SANTA ANA RIVER WATERMASTER

FOR

ORANGE COUNTY WATER DISTRICT

VS. CITY OF CHINO et al.

CASE NO. 117628 - COUNTY OF ORANGE

THIRTIETH

ANNUAL REPORT

OF THE

SANTA ANA RIVER WATERMASTER

FOR WATER YEAR

OCTOBER 1, 1999 - SEPTEMBER 30, 2000

APRIL 30, 2001

SANTA ANA RIVER WATERMASTER

ORANGE COUNTY WATER DISTRICT VS. CITY OF CHINO ET AL.
CASE NO. 117628--COUNTY OF ORANGE

WATERMASTER
Richard W. Atwater
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William R. Mills, Jr
Robert L. Reiter

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April 30, 2001

To: Clerk of Superior Court of Orange County and all Parties

Re: Watermaster Report for Water Year October 1, 1999 - September 30, 2000

Ladies and Gentlemen:

We have the honor of submitting herewith the Thirtieth Annual Report of the Santa Ana River Watermaster. We wish to point out that the supporting basic data heretofore presented as Appendices are bound separately.

The principal findings of the Watermaster for the water year 1999-00 are as follows:

At Prado

1	Base Flow at Prado	148,269 acre-feet
2	Annual Weighted TDS in Base and Storm Flows	527 mg/L
3	Annual Adjusted Base Flow	169,644 acre-feet
4	Cumulative Adjusted Base Flow	3,358,244 acre-feet
5	One-Half San Jacinto Watershed Discharge Reaching Prado Dam and Recharging Orange County Groundwater Basin	0 acre-feet
6	Cumulative Entitlement of OCWD	1,260,000 acre-feet
7	Cumulative Credit	2,098,244 acre-feet
8	One-Third of Cumulative Debit	0 acre-feet
9	Minimum Required Base Flow in 1999-00	34,000 acre-feet

At Riverside Narrows

1	Base Flow at Riverside Narrows	63,499 acre-feet
2	Annual Weighted TDS in Base Flow	602 mg/L
3	Annual Adjusted Base Flow	63,499 acre-feet
4	Cumulative Adjusted Base Flow	1,238,409 acre-feet
5	Cumulative Entitlement of IEUA and WMWD	457,500 acre-feet
6	Cumulative Credit	780,909 acre-feet
7	One-Third of Cumulative Debit	0 acre-feet
8	Minimum Required Base Flow in 1999-00	12,420 acre-feet

The above findings show that at the end of the 1999-00 water year, Inland Empire Utilities Agency (formerly Chino Basin Municipal Water District) and Western Municipal Water District have a cumulative credit of 2,098,291 acre-feet to their Base Flow obligation at Prado Dam. San Bernardino Valley Municipal Water District has a cumulative credit of 780,909 acre-feet to its Base Flow obligation at Riverside Narrows.

Based on these findings, the Watermaster concludes that there was full compliance with the provisions of the Stipulated Judgment in 1999-00.

The Watermaster continued to exercise surveillance over the many active and proposed projects within the watershed for their potential effect on Base Flow.

Sincerely yours,

Santa Ana River Watermaster

By: Richard W. Atwater

Richard W. Atwater

Bill B. Dendy

Bill B. Dendy

Donald L. Harriger

William R. Mills, Jr.

Robert L. Reiter

Robert L. Reiter

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APPENDICES

The following appendices are bound separately and available for review at the office of the Secretary of the Santa Ana River Watermaster.

CHAPTER I

WATERMASTER ACTIVITIES AND WATER CONDITIONS

Introduction

This Thirtieth Annual Report of the Santa Ana River Watermaster covers Water Year 1999-00. The annual report is required by the Stipulated Judgment (Judgment) in the case of Orange County Water District vs. City of Chino et al., entered by the court on April 17, 1969 (Case No. 117628-County of Orange). The Stipulated Judgment became effective on October 1, 1970. It contains a declaration of rights of the water users and other entities in the Lower Area of the Santa Ana River Basin downstream of Prado Dam as against those in the Upper Area tributary to Prado Dam, and provides a physical solution to satisfy those rights. Chapter IV presents a history of the litigation and a summary of the Judgment.

The physical solution accomplishes, in general, a regional intrabasin allocation of the surface flow of the Santa Ana River System. The Judgment leaves to each of the major hydrologic units within the basin the determination and regulation of individual rights therein and the development and implementation of its own water management plan subject only to compliance with the physical solution.

The Judgment designates four public agencies to represent the interests of the Upper and Lower Areas and gives them the responsibility to fulfill the obligations set forth in the Judgment, including the implementation of the physical solution. The Lower Area is represented by Orange County Water District (OCWD). The Upper Area is represented by San Bernardino Valley Municipal Water District (SBVMWD), Western Municipal Water District of Riverside County (WMWD) and Inland Empire Utilities Agency (IEUA), formerly the Chino Basin Municipal Water District (CBMWD). The locations of the districts are shown on Plate 1, "Santa Ana River Watershed".

The court appoints a five-member Watermaster Committee to administer the provisions of the Judgment. The Watermaster's duty is to maintain a continuous accounting of each of the items listed in the letter of transmittal hereof and to report thereon annually for each water year to the court and the parties. The water year begins October 1 and ends the following September 30. The time for submission of the annual report is April 30, seven months after the end of the water year.

For the 1999-00 Water Year the Watermaster Committee consisted of Donald L. Harriger, William R. Mills, Jr., Robert L. Reiter, Bill B. Dendy, and Richard W. Atwater. Mr. Mills served as Chairman and Mr. Reiter served as Secretary/Treasurer. Chapter IV presents the history of Watermaster Committee membership.

Watermaster Service Expenses

In accordance with Paragraph 7(d) of the Stipulated Judgment, the fees and expenses of each of the members of the Watermaster are borne by the parties by whom they were nominated. All other Watermaster service expenses are shared by the parties, with OCWD paying 40% of the cost and WMWD, SBVMWD, and IEUA each paying 20% of the cost.

Stream flow measurements and water quality data required by the Watermaster are, for the most part, furnished by the U.S. Geological Survey (USGS) through a cooperative monitoring program. The costs of the cooperative monitoring program for the 1999-00 Water Year, and each party's share of the costs, are set forth in Table 1.

TABLE 1
COSTS TO THE PARTIES AND USGS FOR MEASUREMENTS WHICH PROVIDE DATA USED BY THE SANTA ANA RIVER WATERMASTER

October 1, 1999 to September 30, 2000

	Total Cost	USGS Share	Parties' Share
USGS GAGING STATION			
Santa Ana River at MWD Crossing (Riverside Narrows)			
Surface Water Gage	$21,200	$10,600	$10,600
Water Quality Monitoring/TDS Sampling	8,700	4,350	4,350
Chino Creek at Schaefer	15,100	7,550	7,550
Cucamonga Creek at Mira Loma	15,100	7,550	7,550
Santa Ana River below Prado Dam			
Surface Water Gage	15,100	7,550	7,550
Water Quality Monitoring/TDS Sampling	18,300	9,150	9,150
Water Quality Conductance Program	1,700	0	1,700
TOTAL COST AND SHARES	$95,200	$46,750	$48,450
COST DISTRIBUTION AMONG PARTIES			
Inland Empire Utilities Agency	20%		$9,690
Orange County Water District	40%		$19,380
San Bernardino Valley Municipal Water District	20%		$9,690
Western Municipal Water District	20%		$9,690

The Watermaster annually adopts an expense budget. Table 2 shows the budget and actual expenses incurred for the 1999-00 fiscal year as well as the budget adopted for the 2000-01 fiscal year. A financial review was performed by OCWD and is reported in Appendix C.

TABLE 2

WATERMASTER SERVICE BUDGET AND EXPENSES

Budget Item	July 1, 1999 to June 30, 2000 Budget	July 1, 1999 to June 30, 2000 Expenses[1]	July 1, 2000 to June 30, 2001 Budget
Support Services	$9,500.00	$6,873.26	$9,500.00
Reproduction of Annual Report	2,500.00	2,173.94	2,500.00
TOTAL	$12,000.00	$9,047.20	$12,000.00

(1) Expenses for 1998-99 were paid in 1999-00.

Compilation of Basic Data

The Watermaster annually compiles the basic hydrologic and water quality data necessary to determine compliance with the provisions of the Judgment. The data include records of stream flow and quality for the Santa Ana River at Prado Dam and at Riverside Narrows as well as stream flows for several tributaries; flow and quality of nontributary water entering the river; rainfall records at San Bernardino County Hospital and other locations in or adjacent to the Watershed; and other data that may be used to support the Watermaster's determinations.

For Water Year 1999-00 the USGS provided flow and water quality data for the Santa Ana River at two gaging stations, "Santa Ana River Below Prado" (Prado) and "Santa Ana River at Metropolitan Water District (MWD) Crossing" (Riverside Narrows). The flow data at both stations consist of computed mean daily discharges, expressed in cubic feet per second (cfs), based on continuous recordings. The water quality data at Prado consist of daily maximum and minimum values for electrical conductivity (EC), measured as specific conductance and expressed in microsiemens per centimeter (μs/cm) based on a continuous recording, and twice-monthly measured values for total dissolved solids (TDS), expressed in milligrams per liter (mg/L). The water quality data at Riverside Narrows consist of twice-monthly values for both EC and TDS. The USGS also provided discharge data for other gaging stations that measure flows tributary to Prado, including, among others, the Santa Ana River at E Street in San Bernardino,

Chino Creek at Schaefer Avenue, Cucamonga Creek near Mira Loma, and Temescal Creek in the City of Corona (see Appendix A).

The 1999-00 daily mean discharge record at Prado is considered by the USGS to be an "excellent" record. Daily mean discharges at the station are controlled at times by storage operations in the reservoir behind Prado Dam just upstream. The maximum and minimum daily mean discharge values reported by the USGS during the water year were, respectively, 3,780 cfs on February 22, 2000, and 123 cfs on September 29, 2000. The maximum and minimum daily mean EC values reported by the USGS were, respectively, 1040 µs/cm on April 5, 7, 8, and 15 and May 15, 2000, and 436 µs/cm on February 23, 2000. The respective corresponding calculated TDS concentrations were 630 and 264 mg/L.

The 1999-00 daily mean discharge record at Riverside Narrows is considered by the USGS to be "fair" below 500 cfs and "poor" above. The maximum and minimum daily mean discharge values reported by the USGS during the year were 1920 cfs on February 21, 2000 and 56 cfs on August 22, 2000. The maximum and minimum daily mean EC values reported by the USGS were 1020 µs/cm on October 6, 1999 and January 6, 2000, and 383 µs/cm on April 18, 2000. The respective corresponding measured TDS concentrations were 624, 634, and 252 mg/L.

The National Oceanic and Atmospheric Administration reported precipitation totaling 11.09 inches at the San Bernardino County Hospital during 1999-00 (see Appendix B). The rainfall total was 62% of the average of 17.98 inches per year that occurred during the 26-year base period (1934-35 through 1959-60) that was used in the formulation of the physical solution. Plate 3 shows annual precipitation from 1934-35 through 1999-00.

Watermaster Determinations

Each year the Watermaster uses its long-established procedures for analyzing the basic hydrologic and water quality data to determine, at Riverside Narrows and at Prado, Base Flow, Base Flow TDS, Adjusted Base Flow, Cumulative Credits or Debits to Upper Area parties, and the Minimum Required Base Flow for the following Water Year. The procedures include determining, for both locations, the amounts of Nontributary Flow or other flow to be excluded from Base Flow, the relative amounts of Base Flow and Storm Flow, and the relationships between EC and TDS concentrations.

During the year there were two sources of non-storm flow in the river at Prado that the Watermaster has not included in Base Flow. A total of 14,569 acre-feet of Nontributary Flow attributable to State Water Project water, purchased by OCWD and released at the OC-59 turnout from MWD's Foothill Feeder into San Antonio Creek, was calculated to have reached Prado with an estimated average TDS concentration of 387 mg/L. At its Arlington Desalter in Riverside the Santa Ana Watershed Project Authority (SAWPA) produced and delivered to a channel tributary to the Santa Ana River between

Riverside Narrows and Prado 5,376 acre-feet of water having an average TDS concentration of 401 mg/L.

The Watermaster previously decided that water pumped from the Bunker Hill Basin pursuant to the High Groundwater Mitigation Project Agreement between SBVMWD and OCWD will not be included in Base Flow. Under that Agreement, SBVMWD pumped 2,346 acre-feet of groundwater from the Bunker Hill Basin and conveyed it to the river during Water Year 1999-00. None of the pumped groundwater was deemed to have reached Riverside Narrows during the year. Instead, after sustaining a loss of one per cent (23 acre-feet), the remaining 2,323 acre-feet of it percolated to storage in the Colton and Riverside Basins. The total of such pumped groundwater in storage in the Colton and Riverside Basins, including carryover from the prior year, was 5,655 acre-feet at the end of Water Year 1999-00. The Watermaster previously had decided to establish a multi-year schedule by which the water would be deemed to reach Riverside Narrows and be deducted from Base Flow. Watermasters Reiter and Harriger reported that they would pursue plans to repump the water from storage such that, net of losses, it will reach Riverside Narrows during Water Year 2000-01.

The Watermaster's determinations for the 1999-00 Water Year are explained in detail for Prado in Chapter II and for Riverside Narrows in Chapter III. A summary of annual determinations by the Watermaster for the period 1970-71 through 1999-00 is presented in Table 3. Note that the Base Flow obligations set forth in the Judgment at both Prado and Riverside Narrows have been met and cumulative credits have accrued to WMWD and IEUA at Prado and to SBVMWD at Riverside Narrows.

Upper Area Wastewater Discharges and Salt Exports

Although not used directly in the Watermaster's analyses and determinations, data on municipal wastewater discharged in the Upper Area are compiled annually because it is a major contributor to Base Flow in the river. During the 1999-00 Water Year, about 172,952 acre-feet of effluent were discharged above Prado Dam by major agencies. The historical data on wastewater discharged are summarized in Table 4.

Similarly, while data on the amount of salt exported from the Upper Area directly to the ocean through SAWPA's Santa Ana Regional Interceptor (SARI) and IEUA's Non-Reclaimable Wastewater pipeline (NRW) are not used directly by the Watermaster, salt export helps to protect river water quality and, therefore, helps the Upper Area parties comply with the Judgment. The historical data on salt export are summarized in Table 5. The locations of Wastewater Treatment Plants and the SARI and NRW pipelines are shown in Plate 2.

TABLE 3

SUMMARY OF FINDINGS AT PRADO

Water Year	Rainfall (in)[1]	Total Flow (ac-ft)[2]	Base Flow (ac-ft)	Weighted TDS (mg/L)[3]	Adjusted Base Flow (ac-ft)	Cumulative Credit (ac-ft)
1970-71	11.97	51,864	38,402	727	38,402	-3,598
1971-72	9.62	51,743	40,416	707	40,416	-5,182
1972-73	18.46	76,375	48,999	638	51,531	4,349
1973-74	12.72	63,620	43,106	633	45,513	7,862
1974-75	13.49	61,855	50,176	694	51,263	17,125
1975-76	15.86	59,209	45,627	635	48,098	23,223
1976-77	11.95	62,953	48,387	660	50,000	31,223
1977-78	30.47	252,837	58,501	383	73,955	63,178
1978-79	17.51	134,486	71,863	580	79,049	100,227
1979-80	30.93	527,760	82,509	351	106,505	164,732
1980-81	10.45	117,888	74,875[5]	728	74,875[5]	205,652[6]
1981-82	18.34	143,367	81,548	584	89,431	253,083
1982-83	32.36	425,938	111,692[5]	411	138,591[5]	353,036[6]
1983-84	10.81	178,395[4]	109,231[5]	627	115,876[5]	431,514[6]
1984-85	12.86	162,912	125,023[8]	617	133,670	523,184
1985-86	17.86	196,565	127,215[8]	567	141,315	622,499
1986-87	8.08	140,538	119,848	622	127,638	708,137
1987-88	13.78	170,279[9]	124,104[9]	582	136,308	802,445
1988-89	12.64	152,743[9]	119,572[9]	583	131,230	891,675
1989-90	8.53	144,483	119,149[10]	611	127,986	977,611
1990-91	15.48	191,321	111,151[11]	514	128,379	1,064,040
1991-92	16.54	193,225	106,948[11]	499	124,869	1,146,909
1992-93	30.92	568,677	128,068[11]	368	163,499	1,268,408
1993-94	11.62	158,241	111,186[11]	611	119,432	1,345,840
1994-95	25.14	424,017[4]	123,468[11]	415	152,792[5]	1,458,394[6]
1995-96	11.92	194,797	131,861[11]	514	152,299	1,568,693
1996-97	18.64	204,610	136,676[11]	514	157,861	1,684,554
1997-98	33.41	462,633[4]	155,711[11]	392	195,677	1,838,231
1998-99	8.02	182,310	158,637	581	174,369	1,970,600
1999-00	11.09	187,905	148,269	527	169,644	2,098,244

TABLE 3 (Continued)

SUMMARY OF FINDINGS AT RIVERSIDE NARROWS

Water Year	Rainfall (in)[1]	Total Flow (ac-ft)[2]	Base Flow (ac-ft)	Weighted TDS (mg/L)[3]	Adjusted Base Flow (ac-ft)	Cumulative Credit (ac-ft)
1970-71	11.97	24,112	17,061	704	17,021	1,762
1971-72	9.62	22,253	16,157	712	16,017	2,529
1972-73	18.46	32,571	17,105	700	17,105	4,384
1973-74	12.72	24,494	16,203	700	16,203	5,337
1974-75	13.49	19,644	15,445	731	15,100	5,187
1975-76	15.86	26,540	17,263	723	16,977	6,914
1976-77	11.95	23,978	18,581	722	18,286	9,950
1977-78	30.47	181,760	22,360	726	21,941	16,641
1978-79	17.51	47,298	26,590	707	26,456	27,847
1979-80	30.93	253,817	25,549[7]	676	25,549	38,146
1980-81	10.45	34,278	19,764	715	19,550	42,446
1981-82	18.34	82,708	32,778	678	32,778	59,974
1982-83	32.36	279,645	57,128	610	57,128	101,852
1983-84	10.81	82,745	56,948	647	56,948	143,550
1984-85	12.86	78,771	69,772[8]	633	69,772	198,072
1985-86	17.86	99,258	68,220[8]	624	68,220	251,042
1986-87	8.08	77,752	59,808	649	59,808	295,600
1987-88	13.78	79,706	55,324	620	55,324	335,674
1988-89	12.64	62,376	52,259	607	52,259	372,683
1989-90	8.53	58,159	53,199	590	53,583	411,016
1990-91	15.48	73,790	45,041[11]	616	45,041	440,807
1991-92	16.54	71,427	40,306	620	40,306	465,863
1992-93	30.92	267,043	41,434	634	41,434	492,047
1993-94	11.62	45,006	31,278[11]	677	31,278	508,075
1994-95	25.14	243,411	45,562[11]	646	45,562	538,387
1995-96	11.92	81,786	54,548[11]	625	54,548	577,685
1996-97	18.64	104,518	62,618[11]	624	62,618	625,053
1997-98	33.41	214,375	65,013[11]	601	65,013	674,816
1998-99	8.02	76,294	73,094	603	73,094	732,660
1999-00	11.09	75,572	63,499	602	63,499	780,909

TABLE 3 (Continued)

(1) Measured at San Bernardino County Hospital.
(2) Excludes Nontributary Flow and Exchange Waters.
(3) For Base and Storm Flow at Prado and Base Flow only at Riverside Narrows.
(4) Includes San Jacinto Watershed discharges which passed Prado Dam totaling 16,090 acre-feet in 1980-81; 7,720 acre-feet in 1982-83; 12,550 acre-feet in 1983-84; 4,697 acre-feet in 1994-95; and 1,690 acre-feet in 1997-98.
(5) Excludes water discharged from the San Jacinto Watershed.
(6) Includes a credit for a portion of San Jacinto Watershed discharges totaling 8,045 acre-feet in 1980-81; 3,362 acre-feet in 1982-83; 4,602 acre-feet in 1983-84; and 1,762 acre-feet in 1994-95.
(7) Includes Rubidoux Wastewater in 1979-80 and subsequent years.
(8) Includes groundwater pumped from San Bernardino Basin and released to the river in accordance with Court Orders approving agreement and allowing temporary additional extractions of water from the San Bernardino Basin Area.
(9) Excludes Nontributary Flow released to San Antonio Creek by MWDSC under the Ontario/MWDSC Exchange Program.
(10) Excludes water discharged to Santa Ana River from Arlington Desalter in 1989-90 and subsequent years in accordance with an agreement between OCWD, WMWD, and Santa Ana Watershed Project Authority.
(11) Excludes groundwater pumped from San Bernardino, Colton, and Riverside Basins and discharged to the Santa Ana River to flow to OCWD under the Exchange Water agreements.

Note: For the years 1973-74 through 1979-80, a correction has been made for different losses of State Water than assumed in reports published for these years. The values changed are Base Flow, weighted TDS, and Adjusted Base Flow. These changes, in turn, have changed the cumulative credit for these years. See Appendix C in the Twelfth Annual Report (1981-82).

TABLE 4

MUNICIPAL WASTEWATER EFFLUENT DISCHARGED ABOVE PRADO
(acre-feet)

Water Year	Wastewater discharges upstream from Colton that generally do not flow continuously to Santa Ana River above Colton				Wastewater discharges to Santa Ana River and its tributaries that have hydraulic continuity to the Santa Ana River above Riverside Narrows					Wastewater discharges to Santa Ana River and its tributaries that have hydraulic continuity to the Santa Ana River above Prado Dam							Total Discharge to Surface Flow of the Santa Ana River (B + C)	Total Wastewater Discharged in Watershed (A + B + C)
												Inland Empire Utilities Agency						
	Redlands	Beaumont	Yucaipa	Subtotal above Colton (A)	San Bernardino	Colton	Rialto	RIX[1]	Subtotal above Riverside Narrows (B)	Riverside	Corona	RP #1&4[2]	RP #2	CCWRF[3]	WRCR[4]	Subtotal above Prado Dam (C)		
1970-71	2,650	no record	--	2,650	17,860	2,520	2,270	--	22,650	18,620	3,190	--	--	--	--	21,810	44,460	47,110
1971-72	2,830	no record	--	2,830	16,020	2,230	2,400	--	20,650	19,010	3,230	6,740	--	--	--	28,980	49,630	52,460
1972-73	2,810	450	--	3,260	18,670	2,530	2,260	--	23,460	19,060	3,340	10,380	--	--	--	32,780	56,240	59,500
1973-74	2,770	600	--	3,370	17,680	2,530	2,320	--	22,530	19,560	3,510	11,440	2,320	--	--	36,830	59,360	62,730
1974-75	2,540	570	--	3,110	16,750	1,980	2,320	--	21,050	19,340	4,020	14,960	2,280	--	--	40,600	61,650	64,760
1975-76	2,450	620	--	3,070	17,250	2,540	2,240	--	22,030	19,580	4,700	15,450	2,950	--	--	42,680	64,710	67,780
1976-77	3,170	580	--	3,750	17,650	3,260	2,330	--	23,240	18,770	5,010	14,640	3,380	--	--	41,800	65,040	68,790
1977-78	3,280	620	--	3,900	18,590	3,810	2,380	--	24,780	20,310	5,200	14,650	4,060	--	--	44,220	69,000	72,900
1978-79	3,740	670	--	4,410	19,040	3,850	3,050	--	25,940	21,070	5,390	15,040	5,070	--	--	46,570	72,510	76,920
1979-80	4,190	690	--	4,880	20,360	4,190	2,990	--	27,540	22,910	5,360	14,410	5,520	--	--	48,200	75,740	80,620
1980-81	4,410	690	--	5,100	20,550	3,930	3,370	--	27,850	24,180	5,590	17,270	5,260	--	--	52,300	80,150	85,250
1981-82	4,420	700	--	5,120	23,340	3,780	3,470	--	30,590	25,640	5,410	19,580	5,360	--	--	55,990	86,580	91,700
1982-83	4,530	710	--	5,240	24,160	3,600	3,620	--	31,380	25,020	5,860	20,790	4,290	--	--	55,960	87,340	92,580
1983-84	5,150	800	--	5,950	22,080	3,700	3,830	--	29,610	26,090	6,200	20,950	3,950	--	--	57,190	86,800	92,750
1984-85	4,990	840	--	5,830	23,270	3,830	4,070	--	31,170	27,750	6,250	25,160	4,280	--	--	63,440	94,610	100,440
1985-86	5,200	820	--	6,020	24,720	4,010	4,720	--	33,450	28,820	5,900	28,240	2,660	--	--	65,620	99,070	105,090
1986-87	5,780	880	800	7,460	26,810	4,170	5,350	--	36,330	30,340	6,170	27,160	5,000	--	--	68,670	105,000	112,460
1987-88	6,060	940	1,850	8,850	27,880	5,240	6,040	--	39,160	34,660	6,050	31,290	5,500	--	--	77,500	116,660	125,510
1988-89	5,250	1,030	2,260	8,540	27,640	5,550	6,280	--	39,470	35,490	8,080	35,510	6,180	--	--	85,260	124,730	133,270
1989-90	6,360	1,100	2,370	9,830	28,350	5,810	6,260	--	40,420	33,210	9,140	34,760	5,730	--	--	82,840	123,260	133,090
1990-91	6,690	1,120	2,490	10,300	27,570	5,670	6,290	--	39,530	32,180	9,110	36,840	6,100	--	--	84,230	123,760	134,060
1991-92	6,230	1,150	2,580	9,960	25,060	5,660	6,360	--	37,080	32,660	9,010	40,360	5,780	1,550	--	89,360	126,440	136,400
1992-93	6,880	1,180	2,580	10,640	25,550	6,210	6,460	--	38,220	34,100	9,600	41,510	5,640	4,720	--	95,570	133,790	144,430
1993-94	6,440	1,150	2,710	10,300	23,800	5,830	6,540	--	36,170	32,640	7,790	37,310	5,430	7,010	--	90,180	126,350	136,650
1994-95	6,720	1,180	2,560	10,460	26,330	5,500	6,820	--	38,650	33,950	7,340	39,680	5,360	8,690	--	95,020	133,670	144,130
1995-96	6,550	1,260	2,640	10,450	13,240	2,770	6,890	20,760	43,660	33,960	7,850	39,590	4,810	9,060	--	95,270	138,930	149,380
1996-97	6,510	1,280	2,780	10,570	--	--	7,160	42,800	49,960	34,240	5,040	39,940	4,790	9,750	--	93,760	143,720	154,290
1997-98	7,022	1,356	3,116	11,494	--	--	7,063	49,683	56,746	35,422	8,718	44,940	4,969	9,264	1,461	104,774	161,520	173,014
1998-99	7,379	1,367	3,128	11,874	--	--	6,524	47,587	54,111	34,844	11,629	43,354	5,345	9,534	4,594	109,300	163,411	175,285
1999-00	7,670	1,373	3,284	12,327	--	--	7,392	45,012	52,404	35,399	13,152	42,967	4,378	9,954	2,371	108,221	160,625	172,952

1. RIX = Rapid Infiltration and Extraction Facility for San Bernadino and Colton, including over-extraction of groundwater
2. Beginning in 1997-98, includes IEUA Plant #4 flows.
3. CCWRF = Carbon Canyon Water Reclamation Facility
4. WRCR = Western Riverside County Regional Wastewater Treatment Plant

The amounts shown in this table were determined from data provided by the agencies.

