surveys: Morena 1948; Barrett 1948, 1951, and 1955; and Rodriguez 1927, when the reservoir area was initially surveyed.

The storage data for Morena and Barrett reservoirs are obtained and provided by the City of San Diego, California and the U.S. Geological Survey. The data for Rodriguez Dam were provided by the Secretariat of Hydraulic Resources in Mexico up to May 1961, from June 1961 to March 1966 the data were provided by the Potable Water and Sewerage Board for the Urban District of Tijuana, from April 1966 to December 1991, the data were provided by the State Public Service Commission of Tijuana, Baja California, and since 1992, by the Secretariat of Agriculture and Hydraulic Resources.

IN THOUSAND CUBIC METERS

Month	MORENA RESERVOIR, CALIFORNIA (Capacity 61,933)		BARRETT RESERVOIR, CALIFORNIA (Capacity 55,211)		RODRIGUEZ RESERVOIR, BAJA CALIFORNIA (Capacity 138,000)		TOTAL IN TIJUANA RIVER BASIN RESERVOIRS (Capacity 255,147)	
	1996	Average 1937-1996	1996	Average 1937-1996	1996	Average 1937-1996	1996	Average 1937-1996
Jan.	53,627	23,065	38,318	17,575	80,860	42,716	172,805	83,356
Feb.	54,139	24,520	39,579	18,706	75,590	44,445	169,308	87,671
Mar.	54,556	25,966	40,836	20,989	70,920	50,110	166,312	97,065
April	53,864	26,137	38,955	21,627	64,136	50,495	156,955	98,259
May	52,444	25,890	37,310	21,189	57,224	49,685	146,978	96,764
June	50,493	25,243	37,407	20,364	50,947	48,139	138,847	93,746
July	48,974	24,545	37,511	19,461	46,060	46,196	132,545	90,202
Aug.	46,903	23,935	37,556	18,540	39,740	44,262	124,199	86,737
Sept.	45,494	23,285	37,670	17,913	34,996	42,814	118,160	84,012
Oct.	44,263	22,870	37,910	17,310	29,534	41,270	111,707	81,450
Nov.	43,764	22,719	38,362	16,921	23,576	40,549	105,702	80,189
Dec.	43,266	22,871	38,866	17,220	17,800	40,490	99,932	80,581
Avg.	49,316	24,254	38,357	18,985	49,282	45,098	136,955	88,337
Max.	54,556	#1 76,069	40,836	*1 56,641	80,860	! 138,486	172,805	! 263,471
Min.	43,266	!! 12	37,310	!! 131	17,800	!! 0	99,932	!! 1,559

- March 31, 1941 - Prior to removal of spillway gates

* - April 30, 1937 - Sandbags were placed on crest of spillway

! - Maximum end of month storage for period of record

!! - Minimum end of month storage for period of record

RAINFALL ON THE TIJUANA RIVER WATERSHED
IN MILLIMETERS

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

IN THE UNITED STATES

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Sawday Ranch, California		Campo, California	
	1996	Average 1906-1996	1996	Average 1907-1996	1996	Average 1951-1996	1996	Average 1950-1996	1996	Average 1900-1996
Jan.	53	99	45	91	#	#	40	93	39	80
Feb.	105	97	81	87	#	#	88	79	81	82
Mar.	73	92	64	83	#	#	63	82	70	75
April	16	41	10	37	#	#	13	35	13	34
May	4	15	4	13	#	#	0	9	2	12
June	0	3	0	2	#	#	0	1	0	2
July	9	9	1	3	#	#	3	14	0	12
Aug.	1	14	0	6	#	#	2	21	2	14
Sept.	0	10	0	6	#	#	5	11	1	9
Oct.	41	22	45	18	#	#	30	15	40	16
Nov.	75	40	47	37	#	#	41	43	23	34
Dec.	75	76	52	69	#	#	51	59	50	61
Yearly	452	518	349	452	#	#	336	462	321	431

Month	Chula Vista, California		Lower Otay Dam, California					
	1996	Average 1930-1996	1996	Average 1906-1996				
Jan.	15	48	29	56				
Feb.	44	45	65	44				
Mar.	28	45	41	58				
April	8	20	9	25				
May	0	5	1	10				
June	0	2	0	3				
July	0	0	1	1				
Aug.	0	2	0	3				
Sept.	0	4	5	5				
Oct.	34	9	38	10				
Nov.	41	29	43	32				
Dec.	22	39	22	38				
Yearly	192	248	254	285				

Missing record

IN MEXICO

Month	El Pinal, Baja California		El Hongo, Baja California		Belen, Baja California		Tecate, Baja California		El Carrizo, Baja California	
	1996	Average 1964-1996	1996	Average 1980-1996	1996	Average 1965-1996	1996	Average 1946-1959 1961-1996	1996	Average 1980-1996
Jan.	#	84	61	72	#	63	28	78	32	45
Feb.	#	90	32	69	#	71	33	53	29	45
Mar.	#	94	54	76	#	71	38	67	19	66
April	#	37	1	17	#	27	5	26	3	17
May	#	9	0	6	#	5	0	7	0	4
June	#	1	0	2	#	T	0	2	0	1
July	#	18	25	14	#	3	1	4	T	4
Aug.	#	23	2	20	#	6	T	6	0	2
Sept.	#	18	6	7	#	9	3	4	T	3
Oct.	#	16	21	13	#	15	25	12	13	16
Nov.	#	46	11	31	#	39	13	35	27	34
Dec.	#	71	22	30	#	48	15	50	12	36
Yearly	#	494	235	360	#	367	161	346	135	291

Missing record T Trace

RAINFALL ON THE TIJUANA RIVER WATERSHED
IN MILLIMETERS

IN MEXICO

	Valle de Palmas, Baja California		Rodriguez Dam, Baja California			
	1996	Average 1948-1996	1996	Average 1938-1996		
Jan.	34	44	28	45		
Feb.	37	37	33	40		
Mar.	27	41	38	45		
April	3	15	5	18		
May	0	3	0	3		
June	0	1	0	1		
July	4	2	1	1		
Aug.	3	5	1	2		
Sept.	0	5	3	5		
Oct.	14	9	25	10		
Nov.	0	21	13	24		
Dec.	6	27	15	38		
Yearly	128	201	161	231		

T Trace

LOCATION OF RAINFALL STATIONS ON THE TIJUANA RIVER WATERSHED

The precipitation records of the stations listed alphabetically below began on the date shown and extend through 1996.