TABLE 5

HIGH SALINITY WATER EXPORTED
FROM THE SANTA ANA RIVER WATERSHED

Water Year	Inland Empire Utility Agency Non-Reclaimable Wastewater		Santa Ana Watershed Project Authority Santa Ana Regional Interceptor Pipeline		
	North System acre-feet	South System acre-feet	Total Flow acre-feet	Average TDS mg/L	Total Discharge Flow acre-feet
1970-71	---	---	---	---	---
1971-72	---	---	---	---	---
1972-73	---	---	---	---	---
1973-74	---	---	---	---	---
1974-75	---	---	---	---	---
1975-76	---	---	---	---	---
1976-77	---	---	---	---	---
1977-78	---	---	---	---	---
1978-79	---	---	---	---	---
1979-80	---	---	---	---	---
1980-81	---	---	---	---	---
1981-82	1,380	Not available	---	---	---
1982-83	1,516	Not available	---	---	---
1983-84	1,350	Not available	---	---	---
1984-85	764	Not available	---	---	---
1985-86	976	909	---	---	1,885
1986-87	1,611	935	---	---	2,546
1987-88	1,687	631	---	---	2,317
1988-89	1,938	1,180	---	---	3,119
1989-90	1,707	1,387	7,393	1649	10,487
1990-91	928	1,200	7,340	1906	9,468
1991-92	1,115	1,125	6,457	2346	8,697
1992-93	1,230	192	5,277	2516	6,699
1993-94	1,227	186	7,860	2302	9,272
1994-95	1,346	306	8,656	1903	10,308
1995-96	1,259	361	9,597	2175	11,216
1996-97	1,366	401	10,225	2292	11,992
1997-98	1,491	364	8,210	2456	10,064
1998-99	1,195	344	4,305	2611	5,843
1999-00	1,392	360	7,711	2154	9,463

CHAPTER II

BASE FLOW AT PRADO

This chapter deals with determinations of 1) the components of flow at Prado, which include Nontributary Flow, Arlington Desalter discharge, Storm Flow and Base Flow and 2) the Adjusted Base Flow at Prado credited to IEUA and WMWD.

Flow at Prado

During the 1999-00 Water Year, the flow of the Santa Ana River as measured at the USGS gaging station below Prado Dam amounted to 207,850 acre-feet. There was no water in storage behind the dam at the beginning and 633 acre-feet in storage at the end of the Water Year. Inflow to the reservoir included 148,269 acre-feet of Base Flow and 40,269 acre-feet of Storm Flow, based on an adjusted Prado Reservoir storage-elevation curve described in the following section. Of the nontributary flow due to State Water Project water released to San Antonio Creek at turnout OC-59, 14,569 acre-feet were calculated to have reached Prado Reservoir during 1999-00. Nontributary flows due to the Arlington Desalter totaled 5,376 acre-feet. The monthly components of flow of the Santa Ana River at Prado Dam for 1999-00 are listed in Table 6 and are shown graphically on Plate 4. Historical Base and Storm Flows of the Santa Ana River below Prado during the period 1934-35 through 1999-00 are presented on Plate 5.

Prado Reservoir Storage-Elevation Curve Adjustment

The Watermaster calculates inflow to Prado Reservoir by adjusting outflow data using change in reservoir storage. Reservoir storage is based on a storage-elevation curve last updated by the U.S. Army Corps of Engineers (ACOE) in 1988. The ACOE reports that sedimentation averaged about 200 acre-feet per year between 1969 and 1979. Such sedimentation affects the accuracy of the storage-elevation curve when the storage in the reservoir is low. This inaccuracy results in anomalies in the calculated inflow near the end of each period of reservoir storage.

In 1997, the Watermaster adjusted the Prado Reservoir storage-elevation curve to improve the calculated Santa Ana River inflow hydrograph from which Base Flow and Storm Flow are determined. Assuming an average sedimentation rate of 200 acre-feet per year from 1988 through 1996, the portion of the ACOE storage-elevation curve below elevation 520 feet was adjusted to include a 1,600 acre-feet reservoir storage loss. Elevation 520 feet represents the approximate maximum flood storage elevation attained behind Prado Dam in the last several years where most sedimentation would likely have occurred. The new storage-elevation curve was developed by distributing the 1,600 acre-feet storage loss until the curve produced inflow values without significant anomalies.

TABLE 6

COMPONENTS OF FLOW AT PRADO DAM

FOR WATER YEAR 1999-00
(acre-feet)

	USGS Measured Outflow	Storage Change (1)	Computed Inflow	Lake Elsinore Flows at Prado Dam (2)	SBVMWD Mitigation Water (3)	San Antonio Creek (4)	Arlington Desalter	Storm Flow	Base Flow
1999									
October	17,169	0	17,169	0	0	5,827	441	0	10,901
November	12,079	304	12,384	0	0	0	348	150	11,885
December	16,635	(31)	16,604	0	0	2,935	494	111	13,065
2000									
January	20,237	(45)	20,192	0	0	3,750	425	2,027	13,990
February	35,530	4,493	40,022	0	0	2,057	382	24,336	13,248
March	26,519	(2,925)	23,594	0	0	0	277	9,386	13,931
April	19,809	(1,026)	18,783	0	0	0	497	3,894	14,391
May	14,164	(770)	13,394	0	0	0	444	0	12,950
June	12,198	0	12,198	0	0	0	485	0	11,713
July	11,528	0	11,528	0	0	0	529	0	10,999
August	11,211	0	11,211	0	0	0	537	0	10,674
September	10,770	633	11,403	0	0	0	516	364	10,523
Total	207,850	633	208,483	0	0	14,569	5,376	40,269	148,269

(1) The monthly change in storage is included in the monthly components of flow.

(2) Because Lake Elsinore discharge was not envisioned during the formulation of the Final Judgment, it is removed from Santa Ana River flows at Prado Dam for the purpose of calculating Base and Storm flow.

(3) SBVMWD water pumped from the Bunker Hill groundwater basin and discharged into the Santa Ana River less 1% for evapotranspiration which reached Prado Dam.

(4) State Water Project water released into San Antonio Creek from turnout OC-59 during 1999-00 and calculated to have reached Prado Dam in the 1999-00 Water Year.

Nontributary Flow

Nontributary Flow includes water that originated outside the watershed, as well as other non-storm water that the Watermaster has determined should be excluded from Base Flow. During the 1999-00 Water Year it included State Water Project water imported by OCWD and released to San Antonio Creek as well as water discharged to the river from the Arlington Desalter. In the future it is expected to include water discharged to the river by the High Groundwater Mitigation Project. In the past it has included, and in the future may include, water discharged to the river pursuant to the water exchanges or other such programs, as well as discharges of water from the San Jacinto River watershed to the Santa Ana River watershed.

Releases to San Antonio Creek

Since May 1973, OCWD has from time to time purchased State Water Project water for the replenishment of the groundwater basin in Orange County. The water has been released at two locations: Santa Ana River above Riverside Narrows (1972-73 only) and San Antonio Creek near the City of Upland.

During the 1999-00 Water Year, 14,709 acre-feet of State Water Project water was released into San Antonio Creek from the Foothill Feeder at turnout OC-59 near Upland. Total monthly deliveries and daily flow rates were provided by the MWDSC. Water loss between OC-59 and Prado Dam was calculated per the procedures set forth in the Twelfth Annual Report (1981-82), Appendix C. It was determined that of the OC-59 water released, a total of 14,569 acre-feet reached Prado Dam and 140 acre-feet (1%) was lost to evapotranspiration. A monthly summary of Nontributary Flow released from OC-59 into San Antonio Creek is contained in Appendix E.

Arlington Desalter

The underflow from the Arlington groundwater sub-basin has historically been a component of the Santa Ana River flow. These groundwaters have increasingly been degraded through agricultural and other uses. Two parties to the Stipulated Judgment, WMWD and OCWD, as members of the Santa Ana Watershed Project Authority, constructed a groundwater cleanup project that is designed to reduce the poor quality underflow from the sub-basin. This project is known as the Arlington Desalter and consists of five extraction wells and a treatment facility that reduces salinity. The capacity of the facility is approximately 6 million gallons per day (mgd). The facility began operations in July 1990, with OCWD buying the product water delivered through the Santa Ana River. All parties to the Stipulated Judgment agreed that the water from this facility would be excluded from the computation of Santa Ana River Base Flow and Base Flow quality. During the 1999-00 Water Year, 5,376 acre-feet of water discharged from the Arlington Desalter was determined to have reached Prado Dam. OCWD Operations provided daily discharge rates and electrical conductance of water discharged. A summary of Arlington Desalter discharges is contained in Appendix F.

High Groundwater Mitigation Project

As mentioned in Chapter 1, a total of 2,323 acre-feet of High Groundwater Mitigation Project groundwater from the Bunker Hill Basin was determined to have percolated to storage in Colton and Riverside Basins. None of it reached Prado during the 1999-00 Water Year. A summary of the High Groundwater Mitigation Project discharges is contained in Appendix D. All parties to the Stipulated Judgment agreed that High Groundwater Mitigation Project water would be excluded from the computation of Santa Ana River Base Flow and Base Flow quality.

San Jacinto Watershed Discharge

No stream flow or other discharges from the San Jacinto Watershed reached Prado Dam during the 1999-00 Water Year. All parties to the Stipulated Judgment have previously agreed that to the extent such discharges occur and are captured by OCWD, fifty percent of such captured water will be credited as Base Flow at Prado.

Storm Flow

Portions of storm flows are retained behind Prado Dam for flow regulation and for water conservation purposes. The ACOE owns the Dam, which has a spillway elevation of 543 feet above mean sea level, and operates it according to a flow release schedule with a buffer pool elevation of 494 feet until March 1 of each year. In 1994 an agreement was signed by OCWD, ACOE, and the U.S. Fish and Wildlife Service, which provides that between March 1 and August 30 the pool would be raised, given sufficient flows, to elevation 497 feet. This elevation would be increased year by year, as additional biological habitat mitigation by OCWD comes on line, to a maximum elevation of 505 feet. On April 12, 1995, the ACOE, the U.S. Fish and Wildlife Service, and OCWD reached an agreement to accelerate immediately the raising of the seasonal water conservation pool to elevation 505 feet, in exchange for a $1 million contribution by OCWD to the U.S. Fish and Wildlife Service to be used to develop Least Bell's vireo habitat by the removal of a non-native plant, *Arundo donax*. Storm flows captured within the reservoir for conservation are released following the storm to downstream groundwater recharge facilities. Monthly and annual quantities of Storm Flow are shown in Table 6.

During the 1999-00 Water Year, the maximum volume of water stored in Prado Reservoir reached 9,470 acre-feet on March 9, 2000. The maximum daily mean flow released from Prado Dam to the Santa Ana River was 3,780 cfs on February 22, 2000.

During the year, construction continued on elements of the Santa Ana River Mainstem flood control project. Construction of the Seven Oaks Dam, located on the Santa Ana River above the community of Mentone was completed in summer 1999 and began operation. Design work on the raising of Prado Dam and spillway continued.

Base Flow

The Base Flow is affected by Nontributary Flow releases to San Antonio Creek, discharges from the Arlington Desalter, discharges of the High Groundwater Mitigation Project water, and discharges from the San Jacinto Watershed. Arlington Desalter discharges and Nontributary Flow releases to San Antonio Creek were the only components affecting the Base Flow during the 1999-00 Water Year. The general procedure used by the Watermaster to separate the 1999-00 flow components was the same as used for previous years and is fully described in the Fifth (1974-75) and the Twelfth (1981-82) Annual Reports. The monthly and annual quantities of Base Flow are shown in Table 6.

Water Quality Adjustments

The flow-weighted average TDS for the total flow passing Prado Dam, including Nontributary Flow released to San Antonio Creek and Arlington Desalter discharge, was found to be 514 milligrams per liter (mg/L). This determination was based on records from a continuous monitoring device operated by the USGS for EC of the Santa Ana River flow below Prado Dam. This record was supplemented by twenty-four (24) grab samples for EC collected by the USGS and analyzed for TDS.

A correlation between TDS and EC yields the following best fit equation:

$$TDS = EC \times 0.605585$$

(where the units of TDS and EC are mg/L and microsiemens/centimeter, respectively)

Using the daily EC data, flow-weighted average daily values for TDS were calculated using the above equation. The plot of TDS on Plate 6 shows the daily average TDS concentration of the Santa Ana River flow passing Prado Dam. A summary of daily TDS and EC of the Santa Ana River below Prado Dam is contained in Appendix H.

At Prado Dam, the flow-weighted average annual TDS value of 514 mg/L represents the quality of the total flow including releases to San Antonio Creek and from the Arlington Desalter. The Stipulated Judgment requires that Base Flow shall be subject to adjustment based on the TDS of Base Flow and Storm Flow only. Hence, a determination of the TDS of Base Flow plus Storm Flow only, is detailed in the following paragraphs.

Adjustment for Flow to San Antonio Creek

During the 1999-00 Water Year, 14,569 acre-feet of water released from OC-59 to San Antonio Creek was calculated to have reached Prado Dam. A flow-weighted average TDS of 387 mg/L was calculated for State Water Project water reaching Prado Dam. A summary of these calculations is contained in Appendix E

Adjustment for Arlington Desalter Discharge

The amount of product water discharged to the Santa Ana River during the 1999-00 Water Year totaled 5,376 acre-feet. A conversion factor of 0.610251 was calculated from ten (10) grab samples collected by the OCWD and analyzed for EC and TDS. Using daily EC, and daily flow values, a flow-weighted average TDS of 401 mg/L was calculated. A summary of these calculations is contained in Appendix F.

Adjustment for High Groundwater Mitigation Project Discharge

None of the Mitigation Project water discharged to the Santa Ana River during the 1998-99 or 1999-00 Water Years reached Prado during the 1999-00 Water Year. Therefore, no water quality adjustment is necessary this year. The discharge data are contained in Appendix D.

Adjustment for San Jacinto Watershed Discharge

During the 1999-00 Water Year, no water discharged from the San Jacinto Watershed reached Prado Dam.

Flow Component	Annual Flow (acre-feet)	Average TDS (mg/L)	Annual Flow x Average TDS (acre-feet x mg/L)
1. Measured Outflow	207,850	514	106,834,900
2. Less Arlington Desalter	5,376	401	2,154,169
3. Less Nontributary Flow San Antonio Creek	14,569	387	5,639,307
4. Less High Groundwater Mitigation Project	0	0	0
5. Measured Outflow less lines 2, 3, and 4	187,905		99,041,424
Average TDS in total Base and Storm Flow	99,041,424 ÷ 187,905 = 527 mg/L		

After adjusting for Arlington Desalter discharges and Nontributary Flow of OC-59 water to San Antonio Creek the weighted average annual TDS of Storm Flow and Base Flow for 1999-00 is 527 mg/L, as shown above.

Adjusted Base Flow at Prado

The Stipulated Judgment provides that the amount of Base Flow at Prado received during any year shall be subject to adjustment based on weighted average annual TDS of the Base Flow and Storm Flow at Prado as follows:

If the Weighted Average TDS in Base Flow and Storm Flow at Prado is:	Then the Adjusted Base Flow shall be determined by the formula:
Greater than 800 mg/L	$Q - \frac{35}{42{,}000} Q(TDS-800)$
700 mg/L to 800 mg/L	Q
Less than 700 mg/L	$Q + \frac{35}{42{,}000} Q(700-TDS)$

Where: Q = Base Flow actually received.

The weighted average annual TDS of 527 mg/L is less than 700 mg/L. Therefore, the Base Flow must be adjusted by the above equation for TDS less than 700 mg/L. Thus the Adjusted Base Flow is as follows:

$$(148{,}269 \text{ acre-feet}) + \frac{35}{42{,}000} (148{,}269 \text{ acre-feet}) (700 - 527) = 169{,}644 \text{ acre-feet}$$

Entitlement and Credit or Debit

Paragraph 5(c) of the Stipulated Judgment states that "CBMWD [now IEUA] and WMWD shall be responsible for an average annual Adjusted Base Flow of 42,000 acre-feet at Prado. CBMWD [IEUA] and WMWD each year shall be responsible for not less than 37,000 acre-feet of Base Flow at Prado, plus one-third of any cumulative debit; provided, however, that for any year commencing on or after October 1, 1986, when there is no cumulative debit, or for any year prior to 1986 whenever the cumulative credit exceeds 30,000 acre-feet, said minimum shall be 34,000 acre-feet."

The Watermaster's findings concerning flow at Prado for 1999-00 required under the Stipulated Judgment are as follows:

1.	Measured Outflow at Prado	207,850 acre-feet
2.	Base Flow at Prado	148,269 acre-feet
3.	Annual Weighted TDS of Base and Storm Flow	527 mg/L
4.	Annual Adjusted Base Flow	169,644 acre-feet
5.	Cumulative Adjusted Base Flow	3,358,244 acre-feet
6.	Cumulative Entitlement of OCWD	1,260,000 acre-feet
7.	Cumulative Credit	2,098,244 acre-feet
8.	One-Third of Cumulative Debit	0 acre-feet
9.	Minimum Required Base Flow in 2000-01	34,000 acre-feet

CHAPTER III

BASE FLOW AT RIVERSIDE NARROWS

This chapter deals with determinations of 1) the components of flow at Riverside Narrows, which include Storm Flow and Base Flow and 2) the Adjusted Base Flow at Riverside Narrows credited to SBVMWD.

Flow at Riverside Narrows

The flow of the Santa Ana River at Riverside Narrows amounted to 75,572 acre-feet, measured at the USGS gaging station near the MWDSC Upper Feeder Crossing. Separated into its components, Base Flow was 63,499 acre-feet and Storm Flow was 14,312 acre-feet. Included in Base Flow are 2,239 acre-feet of wastewater from Rubidoux Community Services District that now by-passes the USGS gaging station. The Storm and Base Flow components of the flow of the Santa Ana River at Riverside Narrows for each month in the 1999-00 Water Year are listed in Table 7 and graphically shown on Plate 7. The components of flow of the Santa Ana River at Riverside Narrows during the period 1934-35 through 1999-00 are presented on Plate 8.

High Groundwater Mitigation Project

As mentioned in Chapter 1, a total of 2,323 acre-feet of High Groundwater Mitigation Project groundwater from the Bunker Hill Basin was determined to have percolated to storage in Colton and Riverside Basins. None of it reached Riverside Narrows during the 1999-00 Water Year. A summary of the High Groundwater Mitigation Project discharges is contained in Appendix D. All parties to the Stipulated Judgment agreed that High Groundwater Mitigation Project water would be excluded from the computation of Santa Ana River Base Flow and Base Flow quality.

Base Flow

Based on the hydrograph shown on Plate 7 and utilizing in general the procedures reflected in the Work Papers of the engineers (as referenced in Paragraph 2 of the Engineering Appendix of the Stipulated Judgment), a separation was made between Storm Flow and the sum of Base Flow and Nontributary Flow.

In April 1980, Rubidoux Community Services District made the first delivery of wastewater to the regional treatment plant at Riverside. Prior to that time, Rubidoux had discharged to the river upstream of the Riverside Narrows gaging station. Wastewater from Rubidoux during Water Year 1999-00, in the amount of 2,239 acre-feet, has been added to the stream flow as measured at the gaging station.

TABLE 7

COMPONENTS OF FLOW AT RIVERSIDE NARROWS

FOR WATER YEAR 1999-00
(acre-feet)

	Month	USGS Measured Flow	Storm Flow	SBVMWD Mitigation Water (1)	Rubidoux Waste-water	Base Flow (2)
1999	October	5,042	0	0	188	5,230
	November	4,848	16	0	183	5,015
	December	5,284	14	0	189	5,459
2000	January	5,986	607	0	189	5,568
	February	12,742	7,674	0	177	5,245
	March	10,102	4,239	0	188	6,052
	April	8,017	1,729	0	180	6,469
	May	5,215	0	0	190	5,405
	June	4,867	0	0	181	5,049
	July	4,491	0	0	191	4,682
	August	4,366	0	0	191	4,557
	September	4,614	34	0	189	4,769
Total		75,572	14,312	0	2,239	63,499

(1) SBVMWD water pumped from the Bunker Hill groundwater basin and discharged into the Santa Ana River, less an estimated loss of 1% for evapotranspiration.

(2) Baseflow equals USGS measured flow, minus storm flow, minus SBVMWD Mitigation Water, plus Rubidoux Wastewater.

Water Quality

The determination of water quality at the Riverside Narrows Gaging Station was made using periodic grab samples taken and analyzed for TDS by the USGS and the City of Riverside. Water quality data based on samples taken during storm flow periods were not used in the calculations.

The flow-weighted quality of wastewater from Rubidoux was 683 mg/L. The Base Flow quality resulting from exclusion of the Nontributary Flow and inclusion of the Rubidoux wastewater is shown in the following table as 602 mg/L.

Flow Component	Annual Flow (acre-feet)	Average TDS (mg/L)	Annual Flow x Average TDS (acre-feet x mg/L)
1. Base Flow plus Nontributary Flow	61,260	599	36,694,740
2. Less High Groundwater Mitigation Project Water	0	--	---
3. Plus Rubidoux Wastewater	2,239	683	1,529,237
4. Base Flow (line 1 less line 2 plus line 3)	63,499		38,223,977
Average TDS of Base Flow	38,223,977 ÷ 63,499 = 602 mg/L		

Adjusted Base Flow at Riverside Narrows

The Stipulated Judgment provides that the amount of Base Flow at Riverside Narrows received during any year shall be subject to adjustment based on weighted average annual TDS in the Base Flow as follows:

If the Weighted Average TDS in Base Flow at Riverside Narrows is:	Then the Adjusted Base Flow shall be determined by the formula:
Greater than 700 mg/L	$Q - \frac{11}{15,250} Q(TDS-700)$
600 mg/L to 700 mg/L	Q
Less than 600 mg/L	$Q + \frac{11}{15,250} Q(600-TDS)$

Where: Q = Base Flow actually received.

From the previous subsection, the weighted average annual TDS in the Base Flow at Riverside Narrows for Water Year 1999-00 was 602 mg/L. Therefore, no adjustment is necessary, and the Adjusted Base Flow for 1999-00 is 63,499 feet.

Entitlement and Credit or Debit

Paragraph 5(b) of the Stipulated Judgment states that "SBVMWD shall be responsible for an average annual Adjusted Base Flow of 15,250 acre-feet at Riverside Narrows . . . SBVMWD each year shall be responsible for not less than 13,420 acre-feet of Base Flow plus one-third of any cumulative debit, provided, however, that for any year commencing on or after October 1, 1986, when there is no cumulative debit, or for any year prior to 1986 whenever the cumulative credit exceeds 10,000 acre-feet, said minimum shall be 12,420 acre-feet."

The Watermaster's findings concerning flow at Riverside Narrows for 1999-00 required under the Stipulated Judgment are as follows:

1.	Base Flow at Riverside Narrows	63,499 acre-feet
2.	Annual Weighted TDS of Base Flow	602 mg/L
3.	Annual Adjusted Base Flow	63,499 acre-feet
4.	Cumulative Adjusted Base Flow	1,238,409 acre-feet
5.	Cumulative Entitlement of CBMWD and WMWD	457,500 acre-feet
6.	Cumulative Credit	780,909 acre-feet
7.	One-Third of Cumulative Debit	0 acre-feet
8.	Minimum Required Base Flow in 2000-01	12,420 acre-feet

CHAPTER IV

HISTORY AND SUMMARY OF THE JUDGMENT

History of Litigation

The complaint in the case was filed by Orange County Water District on October 18, 1963, seeking an adjudication of water rights against substantially all water users in the area tributary to Prado Dam within the Santa Ana River Watershed, but excluding the area tributary to Lake Elsinore. Thirteen cross-complaints were filed in 1968, extending the adjudication to include substantially all water users in the area downstream from Prado Dam. With some 4,000 parties involved in the case (2,500 from the Upper Area and 1,500 from the Lower Area), it became obvious that every effort should be made to arrive at a settlement and physical solution in order to avoid enormous and unwieldy litigation.

Efforts to arrive at a settlement and physical solution were pursued by public officials, individuals, attorneys, and engineers. Attorneys for the parties organized in order to facilitate settlement discussions and, among other things, provided guidance for the formation and activities of an engineering committee to provide information on the physical facts.

An initial meeting of the engineers representing the parties was held on January 10, 1964. Agreement was reached that it would be beneficial to undertake jointly the compilation of basic data. Liaison was established with the Department of Water Resources, State of California, to expedite the acquisition of data. Engineers representing the parties were divided into subcommittees which were given the responsibility of investigating such things as the boundary of the Santa Ana River Watershed and its subareas, standardization of the terminology, the location and description of wells and diversion facilities, waste disposal and transfer of water between subareas.

In response to a request from the attorneys' committee at a meeting held April 17, 1964, on April 30, 1964, the joint engineering committee prepared a list of preliminary engineering studies directed toward settlement of the Santa Ana River water rights litigation. Special assignments were made to individual engineers on selected items requested by the attorneys' committee.

The attorneys and engineers for the defendants then commenced a series of meetings separate from the representatives of the plaintiffs in order to consolidate their positions and to determine a course of action. On October 7, 1964, engineers for the defendants presented the results of the studies made by the joint engineering committee. The defendants' attorneys requested that additional information be provided on the methods of measuring flow at Prado Dam, the historical supply and disposal of water passing Prado Dam, segregation of flow into components, and determination of the amount of

supply which was usable by the downstream area. On December 11, 1964, the supplemental information was presented to the defendants' attorneys.

During 1965, engineers and attorneys for the defendants held numerous conferences and conducted additional studies in an attempt to determine their respective positions in the case. Early in 1966, the plaintiff and defendants exchanged drafts of possible principles for settlement. Commencing March 22 and ending April 13, 1966, four meetings were held by the engineers to discuss the draft of principles for settlement.

On February 25, 1968, the defendants submitted a request to the Court that the Order of Reference be issued requesting the California Department of Water Resources to determine the physical facts. On May 9, 1968, the plaintiffs' attorney submitted motions opposing the Order of Reference and requested that a preliminary injunction be issued. In the meantime, every effort was being made to come to an agreement on the Stipulated Judgment. Commencing on February 28, 1968 and extending until May 14, 1968, six meetings were held to determine the scope of physical facts on which agreement could be reached so that if an Order of Reference were to be approved by the Court, the work under the proposed reference would not repeat the extensive basic data collection and compilation which had already been completed and on which engineers for both plaintiffs and defendants had reached substantial agreement. Such basic data were compiled and published in two volumes under date of May 14, 1968 entitled "Appendix A, Basic Data."

On May 21, 1968, an outline of a proposal for settlement of the case was prepared and a committee of attorneys and engineers for the parties commenced preparation of the settlement documents. On June 16, 1968, the Court held a hearing on the motions it had received requesting a preliminary injunction and an Order of Reference. The parties requested that the Court delay the preliminary hearings on these motions in view of the efforts toward settlement that were underway. The plaintiff, however, was concerned regarding the necessity of bringing the case to trial within the statutory limitation and, accordingly, on July 15, 1968, submitted a motion to set the complaint in the case for trial. On October 15, 1968, the trial was commenced and was adjourned after one-half day of testimony on behalf of the plaintiff. Thereafter, the parties filed with the Court the necessary Settlement Documents including a Stipulation for Judgment. The Court entered the Judgment on April 17, 1969, along with Stipulations and Orders dismissing all defendants and cross-defendants except for the four major public water districts overlying, in aggregate, substantially all of the major areas of water use in the watershed. The districts, the locations of which are shown on Plate 1, "Santa Ana River Watershed", are as follows:

(1) Orange County Water District (OCWD), representing all lower basin entities located within Orange County downstream of Prado Dam.

(2) Western Municipal Water District (WMWD), representing middle basin entities located within Riverside County on both sides of the Santa Ana River primarily upstream from Prado Dam.

(3) Inland Empire Utilities Agency (IEUA), formerly Chino Basin Municipal Water District (CBMWD), located in the San Bernardino County Chino Basin area, representing middle basin entities within its boundaries and located primarily upstream from Prado Dam.

(4) San Bernardino Valley Municipal Water District (SBVMWD), representing all entities within its boundaries, and embraced within the upper portion of the Riverside Basin area, the Colton Basin area (being an upstream portion of the middle basin) and the San Bernardino Basin area, being essentially the upper basin.

Summary of Judgment

Declaration of Rights. The Judgment sets forth a declaration of rights. Briefly stated, the Judgment provides that the water users in the Lower Area have rights, as against the water users in the Upper Area, to receive certain average and minimum annual amounts of non-storm flow ("base flow") at Prado Dam, together with the right to all storm flow reaching Prado Dam. The amount of the Lower Area entitlement is variable based on the quality of the water received by the Lower Area. Water users in the Upper Area have the right as against the water users in the Lower Area to divert, pump, extract, conserve, store and use all surface and groundwater supplies originating within the Upper Area, so long as the Lower Area receives the water to which it is entitled under the Judgment and there is compliance with all of its provisions.

Physical Solution. The Judgment also sets forth a comprehensive "physical solution" for satisfying the rights of the Lower Area. To understand the physical solution it is necessary to understand the following terms that are used in the Judgment:

Storm Flow – That portion of the total flow which originates from precipitation and runoff and which passes a point of measurement (either Riverside Narrows or Prado Dam) without having first percolated to groundwater storage in the zone of saturation, calculated in accordance with procedures referred to in the Judgment.

Base Flow - That portion of the total surface flow passing a point of measurement (either Riverside Narrows or Prado Dam) which remains after deduction of storm flow, nontributary flows, exchange water purchased by OCWD, and certain other flows as determined by the Watermaster.

Adjusted Base Flow - Actual base flow in each year adjusted for water quality pursuant to formulas specified in the Judgment. The adjustment of Base Flow for water quality is intended to provide an incentive to the Upper Area to maintain a better quality of water in the river. When the total dissolved solids (TDS) is lower than a specified value at one of the measuring points, the water quantity obligation is lower. When the TDS is higher than a specified value, the water quantity

obligation is higher. This is the first comprehensive adjudication in Southern California in which the quality of water is taken into consideration in the quantification of water rights.

Credits and Debits - Under the accounting procedures provided for in the Judgment, credits accrue to SBVMWD in any year when the Adjusted Base Flow exceeds 15,250 acre-feet at Riverside Narrows and jointly to IEUA and WMWD when the Adjusted Base Flow exceeds 42,000 acre-feet at Prado Dam. Debits accrue in any year when the Adjusted Base Flows falls below those levels. Credits or debits accumulate year to year.

Obligation at Riverside Narrows. SBVMWD has an obligation to assure an average annual Adjusted Base Flow of 15,250 acre-feet at Riverside Narrows, subject to the following:

(1) A minimum Base Flow of 13,420 acre-feet plus one-third of any cumulative debit.

(2) After October 1, 1986, if no cumulative debit exists, the minimum Base Flow shall be 12,420 acre-feet.

(3) Prior to 1986, if the cumulative credits exceed 10,000 acre-feet, the minimum Base Flow shall be 12,420 acre-feet.

(4) All cumulative debits shall be removed by the discharge of a sufficient Base Flow at Riverside Narrows at least once in any ten consecutive years following October 1, 1976. Any cumulative credits shall remain on the books of account until used to offset any subsequent debits or until otherwise disposed of by SBVMWD.

(5) The Base Flow at Riverside Narrows shall be adjusted using weighted average annual TDS in such Base Flow in accordance with the formula set forth in the Judgment.

Obligation at Prado Dam. IEUA and WMWD have a joint obligation to assure an average annual Adjusted Base Flow of 42,000 acre-feet at Prado Dam, subject to the following:

(1) Minimum Base Flow at Prado shall not be less than 37,000 acre-feet plus one-third of any cumulative debit.

(2) After October 1, 1986, if no cumulative debit exists, the minimum Base Flow quantity shall be 34,000 acre-feet.

(3) Prior to 1986, if the cumulative credit exceeds 30,000 acre-feet, the minimum Base Flow shall be 34,000 acre-feet.

(4) Sufficient quantities of Base Flow shall be provided at Prado to discharge completely any cumulative debits at least once in any ten consecutive years following October 1, 1976. Any cumulative credits shall remain on the books of account until used to offset any debits, or until otherwise disposed of by IEUA and WMWD.

(5) The Base Flow at Prado during any year shall be adjusted using the weighted average annual TDS in the total flow at Prado (Base Flow plus Storm Flow) in accordance with the formula set forth in the Judgment.

Other Provisions. SBVMWD, IEUA and WMWD are enjoined from exporting water from the Lower Area to the Upper Area. OCWD is enjoined from exporting or "causing water to flow" from the Upper Area to the Lower Area. Any inter-basin acquisition of water rights will have no effect on Lower Area entitlements. OCWD is prohibited from enforcing two prior judgments so long as the Upper Area Districts are in compliance with the physical solution. The composition of the Watermaster and the nomination and appointment process for members are described along with a definition of the Watermaster's duties and a formula for sharing its costs. The court retains continuing jurisdiction over the case. There are provisions for appointment of successor parties and rules for dealing with future actions that might conflict with the physical solution.

History of the Watermaster Committee Membership

The Santa Ana River Watermaster is a committee composed of five members nominated by the parties and appointed by the court. SBVMWD, IEUA (formerly CBMWD), and WMWD nominate one member each and OCWD nominates two. The Watermaster members annually elect two officers: chairman and secretary.

The original five members were appointed at the time of entry of the judgment. They prepared a *pro forma* annual report for the 1969-70 Water Year. The first annual report required by the judgment was prepared for the 1970-71 Water Year and reports have been prepared annually since then.

The membership of the Watermaster has changed over the years. The historical listing of members and officers shown in Table 8 reflects the signatories to each annual report prior to this year.

TABLE 8

HISTORY OF THE WATERMASTER COMMITTEE MEMBERSHIP

Water Year	SBVMWD	IEUA	WMWD	OCWD	OCWD
1969-70	Clinton O. Henning	William J. Carroll	Albert A. Webb, Secretary	Max Bookman, Chairman	John M. Toups
1970-71 through 1973-74	James C. Hanson	William J. Carroll	Albert A. Webb, Secretary	Max Bookman, Chairman	John M. Toups
1974-75 through 1977-78	James C. Hanson	William J. Carroll	Donald L. Harriger	Max Bookman, Chairman	John M. Toups, Secretary
1978-79 through 1981-82	James C. Hanson	William J. Carroll	Donald L. Harriger	Max Bookman, Chairman	William R. Mills, Jr., Secretary
1982-83 through 1983-84	James C. Hanson	William J. Carroll	Donald L. Harriger	Harvey O. Banks, Chairman	William R. Mills, Jr., Secretary
1984-85 through 1988-89	Robert L. Reiter	William J. Carroll	Donald L. Harriger	Harvey O. Banks, Chairman	William R. Mills, Jr., Secretary
1989-90 through 1994-95	Robert L. Reiter, Secretary/Treasurer	William J. Carroll	Donald L. Harriger	Harvey O. Banks, Chairman	William R. Mills, Jr.
1995-96	Robert L. Reiter, Secretary/Treasurer	William J. Carroll, Chairman	Donald L. Harriger	Bill B. Dendy	William R. Mills, Jr.
1996-97	Robert L. Reiter, Secretary/Treasurer	William J. Carroll	Donald L. Harriger	Bill B. Dendy	William R. Mills, Jr., Chairman
1997-98	Robert L. Reiter, Secretary/Treasurer	Robb D. Quincey	Donald L. Harriger	Bill B. Dendy	William R. Mills, Jr., Chairman
1998-99	Robert L. Reiter, Secretary/Treasurer	Richard W. Atwater	Donald L. Harriger	Bill B. Dendy	William R. Mills, Jr., Chairman