IN THE UNITED STATES

NAME OF STATION	LATITUDE	LONGITUDE	φ ELEV. (Meters)	RECORD BEGAN	OBSERVER
Barrett Dam, California	32° 41'	116° 40'	494.69	1907	City of San Diego
Campo, California	32° 38'	116° 28'	801.62	1877	County of San Diego
Chula Vista, California	32° 36'	117° 06'	2.74	1930	Chula Vista Fire Department
Lower Otay Dam, California	32° 37'	116° 56'	164.59	1906	City of San Diego
Marron Valley, California	32° 34'	116° 46'	167.64	1951	County of San Diego
Morena Dam, California	32° 41'	116° 31'	937.26	1906	City of San Diego
Sawday Ranch, California	32° 45'	116° 29'	975.36	1950	William Tulloch

IN MEXICO

NAME OF STATION	LATITUDE	LONGITUDE	φ ELEV. (Meters)	RECORD BEGAN	OBSERVER
Belen, Baja California	32° 12'	116° 29'	555.04	1965	** CNA
El Carrizo, Baja California	32° 29'	116° 42'	494.99	1980	CNA
El Hongo, Baja California	32° 31'	116° 18'	960.12	1981	CNA
El Pinal, Baja California	32° 11'	116° 17'	1350.00	1964	CNA
Rodriguez Dam, Baja California	32° 27'	116° 54'	120.09	1938	CNA
Tecate, Baja California	32° 33'	116° 41'	480.06	1946	CNA
Valle de Las Palmas, Baja California	32° 22'	116° 37'	280.11	1948	CNA

φ Elevation above mean sea level

* Estimated from topographic maps

** Baja California State Office of the National Water Commission

EVAPORATION IN THE TIJUANA RIVER BASIN
IN MILLIMETERS

Tabulated below are records of evaporation observed at 3 stations in California and at 2 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 Agriculture and Hydraulic Resources of Mexico. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations on the Tijuana River Watershed" in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan. October 1926 through 1996, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.
2. Morena Reservoir: October 1915 through December 1921, square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan and a land pan of the same dimensions. September 1926 through 1996, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.
3. Lower Otay Dam: January 1950 through 1996, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.

IN THE UNITED STATES

Month	Morena Dam, California		Barrett Dam, California		Lower Otay Dam California	
	1996	Average 1916-1996	1996	Average 1921-1996	1996	Average 1950-1996
Jan.	56	54	44	48	58	50
Feb.	42	53	31	54	53	58
Mar.	105	82	75	84	98	85
April	126	118	121	117	140	119
May	155	164	148	164	167	153
June	211	212	167	202	186	175
July	220	242	177	237	187	209
Aug.	225	225	177	223	187	198
Sept.	162	179	137	182	154	163
Oct.	131	125	100	127	119	118
Nov.	59	80	51	79	73	72
Dec.	42	57	38	49	51	54
Yearly	1,534	1,591	1,266	1,566	1,473	1,454

IN MEXICO

Month	Rodríguez Dam, Baja California		El Carrizo, Baja California	
	1996	Average 1939-1942 1946-1996	1996	Average 1980-1996
Jan.	78	103	143	140
Feb.	62	105	99	118
Mar.	109	111	178	144
April	176	140	283	185
May	193	129	305	223
June	210	191	301	277
July	215	215	345	299
Aug.	204	199	323	292
Sept.	151	167	288	248
Oct.	118	137	228	209
Nov.	98	110	227	159
Dec.	83	86	154	134
Yearly	1,697	1,713	2,874	2,417

TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES CELSIUS

The maximum, minimum, and monthly average temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few meters 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 on Tijuana River Watershed" in this bulletin.

IN THE UNITED STATES

Month	Barrett Dam, California				Campo, California				Chula Vista, California			
	1996			Average 1931- 1996	1996			Average 1951- 1996	1996			Average 1931- 1996
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	12.6	28.3	0.6	9.7	9.7	26.1	-4.4	8.7	14.6	31.1	3.9	12.0
Feb.	12.8	28.9	-1.1	10.7	11.1	28.9	-3.3	9.4	15.5	27.8	4.4	12.8
Mar.	13.7	28.3	2.8	12.0	11.3	28.3	-2.8	10.1	15.4	32.2	7.2	13.5
April	16.8	32.2	5.0	14.6	15.1	35.0	-1.7	12.3	17.8	32.8	8.3	15.0
May	17.9	36.1	6.1	17.1	16.3	35.6	1.7	15.0	19.2	27.8	11.7	16.3
June	21.7	36.7	10.0	20.5	18.7	36.7	1.7	18.6	19.9	29.4	13.9	17.7
July	24.7	38.9	11.1	24.5	24.1	38.9	7.8	22.7	21.5	29.4	15.6	19.8
Aug.	26.0	38.3	12.8	24.6	24.1	40.0	4.4	22.9	22.6	28.9	16.7	20.7
Sept.	22.9	36.7	11.1	22.5	20.3	35.6	3.3	20.5	21.5	28.3	15.6	20.0
Oct.	18.4	37.8	2.2	18.1	15.9	37.2	-3.3	16.1	18.2	25.6	7.8	17.7
Nov.	14.4	31.7	1.7	13.4	12.8	31.7	-5.0	11.4	16.6	33.3	5.6	14.8
Dec.	12.1	25.0	-0.6	10.3	9.9	25.0	-5.0	8.8	14.4	26.1	4.4	12.7
Yearly	17.8	38.9	-1.1	16.5	15.8	40.0	-5.0	14.7	18.1	33.3	3.9	16.1