Santa Ana River Watershed

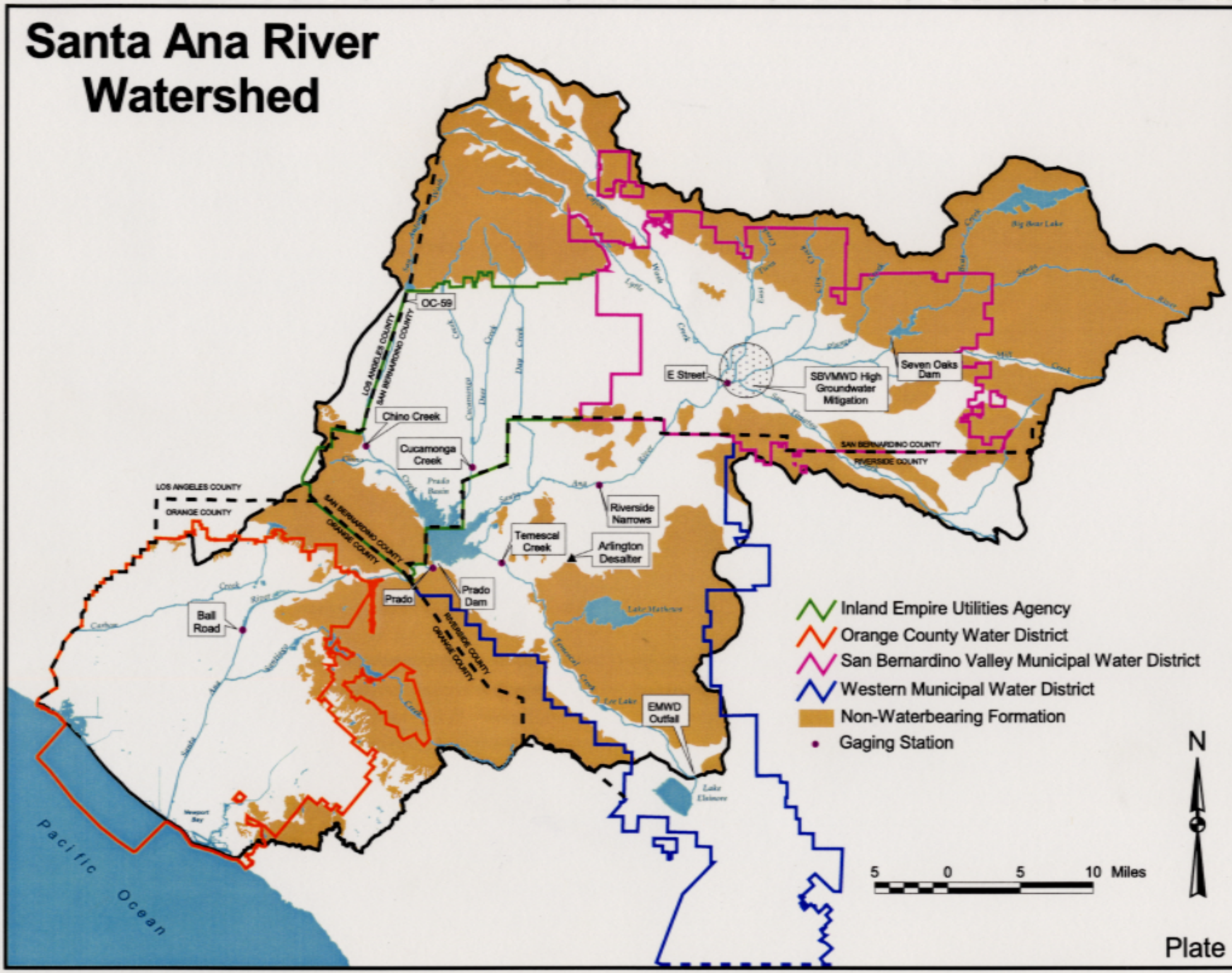


Plate 1

Santa Ana River Watershed Wastewater Treatment Plants and Salt Export Pipelines

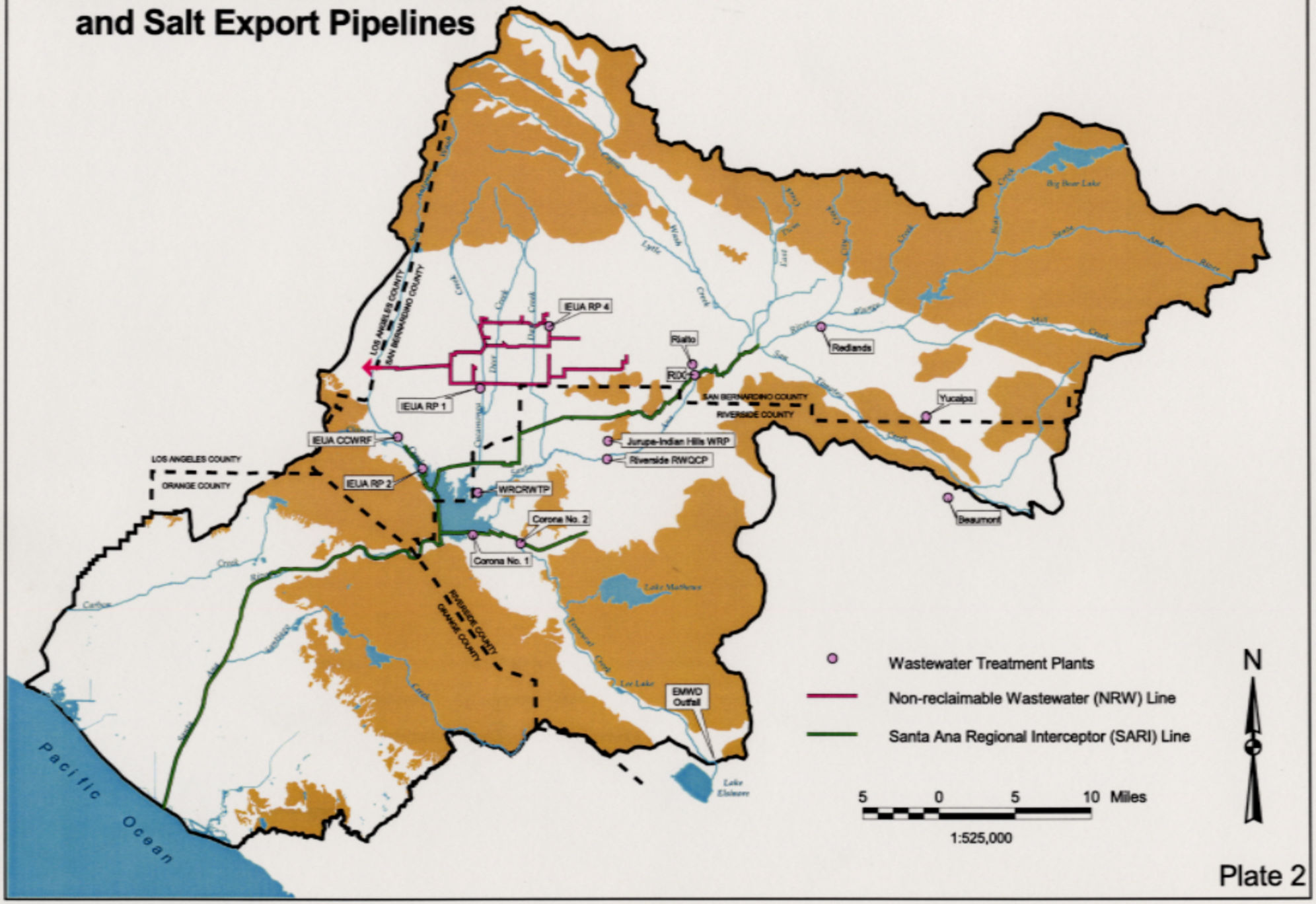


Plate 2

PRECIPITATION AT SAN BERNARDINO SINCE 1934-35

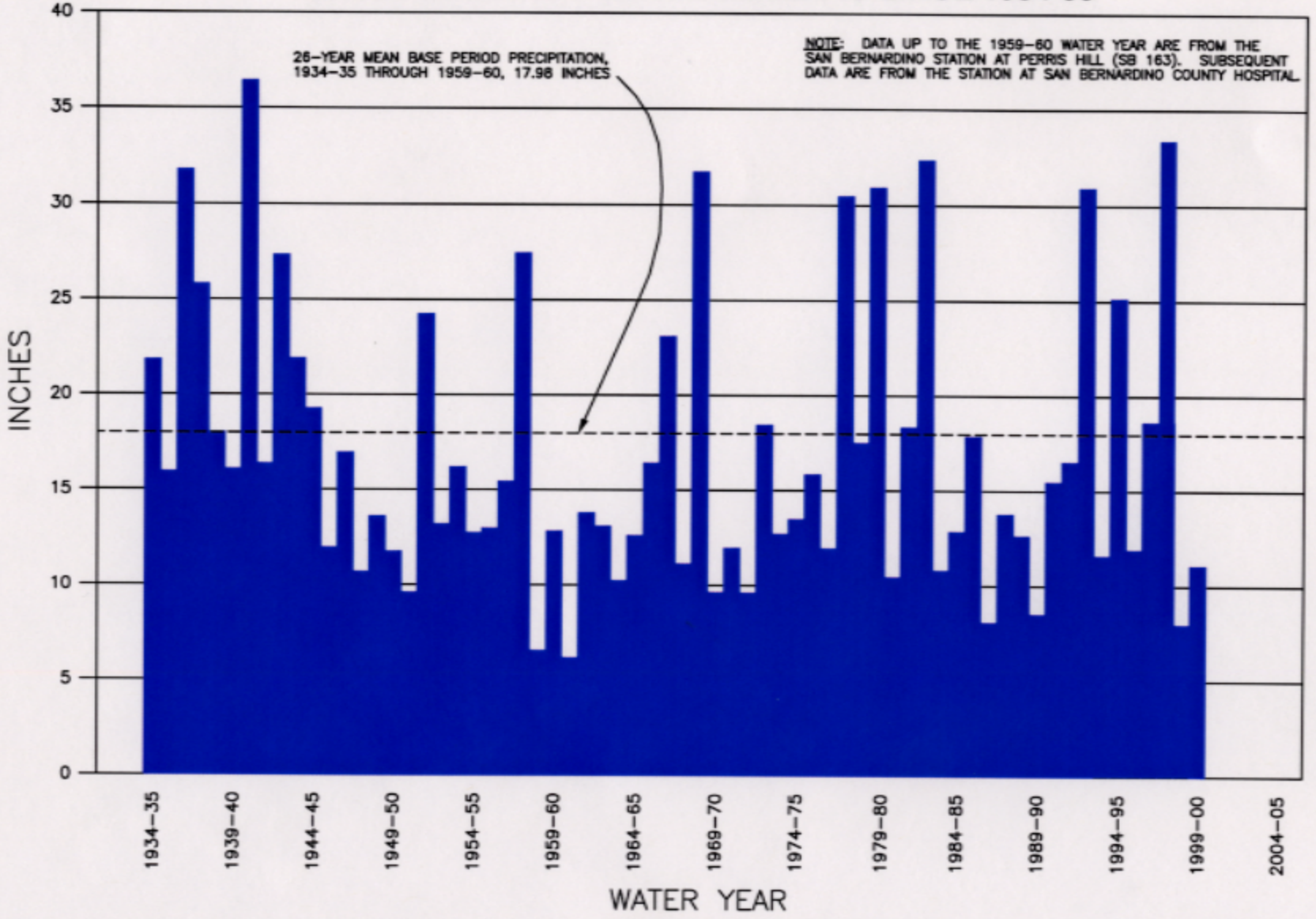
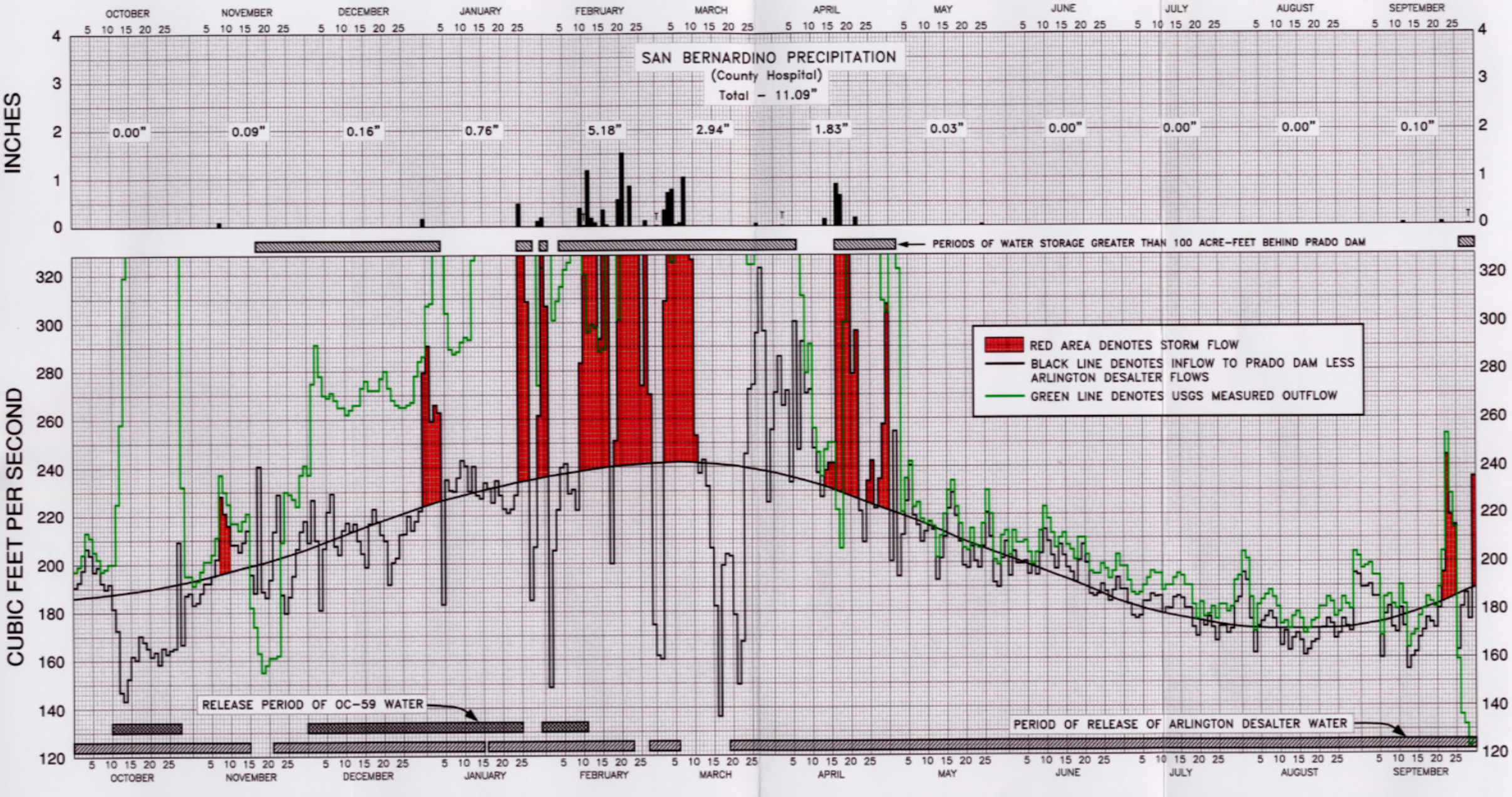


PLATE 3



DISCHARGE OF SANTA ANA RIVER AT PRADO DAM & SAN BERNARDINO PRECIPITATION
WATER YEAR 1999-00

Plate 4

DISCHARGE OF SANTA ANA RIVER AT PRADO SINCE 1934-35

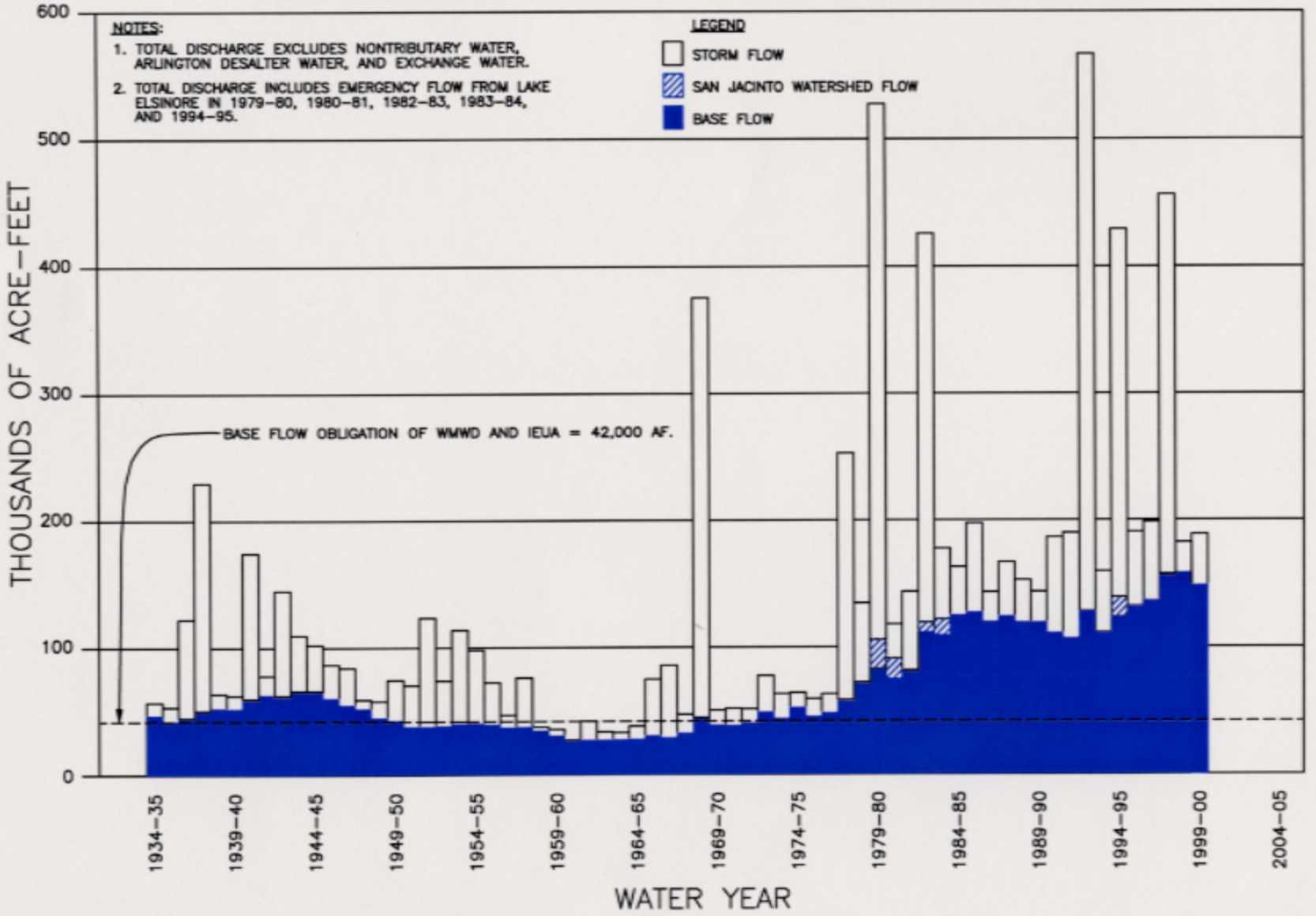
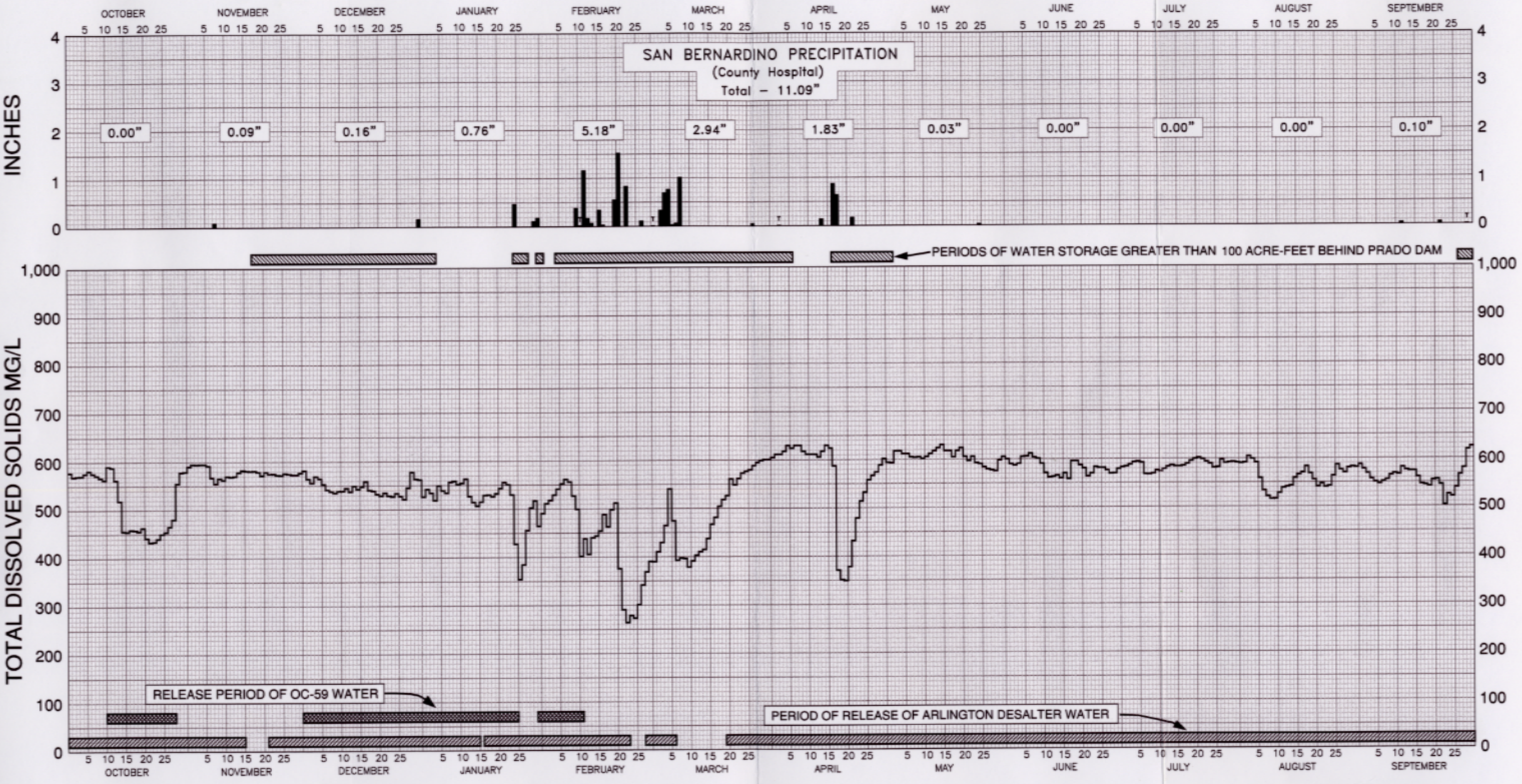
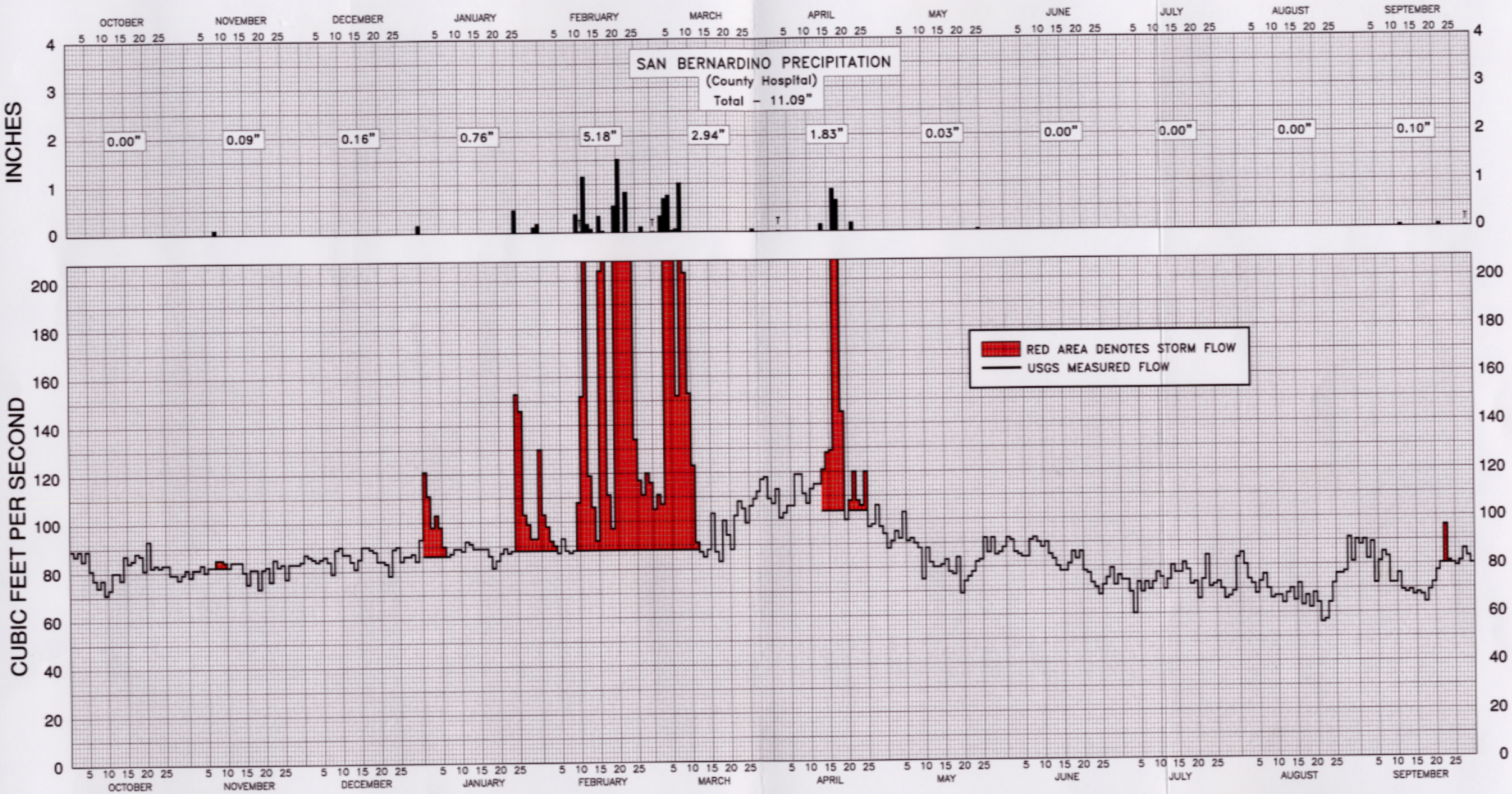


PLATE 5



DISSOLVED SOLIDS IN SANTA ANA RIVER BELOW PRADO DAM
WATER YEAR 1999-00

Plate 6



DISCHARGE OF SANTA ANA RIVER AT RIVERSIDE NARROWS & SAN BERNARDINO PRECIPITATION
WATER YEAR 1999-00

Plate 7

DISCHARGE OF SANTA ANA RIVER AT RIVERSIDE NARROWS SINCE 1934-35

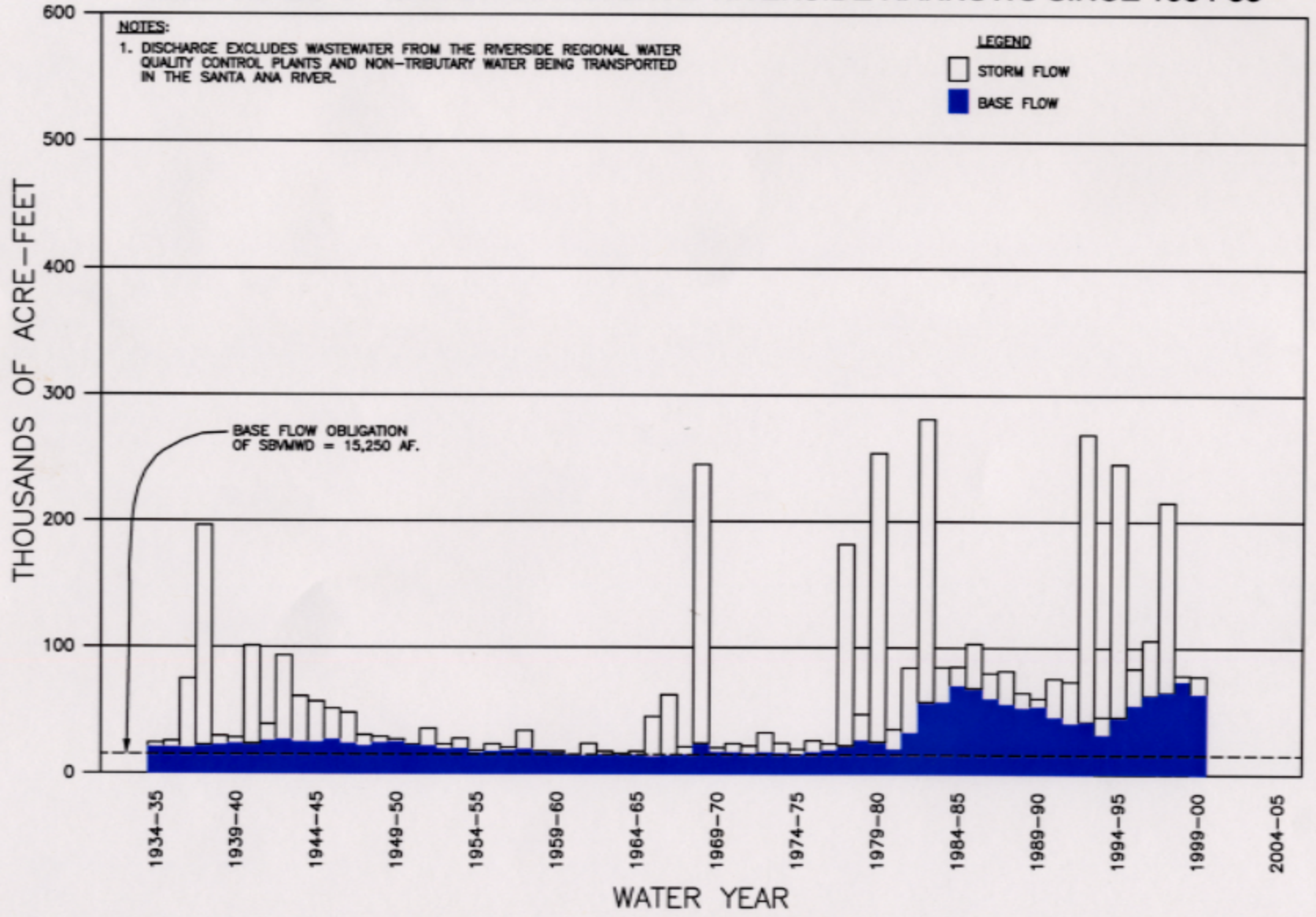


PLATE 8

SANTA ANA RIVER WATERMASTER

FOR

ORANGE COUNTY WATER DISTRICT

VS. CITY OF CHINO et al.

CASE NO. 117628 - COUNTY OF ORANGE

BASIC DATA

FOR THE

THIRTIETH ANNUAL REPORT

OF THE

SANTA ANA RIVER WATERMASTER

FOR WATER YEAR

OCTOBER 1, 1999 - SEPTEMBER 30, 2000

APRIL 30, 2001

APPENDIX A

USGS FLOW MEASUREMENTS OF THE SANTA ANA RIVER FLOWS BELOW PRADO, AT MWD CROSSING, AND AT E STREET AND OF TEMESCAL CREEK ABOVE MAIN STREET (AT CORONA), CUCAMONGA CREEK (NEAR MIRA LOMA) AND CHINO CREEK AT SCHAEFER AVENUE (NEAR CHINO), AND WATER QUALITY RECORDS FOR THE SANTA ANA RIVER AT PRADO DAM AND AT MWD CROSSING

WATER YEAR 1999-00

11074000 SANTA ANA RIVER BELOW PRADO DAM, CA

LOCATION.—Lat 33°53'00", long 117°38'40", in La Sierra Grant, Riverside County, Hydrologic Unit 18070203, on left bank of outlet channel, 2,500 ft downstream from axis of Prado Dam, and 4.5 mi west of Corona.

DRAINAGE AREA.—1,490 mi^2, excludes 768 mi^2 above Lake Elsinore.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.—May 1930 to November 1939 (irrigation seasons only), March 1940 to current year. Published as "at Santa Fe Railroad Bridge, near Prado" May 1930 to November 1931, as "at Atchison, Topeka, and Santa Fe Railroad Bridge, near Prado" May 1932 to November 1939, and as "below Prado Dam, near Prado" March 1940 to September 1950.

GAGE.—Water-stage recorder and concrete control since August 1944. Datum of gage is approximately 449 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Mar. 18, 1940, at about same site at various datums.

REMARKS.—Records excellent. Flow regulated since 1940 by Prado flood-control reservoir, capacity, 196,200 acre-ft. Natural streamflow affected by extensive ground-water withdrawals, diversion for irrigation, discharges of treated effluent, and return flow from irrigated areas. Releases of imported water are made to the basin by the California Water Project at times in some years, via San Antonio Creek from Rialto Pipeline below San Antonio Dam. During the current year, the California Water Project released 15,720 acre-ft to the basin. See schematic diagram of Santa Ana River Basin.

EXTREMES FOR PERIOD OF RECORD.—Maximum discharge, 7,440 ft^3/s, Feb. 21, 1980, gage height, 6.88 ft; maximum gage height, 7.29 ft, Jan. 19, 1993; minimum daily, 2.4 ft^3/s, July 29 to Aug. 3, Sept. 20, 1978 (result of gate closure).