IN MEXICO

Month	El Pinal, Baja California				El Hongo, Baja California				Belen, Baja California			
	1996		1964-1996		1996		1981-1996		1996		1965-1996	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	*	*	29	-16	25	-2	25	-9	*	*	34	-6
Feb.	*	*	31	-10	26	-1	27	-6	*	*	32	-6
Mar.	*	*	29	-7	26	-1	29	-2	*	*	36	-4
April	*	*	33	-8	33	3	32	-1	*	*	38	-3
May	*	*	34	-4	35	6	38	1	*	*	40	0
June	*	*	43	-4	36	7	41	2	*	*	43	3
July	*	*	44	0	39	13	42	7	*	*	45	4
Aug.	*	*	44	0	38	10	41	3	*	*	45	5
Sept.	*	*	45	-4	35	8	39	2	*	*	44	1
Oct.	*	*	40	-5	35	0	37	0	*	*	40	-6
Nov.	*	*	35	-10	27	-2	29	-2	*	*	34	-4
Dec.	*	*	29	-4	25	1	27	-8	*	*	33	-7
Yearly	*	*	45	-16	39	-2	42	-9	*	*	45	-7

Month	Tecate, Baja California				El Carrizo, Baja California				Valle de Palmas, Baja California			
	1996		1946-1996		1996		1980-1996		1996		1948-1996	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	32	-1	38	-9	32	2	32	-1	33	-2	33	-11
Feb.	32	1	38	-8	30	4	36	-2	35	1	37	-5
Mar.	35	0	36	-5	29	4	32	-4	30	0	38	-2
April	35	2	39	-2	36	7	41	4	38	3	41	-2
May	37	6	42	1	36	10	42	5	40	5	44	2
June	41	4	44	0	37	11	42	9	40	6	48	7
July	41	6	46	2	38	12	46	8	43	11	49	7
Aug.	41	4	47	1	38	11	45	5	46	10	48	5
Sept.	39	10	46	2	35	12	42	6	39	9	47	4
Oct.	33	1	41	-3	35	7	38	6	43	1	43	0
Nov.	30	1	36	-3	35	6	35	4	38	0	38	-7
Dec.	28	-1	36	-5	26	4	32	-3	28	1	35	-6
Yearly	41	-1	47	-9	38	2	46	-4	46	-2	49	-11

TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES CELSIUS

IN MEXICO

Month	Rodriguez Dam, Baja California										
	1996		1938-1996								
	Max.	Min.	Max.	Min.							
Jan.	29	3	32	-3							
Feb.	31	6	34	0							
Mar.	30	5	38	0							
April	36	8	40	2							
May	34	12	39	3							
June	37	14	42	8							
July	34	16	40	8							
Aug.	38	16	41	10							
Sept.	34	13	43	8							
Oct.	30	8	42	1							
Nov.	34	7	37	-1							
Dec.	26	5	34	-3							
Yearly	38	3	43	-3							

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

1996

The total area within the Tijuana River basin is 4,484 square kilometers, 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 Mr. Art Letter, General Manager, Tia Juana Valley County Water District, or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana River basin in 1996 was by pumping from ground water.

Designation of Areas	Drainage Basin-Square Kilometers			Irrigated Areas-Hectares		
	United States	Mexico	Total	United States	Mexico	Total
Cottonwood Creek above Morena Dam	295	0	295	0		0
Morena Dam to Barrett Dam	344	0	344	0		0
above Barrett Dam	640	0	640	0		0
below Barrett Dam and above Tecate Creek	168	0	168	0		0
above Tecate Creek	808	0	808	0		0
Campo Creek above International Boundary	220	10	230	0		0
Tecate Creek above International Boundary (not including Campo Creek)	49	166	215	0		0
Cottonwood Creek above International Boundary Station	1,070	176	1,246	0		0
Rio de las Palmas above Rodriguez Dam	18	2,541	2,559	0	(b)	0
Tijuana River above Nestor Gaging Station	1,186	3,279	4,465	49		49
above the Mouth	1,197	3,287	4,484	(a) 244		244

(a) Data from Otay Water District, leased areas from IBWC irrigation and private landowners.

(b) There was no irrigation in 1996 in the Tijuana Irrigation District, Tijuana Valley, Baja California Mexico, from the Rodriguez Reservoir.



09-5375.00 WHITEWATER DRAIN NEAR DOUGLAS, ARIZONA

DESCRIPTION: Water-stage recorder located on U. S. Highway 80 bridge between Douglas and Bisbee, Arizona, about 137 meters upstream from the Southern Pacific Railroad bridge, 2.4 kilometers upstream from the international boundary, and 3.2 kilometers west of Douglas, Arizona. Zero of gage is 1,191.505 meters above mean sea level, U. S. C. & G. S. datum of 1929. Location April 26, 1972 to April 10, 1974 was 61 meters upstream from bridge with the datum 1,340 meters higher.

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by the U. S. Section of the Commission. Records fair. 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), July 1930 to December 1933, May 1935 to July 1947, October 1947 through 1996 (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.

EXTREMES: Prior to 1936: Maximum recorded discharge, 97.7 CMS August 10, 1931 (gage height 3.700 meters); maximum estimated discharge, 115 CMS July 27, 1919; minimum discharge, no flow for several days of many years. Since 1936: Maximum discharge, 143 CMS August 7, 1955; maximum gage height, 5.045 meters July 29, 1966; minimum daily discharge, no flow at times during most years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0.40	0.21	0.76	0.07	0.07	0.07
2	0	0	0	0	0	0	0.06	0.06	.72	.07	.07	.07
3	0	0	0	0	0	0	.05	.86	1.21	.07	.07	.07
4	0	0	0	0	0	0	.06	1.23	.08	.07	.07	.07
5	0	0	0	0	0	0	.05	.07	.40	.07	.07	.07
6	0	0	0	0	0	0	.05	.06	.18	.07	.07	.07
7	0	0	0	0	0	0	.05	.05	.06	.07	.07	.08
8	0	0	0	0	0	0	.26	.05	.05	.07	.07	.08
9	0	0	0	0	0	0	.62	.05	.04	.07	.07	.08
10	0	0	0	0	0	0	.62	.05	.16	.07	.07	.08
11	0	0	0	0	0	0	.90	.06	.06	.07	.07	.08
12	0	0	0	0	0	0	.15	.06	.10	.07	.07	.08
13	0	0	0	0	0	0	.30	.06	.07	.07	.06	.08
14	0	0	0	0	0	0	.23	.05	.06	.07	.07	.08
15	0	0	0	0	0	0	.46	.05	.05	.07	.07	.08
16	0	0	0	0	0	0	.10	.05	.05	.07	.07	.08
17	0	0	0	0	0	0	.05	.05	.05	.07	.06	.08
18	0	0	0	0	0	0	.04	.10	.06	.07	.07	.08
19	0	0	0	0	0	0	.04	.23	.05	.07	.07	.08
20	0	0	0	0	0	0	.04	.08	.05	.07	.07	.09
21	0	0	0	0	0	0	.20	.16	.06	.07	.06	.09
22	0	0	0	0	0	0	.12	.79	.06	.07	.06	.09
23	0	0	0	0	0	0	.06	.08	.06	.07	.07	.10
24	0	0	0	0	0	0	.46	.06	.06	.07	.07	.10
25	0	0	0	0	0	0	1.25	.05	.06	.07	.06	.10
26	0	0	0	0	0	0	.07	.05	.07	.07	.06	.10
27	0	0	0	0	0	0	.04	.05	.22	.07	.07	.10
28	0	0	0	0	0	0	.04	.05	.09	.08	.07	.11
29	0	0	0	0	0	0	.04	.05	.07	.08	.06	.11
30	0	0	0	0	0	1.66	.03	.05	.07	.07	.06	.12
31	0	0	0	0	0	0	.10	.06	.07	.07	.06	.12
Sum	0	0	0	0	0	1.66	6.37	4.93	5.08	2.19	2.02	2.69

Current Year 1996

Period 1936-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	1.630	1.630	1	0	1	0	0	0	41.8	556	0
Feb.	1.630	1.630	1	0	1	0	0	0	20.2	163	0
Mar.	1.630	1.630	1	0	1	0	0	0	25.7	364	0
April	1.630	1.630	1	0	1	0	0	0	18.8	213	0
May	1.630	1.630	1	0	1	0	0	0	13.4	170	0
June	2.230	1.630	30	2.97	1	0	.06	143	127	1,961	0
July	2.205	1.480	1	2.75	10	.03	.21	550	1,932	10,004	0
Aug.	2.210	1.485	4	2.80	17	.04	.16	426	3,136	17,861	0
Sept.	1.985	1.475	3	2.61	9	.03	.17	439	825	3,910	0
Oct.	1.495	1.475	128	.08	1	.07	.07	189	386	7,528	0
Nov.	1.505	1.485	1	.07	22	.06	.07	175	30.7	714	0
Dec.	1.565	1.505	31	.12	1	.07	.09	232	135	2,915	0
Yearly	2.230	1.475		2.97		0	0.07	2,154	6,712	27,533	0

! And other days

SEWAGE INFLUENT, DOUGLAS, ARIZONA
INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Parshall flume in the influent line of the older trickling filter unit and a Parshall flume in the influent line of the newer extended aeration unit. The treatment plant is located about 1.6 kilometers west of the Douglas-Agua Prieta Port of Entry immediately adjacent to the international boundary in Douglas, Cochise County, Arizona.

RECORDS: Continuous monthly records since March 1948; daily records from March 18, 1948 through 1950 and from January 1952 through 1996.

REMARKS: The older 4.9 thousand cubic meters per day trickling filter unit was constructed in 1947 by the International Boundary and Water Commission. Since April 8, 1968 all sewage from Agua Prieta has been retained and treated in Mexico to be used for irrigation along with the effluent from the Douglas International Treatment Plant. On July 1, 1973, ownership and operation of the plant was transferred from the International Boundary and Water Commission to the City of Douglas. In 1980 the plant was enlarged, with the addition of the extended aeration unit bringing the total capacity up to 9.8 thousand cubic meters per day. The effluent from the Douglas Treatment Plant is discharged through a conduit to Mexico.