EXTREMES OUTSIDE PERIOD OF RECORD.—Flood of Mar. 2, 1938 reached a discharge of 100,000 ft^3/s, on basis of slope-area measurement of peak flow at site 2.5 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	197	191	237	307	372	505	416	361	203	198	204	197
2	199	193	275	308	359	500	415	382	213	192	201	198
3	204	197	291	351	301	506	413	322	208	187	185	199
4	213	201	278	361	309	500	401	221	208	186	171	194
5	211	201	270	336	315	325	390	235	209	187	182	194
6	205	204	269	304	322	475	396	242	204	190	184	169
7	202	211	271	289	325	483	382	223	199	193	186	185
8	197	237	268	287	337	496	311	225	204	196	188	186
9	198	230	265	288	341	510	279	218	213	195	185	182
10	200	225	265	292	340	503	291	216	223	195	181	180
11	200	217	262	294	320	502	256	217	218	188	174	190
12	225	217	264	293	296	501	246	215	212	190	175	182
13	258	214	266	326	299	498	236	202	206	190	172	164
14	319	218	266	337	298	449	247	211	210	193	177	169
15	355	221	273	335	288	386	250	220	212	195	179	171
16	351	182	276	334	289	385	250	230	207	194	176	177
17	340	174	272	333	406	383	222	234	205	190	170	180
18	346	163	272	334	464	381	206	223	201	190	172	185
19	333	155	272	334	360	381	300	216	210	182	175	183
20	329	158	277	333	301	385	378	206	210	176	176	181
21	347	161	280	332	1480	388	393	205	203	183	181	189
22	365	161	273	330	3780	416	389	214	196	177	181	204
23	367	162	268	331	1950	427	384	207	195	178	185	253
24	373	209	266	334	1400	376	387	206	195	181	183	228
25	372	230	265	357	630	324	396	216	199	176	177	214
26	375	229	265	401	572	324	395	230	197	182	179	159
27	376	227	266	405	484	384	397	220	193	182	185	136
28	377	224	267	390	462	420	348	201	196	179	182	132
29	232	237	278	350	513	420	309	199	203	181	180	123
30	195	241	284	274	---	419	304	211	198	192	204	126
31	195	---	286	323	---	418	---	213	---	194	202	---
TOTAL	8656	6090	8387	10203	17913	13370	9987	7141	6150	5812	5652	5430
MEAN	279	203	271	329	618	431	333	230	205	187	182	181
MAX	377	241	291	405	3780	510	416	382	223	198	204	253
MIN	195	155	237	274	288	324	206	199	193	176	170	123
AC-FT	17170	12080	16640	20240	35530	26520	19810	14160	12200	11530	11210	10770

11066460 SANTA ANA RIVER AT MWD CROSSING, NEAR ARLINGTON, CA

LOCATION.—Lat 33°58'07", long 117°26'51", in NE 1/4 SW 1/4 sec.30, T.2 S., R.5 W., Riverside County, Hydrologic Unit 18070203, on left bank, at MWD pipeline crossing, 0.8 mi downstream from Union Pacific Railroad Bridge, 1.1 mi upstream from bridge on Van Buren Boulevard, and 3.3 mi north of Arlington.

DRAINAGE AREA.—852 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.—March 1970 to current year.

REVISED RECORDS.—WDR CA-83-1: Drainage area.

GAGE.—Water-stage recorder and crest-stage gage. Elevation of gage is 685 ft above sea level, from topographic map. Prior to Apr. 15, 1985, water-stage recorder at site 300 ft upstream on left bank at different datum. From Apr. 15 to Sept. 30, 1985, water-stage recorder near right bank (atop pier 9 of MWD pipeline crossing), at same site and datum. From Oct. 1, 1985, to June 16, 1993, water-stage recorder and crest-stage gage on right bank at same site and datum.

REMARKS.—Records fair below 500 ft^3/s and poor above. Flow partly regulated by Big Bear Lake (station 11049000) and, since November 1999, by Seven Oaks flood-control reservoir, capacity, 145,600 acre-ft. Natural streamflow affected by ground-water withdrawals, diversions for irrigation, return flows from irrigated areas, and discharges of treated effluent. The records at this station are equivalent to those collected at Santa Ana River at Riverside Narrows, near Arlington minus the flow at Riverside Water-Quality Control Plant at Riverside Narrows, near Arlington. See schematic diagram of Santa Ana River Basin.

EXTREMES FOR PERIOD OF RECORD.—Maximum discharge, 31,300 ft^3/s, Feb. 24, 1998, gage height, 14.69 ft, on basis of area-velocity study; maximum gage height, 20.23 ft, site and datum then in use, Mar. 4, 1978; minimum daily, 15 ft^3/s, Sept. 7, 8, 1980.

EXTREMES OUTSIDE PERIOD OF RECORD.—Maximum discharge since at least 1927, 100,000 ft^3/s, Mar. 2, 1938, on basis of slope-area measurement at site 1.1 mi downstream. Flood of Jan. 22, 1862, 320,000 ft^3/s, on basis of slope-conveyance study at site 8.2 mi upstream. Stage at that site was 5 ft higher than that of Mar. 2, 1938.

EXTREMES FOR CURRENT YEAR.—Peak discharges greater than base discharge of 1,500 ft^3/s, or maximum:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	1000	2,030	9.38	Mar. 8	1630	2,410	8.84
Feb. 21	2000	5,310	10.38	Apr. 17	2200	1,730	8.50
Mar. 5	0015	2,050	8.84				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89	78	87	121	103	105	107	88	92	74	85	88
2	87	81	86	111	98	111	113	91	91	74	80	90
3	89	81	85	98	92	107	101	95	86	69	74	82
4	85	83	84	103	90	220	103	92	85	60	72	89
5	89	80	85	98	87	962	106	103	84	73	68	72
6	81	82	86	90	93	300	106	91	84	69	73	81
7	77	82	84	86	88	152	119	92	91	73	76	85
8	74	85	79	87	87	666	119	90	92	70	70	83
9	77	85	89	89	88	203	111	88	90	73	66	72
10	71	84	90	89	108	e153	107	75	88	77	67	72
11	73	82	87	88	152	e123	113	88	90	75	67	76
12	80	84	87	92	377	e91	115	82	85	70	64	69
13	80	84	84	91	119	e87	115	80	83	74	68	68
14	77	84	81	89	106	e85	121	80	80	80	70	69
15	87	80	85	89	92	88	128	81	78	77	65	67
16	84	75	90	89	204	103	129	83	78	77	72	68
17	85	81	90	89	254	87	337	78	81	81	63	67
18	88	81	89	86	111	83	593	77	86	78	67	64
19	87	73	88	81	97	100	145	84	83	72	62	69
20	81	81	84	84	240	94	100	69	86	73	68	72
21	93	82	84	87	1920	88	108	74	78	66	64	77
22	82	76	83	89	355	102	120	76	77	74	56	80
23	83	85	78	87	595	108	108	78	73	84	57	96
24	82	82	89	88	270	105	106	82	71	71	64	81
25	83	83	90	153	134	99	120	83	68	72	72	80
26	83	77	84	146	e117	106	97	92	72	73	76	79
27	79	83	86	103	e111	109	98	86	75	70	76	81
28	79	83	86	99	e120	112	106	92	79	66	77	86
29	77	83	87	93	116	117	97	85	72	67	91	83
30	79	84	84	93	---	118	94	86	76	69	81	80
31	81	---	93	130	---	109	---	88	---	83	90	---
TOTAL	2542	2444	2664	3018	6424	5093	4042	2629	2454	2264	2201	2326
MEAN	82.0	81.5	85.9	97.4	222	164	135	84.8	81.8	73.0	71.0	77.5
MAX	93	85	93	153	1920	962	593	103	92	84	91	96
MIN	71	73	78	81	87	83	94	69	68	60	56	64
AC-FT	5040	4850	5280	5990	12740	10100	8020	5210	4870	4490	4370	4610

e Estimated.

11059300 SANTA ANA RIVER AT E STREET, NEAR SAN BERNARDINO, CA

LOCATION.—Lat 34°03'54", long 117°17'58", in San Bernardino Grant, San Bernardino County, Hydrologic Unit 18070203, on left bank, 0.4 mi downstream from E Street Bridge, 0.4 mi upstream from Warm Creek, 1.2 mi downstream from San Timoteo Creek, 2.8 mi south of San Bernardino, and 26 mi downstream from Big Bear Lake.

DRAINAGE AREA.—541 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.—March 1939 to September 1954, October 1966 to current year.

GAGE.—Water-stage recorder and crest-stage gage. Elevation of gage is 940 ft above sea level, from topographic map. Prior to Nov. 10, 1950, water-stage recorder on right bank 0.4 mi upstream at datum 964.50 ft above sea level. Nov. 11, 1950, to September 1954, water-stage recorder on both banks 0.4 mi upstream at datum 964.50 ft above sea level. October 1966 to September 1976, water-stage recorder on right bank 0.4 mi upstream at datum 954.50 ft above sea level. October 1976 to September 1977, gage was removed for channel construction. October 1977 to Jan. 28, 1981, water-stage recorder on right bank, 0.5 mi upstream at elevation 950 ft above sea level, from topographic map.

REMARKS.—Records poor. Flow partly regulated by Big Bear Lake (station 11049000) and, since November 1999, by Seven Oaks flood-control reservoir, capacity, 145,600 acre-ft. Natural flow of stream affected by ground-water withdrawals and diversion for domestic use and irrigation upstream from station. Effluent from sewage reclamation plant 1.0 mi upstream caused sustained flow past gage from 1967 to Mar. 21, 1996. See schematic diagram of Santa Ana River Basin.

EXTREMES FOR PERIOD OF RECORD.—Maximum discharge, 28,000 ft^3/s, Feb. 25, 1969, gage height, 11.9 ft, site and datum then in use; no flow for many days many years prior to 1967 and since Mar. 21, 1996.

EXTREMES FOR CURRENT YEAR.—Peak discharges greater than base discharge of 1,000 ft^3/s, from rating curve extended above 5,930 ft^3/s on basis of critical-depth computations, or maximum:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	0615	2,060	5.02	Mar. 8	1345	2,180	5.06
Feb. 21	1715	4,140	5.56	Apr. 17	1900	1,460	4.78
Mar. 4	2115	2,740	5.23				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	7.2	16	18	8.5	40	.34	e3.5	e2.2	.17	e.90	e.80
2	7.0	6.8	e15	16	8.0	35	1.2	e4.0	e1.5	.48	.57	.12
3	7.0	7.0	e15	12	7.7	72	1.3	e4.5	e1.1	e.50	1.4	.29
4	7.0	7.3	e15	15	7.7	281	2.4	e4.2	e1.6	e.45	1.4	.00
5	7.2	7.5	e15	14	8.1	397	1.1	e5.0	e1.5	e.46	.92	.08
6	7.1	8.1	e16	13	7.7	61	1.4	4.6	e2.0	e.50	.87	.16
7	6.7	7.4	e15	12	7.6	46	1.6	4.6	e1.9	e.47	.41	.38
8	8.3	8.7	e14	13	7.6	309	1.3	4.9	e2.0	e.45	.31	.90
9	6.1	9.3	e14	12	7.0	50	1.4	2.3	e2.1	e.46	1.1	.37
10	5.8	8.2	e15	12	37	29	2.5	1.3	e2.0	e.50	1.3	.10
11	6.3	8.3	e14	12	23	24	2.2	1.3	e1.9	e.48	.73	.00
12	6.5	8.8	e13	12	295	21	1.7	2.7	e1.9	.52	1.5	.00
13	7.2	8.5	e13	11	17	19	1.4	1.6	e1.8	.54	1.3	.00
14	6.3	9.1	e15	10	10	22	16	.00	e1.8	.53	.92	.00
15	7.0	9.8	e16	11	8.0	15	8.8	.00	e1.8	e.67	1.0	.00
16	8.0	8.5	e16	10	15	8.5	5.2	2.3	e1.7	e1.0	1.6	.00
17	8.8	9.3	e14	11	19	13	234	6.0	e1.7	e.95	1.3	.00
18	11	9.8	e15	12	10	5.4	355	4.5	e1.8	e.72	.94	.00
19	6.4	9.1	e14	12	7.7	4.3	42	2.6	e1.6	e.67	.84	.00
20	6.8	10	e12	12	59	5.6	23	.00	e1.7	e.95	e.80	.49
21	6.0	8.7	e13	14	1230	6.4	13	.48	e1.8	e1.0	e.75	1.3
22	5.7	8.3	e14	16	146	6.6	13	.94	e1.8	e1.1	e.78	1.6
23	5.5	8.1	e15	11	450	3.9	7.8	1.7	e1.7	e1.2	.00	1.5
24	6.2	8.3	e14	11	145	.99	8.2	1.8	1.6	e1.1	.00	.07
25	6.3	9.6	e14	32	24	1.1	4.8	e2.5	1.5	e2.0	11	.01
26	6.0	10	e13	45	e20	1.5	4.6	e2.2	1.8	e1.4	1.4	.00
27	6.5	9.8	e13	10	e57	3.9	3.5	e1.7	1.2	e1.3	.63	.00
28	10	9.4	e12	10	e40	8.2	4.0	e2.0	.38	e1.2	e1.5	.00
29	9.3	12	e13	11	37	1.8	3.6	e2.6	.45	e1.3	e1.7	.00
30	8.4	16	e16	10	---	1.7	e3.8	e2.1	.18	e1.2	e1.4	.00
31	7.2	---	24	16	---	.27	---	e2.5	---	e1.0	e1.5	---
TOTAL	220.4	268.9	453	436	2719.6	1494.16	770.14	80.42	48.01	25.27	40.77	8.17
MEAN	7.11	8.96	14.6	14.1	93.8	48.2	25.7	2.59	1.60	.82	1.32	.27
MAX	11	16	24	45	1230	397	355	6.0	2.2	2.0	11	1.6
MIN	5.5	6.8	12	10	7.0	.27	.34	.00	.18	.17	.00	.00
AC-FT	437	533	899	865	5390	2960	1530	160	95	50	81	16

e Estimated.

11059300 SANTA ANA RIVER AT E STREET, NEAR SAN BERNARDINO, CA—Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1954, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	.88	3.47	20.9	23.7	20.6	37.4	27.2	11.3	2.39	.93	.87	.63
MAX	3.35	21.3	117	109	72.2	183	237	145	31.2	9.87	8.37	6.32
(WY)	1942	1945	1946	1943	1945	1943	1941	1941	1941	1940	1940	1939
MIN	.000	.007	.000	1.90	2.41	1.70	1.14	.14	.000	.000	.000	.000
(WY)	1951	1952	1951	1948	1942	1951	1951	1942	1950	1950	1942	1948

SUMMARY STATISTICS	WATER YEARS 1939 - 1954	
ANNUAL MEAN	12.7	
HIGHEST ANNUAL MEAN	56.6	1941
LOWEST ANNUAL MEAN	.78	1951
HIGHEST DAILY MEAN	2350	Jan 23 1943
LOWEST DAILY MEAN	.00	Jun 19 1940
ANNUAL SEVEN-DAY MINIMUM	.00	Sep 10 1940
ANNUAL RUNOFF (AC-FT)	9190	
10 PERCENT EXCEEDS	16	
50 PERCENT EXCEEDS	1.0	
90 PERCENT EXCEEDS	.00	

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1995, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	33.9	43.3	77.4	158	232	253	132	103	63.9	40.8	36.8	34.6
MAX	117	191	469	1327	2096	1279	742	707	339	162	160	75.0
(WY)	1984	1984	1967	1993	1980	1980	1980	1983	1983	1969	1983	1983
MIN	12.4	13.2	14.8	13.2	11.6	10.6	12.5	9.35	13.0	9.08	9.97	9.93
(WY)	1968	1972	1970	1972	1968	1972	1972	1967	1971	1967	1967	1967

SUMMARY STATISTICS	WATER YEARS 1967 - 1995	
ANNUAL MEAN	100	
HIGHEST ANNUAL MEAN	441	1980
LOWEST ANNUAL MEAN	17.2	1968
HIGHEST DAILY MEAN	14800	Feb 25 1969
LOWEST DAILY MEAN	6.4	Jul 13 1967
ANNUAL SEVEN-DAY MINIMUM	8.1	Sep 16 1967
INSTANTANEOUS PEAK FLOW	28000	Feb 25 1969
INSTANTANEOUS PEAK STAGE	11.90	Feb 25 1969
ANNUAL RUNOFF (AC-FT)	72490	
10 PERCENT EXCEEDS	165	
50 PERCENT EXCEEDS	35	
90 PERCENT EXCEEDS	14	

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 2000, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	15.4	26.8	26.8	83.4	220	48.0	49.4	88.4	25.3	7.46	14.9	18.2
MAX	38.1	56.2	42.6	230	729	114	190	430	116	20.9	66.1	75.8
(WY)	1996	1997	1998	1997	1998	1998	1998	1998	1998	1999	1998	1998
MIN	4.97	8.96	14.6	14.1	7.57	.10	.000	.000	.000	.000	.000	.000
(WY)	1998	2000	2000	2000	1997	1997	1997	1996	1996	1996	1996	1996

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1996 - 2000	
ANNUAL TOTAL	5082.95		6564.84			
ANNUAL MEAN	13.9		17.9		51.1	
HIGHEST ANNUAL MEAN					152	1998
LOWEST ANNUAL MEAN					15.9	1999
HIGHEST DAILY MEAN	154	Apr 7	1230	Feb 21	5050	Feb 24 1998
LOWEST DAILY MEAN	.53	May 30	.00	May 14	.00	Mar 22 1996
ANNUAL SEVEN-DAY MINIMUM	1.5	May 26	.00	Sep 11	.00	Mar 22 1996
INSTANTANEOUS PEAK FLOW			4140	Feb 21	21100	Feb 23 1998
INSTANTANEOUS PEAK STAGE			5.56	Feb 21	7.70	Feb 23 1998
ANNUAL RUNOFF (AC-FT)	10080		13020		37000	
10 PERCENT EXCEEDS	23		17		100	
50 PERCENT EXCEEDS	8.5		5.6		7.0	
90 PERCENT EXCEEDS	4.0		.44		.00	

11073360 CHINO CREEK AT SCHAEFER AVENUE, NEAR CHINO, CA

LOCATION.—Lat 34°00'14", long 117°43'34", in Santa Ana del Chino Grant, San Bernardino County, Hydrologic Unit 18070203, on right bank, 300 ft downstream from Schaefer Avenue, 0.8 mi downstream from San Antonio Creek, and 1.5 mi southwest of Chino.

DRAINAGE AREA.—48.9 mi^2.

PERIOD OF RECORD.—October 1969 to current year.
CHEMICAL DATA: Water year 1998.
SEDIMENT DATA: Water year 1998.

REVISED RECORDS.—WDR CA-84-1: 1983(M). WDR CA-95-1: 1992, 1993.

GAGE.—Water-stage recorder and concrete-lined flood-control channel. Concrete dikes formed low-water control from October 1975 to Apr. 16, 1991. Elevation of gage is 685 ft above sea level, from topographic map.

REMARKS.—Records fair above 10 ft^3/s and poor below. Since 1997, due to construction in area of gage, Schaefer Avenue no longer extends to the Chino Creek crossing. The Schaefer Avenue Bridge, however, remains. Flow mostly regulated by San Antonio Flood-Control Reservoir, capacity, 7,700 acre-ft. Natural streamflow affected by extensive ground-water withdrawals, diversions for power, domestic use, irrigation, and return flow from irrigated areas. Releases of imported water are made to the basin by the California Water Project at times in some years, via San Antonio Creek from Rialto Pipeline below San Antonio Dam, at a site approximately 11 mi upstream. During the current year, 15,700 acre-ft was released. See schematic diagram of Santa Ana River Basin.

EXTREMES FOR PERIOD OF RECORD.—Maximum discharge, 12,700 ft^3/s, Feb. 27, 1983, gage height, 10.32 ft, from rating curve extended above 560 ft^3/s on basis of slope-conveyance study; no flow May 21, June 30, July 1, Oct. 30, Nov. 3, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.—Flood of Jan. 25, 1969, reached a stage of 9.23 ft, present datum, discharge, 9,200 ft^3/s, on basis of contracted-opening measurement at site 6.1 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	3.4	14	51	79	2.7	3.8	2.7	1.8	1.5	1.7	1.3
2	1.9	3.5	49	53	80	2.6	3.5	2.8	1.8	1.4	2.0	1.2
3	2.0	3.0	49	54	85	9.2	3.7	2.6	1.7	1.4	1.8	1.1
4	1.9	2.1	49	57	80	26	4.1	2.8	2.4	3.0	2.0	1.2
5	1.9	2.3	47	54	81	151	3.4	2.7	2.3	1.5	1.7	1.5
6	2.0	2.4	47	50	83	16	3.9	2.8	2.0	1.5	1.5	1.1
7	2.0	2.0	48	47	86	8.4	3.7	2.6	1.6	1.5	2.2	1.1
8	1.9	14	48	44	90	105	4.1	2.9	1.9	1.5	2.2	1.2
9	1.9	3.1	49	47	93	4.7	4.0	2.8	1.9	1.7	2.0	1.2
10	1.8	2.2	48	50	148	3.3	4.5	2.8	1.7	1.7	1.8	1.1
11	16	2.3	47	48	44	2.8	4.0	2.6	1.7	1.7	1.8	1.2
12	70	2.0	49	54	128	2.8	3.8	2.6	1.8	1.7	2.2	1.1
13	133	1.9	50	70	22	2.8	4.1	2.5	1.8	1.6	1.9	1.1
14	210	2.0	51	71	16	2.8	4.3	2.5	1.5	1.5	2.1	1.2
15	200	2.2	52	71	2.9	2.9	4.6	2.5	2.2	1.5	2.1	1.3
16	178	2.2	51	72	104	3.3	4.5	2.6	1.9	1.5	2.2	1.2
17	170	2.2	51	73	5.9	3.3	157	2.4	1.8	1.7	1.2	1.7
18	170	2.1	52	74	2.8	3.3	139	2.3	2.0	1.7	1.1	1.3
19	168	2.3	52	75	2.7	3.5	3.4	2.1	1.4	1.7	1.1	1.3
20	173	2.9	51	81	182	4.1	2.8	2.5	1.5	1.6	1.1	1.4
21	187	1.9	52	88	300	3.8	2.8	2.5	1.4	1.7	1.3	1.5
22	190	1.8	52	93	6.5	4.0	4.0	2.1	1.7	1.8	1.1	2.0
23	200	1.8	52	96	277	3.9	2.8	2.2	1.7	1.7	1.1	12
24	196	1.7	51	103	5.7	4.1	3.2	2.3	1.6	1.8	1.4	1.9
25	215	1.8	51	153	3.2	3.8	2.8	2.6	1.4	1.7	1.2	1.9
26	230	2.0	51	7.3	2.8	3.9	3.0	2.4	1.4	1.7	1.1	1.9
27	236	1.6	51	2.3	33	3.8	2.9	1.9	1.3	1.6	1.3	2.2
28	162	2.1	51	2.5	3.3	4.1	3.0	1.6	1.4	1.6	1.3	2.4
29	3.7	2.2	52	3.1	2.7	5.1	3.0	1.8	1.4	1.6	1.6	2.6
30	4.7	1.9	54	5.3	---	4.0	2.8	1.9	1.6	1.8	1.3	2.2
31	4.3	---	100	39	---	3.6	---	1.7	---	1.9	1.3	---
TOTAL	3135.9	78.9	1571	1788.5	2049.5	404.6	396.5	75.1	51.6	51.8	49.7	55.4
MEAN	101	2.63	50.7	57.7	70.7	13.1	13.2	2.42	1.72	1.67	1.60	1.85
MAX	236	14	100	153	300	151	157	2.9	2.4	3.0	2.2	12
MIN	1.8	1.6	14	2.3	2.7	2.6	2.8	1.6	1.3	1.4	1.1	1.1
AC-FT	6220	156	3120	3550	4070	803	786	149	102	103	99	110

11073495 CUCAMONGA CREEK NEAR MIRA LOMA, CA

LOCATION.—Lat 33°58'58", long 117°35'55", in SW 1/4 NE 1/4 sec.22, T.2 S., R.7 W., San Bernardino County, Hydrologic Unit 18070203, on right bank, 300 ft upstream from Merrill Avenue Bridge, and 4.6 mi west of Mira Loma.

DRAINAGE AREA.—75.8 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.—January 1968 to July 1977, January 1979 to current year.

GAGE.—Water-stage recorder and concrete-lined flood-control channel. Elevation of gage is 660 ft above sea level, from topographic map. Prior to July 1977 at site 100 ft downstream at different datum.

REMARKS.—Records poor. Channel is a trapezoidal concrete floodway; records for low and medium flows prior to July 31, 1977, are not equivalent (channel concrete lined since July 31, 1977). Inland Empire Utilities Agency Tertiary Plant No. 1 began discharging effluent 3.3 mi upstream from station on May 8, 1985. See schematic diagram of Santa Ana River Basin.

EXTREMES FOR PERIOD OF RECORD.—Maximum discharge, 16,100 ft^3/s, Feb. 27, 1983, gage height, 7.85 ft, from floodmark, on basis of slope-conveyance study of peak flow; prior to operation of Plant No. 1, no flow for most of some years; minimum daily, since 1985, 2.5 ft^3/s, June 6, 1987.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	30	34	38	35	41	40	44	44	38	60	33
2	36	30	33	31	42	e40	38	40	42	39	50	35
3	35	31	33	37	37	38	34	39	43	37	34	32
4	36	31	37	44	37	53	33	45	44	42	32	38
5	36	32	40	38	34	257	37	43	45	35	35	38
6	31	34	42	36	35	64	37	38	40	38	35	34
7	34	42	32	39	37	36	36	38	38	36	34	34
8	35	56	36	39	37	131	35	39	38	44	33	35
9	37	38	42	39	36	33	42	34	37	43	35	34
10	36	33	31	40	180	31	39	37	39	40	34	37
11	37	37	28	33	116	32	41	37	37	40	35	36
12	35	33	27	30	276	32	35	36	39	39	36	37
13	32	34	37	29	114	36	38	39	39	37	38	34
14	30	36	37	37	79	41	44	41	38	38	34	32
15	27	35	31	29	48	16	36	40	35	41	32	35
16	35	32	30	35	170	43	42	40	36	40	34	36
17	31	31	35	34	51	37	152	42	40	42	29	37
18	32	33	33	25	38	34	190	41	40	40	33	38
19	30	29	32	36	47	30	39	41	39	33	35	37
20	30	38	33	38	346	34	e40	39	41	35	34	34
21	27	34	35	33	475	39	e41	38	37	37	36	34
22	29	38	29	36	72	20	53	39	40	37	35	38
23	31	30	35	31	378	40	37	37	38	41	36	55
24	31	29	38	34	81	32	39	37	37	36	39	37
25	30	33	35	199	e40	35	41	36	41	35	35	36
26	31	27	29	61	e41	37	40	39	37	35	39	32
27	28	33	40	39	58	39	43	39	36	30	40	33
28	28	35	36	35	e42	38	40	40	34	31	38	34
29	28	38	36	36	e41	39	42	41	34	40	33	37
30	31	35	36	35	---	39	42	45	35	47	37	36
31	34	---	126	97	---	38	---	46	---	43	34	---
TOTAL	992	1027	1158	1343	3023	1455	1446	1230	1163	1189	1124	1078
MEAN	32.0	34.2	37.4	43.3	104	46.9	48.2	39.7	38.8	38.4	36.3	35.9
MAX	37	56	126	199	475	257	190	46	45	47	60	55
MIN	27	27	27	25	34	16	33	34	34	30	29	32
AC-FT	1970	2040	2300	2660	6000	2890	2870	2440	2310	2360	2230	2140

e Estimated.

11072100 TEMESCAL CREEK ABOVE MAIN STREET, AT CORONA, CA

LOCATION.—Lat 33°53'21", long 117°33'43", in La Sierra Grant, Riverside County, Hydrologic Unit 18070203, on right bank, 500 ft upstream from Main Street Bridge in Corona, and 1.5 mi upstream from topographic boundary of Prado Flood-Control Basin.

DRAINAGE AREA.—224 mi^2, excludes 768 mi^2 above Lake Elsinore.

PERIOD OF RECORD.—October 1980 to July 1983, February 1984 to current year. December 1967 to September 1974, water-stage recorder at site 1.2 mi downstream at different datum (published as station 11072200, Temescal Creek at Corona).

GAGE.—Water-stage recorder and concrete-lined flood-control channel. Elevation of gage is 600 ft above sea level, from topographic map. October 1980 to July 1983 at site 500 ft downstream at different datum.

REMARKS.—Records fair except for estimated daily discharges, which are poor. Flow regulated by several small storage reservoirs. Many diversions upstream from station for irrigation. Water discharged to channel from Arlington Desalter at times since September 1990; records for water years 1981 to 1990 and 1991 to current year are not equivalent. See schematic diagram of Santa Ana River Basin.

EXTREMES FOR PERIOD OF RECORD.—Maximum discharge, 4,720 ft^3/s, Mar. 1, 1983, gage height, 11.67 ft, site and datum then in use, on basis of slope-conveyance study; minimum daily, 0.27 ft^3/s, Sept. 25, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.—Maximum discharge, 8,850 ft^3/s, Feb. 25, 1969, gage height, 8.17 ft, from floodmark, at old site (station 11072200) 1.2 mi downstream on basis of slope-area measurement of peak flow.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	13	11	15	12	12	11	12	15	14	12	9.1
2	11	17	11	16	9.3	10	12	12	14	13	14	12
3	11	16	14	14	6.2	21	12	13	15	14	13	12
4	11	16	14	13	8.4	31	12	14	15	13	14	12
5	11	14	13	12	15	118	14	13	14	13	13	12
6	13	15	15	12	15	17	7.7	13	15	15	13	13
7	8.4	16	15	13	14	4.6	e14	13	16	15	13	12
8	7.5	17	14	14	15	104	e14	14	15	15	13	6.3
9	12	14	13	13	15	5.3	e13	15	15	14	13	14
10	12	15	13	6.0	28	3.8	e14	8.6	16	15	13	14
11	12	17	8.0	9.6	15	3.7	e13	4.6	15	15	13	14
12	12	15	8.3	14	55	2.9	e13	4.6	14	14	8.1	13
13	11	13	12	15	29	2.9	e12	e14	14	12	14	13
14	11	12	11	16	27	2.8	e12	e13	14	14	14	13
15	13	7.9	11	17	13	3.2	e13	e13	13	14	15	13
16	14	7.1	13	10	46	3.4	e13	e12	14	15	16	14
17	12	7.5	14	14	29	2.6	92	e10	14	16	14	14
18	11	6.3	13	21	17	2.3	109	e9.0	14	17	14	14
19	10	5.4	12	12	16	2.2	20	e12	12	15	14	14
20	11	5.5	12	17	95	5.4	18	e12	9.4	19	14	15
21	9.3	6.2	13	27	222	13	21	e12	14	16	14	17
22	3.4	5.5	26	26	19	12	20	e11	14	8.3	13	17
23	13	3.7	13	25	108	13	18	e10	12	e6.0	13	18
24	12	7.7	21	20	4.7	13	16	e12	11	e15	13	16
25	13	14	13	109	3.1	13	11	e14	12	e15	13	15
26	14	13	14	37	2.4	15	13	e13	12	e16	14	16
27	15	12	14	19	6.2	14	13	e13	11	e16	13	15
28	12	11	13	16	2.7	13	13	e14	13	17	12	14
29	13	10	13	15	5.6	13	13	e14	13	14	13	14
30	15	11	15	16	---	14	13	e15	13	15	12	12
31	12	---	38	16	---	12	---	e8.5	---	14	10	---
TOTAL	355.6	343.8	440.3	599.6	853.6	503.1	589.7	368.3	408.4	444.3	407.1	407.4
MEAN	11.5	11.5	14.2	19.3	29.4	16.2	19.7	11.9	13.6	14.3	13.1	13.6
MAX	15	17	38	109	222	118	109	15	16	19	16	18
MIN	3.4	3.7	8.0	6.0	2.4	2.2	7.7	4.6	9.4	6.0	8.1	6.3
AC-FT	705	682	873	1190	1690	998	1170	731	810	881	807	808

e Estimated.

11074000 SANTA ANA RIVER BELOW PRADO DAM, CA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.—Water years 1967 to current year.
CHEMICAL DATA: Water years 1967 to current year.
SPECIFIC CONDUCTANCE: Water years 1970 to current year.
WATER TEMPERATURE: Water years 1970 to current year.
BIOLOGICAL DATA: Water years 1975–81.
SEDIMENT DATA: Water years 1974–94, 1999 to current year.

PERIOD OF DAILY RECORD.—Water years 1970 to current year.
SPECIFIC CONDUCTANCE: October 1969 to current year.
WATER TEMPERATURE: October 1969 to current year.
CHLORIDE: October 1970 to September 1971.
SUSPENDED-SEDIMENT DISCHARGE: October 1973 to June 1982.

INSTRUMENTATION.—Water-quality monitor recording specific conductance and water temperature since October 1969.

REMARKS.—Specific-conductance and water-temperature values are affected by releases from Prado Dam. Interruptions in record at times due to malfunction of recording or sensing equipment. Sediment data and a portion of chemical data collected for the National Water-Quality Assessment (NAWQA) Program.

EXTREMES FOR PERIOD OF DAILY RECORD.—
SPECIFIC CONDUCTANCE: Maximum recorded, 1,830 microsiemens, Apr. 30, 1971; minimum recorded, 220 microsiemens, Feb. 20, 1978.
WATER TEMPERATURE: Maximum recorded, 36.0°C, Sept. 4, 1972, Sept. 8, 1984; minimum recorded, 2.5°C, Dec. 30, 1969.
SEDIMENT CONCENTRATION: Maximum daily mean, 2,870 mg/L, Mar. 5, 1978; minimum daily mean, 3 mg/L, Apr. 2, 1980, and several days during 1982.
SEDIMENT LOAD: Maximum daily, 18,900 tons, Mar. 5, 1978; minimum daily, 0.58 ton, Sept. 20, 1978.

EXTREMES FOR CURRENT YEAR.—
SPECIFIC CONDUCTANCE: Maximum recorded, 1,070 microsiemens, Apr. 14, May 20; minimum recorded, 392 microsiemens, Feb. 24.
WATER TEMPERATURE: Maximum recorded, 29.0°C, June 26-27, Aug.1; minimum recorded, 10.0°C, Jan. 8.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT										
01...	1200	194	--	--	--	--	964	--	21.5	--
15...	1230	355	746	87	7.8	8.0	753	23.5	19.5	200
18...	1200	349	--	--	--	--	759	--	18.0	--
NOV										
05...	1150	197	--	--	--	--	996	--	19.0	--
17...	1000	174	750	97	9.0	8.2	952	18.5	18.5	260
18...	1245	170	--	--	--	--	959	--	16.5	--
DEC										
06...	1430	266	--	--	--	--	918	--	12.0	--
15...	1010	282	756	94	10.4	8.3	888	19.0	11.0	240
15...	1145	282	--	--	--	--	897	--	11.0	--
JAN										
12...	1240	290	--	--	--	--	935	--	13.0	--
13...	1120	345	755	94	10.0	7.8	866	18.0	12.5	220
20...	1130	333	--	--	--	--	873	--	15.0	--
25...	1850	382	749	85	8.3	7.7	512	20.0	15.5	140
31...	1330	336	753	91	8.9	7.9	718	17.0	15.5	200
FEB										
04...	1230	310	--	--	--	--	881	--	14.0	--
12...	1300	307	750	85	8.6	8.1	719	17.5	15.0	200
17...	1210	471	752	90	9.0	7.8	858	16.0	15.5	230
18...	1300	461	--	--	--	--	740	--	15.5	--
MAR										
09...	1325	505	--	--	--	--	644	--	14.0	--
17...	1300	379	758	96	9.3	8.1	790	26.0	16.5	210
21...	1330	387	--	--	--	--	942	--	18.0	--
APR										
11...	1210	244	--	--	--	--	1010	--	19.5	--
13...	1530	231	751	100	8.5	8.2	1020	25.5	23.5	280
21...	1325	394	--	--	--	--	600	19.0	17.5	--
MAY										
02...	1245	383	--	--	--	--	981	--	22.0	--
11...	1430	210	750	101	8.6	8.2	1010	24.5	23.5	260
24...	1210	195	--	--	--	--	988	--	20.5	--
JUN										
09...	1320	211	--	--	--	--	1000	--	22.0	--
14...	1030	204	747	90	7.9	8.2	960	24.5	22.0	250
20...	1245	206	--	--	--	--	1010	--	24.0	--
JUL										
06...	1140	187	--	--	--	--	992	--	22.5	--
13...	1530	190	750	101	8.1	8.2	975	30.0	25.5	250
21...	1110	181	--	--	--	--	1010	--	23.5	--

11074000 SANTA ANA RIVER BELOW PRADO DAM, CA—Continued

AUG										
04...	1200	168	--	--	--	--	1000	--	25.0	--
17...	1050	169	749	95	7.9	8.2	965	30.0	23.5	250
18...	1220	166	--	--	--	--	988	--	24.5	--
SEP										
01...	1130	194	--	--	--	--	972	--	22.0	--
13...	1010	159	746	88	7.6	8.2	963	30.0	21.5	250
14...	1120	161	--	--	--	--	970	28.5	22.5	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SODIUM ADSORPTION RATIO (00931)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
OCT										
01...	--	--	--	--	--	--	--	--	--	--
15...	52	56.4	15.4	8.3	2	70.1	42	151	185	--
18...	--	--	--	--	--	--	--	--	--	--
NOV										
05...	--	--	--	--	--	--	--	--	--	--
17...	64	75.2	17.3	11.2	2	88.7	41	195	238	--
18...	--	--	--	--	--	--	--	--	--	--
DEC										
06...	--	--	--	--	--	--	--	--	--	--
15...	53	65.8	17.2	8.0	2	85.5	43	183	218	2
15...	--	--	--	--	--	--	--	--	--	--
JAN										
12...	--	--	--	--	--	--	--	--	--	--
13...	52	62.2	16.8	8.0	2	83.0	44	172	210	--
20...	--	--	--	--	--	--	--	--	--	--
25...	38	37.9	10.0	10.3	2	45.4	40	98	119	--
31...	41	56.8	13.9	8.3	2	66.8	41	159	193	--
FEB										
04...	--	--	--	--	--	--	--	--	--	--
12...	48	57.0	14.2	9.0	2	64.5	40	153	187	--
17...	63	64.6	16.0	8.6	2	68.9	39	164	200	--
18...	--	--	--	--	--	--	--	--	--	--
MAR										
09...	--	--	--	--	--	--	--	--	--	--
17...	42	61.8	14.6	11.2	2	63.9	38	172	210	--
21...	--	--	--	--	--	--	--	--	--	--
APR										
11...	--	--	--	--	--	--	--	--	--	--
13...	69	82.1	18.1	10.4	2	93.2	41	210	256	--
21...	--	--	--	--	--	--	--	--	--	--
MAY										
02...	--	--	--	--	--	--	--	--	--	--
11...	54	75.9	17.8	10.4	2	91.0	42	208	254	--
24...	--	--	--	--	--	--	--	--	--	--
JUN										
09...	--	--	--	--	--	--	--	--	--	--
14...	46	71.3	17.5	10.1	3	94.4	44	204	249	--
20...	--	--	--	--	--	--	--	--	--	--
JUL										
06...	--	--	--	--	--	--	--	--	--	--
13...	50	71.8	17.5	7.9	3	94.2	44	201	245	--
21...	--	--	--	--	--	--	--	--	--	--
AUG										
04...	--	--	--	--	--	--	--	--	--	--
17...	56	70.9	18.0	10.3	3	94.5	44	195	238	--
18...	--	--	--	--	--	--	--	--	--	--
SEP										
01...	--	--	--	--	--	--	--	--	--	--
13...	46	69.0	17.7	11.0	3	95.7	45	199	243	--
14...	--	--	--	--	--	--	--	--	--	--

11074000 SANTA ANA RIVER BELOW PRADO DAM, CA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)
OCT										
01...	--	--	--	--	--	--	--	--	--	--
15...	83.2	.3	18.3	81.4	.71	.75	.184	2.88	.065	.655
18...	--	--	--	--	--	--	--	--	--	--
NOV										
05...	--	--	--	--	--	--	--	--	--	--
17...	106	.4	21.2	103	.68	1.3	.118	5.92	.060	.822
18...	--	--	--	--	--	--	--	--	--	--
DEC										
06...	--	--	--	--	--	--	--	--	--	--
15...	101	.4	19.4	91.3	.54	1.1	.046	5.57	.037	.850
15...	--	--	--	--	--	--	--	--	--	--
JAN										
12...	--	--	--	--	--	--	--	--	--	--
13...	101	.4	18.2	87.1	.66	1.8	.139	5.57	.046	.696
20...	--	--	--	--	--	--	--	--	--	--
25...	56.5	.3	9.7	52.6	2.3	3.3	1.04	4.04	.105	.730
31...	72.7	.5	15.1	74.6	1.1	1.9	.400	4.59	.090	.647
FEB										
04...	--	--	--	--	--	--	--	--	--	--
12...	73.2	.4	16.0	76.5	.79	1.5	.324	4.95	.079	.673
17...	84.0	.4	17.5	101	1.1	1.4	.594	5.08	.146	.621
18...	--	--	--	--	--	--	--	--	--	--
MAR										
09...	--	--	--	--	--	--	--	--	--	--
17...	75.8	.4	16.0	84.2	1.2	1.9	.393	4.02	.144	.883
21...	--	--	--	--	--	--	--	--	--	--
APR										
11...	--	--	--	--	--	--	--	--	--	--
13...	108	.5	19.8	111	.65	1.4	.108	5.63	.068	.682
21...	--	--	--	--	--	--	--	--	--	--
MAY										
02...	--	--	--	--	--	--	--	--	--	--
11...	109	.5	20.3	109	.61	1.5	.058	5.55	.055	.900
24...	--	--	--	--	--	--	--	--	--	--
JUN										
09...	--	--	--	--	--	--	--	--	--	--
14...	111	.5	20.9	103	.61	1.1	.099	5.12	.070	.943
20...	--	--	--	--	--	--	--	--	--	--
JUL										
06...	--	--	--	--	--	--	--	--	--	--
13...	111	.4	22.0	104	.52	1.1	.027	4.94	.043	.752
21...	--	--	--	--	--	--	--	--	--	--
AUG										
04...	--	--	--	--	--	--	--	--	--	--
17...	104	.4	21.5	102	.71	1.0	.091	5.65	.075	.966
18...	--	--	--	--	--	--	--	--	--	--
SEP										
01...	--	--	--	--	--	--	--	--	--	--
13...	106	.4	20.5	101	.75	1.3	.116	5.47	.096	.853
14...	--	--	--	--	--	--	--	--	--	--

11074000 SANTA ANA RIVER BELOW PRADO DAM, CA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTIC-ULATE TOTAL (MG/L AS C) (00689)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)
OCT										
01...	--	--	--	--	--	582	--	--	--	--
15...	.628	.664	5.9	1.9	.61	450	439	20	63	e16
18...	--	--	--	--	--	453	--	--	--	--
NOV										
05...	--	--	--	--	--	613	--	--	--	--
17...	.850	1.21	4.4	1.0	.78	574	569	10	52	e11
18...	--	--	--	--	--	592	--	--	--	--
DEC										
06...	--	--	--	--	--	550	--	--	--	--
15...	.738	.980	3.9	.7	.74	546	525	e10	52	e19
15...	--	--	--	--	--	546	--	--	--	--
JAN										
12...	--	--	--	--	--	559	--	--	--	--
13...	.651	1.57	3.8	1.0	.72	528	507	10	82	92
20...	--	--	--	--	--	524	--	--	--	--
25...	.584	1.16	14	4.2	.44	327	302	70	84	48
31...	.551	1.01	8.4	.7	.60	444	426	20	74	22
FEB										
04...	--	--	--	--	--	521	--	--	--	--
12...	.608	.955	6.9	1.0	.62	457	427	20	20	91
17...	.550	.780	5.4	.9	.72	526	484	10	20	36
18...	--	--	--	--	--	450	--	--	--	--
MAR										
09...	--	--	--	--	--	388	--	--	--	--
17...	.829	1.34	6.2	.8	.66	482	452	10	148	139
21...	--	--	--	--	--	579	--	--	--	--
APR										
11...	--	--	--	--	--	620	--	--	--	--
13...	.677	1.42	4.7	4.9	.82	606	596	10	147	e14
21...	--	--	--	--	--	365	--	--	--	--
MAY										
02...	--	--	--	--	--	604	--	--	--	--
11...	.819	1.92	4.4	3.3	.82	604	587	e10	135	23
24...	--	--	--	--	--	609	--	--	--	--
JUN										
09...	--	--	--	--	--	601	--	--	--	--
14...	.916	1.21	4.7	1.8	.81	597	577	e10	73	e11
20...	--	--	--	--	--	607	--	--	--	--
JUL										
06...	--	--	--	--	--	600	--	--	--	--
13...	.751	1.03	4.7	2.6	.81	595	573	<10	42	<20
21...	--	--	--	--	--	599	--	--	--	--
AUG										
04...	--	--	--	--	--	598	--	--	--	--
17...	.964	1.17	4.4	1.2	.79	582	567	e10	48	e15
18...	--	--	--	--	--	596	--	--	--	--
SEP										
01...	--	--	--	--	--	584	--	--	--	--
13...	.785	1.06	4.8	2.7	.78	575	568	10	55	<20
14...	--	--	--	--	--	598	--	--	--	--

e Estimated.
< Actual value is known to be less than the value shown.

11074000 SANTA ANA RIVER BELOW PRADO DAM, CA—Continued

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	SAMPLE LOC-ATION, CROSS SECTION (FT FM L BANK) (00009)
APR								
13...	1541	751	102	8.5	8.1	1010	23.5	4.00
13...	1542	751	102	8.5	8.1	1010	23.5	11.0
13...	1543	751	102	8.5	8.1	1010	23.5	18.0
13...	1544	751	102	8.5	8.1	1010	23.5	25.0
13...	1545	751	101	8.4	8.1	1010	23.5	32.0

Instantaneous discharge at the time of cross-sectional measurements: 233 ft^3/s.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
15...N	1230	355	19.5	230	220	67
NOV						
17...N	1000	174	18.5	177	83	52
DEC						
15...N	1010	282	11.0	105	80	64
JAN						
13...N	1120	345	12.5	553	515	71
25...N	1850	382	15.5	260	268	70
31...N	1330	336	15.5	241	219	59
FEB						
12...N	1300	307	15.0	216	179	67
17...N	1210	471	15.5	68	86	50
MAR						
17...N	1300	379	16.5	239	245	51
APR						
13...N	1530	231	23.5	427	266	77
MAY						
11...N	1430	210	23.5	604	342	73
JUN						
14...N	1030	204	22.0	119	66	93
JUL						
13...N	1530	190	25.5	120	62	82
AUG						
17...N	1050	169	23.5	80	37	92
SEP						
13...N	1010	159	21.5	65	28	93

N Suspended-sediment concentration value determined from sample collected and processed according to National Water-Quality Assessment (NAWQA) Program protocol.