Month	Total Monthly Flows			Mean Daily Flows—Thousand Cubic Meters Per Day					
	Thousand Cubic Meters			Current Year 1996			Period 1952-1996		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	156	0	156	5.8	4.2	5.0	9.6	1.6	4.4
Feb.	143	0	143	6.2	3.6	5.1	17.7	2.1	4.4
Mar.	155	0	155	5.6	4.4	5.0	13.9	2.2	4.4
April	136	0	136	5.5	3.7	4.5	12.9	1.4	4.4
May	139	0	139	6.0	2.7	4.5	12.2	1.9	4.4
June	132	0	132	6.9	2.6	4.4	9.5	2.1	4.5
July	136	0	136	5.4	3.7	4.4	14.1	1.8	4.7
Aug.	138	0	138	5.0	3.4	4.5	10.2	1.4	4.7
Sept.	140	0	140	7.2	3.2	4.7	9.6	1.8	4.6
Oct.	130	0	130	6.3	2.8	4.2	12.0	2.3	4.5
Nov.	124	0	124	5.4	3.4	4.1	10.9	1.2	4.5
Dec.	130	0	130	6.2	3.0	4.2	12.6	1.9	4.5
Yearly	1,659	0	1,659	7.2	2.6	4.6	17.7	1.2	4.5

WESTERN BOUNDARY WATER BULLETIN - 1996 - INTERNATIONAL BOUNDARY AND WATER COMMISSION

09-4705.00 SAN PEDRO RIVER AT PALOMINAS, ARIZONA

DESCRIPTION: Water-stage recorder located near left bank on downstream side of the bridge pier at Highway 92, 1.1 kilometers east of Palominas, 4.0 kilometers upstream from Green Brush Draw, 7.2 kilometers downstream from international boundary, and 19 kilometers southwest of Bisbee, Arizona. Zero of gage is 1,276.39 meters above mean sea level (State Highway bench mark).

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records available: May 1930 to October 1933, May 1935 to July 1941, and July 1950 through 1996. Records obtained and furnished by U. S. Geological Survey prior to October 1, 1981 and from October 1, 1995 through 1996, and by the United States Section of the Commission from October 1, 1981 through September 30, 1995.

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

EXTREMES: Maximum daily discharge, 623 CMS on August 14, 1940 (gage height 4.93 meters present datum), from rating curve extended above 159 CMS on basis of slope-area measurement of peak flow; no flow at time in most years. Greatest flood known occurred on September 28, 1926 (gage height, about 7.28 meters present datum), from flood marks; discharge not determined.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.03	0.05	0.06	0.02	0	0	0	1.08	1.25	0.01	0	0.05
2	.03	.05	.06	.02	0	0	0	15.5	.71	.01	0	.06
3	.03	.05	.06	.02	0	0	0	31.7	.45	.01	0	.05
4	.03	.04	.06	.02	0	0	0	1.53	.45	.01	0	.05
5	.03	.04	.06	.02	0	0	0	.88	.45	.01	0	.05
6	.03	.05	.06	.02	0	0	0	.62	.71	.01	0	.05
7	.03	.05	.06	.02	0	0	0	.45	1.10	.01	0	.05
8	.03	.05	.06	.02	0	0	0	.37	.51	0	0	.05
9	.04	.05	.05	.02	0	0	0	.31	.37	0	0	.05
10	.04	.05	.05	.01	0	0	0	.26	.26	0	0	.05
11	.04	.05	.05	.01	0	0	0	1.22	.18	0	0	.05
12	.04	.06	.05	.01	0	0	0	.34	.10	0	0	.05
13	.04	.07	.05	.01	0	0	0	.23	.06	0	0	.05
14	.04	.06	.05	.01	0	0	0	.20	.08	0	0	.05
15	.04	.06	.05	.01	0	0	23.1	.18	.07	0	0	.05
16	.04	.06	.05	0	0	0	2.41	.17	.05	0	0	.06
17	.04	.05	.05	0	0	0	1.36	.16	.04	0	0	.06
18	.03	.05	.04	0	0	0	.99	.16	.03	0	0	.05
19	.04	.05	.04	0	0	0	.34	1.05	.03	0	0	.06
20	.04	.05	.04	0	0	0	.34	.59	.03	0	0	.06
21	.04	.05	.03	0	0	0	.59	.31	.02	0	0	.07
22	.04	.05	.03	0	0	0	.37	.28	.02	0	0	.06
23	.04	.05	.03	0	0	0	.37	.26	.01	0	0	.06
24	.04	.06	.03	0	0	0	7.45	.21	.01	0	0	.06
25	.04	.06	.03	0	0	0	10.1	.23	.01	0	.01	.07
26	.04	.06	.03	0	0	0	1.25	.20	.02	0	.02	.06
27	.04	.06	.03	0	0	0	.76	1.16	.01	0	.03	.06
28	.04	.06	.03	0	0	0	.42	.34	.01	0	.03	.06
29	.04	.06	.03	0	0	0	.20	.40	.01	0	.04	.05
30	.04	.06	.03	0	0	0	.07	.31	.01	0	.05	.05
31	.04	.06	.02	0	0	0	.71	.31	0	0	.05	.05
Sum	1.15	1.55	1.37	0.24	0	0	50.83	61.01	7.06	0.07	0.18	1.70

Current Year 1996

Period 1951-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.750	0.725	110	0.05	112	0.03	0.04	99.4	2,529	35,987	3.2
Feb.	.770	.745	112	.07	114	.04	.05	134	1,046	8,343	3.7
Mar.	.770	.735	113	.07	31	.02	.04	118	913	9,129	16.4
April	.745	.510	111	.02	126	0	.01	20.7	209	1,282	0
May	.675	.460	111	0	11	0	0	0	70.0	502	0
June	.540	.460	111	0	11	0	0	0	149	1,716	0
July	2.675	.540	15	69.1	11	0	1.64	4,392	5,619	21,263	0
Aug.	3.725	.850	3	179	117	.15	1.97	5,271	9,025	44,860	204
Sept.	1.395	.735	1	6.68	128	.01	.24	610	2,127	20,160	13.9
Oct.	.755	.735	1	.01	16	0	0	6.0	2,043	58,371	0
Nov.	.815	.745	26	.50	11	0	.01	15.6	704	19,006	0
Dec.	.815	.810	28	.06	14	.04	.05	147	2,084	31,428	7.6
Yearly	3.725	0.460		179		0	0.34	10,814	26,518	77,448	5,427

1 And other days

09-4800.00 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, 4.0 kilometers northeast of Lochiel, Arizona, and 2.7 kilometers 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 1,408 meters.