11074000 SANTA ANA RIVER BELOW PRADO DAM, CA—Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	971	939	984	964	971	953	921	770	827	791	694	615
2	962	920	989	977	960	905	927	852	856	821	794	608
3	967	925	991	977	937	881	923	828	866	849	785	662
4	965	923	994	974	945	935	887	824	888	863	856	697
5	966	932	992	960	940	912	962	869	915	879	1050	763
6	982	947	988	956	922	897	913	873	941	897	1030	606
7	972	938	958	908	921	860	896	872	944	904	660	631
8	957	935	939	883	925	862	951	891	955	880	698	632
9	951	924	942	927	897	869	931	904	888	830	702	618
10	948	915	933	923	923	872	915	899	862	641	675	569
11	1000	934	957	929	923	873	928	891	739	585	680	617
12	1000	934	946	933	924	871	942	915	751	697	681	651
13	976	898	952	932	905	865	930	848	697	631	697	658
14	918	780	965	935	954	876	860	836	785	673	714	660
15	781	741	968	954	914	885	851	825	763	704	794	682
16	758	744	969	949	916	886	869	830	795	718	820	732
17	782	750	969	952	941	902	880	862	873	733	826	764
18	762	748	974	950	910	871	880	869	806	737	867	815
19	764	733	978	928	916	873	877	864	932	768	908	820
20	771	758	967	930	898	866	897	869	882	805	900	846
21	758	717	986	923	881	858	913	881	908	436	1000	869
22	720	708	982	924	899	872	932	900	575	436	954	858
23	721	713	983	925	890	862	925	880	537	408	964	901
24	736	721	965	926	888	856	897	866	543	392	996	925
25	746	733	972	927	892	873	878	512	511	422	977	933
26	756	742	981	927	882	854	607	551	543	455	981	942
27	776	754	978	926	869	842	693	597	656	502	988	962
28	811	775	971	926	969	809	804	693	702	541	996	967
29	953	811	965	931	978	919	857	796	708	581	1000	975
30	965	950	969	937	946	912	877	836	---	---	1020	976
31	967	949	---	---	948	894	844	711	---	---	1020	972
MONTH	1000	708	994	883	978	809	962	512	955	392	1050	569

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	1030	974	1010	951	1010	974	1000	943	982	962	987	959
2	1050	979	1000	947	985	964	994	950	989	966	982	930
3	1050	994	1040	996	984	950	999	947	1010	988	970	904
4	1050	1010	1040	997	999	957	1020	951	1010	966	955	883
5	1060	1020	1020	991	1020	985	1010	956	1010	937	948	887
6	1050	1020	1020	993	1030	977	997	947	950	883	937	886
7	1060	1030	1020	982	1040	990	949	920	898	851	945	890
8	1050	1010	1020	979	1020	977	962	921	872	845	941	899
9	1030	987	1020	984	1010	975	972	919	862	838	960	904
10	1040	999	1010	974	999	944	967	925	866	838	980	908
11	1030	1000	1020	988	974	907	954	941	896	855	960	914
12	1030	997	1030	973	985	885	964	944	920	868	980	920
13	1020	988	1030	968	987	884	971	956	928	871	987	924
14	1070	989	1060	1000	977	901	983	958	929	875	988	926
15	1050	1020	1050	1000	967	883	980	952	949	901	971	927
16	1040	1010	1040	1010	989	891	981	952	966	910	953	881
17	1030	573	1050	996	954	900	979	956	963	927	934	866
18	779	490	1020	990	1030	907	986	964	992	891	922	881
19	603	557	1020	1000	1020	967	997	971	966	907	935	834
20	642	553	1070	991	1010	934	1010	978	941	890	969	845
21	714	570	1020	984	983	933	1010	976	914	866	937	907
22	784	629	1010	966	957	917	1020	963	916	885	922	878
23	829	724	1030	986	981	909	1010	951	907	861	884	749
24	886	797	992	961	1000	938	1000	948	912	877	902	836
25	925	835	1000	963	985	948	970	942	980	880	882	840
26	946	886	987	954	974	944	983	927	989	936	938	844
27	955	915	977	940	976	930	996	945	977	927	948	924
28	963	922	980	936	967	922	1000	963	968	921	1010	936
29	1000	945	980	896	964	926	1000	971	969	937	1030	993
30	1010	969	1020	927	988	934	987	971	976	949	1040	1010
31	---	---	1010	984	---	---	988	970	973	949	---	---
MONTH	1070	490	1070	896	1040	883	1020	919	1010	838	1040	749

11074000 SANTA ANA RIVER BELOW PRADO DAM, CA—Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	24.0	20.5	20.5	17.0	15.5	14.5	13.5	12.0	16.5	14.0	14.5	13.5
2	24.0	20.5	20.0	16.5	15.5	14.0	13.0	12.0	17.0	14.0	14.5	14.0
3	23.5	20.5	20.0	16.5	15.0	13.0	12.0	11.5	16.0	12.5	15.0	14.5
4	23.5	19.5	19.5	17.0	13.5	12.0	13.0	11.5	16.0	13.0	15.5	15.0
5	23.5	20.0	19.5	18.0	14.0	12.0	13.5	11.5	16.5	14.0	15.5	13.0
6	22.5	20.0	19.5	17.0	14.0	12.0	13.0	11.0	17.0	14.0	13.5	12.5
7	22.0	19.0	20.0	18.0	14.0	12.5	13.0	10.5	17.0	14.0	13.0	12.5
8	23.5	19.5	20.0	17.5	14.0	12.5	13.0	10.0	17.0	14.5	13.5	13.0
9	24.0	19.5	19.5	16.5	13.0	11.5	13.0	10.5	17.0	14.5	14.0	13.5
10	23.5	20.0	19.5	16.5	13.0	12.5	13.5	11.0	16.5	15.0	14.0	13.5
11	23.5	20.0	19.5	16.0	13.5	12.0	14.0	11.5	15.5	14.5	14.0	13.5
12	23.5	19.5	19.5	16.0	13.0	11.5	14.0	13.0	15.0	14.5	14.0	13.5
13	23.5	19.5	20.0	16.0	13.0	11.5	14.5	12.0	15.0	15.0	14.5	14.0
14	23.0	19.5	19.5	17.0	13.0	11.5	15.0	12.0	15.5	15.0	15.0	14.0
15	22.0	19.5	20.0	17.5	12.5	11.0	15.5	12.5	15.5	15.0	15.5	14.5
16	22.5	19.5	19.5	16.5	13.5	12.0	15.0	13.5	15.5	15.0	16.0	15.0
17	22.0	18.5	19.5	18.5	13.5	12.0	15.5	14.0	16.0	15.0	17.0	15.5
18	20.5	17.5	18.5	16.5	14.0	12.5	16.5	14.5	15.5	15.0	17.0	16.5
19	21.0	16.5	17.5	16.0	14.0	12.5	16.5	14.0	16.0	15.0	17.5	17.0
20	21.5	17.5	17.5	17.0	14.0	12.5	17.0	15.0	16.0	15.0	18.5	17.5
21	21.0	17.5	17.5	16.5	14.5	12.5	17.0	15.0	16.0	14.0	18.0	17.0
22	21.0	17.5	16.5	15.0	14.0	12.0	16.0	14.0	14.0	13.5	17.5	17.0
23	21.0	18.0	15.0	13.5	13.0	11.5	15.5	13.5	13.5	13.0	18.0	17.0
24	21.0	18.0	14.0	13.0	13.5	12.0	17.0	14.5	13.5	12.5	18.0	17.0
25	21.5	18.0	14.0	13.0	13.5	11.5	17.0	15.0	13.0	12.5	17.5	17.0
26	21.0	18.0	14.5	13.5	13.5	11.5	16.0	15.0	13.5	13.0	18.0	17.0
27	20.5	17.5	14.5	14.0	14.0	12.5	15.5	15.0	14.5	13.0	18.0	17.0
28	20.0	18.0	15.0	14.5	14.0	12.5	15.5	14.5	14.0	13.0	17.5	17.5
29	21.0	18.5	15.5	14.5	14.0	12.0	16.5	14.0	14.5	13.5	17.5	17.5
30	20.5	17.5	15.5	15.0	13.5	11.5	17.0	15.0	---	---	18.0	17.5
31	21.0	16.5	---	---	13.5	12.5	16.5	15.5	---	---	18.5	17.5
MONTH	24.0	16.5	20.5	13.0	15.5	11.0	17.0	10.0	17.0	12.5	18.5	12.5

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	18.5	17.5	24.0	21.5	26.5	20.5	28.0	22.5	29.0	24.0	24.0	21.0
2	18.5	17.5	24.0	22.0	26.5	21.0	27.5	22.0	28.5	24.5	24.5	20.5
3	19.5	18.5	25.5	21.0	27.0	20.5	27.0	22.5	28.0	23.5	24.5	20.0
4	20.5	19.0	25.5	20.5	27.0	20.5	26.5	21.5	28.0	23.0	25.0	20.0
5	21.0	19.5	24.5	21.0	27.0	21.0	26.5	21.0	28.5	23.0	25.0	20.0
6	21.0	20.0	25.0	20.5	27.0	20.5	26.5	21.0	28.0	23.5	25.0	20.0
7	21.5	19.0	24.5	20.0	26.5	20.5	26.5	21.5	27.5	23.5	25.0	20.5
8	23.5	18.5	25.0	20.5	24.0	20.5	26.5	21.5	27.5	22.5	25.0	21.0
9	23.0	18.0	25.5	20.0	25.0	18.5	26.5	21.5	27.0	23.0	24.5	20.0
10	22.5	18.0	25.0	21.0	25.5	19.5	26.0	21.5	27.0	22.0	25.0	19.5
11	24.0	18.0	24.0	19.0	26.5	20.0	26.0	21.0	27.5	22.5	25.5	20.0
12	24.5	18.5	24.5	18.0	26.5	20.5	26.0	21.0	27.5	22.5	25.0	20.5
13	24.0	19.0	24.0	18.0	27.0	21.0	27.0	21.0	27.5	22.5	25.0	21.0
14	21.5	18.5	24.0	18.5	27.5	21.5	27.0	21.5	27.5	23.0	26.0	22.0
15	21.0	17.5	24.0	18.5	27.5	22.0	27.5	22.5	27.5	23.5	26.5	22.5
16	22.5	17.5	22.5	18.5	26.5	22.0	27.0	22.0	28.0	23.5	27.5	22.5
17	20.5	17.5	23.5	17.5	26.5	22.0	27.0	21.5	27.5	23.5	27.0	23.0
18	17.5	16.0	25.0	18.0	26.5	22.0	28.5	22.0	27.0	23.0	26.5	23.0
19	17.0	16.0	25.5	19.0	27.0	22.0	28.5	22.5	27.5	22.0	26.0	22.5
20	17.5	16.5	26.5	20.0	27.0	21.5	28.0	22.5	26.5	21.5	25.0	22.5
21	17.5	17.0	27.0	20.5	27.0	22.0	27.5	22.5	27.0	22.0	24.0	22.5
22	18.5	17.5	26.5	20.5	27.5	22.0	28.0	22.5	26.5	22.5	22.5	21.0
23	19.0	18.5	24.0	20.5	27.0	22.0	28.5	23.5	27.0	22.0	23.5	21.0
24	20.0	19.0	22.5	20.0	27.5	22.0	28.0	23.0	27.0	23.0	24.5	20.0
25	21.0	19.5	21.0	19.0	28.0	22.5	28.5	23.0	27.0	24.0	24.5	20.5
26	22.0	21.0	25.0	19.0	29.0	23.5	28.5	23.0	27.0	23.0	24.5	21.0
27	23.0	22.0	27.0	20.0	29.0	23.0	28.0	23.0	25.5	22.5	23.5	22.0
28	23.0	22.5	27.5	21.0	28.5	23.0	28.5	23.0	25.5	22.5	22.5	22.0
29	22.5	21.5	27.0	21.5	28.5	23.0	27.0	23.0	24.5	22.5	22.5	21.5
30	22.5	20.5	26.0	21.5	28.0	23.0	27.5	23.0	24.5	21.5	22.0	21.0
31	---	---	25.5	21.0	---	---	28.0	23.0	24.5	21.5	---	---
MONTH	24.5	16.0	27.5	17.5	29.0	18.5	28.5	21.0	29.0	21.5	27.5	19.5

DISTRICT CODE 06

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
11066460 - SANTA ANA R A MWD CROSSING CA

PROCESS DATE 1-30-01

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
OCT					
06...	0845	85	1020	17.5	624
19...	0955	90	899	18.0	533
NOV					
01...	0940	84	913	19.0	560
12...	0855	87	900	16.0	544
DEC					
03...	0835	85	890	12.0	--
21...	0930	85	992	13.0	603
JAN					
06...	0945	90	1020	11.0	634
18...	0940	88	931	17.0	550
25...	1130	156	675	17.0	412
26...	0955	197	637	16.5	379
FEB					
03...	0835	93	893	12.5	544
12...	0950	1630	310	13.5	211
15...	0955	97	875	18.0	541
MAR					
01...	1015	101	891	17.5	545
10...	1215	154	828	21.0	508
APR					
04...	1030	101	914	20.0	552
18...	0940	630	383	14.5	252
MAY					
01...	0930	93	876	20.0	537
18...	1325	75	904	28.0	555
JUN					
01...	1005	90	895	22.0	544
19...	0915	85	907	21.5	557
JUL					
03...	0920	70	905	22.0	547
18...	0835	82	920	20.5	565
AUG					
02...	0835	85	904	22.5	551
16...	0845	80	935	22.5	570
SEP					
01...	1105	93	891	23.5	549
13...	1205	67	933	27.0	570

DISTRICT CODE 06

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
11074000 - SANTA ANA R BL PRADO DAM CA

PROCESS DATE 1-30-01

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
OCT					
01...	1200	194	964	21.5	582
18...	1200	349	759	18.0	453
NOV					
05...	1150	197	996	19.0	613
18...	1245	170	959	16.5	592
DEC					
06...	1430	266	918	12.0	550
15...	1145	282	897	11.0	546
JAN					
12...	1240	290	935	13.0	559
20...	1130	333	873	15.0	524
FEB					
04...	1230	310	881	14.0	521
18...	1300	461	740	15.5	450
MAR					
09...	1325	505	644	14.0	388
21...	1330	387	942	18.0	579
APR					
11...	1210	244	1010	19.5	620
21...	1325	394	600	17.5	365
MAY					
02...	1245	383	981	22.0	604
24...	1210	195	988	20.5	609
JUN					
09...	1320	211	1000	22.0	601
20...	1245	206	1010	24.0	607
JUL					
06...	1140	187	992	22.5	600
21...	1110	181	1010	23.5	599
AUG					
04...	1200	168	1000	25.0	598
18...	1220	166	988	24.5	596
SEP					
01...	1130	194	972	22.0	584
14...	1120	161	970	22.5	598

11066460 SANTA ANA RIVER AT MWD CROSSING, NEAR ARLINGTON, CA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.—Water years 1970 to current year.
CHEMICAL DATA: Water years 1970 to current year.
SEDIMENT DATA: October 1998 to September 2000 (discontinued).

PERIOD OF DAILY RECORD.—Water years 1970–78, November 1998 to September 2000 (discontinued).
SPECIFIC CONDUCTANCE: Water years 1970–78, November 1998 to September 2000 (discontinued).
WATER TEMPERATURE: November 1998 to September 2000 (discontinued).

INSTRUMENTATION.—Water-quality monitor recording specific conductance and water temperature since November 1998.

REMARKS.—Interruption in record due to malfunction of recording equipment. Continuous specific-conductance and water-temperature data represent conditions on left bank. Sediment, cross-sectional, and continuous-monitor data, as well as most of the chemical data presented below, collected for the National Water-Quality Assessment (NAWQA) Program.

EXTREMES FOR PERIOD OF DAILY RECORD.—
SPECIFIC CONDUCTANCE: Maximum recorded, 1,320 microsiemens, Nov. 24, 1969; minimum recorded, 95 microsiemens, Nov. 27, 1970.
WATER TEMPERATURE: Maximum recorded, 30.5°C, July 11, 1999, June 13, 2000; minimum recorded, 6.0°C, Jan. 29, 1999.

EXTREMES FOR CURRENT YEAR.—
SPECIFIC CONDUCTANCE: Maximum recorded, 1,130 microsiemens, June 25; minimum recorded, 177 microsiemens, Feb. 21.
WATER TEMPERATURE: Maximum recorded, 30.5°C, June 13; minimum recorded, 9.0°C, Jan. 8.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)
OCT										
06...	0845	85	745	--	--	--	1020	15.5	17.5	--
14...	1130	77	742	107	8.8	8.2	911	24.5	23.5	290
19...	0955	90	745	--	--	--	899	23.0	18.0	--
NOV										
01...	0940	84	740	--	--	--	913	24.5	19.0	--
12...	0855	87	745	--	--	--	900	17.5	16.0	--
16...	1630	77	743	95	8.3	8.2	930	21.0	20.5	310
DEC										
03...	0835	85	--	--	--	--	890	14.5	12.0	--
14...	1450	85	748	101	10.0	8.4	891	17.0	15.0	270
21...	0930	85	745	--	--	--	992	15.0	13.0	--
JAN										
06...	0945	90	750	--	--	--	1020	16.5	11.0	--
12...	1110	93	749	97	9.3	8.3	872	11.5	17.5	270
18...	0940	88	--	--	--	--	931	18.0	17.0	--
25...	1130	156	--	--	--	--	675	15.5	17.0	--
25...	1220	155	744	67	6.4	8.0	676	15.5	17.5	210
26...	0955	197	--	--	--	--	637	15.0	16.5	--
31...	0920	161	--	--	--	7.9	669	15.0	16.5	210
FEB										
03...	0835	93	750	--	--	--	893	10.5	12.5	--
12...	0950	1630	745	--	--	--	310	14.5	13.5	--
15...	0955	97	--	--	--	--	875	--	18.0	--
16...	1630	119	742	70	6.6	8.2	823	15.0	18.5	240
21...	0950	2380	744	84	9.1	8.1	287	9.5	11.5	92
MAR										
01...	1015	101	745	--	--	--	891	14.0	17.5	--
10...	1215	154	750	--	--	--	828	23.0	21.0	--
16...	1000	101	744	96	9.0	8.3	902	17.0	18.5	270
APR										
04...	1030	101	745	--	--	--	914	22.5	20.0	--
11...	1330	110	745	90	7.2	8.3	925	30.5	26.5	280
18...	0940	630	750	--	--	--	383	13.5	14.5	--
MAY										
01...	0930	93	745	--	--	--	876	21.5	20.0	--
10...	1300	62	742	94	7.8	8.3	941	23.0	25.0	290
18...	1325	75	740	--	--	--	904	30.5	28.0	--
JUN										
01...	1005	90	740	--	--	--	895	21.0	22.0	--
13...	1530	82	740	105	7.8	8.3	962	33.5	31.0	280
19...	0915	85	745	--	--	--	907	21.5	21.5	--
JUL										
03...	0920	70	745	--	--	--	905	22.0	22.0	--
12...	1400	70	746	94	7.1	8.3	925	27.5	30.0	290
18...	0835	82	745	--	--	--	920	23.5	20.5	--
AUG										
02...	0835	85	740	--	--	--	904	24.0	22.5	--
15...	1500	65	741	90	6.7	8.3	927	35.0	31.5	270
16...	0845	80	740	--	--	--	935	25.5	22.5	--
SEP										

11066460 SANTA ANA RIVER AT MWD CROSSING, NEAR ARLINGTON, CA—Continued

01...	1105	93	745	--	--	--	891	21.5	23.5	--
12...	1220	71	739	98	7.7	8.3	914	38.0	26.0	280
13...	1205	67	740	--	--	--	933	30.5	27.0	--

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SODIUM ADSORPTION RATIO (00931)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
OCT										
06...	--	--	--	--	--	--	--	--	--	--
14...	59	87.2	16.7	8.7	2	76.2	36	228	278	--
19...	--	--	--	--	--	--	--	--	--	--
NOV										
01...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
16...	76	94.4	17.6	8.9	2	77.1	34	233	281	1
DEC										
03...	--	--	--	--	--	--	--	--	--	--
14...	52	81.0	16.1	7.9	2	75.0	37	217	258	3
21...	--	--	--	--	--	--	--	--	--	--
JAN										
06...	--	--	--	--	--	--	--	--	--	--
12...	47	82.3	15.4	7.9	2	71.1	36	222	264	3
18...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
25...	45	63.2	12.3	11.1	2	54.6	35	163	199	--
26...	--	--	--	--	--	--	--	--	--	--
31...	35	62.6	12.1	7.7	2	56.2	36	171	209	--
FEB										
03...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
16...	42	73.8	14.7	7.9	2	67.1	36	202	247	--
21...	15	27.9	5.29	3.7	.8	16.6	27	76	93	--
MAR										
01...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
16...	56	81.2	15.7	8.2	2	72.1	36	211	254	2
APR										
04...	--	--	--	--	--	--	--	--	--	--
11...	63	85.8	15.4	10.5	2	70.5	35	218	262	--
18...	--	--	--	--	--	--	--	--	--	--
MAY										
01...	--	--	--	--	--	--	--	--	--	--
10...	56	88.9	16.7	8.9	2	75.5	35	235	286	--
18...	--	--	--	--	--	--	--	--	--	--
JUN										
01...	--	--	--	--	--	--	--	--	--	--
13...	51	86.3	16.0	9.6	2	77.7	37	231	269	6
19...	--	--	--	--	--	--	--	--	--	--
JUL										
03...	--	--	--	--	--	--	--	--	--	--
12...	57	89.4	16.3	9.2	2	77.4	36	233	274	5
18...	--	--	--	--	--	--	--	--	--	--
AUG										
02...	--	--	--	--	--	--	--	--	--	--
15...	36	82.3	15.3	9.1	2	77.3	38	233	280	2
16...	--	--	--	--	--	--	--	--	--	--
SEP										
01...	--	--	--	--	--	--	--	--	--	--
12...	52	84.0	16.3	9.9	2	80.0	38	225	270	2
13...	--	--	--	--	--	--	--	--	--	--

11066460 SANTA ANA RIVER AT MWD CROSSING, NEAR ARLINGTON, CA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)
OCT										
06...	--	--	--	--	--	--	--	--	--	--
14...	80.5	.6	25.9	96.3	.31	.25	<.020	5.81	.015	.787
19...	--	--	--	--	--	--	--	--	--	--
NOV										
01...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
16...	82.2	.6	27.0	94.8	.28	.40	<.020	6.24	<.010	.666
DEC										
03...	--	--	--	--	--	--	--	--	--	--
14...	78.8	.5	23.8	94.2	.30	.27	<.020	6.44	.010	.770
21...	--	--	--	--	--	--	--	--	--	--
JAN										
06...	--	--	--	--	--	--	--	--	--	--
12...	75.9	.5	22.9	91.2	.30	.42	<.020	6.55	.011	.739
18...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
25...	59.5	.5	17.0	67.7	1.7	2.4	.101	4.75	.072	.747
26...	--	--	--	--	--	--	--	--	--	--
31...	57.2	.6	18.6	67.2	.62	1.2	.219	5.34	.082	.662
FEB										
03...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
16...	70.5	.5	20.9	83.3	.41	.60	.062	6.51	.042	.691
21...	16.9	.4	6.6	33.0	.46	10	.077	1.89	.024	.192
MAR										
01...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
16...	78.6	.6	22.5	92.9	.27	.28	<.020	7.39	.018	.698
APR										
04...	--	--	--	--	--	--	--	--	--	--
11...	81.2	.6	23.6	92.4	.37	.45	.028	6.73	.016	.858
18...	--	--	--	--	--	--	--	--	--	--
MAY										
01...	--	--	--	--	--	--	--	--	--	--
10...	79.8	.5	24.2	94.2	.26	.36	<.020	6.59	.015	.702
18...	--	--	--	--	--	--	--	--	--	--
JUN										
01...	--	--	--	--	--	--	--	--	--	--
13...	85.7	.6	23.9	94.6	.33	.37	.020	6.69	.012	.799
19...	--	--	--	--	--	--	--	--	--	--
JUL										
03...	--	--	--	--	--	--	--	--	--	--
12...	84.8	.5	25.8	91.8	.27	.38	.020	5.57	.012	.787
18...	--	--	--	--	--	--	--	--	--	--
AUG										
02...	--	--	--	--	--	--	--	--	--	--
15...	83.0	.6	24.3	91.5	.31	.34	<.020	5.71	.011	.944
16...	--	--	--	--	--	--	--	--	--	--
SEP										
01...	--	--	--	--	--	--	--	--	--	--
12...	80.8	.6	25.5	88.7	.28	.34	<.020	6.00	.010	.861
13...	--	--	--	--	--	--	--	--	--	--

11066460 SANTA ANA RIVER AT MWD CROSSING, NEAR ARLINGTON, CA—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	ORGANIC DISSOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTICULATE TOTAL (MG/L AS C) (00689)	DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	IRON, DISSOLVED (UG/L AS FE) (01046)	NESE, DISSOLVED (UG/L AS MN) (01056)
OCT									
06...	--	--	--	--	--	624	--	--	--
14...	.742	.752	2.1	.4	.76	561	557	<10	3
19...	--	--	--	--	--	533	--	--	--
NOV									
01...	--	--	--	--	--	560	--	--	--
12...	--	--	--	--	--	544	--	--	--
16...	.592	.687	2.3	.3	.77	563	571	<10	E2
DEC									
03...	--	--	--	--	--	--	--	--	--
14...	.733	.825	2.1	.2	.74	546	538	<10	E2
21...	--	--	--	--	--	603	--	--	--
JAN									
06...	--	--	--	--	--	634	--	--	--
12...	.701	.792	1.9	.3	.74	545	531	<10	<2
18...	--	--	--	--	--	550	--	--	--
25...	--	--	--	--	--	412	--	--	--
25...	.594	.972	19	3.0	.60	443	407	40	13
26...	--	--	--	--	--	379	--	--	--
31...	.557	.966	5.7	.9	.56	415	411	E10	6
FEB									
03...	--	--	--	--	--	544	--	--	--
12...	--	--	--	--	--	211	--	--	--
15...	--	--	--	--	--	541	--	--	--
16...	.600	.704	3.6	.6	.70	515	491	<10	6
21...	.170	7.94	5.3	<23	.24	177	165	10	E2
MAR									
01...	--	--	--	--	--	545	--	--	--
10...	--	--	--	--	--	508	--	--	--
16...	.695	.709	2.0	.4	.76	559	534	<10	8
APR									
04...	--	--	--	--	--	552	--	--	--
11...	.806	.876	2.1	.5	.76	558	541	<10	4
18...	--	--	--	--	--	252	--	--	--
MAY									
01...	--	--	--	--	--	537	--	--	--
10...	.667	.734	1.9	<.2	.78	577	561	<10	2
18...	--	--	--	--	--	555	--	--	--
JUN									
01...	--	--	--	--	--	544	--	--	--
13...	.756	.827	2.2	.3	.80	585	565	<10	E2
19...	--	--	--	--	--	557	--	--	--
JUL									
03...	--	--	--	--	--	547	--	--	--
12...	.853	.868	2.1	.3	.78	570	562	<10	2
18...	--	--	--	--	--	565	--	--	--
AUG									
02...	--	--	--	--	--	551	--	--	--
15...	.907	.951	2.3	.2	.78	570	551	<10	E2
16...	--	--	--	--	--	570	--	--	--
SEP									
01...	--	--	--	--	--	549	--	--	--
12...	.807	.856	2.0	.3	.75	551	549	<10	3
13...	--	--	--	--	--	570	--	--	--

11066460 SANTA ANA RIVER AT MWD CROSSING, NEAR ARLINGTON, CA—Continued

CROSS- SECTION ANALYSES, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	SAMPLE LOC-ATION, CROSS SECTION (FT FM L BANK) (00009)
MAR								
16...	1001	744	96	8.9	8.0	973	18.5	12.0
16...	1002	744	96	9.0	8.1	974	18.5	36.0
16...	1003	744	96	9.0	8.1	941	18.5	60.0
16...	1004	744	99	9.3	8.1	873	18.5	84.0
16...	1005	744	99	9.3	8.1	828	18.5	108

Instantaneous discharge at the time of cross-sectional measurements: 101 ft^3/s.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	TEMPER-ATURE WATER (DEG C) (00010)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT						
14...N	1130	77	23.5	25	5.2	85
NOV						
16...N	1630	77	20.5	22	4.6	82
DEC						
14...N	1450	85	15.0	11	2.5	37
JAN						
12...N	1110	93	17.5	56	14	11
25...N	1220	155	17.5	104	44	72
31...N	0920	161	16.5	488	212	8
FEB						
16...N	1630	119	18.5	98	31	35
21...N	0950	2380	11.5	6780	43600	91
MAR						
16...N	1000	101	18.5	55	15	37
APR						
11...N	1330	110	26.5	19	5.6	31
MAY						
10...N	1300	62	25.0	48	8.0	14
JUN						
13...N	1530	82	31.0	11	2.4	68
JUL						
12...N	1400	70	30.0	13	2.5	55
AUG						
15...N	1500	65	31.5	5	.88	12
SEP						
12...N	1220	71	26.0	6	1.2	67

N Suspended-sediment concentration value determined from sample collected and processed according to National Water-Quality Assessment (NAWQA) protocol.