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records obtained and furnished by the U. S. Geological Survey, Records available: January 1949 through 1996.

REMARKS: There are small diversions by ground water pumping for irrigating about 80.9 hectares above this station.

EXTREMES: Maximum discharge, 362 CMS on August 15, 1984, (gage height 3.19 meters); minimum discharge, no flow for several days of many years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.02	0.03	0.02	0.02	0.01	0	0.01	0.01	0.05	0.01	0.01	0.02
2	.02	.03	.02	.02	.01	0	0	3.49	.05	.01	.01	.02
3	.02	.03	.02	.02	.01	0	.01	.21	.15	.01	.01	.02
4	.02	.03	.02	.02	.01	0	.03	.05	1.42	.01	.01	.01
5	.02	.03	.02	.02	.01	0	.03	.03	.28	.01	.01	.02
6	.02	.03	.02	.02	.01	0	.03	.02	.05	.01	.01	.02
7	.02	.03	.02	.02	.01	0	.03	.02	.03	.01	.01	.02
8	.02	.02	.02	.01	.01	0	.48	.01	.02	.01	.01	.02
9	.02	.02	.02	.01	.01	0	.23	.02	.04	.01	.01	.02
10	.02	.02	.02	.01	.01	0	1.98	.02	.04	.01	.01	.02
11	.02	.02	.02	.01	0	0	2.97	.01	.04	.01	.01	.02
12	.03	.02	.02	.01	.01	0	0	.01	.03	.01	.01	.02
13	.03	.02	.02	.01	.01	0	0	.01	.03	.01	.01	.02
14	.03	.02	.02	.01	.01	0	0	.01	.03	.01	.01	.02
15	.02	.02	.02	.01	.01	0	0	.01	.02	.01	.01	.02
16	.02	.02	.02	.01	.01	0	0	.01	.02	.01	.01	.02
17	.02	.03	.02	.01	.01	0	0	1.65	.02	.01	.01	.02
18	.02	.03	.02	.01	.01	0	0	.26	.02	.01	.01	.02
19	.02	.03	.02	.01	0	0	0	1.48	.02	.01	.01	.02
20	.02	.02	.02	.01	.01	0	0	.80	.01	.01	.01	.02
21	.02	.02	.02	.01	.01	0	0	.07	.01	.01	.01	.02
22	.02	.02	.02	.01	.01	0	0	.05	.01	.01	.01	.02
23	.02	.02	.02	.01	.01	0	0	.03	.01	.01	.01	.02
24	.02	.02	.02	.01	.01	0	0	.03	.01	.01	.01	.02
25	.02	.02	.02	.01	.01	0	0	.03	.01	.01	.01	.02
26	.02	.02	.02	.01	.02	0	0	.04	.01	.01	.01	.02
27	.02	.03	.02	.01	.02	0	0	.04	.01	.01	.01	.02
28	.02	.02	.02	.01	.02	0	0	.04	.01	.01	.01	.02
29	.02	.02	.02	.01	.02	.01	.01	.03	.01	.01	.01	.02
30	.02	.02	.02	.01	.02	.01	0	.03	.01	.01	.01	.02
31	.02	.02	.02	.01	0	0	.01	.04	.01	.01	.01	.02
Sum	0.65	0.69	0.62	0.37	0.33	0.02	5.82	8.56	2.47	0.31	0.32	0.61

Current Year 1996

Period 1949-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum	
Jan.			112	0.03	1	0.02	0.02	56.2	373	8,822	1.6	
Feb.			1	.03	1	0.02	.02	59.6	130	1,233	2.2	
Mar.			1	.02	1	.02	.02	33.6	146	2,594	.9	
April			1	.02	1	.01	.01	32.0	67.0	638	0	
May			126	.02	111	0	.01	28.5	34.0	210	0	
June			129	.01	1	1	0	1.7	23.0	208	0	
July			11	2.97	1	2	0	.19	503	577	5,267	2.0
Aug.			2	3.49	1	1	.01	.28	740	1,160	14,207	.1
Sept.			4	1.42	120		.01	.08	213	356	3,249	0
Oct.			1	.01	1	1	.01	.01	26.8	339	5,837	0
Nov.			129	.02	1	1	.01	.01	27.6	76.0	497	0
Dec.			1	.02	4		.01	.02	52.7	136	1,348	0
Yearly				3.49		0	0.06	1,795	3,417	21,433	155	

φ Mean daily

1 And other days

09-4805.00 SANTA CRUZ RIVER NEAR NOGALES, ARIZONA

DESCRIPTION: Water-stage recorder, cable with sit-down cable car located 8.9 kilometers east of Nogales, Arizona, 1.3 kilometer downstream from the international boundary and 9.7 kilometers upstream from the Santa Cruz bridge on State Highway No. 82. Zero of gage is 1,128.54 meters above mean sea level, U. S. C. & G. S. datum (levels by International Boundary and Water Commission).

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records obtained and furnished by the U. S. Geological Survey. Records available: March to November 1907 and April 1909 to December 1912 (discharge measurements and fragmentary gage height record); January 1913 to June 1922 (October 1915 to September 1916, monthly discharges only); May 1930 to December 1933; and July 1935 through 1996.

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 1996.

EXTREMES: Maximum discharge, 949 CMS on October 9, 1977 (gage height 4.725 meters); minimum discharge, no flow for several days of many years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1996 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.02	0.01	0	0	0	0	0	0.02	0.01	0	0	0
2	.02	.03	.01	0	0	0	0	.02	.01	0	.01	0
3	.02	.02	0	0	0	0	0	.01	.01	0	.01	0
4	.02	.01	0	0	0	0	0	.01	.01	0	.01	0
5	.02	.01	0	0	0	0	.07	.01	.01	0	.01	0
6	.01	0	0	0	0	0	2.27	.01	.01	0	.01	0
7	.01	0	0	0	0	0	0	.01	.01	0	.01	.01
8	.01	0	0	0	0	0	0	.28	.01	0	.01	.01
9	.01	0	0	0	0	0	.19	.06	.01	0	.01	.01
10	.01	.01	0	0	0	0	0	.03	.01	0	.01	.01
11	.01	0	0	0	0	0	0	.02	.01	0	.01	.01
12	.01	0	0	0	0	0	0	.02	.01	0	.01	.01
13	0	0	0	0	0	0	0	.02	.01	0	0	.02
14	0	0	0	0	0	0	0	.01	.01	0	0	.02
15	0	0	.01	0	0	0	1.25	.01	.01	0	0	.02
16	0	0	.01	0	0	0	.01	3.79	.01	0	0	.02
17	0	.01	.01	0	0	0	0	.99	.01	0	0	.02
18	0	.02	.01	0	0	0	0	2.55	.01	0	0	.02
19	0	.04	0	0	0	0	0	1.05	.01	0	0	.02
20	0	.04	0	0	0	0	0	.03	.01	0	0	.02
21	0	.01	0	0	0	0	0	.02	.01	0	0	.02
22	0	.01	0	0	0	0	0	.17	.01	0	0	.01
23	0	0	0	0	0	0	0	.01	.01	0	0	.01
24	0	0	0	0	0	0	0	.01	.01	0	.01	.01
25	0	0	0	0	0	0	5.18	.01	.01	0	.01	.02
26	0	.01	0	0	0	0	.01	.01	.01	.01	0	.02
27	0	0	0	0	0	0	0	.01	.01	.01	0	.02
28	0	0	0	0	0	0	0	.01	.01	.01	0	.02
29	0	0	0	0	0	0	.15	.01	.01	.01	.01	.01
30	0	0	0	0	0	0	.01	.01	.01	.01	0	.02
31	0	0	0	0	0	0	.28	.01	.01	0	0	.02
Sum	0.17	0.23	0.05	0	0	0	9.42	9.23	0.30	0.05	0.14	0.40

Current Year 1996

Period 1936-1996

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Volume-Thousand Cubic Meters			
	High	Low	Day		Average	Total	Average	Maximum	Minimum	
			φ High	φ Low						
Jan.			1 1	0.02 113	0	0.01	14.7	3,097	37,352	0
Feb.			119	.04 1 6	0	.01	19.9	2,226	25,344	0
Mar.			1 2	.01 1 1	0	0	4.3	1,979	24,145	0
April			1 1	0 1 1	0	0	0	567	4,263	0
May			1 1	0 1 1	0	0	0	144	1,272	0
June			1 1	0 1 1	0	0	0	98.0	1,787	0
July			25	5.18 1 1	0	.30	814	3,092	19,255	0
Aug.			16	3.79 1 3	.01	.30	797	6,489	56,481	12.1
Sept.			1 1	.01 1 1	.01	.01	25.9	1,819	11,633	0
Oct.			126	.01 1 1	0	0	4.3	2,163	72,806	0
Nov.			1 2	.01 1 1	0	0	12.1	634	9,108	0
Dec.			113	.02 1 1	0	.01	34.6	2,969	41,405	0
Yearly				5.18	0	0.05	1,727	25,277	108,071	1,727

φ Mean daily

! And other days

SEWAGE INFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

DESCRIPTION: One 61-centimeter Parshall flume with a water-stage recorder is located at the international boundary for measuring raw wastewater from Nogales, Sonora. The plant influent and effluent flows are measured by flow meters and recorded on individual chart recorders and continuous totalizers. The Nogales Wash Pumping Plant flows are contaminated surface waters from Mexico captured in the U.S. and pumped into the international sewer trunk line downstream of the influent recorder. Flows determined by pump hour clocks. The Nogales International Treatment Plant is located adjacent to I-19, approximately 14.5 kilometers north of the international boundary, all within the City of Nogales, Santa Cruz County, Arizona.

RECORDS: Flows from the United States are deduced from total plant influent less the flows measured crossing the international boundary from Mexico. Records available: Continuous monthly record for plant influent since August 1951; daily records for plant influent, January 1952 through 1996.

REMARKS: Nogales International Treatment Plant treats combined sewage from both Nogales, Arizona and Nogales Sonora by means of aerated stabilization lagoons. In February 1991, a plant expansion was completed which increased the capacity to 65.1 thousand cubic meters per day. Ultraviolet disinfected effluent is discharged directly into the Santa Cruz River. Prior to the expansion, the plant capacity was 31.0 thousand cubic meters per day and chlorinated effluent was discharged directly to the Santa Cruz River. Prior to December 18, 1971 the plant was located along the right bank of Nogales Wash, approximately 3.2 kilometers north of the international boundary.

Month	Total Monthly Flows				Daily Flows—Thousand Cubic Meters Per Day					
	Thousand Cubic Meters				Current Year 1996			Period 1952-1996		
	U.S.	Mexico	Plant*	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	1,110	503	0	1,613	54.5	46.2	52.0	93.0	2.5	21.6
Feb.	1,101	476	0	1,577	62.8	50.1	54.4	80.4	2.5	22.2
Mar.	1,070	486	0	1,556	54.1	46.7	50.2	85.7	2.8	22.0
April	1,000	449	0	1,449	51.1	43.4	48.3	69.2	2.6	20.8
May	921	440	0	1,361	46.4	40.4	43.9	59.4	2.1	19.5
June	880	389	0	1,269	45.7	38.6	42.3	62.5	2.6	18.2
July	990	439	0	1,429	54.7	40.0	46.1	58.2	2.6	19.0
Aug.	964	464	0	1,428	55.1	40.9	46.0	64.6	2.8	20.5
Sept.	965	459	0	1,424	57.7	42.9	47.5	61.1	3.0	21.7
Oct.	1,008	525	0	1,533	59.1	44.2	49.4	76.3	2.6	21.6
Nov.	973	487	0	1,460	51.7	44.1	48.7	81.8	3.0	21.3
Dec.	1,113	428	0	1,541	52.8	44.2	49.7	75.9	1.3	21.7
Yearly	12,095	5,545	0	17,640	62.8	38.6	48.3	93.0	1.3	20.8

* Nogales Wash Pumping Plant

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED
IN MILLIMETERS

Tabulated below are the monthly records of rainfall with averages for their periods of record at stations located in Arizona. Two stations are operated and maintained by the United States Section of the Commission and two by the National Weather Service. For location, elevation, period of record, type of gage in use, and the observer, see alphabetical listing of stations on this page.

IN THE UNITED STATES

Month	San Rafael #2, Arizona		Canelo, Arizona		Patagonia, Arizona		Nogales Sanitation Plant 6N, Arizona	
	1996	Average 1973-1996	1996	Average 1930-1996	1996	Average 1930-1996	1996	Average 1953-1996
Jan.	1	46	2	33	2	34	0	32
Feb.	42	35	20	28	11	28	18	23
Mar.	8	35	7	23	7	25	2	24
April	5	13	3	10	2	10	0	9
May	0	8	0	4	0	5	0	6
June	4	14	7	18	2	11	6	11
July	102	119	125	104	97	109	138	115
Aug.	38	101	35	107	62	105	71	104
Sept.	25	59	22	44	21	45	13	41
Oct.	30	34	23	26	27	28	22	33
Nov.	15	25	13	21	12	21	4	18
Dec.	0	44	0	37	0	38	0	38
Yearly	270	533	257	455	243	459	274	454

LOCATION OF RAINFALL STATIONS ON THE SANTA CRUZ RIVER WATERSHED

The precipitation records of the stations listed alphabetically below begin on the date shown and extend through 1996.

IN THE UNITED STATES

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (Meters)	RECORD BEGAN	OBSERVER
Canelo, Arizona	S	31° 33'	110° 32'	1,527	1930	R. E. Ewing
Nogales Sanitation Plant 6N, Arizona	S	31° 25'	110° 57'	1,085	June 1952	I. B. & W. C.
Patagonia, Arizona	S	31° 33'	110° 45'	1,277	1930	George R. Proctor
San Rafael #2, Arizona	S	31° 22'	110° 38'	1,481	Jan. 1973	I. B. & W. C.

S Standard 203 millimeter rain gage

TEMPERATURE IN THE SANTA CRUZ RIVER BASIN
IN DEGREES CELSIUS

Tabulated below are monthly records of temperature at the station located at the Nogales Sanitation Plant in Arizona 14.5 kilometers north of the international boundary. On December 18, 1971, the station was moved to correspond with a new Nogales Sanitation Plant. Prior to this date, the station was located 3.2 kilometers north of the international boundary at the old Nogales Sanitation Plant. This station is operated and maintained by the United States Section of the Commission. The equipment at the Nogales Sanitation Plant - 9N consists of a standard 203-millimeter rain gage and maximum and minimum thermometer. The collection of data for mean relative humidity, evaporation, and mean wind speed was discontinued in 1984.

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

Month	Nogales Sanitation Plant - 9N		
	1996		
	Mean	Max.	Min.
Jan.	8.3	26.1	-8.9
Feb.	12.3	27.2	-3.3
Mar.	11.8	29.4	-6.1
April	15.9	35.6	-1.1
May	20.7	39.4	2.8
June	25.1	40.0	6.1
July	27.1	38.3	16.7
Aug.	25.8	36.7	14.4
Sept.	22.1	34.4	8.9
Oct.	17.2	36.7	-3.3
Nov.	11.9	30.6	-5.6
Dec.	8.3	26.7	-9.4
Yearly	17.2	40.0	-9.4

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

1996

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 Soil Conservation Service at Douglas, Arizona and estimated from aerial photographs.

Designation of Areas	Drainage Basin-Square Kilometers			Irrigated Areas-Hectares		
	United States	Mexico	Total	United States	Mexico	Total
Santa Cruz River: Above Lochiel, Arizona Gaging Station	212	0	212	40	0	40
Above El Cajon, Mexico Gaging Station	464	324	788	40	952	992
Above Nogales, Arizona Gaging Station	479	901	1,380	40	1,091	1,131
San Pedro River: Above Palominas, Arizona Gaging Station	238	*1,621	1,859	578	1,400	1,978
Whitewater Draw: Above Douglas, Arizona Gaging Station	2,650	0	2,650	8,634	0	8,634

* An additional 122 square kilometers in Mexico is tributary to the San Pedro River downstream from this station.