11066460 SANTA ANA RIVER AT MWD CROSSING, NEAR ARLINGTON, CA—Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	1030	1010	1110	1070	1050	1030	1070	991	1020	976	705	657
2	1020	1000	1120	1060	1050	1030	1030	963	1020	995	748	704
3	1040	1020	1080	1060	1050	1040	1080	1020	1040	1010	777	748
4	1030	1020	1080	1060	1040	1030	1040	1020	1040	1020	795	776
5	1040	1020	1100	1060	1040	1030	1040	1020	1090	1020	795	789
6	1020	1000	1080	1050	1040	1020	1030	1020	1040	1010	799	790
7	1030	1020	1080	1060	1120	1020	1040	1020	1040	1020	819	794
8	1060	1030	1090	1060	1120	1050	1030	1010	1040	1020	844	819
9	1060	1030	1070	1050	1080	1040	1020	1000	1040	1020	862	843
10	1070	1040	1080	1050	1050	1020	1020	1000	1040	663	887	861
11	1070	1040	1070	1050	---	---	1030	1000	978	568	911	886
12	1060	1020	1070	1050	---	---	1010	985	984	272	945	911
13	1060	1020	1070	1050	---	---	1000	991	872	766	1000	939
14	1070	1040	1060	1040	---	---	1020	991	881	767	998	985
15	1060	1050	1110	1040	1080	1040	1030	1010	970	874	1010	988
16	1080	1060	1110	1060	1050	1020	1030	1010	957	482	1030	1000
17	1070	1050	1080	1060	1050	1030	1030	1000	905	482	1050	582
18	1060	1040	1070	1060	1060	1040	1040	1020	936	905	1030	546
19	1060	1050	1100	1060	1060	1030	1080	1030	996	934	1040	902
20	1100	1050	1080	1060	1060	1040	1030	1020	957	522	1020	---
21	1080	1050	1080	1060	1060	1030	1040	1020	661	177	1040	---
22	1080	1050	1070	1040	1060	1040	1020	998	281	201	1040	992
23	1080	1050	1070	1060	1120	1040	1030	1010	305	220	1040	991
24	1070	1050	1070	1040	1060	1030	1030	1010	396	229	1030	1010
25	1080	1050	1050	1040	1070	1030	1010	750	472	396	1040	1020
26	1080	1060	1090	1040	1060	1030	964	735	532	472	1040	1000
27	1100	1060	1050	1030	1050	1040	1020	964	566	532	1040	995
28	1110	1060	1060	1030	1050	1030	1010	985	603	566	1030	1020
29	1110	1060	1050	1030	1060	1040	1010	998	657	602	1030	1000
30	1100	1070	1060	1040	1050	1030	1020	998	---	---	1040	1010
31	1090	1060	---	---	1080	1000	999	791	---	---	1040	1010
MONTH	1110	1000	1120	1030	---	---	1080	735	1090	177	1050	---
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	1050	1020	987	965	1030	1010	1070	1020	1070	1010	1040	999
2	1040	1020	1030	955	1030	1020	1080	1060	1060	1050	1010	986
3	1080	562	1050	1020	1050	1020	1080	1040	1070	1040	1060	989
4	1040	1020	1030	1010	1050	1020	1080	1050	1070	1030	1050	1000
5	1030	1010	1030	1010	1060	1040	1080	1040	1070	1040	1100	1010
6	1030	1010	1020	987	1050	1020	1080	1040	1070	1030	1030	1000
7	1020	1010	1030	998	1050	1010	1070	1020	1070	1030	1030	1000
8	1020	1010	1020	1000	1040	1010	1080	1040	1070	1040	1040	1000
9	1040	1010	1020	999	1030	994	1070	1020	1080	1070	1100	1000
10	1060	1020	1050	996	1050	1020	1070	1010	1090	1070	1050	1020
11	1040	1020	1030	1010	1080	1030	1090	1050	1100	1060	1030	1010
12	1020	992	1030	1000	1060	1030	1100	1030	1100	1050	1050	1020
13	1020	988	1070	1010	1050	1020	1090	1050	1080	1060	1050	1030
14	1020	981	1030	1000	1040	1020	1090	1050	1070	1050	1060	1030
15	1030	971	1040	1020	1040	1020	1090	1030	1080	1040	1060	1020
16	1040	1000	1040	1020	1050	1020	1070	1020	1090	1050	1050	1030
17	1090	316	1030	1000	1050	1030	1080	1030	1080	1060	1040	1030
18	557	316	1070	1010	1050	1020	1080	1050	1080	1060	1060	1030
19	911	557	1040	1020	1060	1020	1080	1050	1070	1060	1040	1020
20	955	910	1080	1030	1050	1030	1080	1030	1060	1040	1040	1010
21	949	933	1040	1010	1060	1030	1120	1060	1080	1050	1020	994
22	938	835	1060	1020	1070	1050	1080	1040	1080	1040	1030	986
23	945	919	1050	1010	1070	1060	1070	1010	1080	1030	1020	935
24	967	942	1030	1000	1080	1050	1070	1020	1080	1020	1010	984
25	967	943	1040	991	1130	1050	1070	1030	1030	988	1010	998
26	977	958	1030	993	1090	1040	1070	1020	1030	1010	1010	990
27	974	953	1040	1020	1070	1020	1060	1040	1040	1000	1000	989
28	965	951	1050	1020	1060	1020	1070	1060	1060	1000	1010	991
29	973	951	1070	1020	1060	1010	1080	1060	1040	970	1010	992
30	986	961	1040	1020	1060	1010	1090	1060	1010	913	1010	996
31	---	---	1040	1000	---	---	1080	1050	1010	992	---	---
MONTH	1090	316	1080	955	1130	994	1120	1010	1100	913	1100	935

11066460 SANTA ANA RIVER AT MWD CROSSING, NEAR ARLINGTON, CA—Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	24.0	16.5	20.5	13.5	17.0	13.0	15.5	13.0	18.5	13.0	21.0	11.0
2	23.5	16.5	19.5	13.5	16.5	12.0	15.0	11.5	18.5	12.5	21.5	10.0
3	23.5	17.0	19.5	13.5	13.5	10.5	15.0	10.0	18.0	11.5	17.0	13.0
4	23.0	16.0	19.0	13.0	14.5	10.5	16.0	10.5	18.5	12.0	14.5	12.5
5	23.0	17.0	19.5	15.5	16.0	10.0	14.5	10.0	19.0	13.5	13.5	11.0
6	21.5	16.5	19.5	14.0	16.0	10.0	14.0	10.0	19.5	12.5	17.0	10.0
7	21.0	16.5	19.5	16.0	15.0	10.5	15.0	9.5	20.0	12.5	13.5	9.5
8	24.0	16.0	19.0	15.5	13.0	10.0	15.0	9.0	18.0	14.0	15.0	11.0
9	23.5	16.0	19.0	14.5	15.0	10.5	15.5	9.5	19.0	13.5	19.0	10.5
10	23.0	16.5	19.0	13.5	14.0	11.5	16.0	10.5	18.5	15.0	23.0	9.5
11	23.0	16.0	19.5	13.5	---	---	16.0	10.5	18.5	14.5	24.0	12.5
12	23.0	16.0	19.5	13.5	---	---	16.5	12.5	15.5	13.5	22.0	12.0
13	23.0	16.5	20.0	14.0	---	---	17.5	11.0	17.0	15.0	23.5	13.5
14	22.5	16.0	19.5	14.5	---	---	17.5	12.0	19.5	16.0	25.0	12.0
15	22.0	17.0	20.0	16.0	14.0	10.0	18.0	13.0	21.5	16.0	24.5	13.5
16	21.5	16.0	19.5	14.0	17.0	11.0	16.5	14.0	18.0	14.5	24.0	15.0
17	18.5	15.0	19.0	15.0	17.0	10.5	19.0	15.5	18.5	13.0	24.5	15.0
18	21.0	13.5	18.0	13.0	16.5	10.5	19.5	15.0	19.0	12.5	25.5	12.0
19	22.0	13.0	17.5	12.5	16.0	11.0	19.5	14.0	21.0	13.0	23.5	13.5
20	22.0	14.0	18.5	15.0	15.5	13.0	19.5	15.0	18.0	15.0	18.0	---
21	22.0	14.0	18.0	14.0	16.0	11.0	19.0	15.0	15.0	11.5	21.0	---
22	21.5	14.0	14.0	11.0	13.5	10.5	18.5	14.5	13.0	11.5	23.0	11.5
23	21.0	14.5	16.0	10.0	15.5	10.5	17.5	12.5	13.5	12.0	23.0	12.5
24	21.0	14.5	15.0	10.5	15.5	10.5	19.5	14.5	15.5	11.5	23.5	12.5
25	21.5	15.0	17.0	11.5	15.0	10.0	17.5	16.5	17.5	11.0	22.5	12.5
26	21.0	15.0	17.5	12.0	16.0	10.0	18.5	14.0	18.5	9.5	25.0	12.5
27	19.5	14.0	17.5	12.0	15.5	11.5	18.0	12.5	13.5	10.0	20.5	14.5
28	19.5	15.5	18.0	12.5	16.5	11.0	17.5	12.0	19.0	10.0	20.5	15.0
29	19.0	15.5	18.0	13.0	16.0	10.5	17.5	12.0	18.0	10.0	22.5	15.0
30	19.5	13.5	17.5	13.0	15.0	10.0	18.0	15.0	---	---	24.0	14.5
31	19.5	13.0	---	---	15.5	12.0	18.0	14.5	---	---	22.5	12.5
MONTH	24.0	13.0	20.5	10.0	---	---	19.5	9.0	21.5	9.5	25.5	---
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	24.0	12.5	27.5	15.5	28.5	18.5	28.5	19.5	28.0	21.0	23.0	19.0
2	24.5	12.5	27.0	16.0	28.0	18.0	28.5	18.5	27.0	21.0	25.5	18.0
3	26.5	13.0	28.0	16.5	28.5	17.0	28.5	19.5	28.5	20.5	26.0	17.5
4	26.5	14.0	27.5	18.0	28.5	17.0	28.0	18.0	28.5	20.0	26.0	18.0
5	26.0	14.0	26.0	18.5	29.0	18.0	27.5	17.5	29.0	20.0	26.0	16.5
6	24.5	15.5	27.0	18.0	28.0	17.0	27.5	17.5	28.5	20.0	27.0	17.5
7	25.5	16.0	26.5	17.0	28.0	17.0	28.0	18.0	28.5	21.0	25.0	18.0
8	26.5	15.5	25.0	18.0	23.5	18.0	27.5	18.0	27.0	19.5	26.5	18.0
9	25.5	13.5	27.5	17.5	26.0	16.0	27.5	19.0	28.0	20.0	26.0	17.0
10	25.5	14.0	26.0	18.0	27.5	17.0	27.5	19.0	27.5	19.0	25.5	16.5
11	26.5	14.5	25.5	17.0	29.0	17.0	27.0	18.5	28.5	19.0	26.5	17.0
12	27.0	15.0	27.5	14.5	28.0	17.5	27.5	18.0	27.5	19.0	27.5	18.0
13	25.5	14.5	26.0	14.5	30.5	18.0	28.0	17.5	29.0	19.5	26.0	18.5
14	20.5	15.5	26.0	15.0	29.5	18.5	27.5	18.0	28.0	20.0	27.0	20.0
15	23.5	15.0	26.0	15.5	30.0	18.5	27.0	19.5	28.0	20.5	26.5	19.5
16	25.0	15.0	22.5	16.0	28.0	19.5	26.0	19.0	28.5	20.5	27.0	19.5
17	19.0	14.5	26.5	15.0	29.0	20.0	26.0	18.0	27.5	20.5	26.5	19.5
18	19.0	14.0	27.0	15.5	28.5	19.5	28.5	18.5	27.5	20.0	26.0	19.5
19	25.0	13.5	28.0	16.5	28.5	19.5	28.5	18.5	28.0	18.5	25.5	19.0
20	24.5	14.0	29.0	17.5	29.0	18.0	28.5	18.5	26.5	18.0	25.0	20.0
21	20.5	15.0	29.5	18.0	29.0	19.0	27.0	19.0	27.0	18.5	22.5	20.0
22	22.0	16.0	28.5	18.0	29.0	19.5	28.0	19.5	27.0	20.0	22.0	19.5
23	23.5	16.0	26.0	18.5	28.5	19.5	28.5	20.5	28.0	19.5	24.5	19.0
24	26.0	14.5	25.0	18.5	29.5	19.0	27.0	19.5	28.0	20.0	24.5	17.0
25	27.0	16.0	22.0	18.5	28.5	19.0	28.0	20.0	27.5	21.0	25.0	17.0
26	28.5	16.0	27.5	18.0	30.0	20.0	28.0	19.5	27.0	20.5	24.0	17.5
27	27.0	16.5	29.5	18.0	29.0	19.5	29.0	19.5	25.5	20.0	22.0	19.5
28	24.5	18.0	30.0	18.5	29.0	19.5	29.0	20.0	25.5	20.5	23.5	19.5
29	26.0	15.5	29.5	18.5	29.0	20.0	27.0	20.0	23.0	20.5	24.5	19.5
30	26.0	14.5	28.0	19.0	29.0	20.0	28.5	19.5	26.0	21.0	23.0	18.0
31	---	---	28.0	19.0	---	---	28.5	20.5	26.0	20.0	---	---
MONTH	28.5	12.5	30.0	14.5	30.5	16.0	29.0	17.5	29.0	18.0	27.5	16.5

APPENDIX B

DAILY PRECIPITATION DATA
AT SAN BERNARDINO COUNTY HOSPITAL

WATER YEAR 1999-00

TABLE B-1

DAILY PRECIPITATION AT SAN BERNARDINO COUNTY HOSPITAL
(inches)

	1999			2000								
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0	0	0	0.01	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	0.33	0.01	0	0	0	0	0
4	0	0	0	0	0	0.69	0	0	0	0	0	0
5	0	0	0	0	0	0.76	0	0	0	0	0	0
6	0	0	0	0	0	0.03	0	0	0	0	0	0
7	0	0	0	0	0	0.06	0	0	0	0	0	0
8	0	0.09	0	0	0	1.01	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0.38	0	0	0	0	0	0	0
11	0	0	0	0	0.02	0	0	0	0	0	0	0
12	0	0	0	0	1.16	0	0	0	0	0	0	0.04
13	0	0	0	0	0.17	0	0	0	0	0	0	0
14	0	0	0	0	0.07	0	0.14	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0.34	0	0	0	0	0	0	0
17	0	0	0	0	0.03	0	0.87	0	0	0	0	0
18	0	0	0	0	0	0	0.64	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0.55	0	0	0	0	0	0	0
21	0	0	0	0	1.52	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0.17	0	0	0	0	0.05
23	0	0	0	0	0.83	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0.47	0	0	0	0.03	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0.11	0.05	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	0.01
30	0	0	0	0.11		0	0	0	0	0	0	0
31	0		0.16	0.18		0		0		0	0	
Total	0	0.09	0.16	0.76	5.18	2.94	1.83	0.03	0.00	0.00	0.00	0.10

Total Rainfall = 11.09 Inches

Data Source: San Bernardino County Flood Control District Hydrology Department

APPENDIX C

SANTA ANA RIVER WATERMASTER
FINANCIAL STATEMENTS WITH REPORT
ON EXAMINATION BY
ORANGE COUNTY WATER DISTRICT CONTROLLER

WATER YEAR 1999-00

ORANGE COUNTY WATER DISTRICT

April 11, 2001

Santa Ana River Watermaster
c/o SBVMWD
P.O. Box 5906
San Bernardino, CA 92412-5906

Gentlemen:

I have reviewed and prepared the attached statement of assets and liabilities comprised of cash transactions for Santa Ana River Watermaster, and the related statement of revenue, expenses, and changes in fund balance for year ended June 30, 2000. This review includes examining evidence that supports the amounts and disclosures in the financial statements. I have reviewed minutes of meetings as well as Bank of America Checking and Savings Account transactions and statements, and have concluded that all transactions were properly recorded.

Very truly yours,

ORANGE COUNTY WATER DISTRICT

Laura R. Li
Internal Auditor

Cc: Andrew V. Czorny, CFO, OCWD

SANTA ANA RIVER WATERMASTER

FINANCIAL STATEMENTS

JUNE 30, 2000

SANTA ANA RIVER WATER MASTER

STATEMENT OF ASSETS AND LIABILITIES ARISING FROM CASH TRANSACTIONS

June 30, 2000

ASSETS

Cash in checking account (Notes 3)	$4,731
Cash in savings account (Notes 3)	2,408
TOTAL ASSETS	$7,139

FUND BALANCE

Fund balance	$7,139

See independent auditor's reports and notes to financial statements.

SANTA ANA RIVER WATER MASTER

STATEMENT OF ASSETS AND LIABILITIES
ARISING FROM CASH TRANSACTIONS

June 30, 2000

	Actual	Budget	Over (Under) Budget
REVENUE COLLECTED:			
Water district contributions (Note 2):			
Orange County Water District	$ 0	$ 4,000	$ (4,000)
Chino Basin Municipal Water District	0	2,000	(2,000)
San Bernardino Valley Municipal Water District	0	2,000	(2,000)
Western Municipal Water District	0	2,000	(2,000)
Interest from Savings Account	24	0	24
TOTAL REVENUE COLLECTED	$ 24	$ 10,000	$ (9,976)
EXPENSES PAID:			
Professional Engineering Service	$ 9,047	$ 9,500	$ (453)
Administrative Expenses:			
Auditing Services	0	0	0
Annual Reports	0	2,500	(2,500)
TOTAL EXPENSES PAID	$ 9,047	$ 12,000	$ (2,953)
EXCESS OF REVENUE COLLECTED OVER (UNDER) EXPENSES PAID	(9,023)	(2,000)	(7,023)
FUND BALANCE AT JULY 1, 1999	16,162		
FUND BALANCE AT JUNE 30, 2000	$ 7,139		

See independent auditor's report and notes to financial statements.

SANTA ANA RIVER WATERMASTER

NOTES TO FINANCIAL STATEMENTS

June 30, 1999

1. SIGNIFICANT ACCOUNTING POLICIES:

Basis of Accounting:

The Santa Ana River Watermaster's ("Watermaster") policy is to prepare its financial statements on the cash basis of accounting; consequently, certain revenues are recognized when received rather than when earned, and certain expenses are recognized when cash is disbursed rather than when the obligation is incurred.

2. ORGANIZATION AND HISTORY:

The Santa Ana River Watermaster is composed of committee of five representatives from four water districts. Two representatives serve from Orange County Water District and one representative each serves from Chino Basin Municipal Water District, Western Municipal Water District and San Bernardino Valley Municipal Water District. The committee was established on April 23, 1969, by order of the Superior Court of California in Orange County as part of a judgment resulting from a lawsuit by the Orange County Water District as plaintiff vs. City of Chino, et al, as defendants.

Costs and expenses incurred by the individual representatives are reimbursed directly from the water districts. Collective Watermaster costs and expenses are budgeted and paid for by the Watermaster after receiving contributions from the water districts. Water district contributions are made in the following ratios:

Orange County Water District	40%
Chino Basin Municipal Water District	20%
Western Municipal Water District	20%
San Bernardino Valley Municipal Water Districts	20%
Total	100%

The Watermaster issues a report each year to satisfy obligation to monitor and test water flows from the Upper Area to the Lower Area of the Santa Ana River.

See independent reviewer's report.

3. CASH IN BANK:

The following disclosures are made in accordance with Statement No. 3 of the Governmental Accounting Standards Board (GASB 3):

Cash at June 30, 1999 consisted of the following:

Bank of America:	
Checking account	$ 4,731
Savings account	$ 2,408
	$ 7,139

All cash is fully insured by the FDIC.

See independent auditor's report.

APPENDIX D

HIGH GROUNDWATER MITIGATION PROJECT WATER DISCHARGED TO THE SANTA ANA RIVER ABOVE RIVERSIDE NARROWS

WATER YEAR 1999-00

TABLE D-1

HIGH GROUNDWATER MITIGATION PROJECT WATER
DISCHARGED TO THE SANTA ANA RIVER

WATER YEAR 1999-00
(acre-feet)

Month	Discharged Above Riverside Narrows	Percolated In Colton and Riverside Basins [1]	Flow Arriving At Riverside Narrows	Flow Arriving At Prado Dam [2]
1999				
October	727	720	0	0
November	707	700	0	0
December	912	903	0	0
2000				
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
Total	2,346	2,323	0	0

(1) Adjusted for a 1% evapotranspiration losses.
(2) Adjusted for a 2% evapotranspiration loss between Riverside Narrows and Prado.

TABLE D-2

HIGH GROUNDWATER MITIGATION PROJECT WATER
DISCHARGED TO THE SANTA ANA RIVER

WATER YEAR 1999-00
October 1999

Day	Discharged Above Riverside Narrows (cfs)	Percolated In Colton and Riverside Basins [1] (cfs)	Flow At Riverside Narrows (cfs)	Flow At Prado Dam [2] (cfs)
1	11.83	11.71	0.00	0.00
2	11.83	11.71	0.00	0.00
3	11.83	11.71	0.00	0.00
4	11.83	11.71	0.00	0.00
5	11.83	11.71	0.00	0.00
6	11.83	11.71	0.00	0.00
7	11.83	11.71	0.00	0.00
8	11.83	11.71	0.00	0.00
9	11.83	11.71	0.00	0.00
10	11.83	11.71	0.00	0.00
11	11.83	11.71	0.00	0.00
12	11.83	11.71	0.00	0.00
13	11.83	11.71	0.00	0.00
14	11.83	11.71	0.00	0.00
15	11.83	11.71	0.00	0.00
16	11.83	11.71	0.00	0.00
17	11.83	11.71	0.00	0.00
18	11.83	11.71	0.00	0.00
19	11.83	11.71	0.00	0.00
20	11.83	11.71	0.00	0.00
21	11.83	11.71	0.00	0.00
22	11.83	11.71	0.00	0.00
23	11.83	11.71	0.00	0.00
24	11.83	11.71	0.00	0.00
25	11.83	11.71	0.00	0.00
26	11.83	11.71	0.00	0.00
27	11.83	11.71	0.00	0.00
28	11.83	11.71	0.00	0.00
29	11.83	11.71	0.00	0.00
30	11.83	11.71	0.00	0.00
31	11.83	11.71	0.00	0.00
Total in cfs-days	367	363	0	0
Total in AF	727	720	0	0

(1) Adjusted for a 1% evapotranspiration losses.
(2) Adjusted for a 2% evapotranspiration loss between Riverside Narrows and Prado.

TABLE D-2 (continued)
HIGH GROUNDWATER MITIGATION PROJECT WATER
DISCHARGED TO THE SANTA ANA RIVER

WATER YEAR 1999-00
November 1999

Day	Discharged Above Riverside Narrows (cfs)	Percolated In Colton and Riverside Basins [1] (cfs)	Flow At Riverside Narrows (cfs)	Flow At Prado Dam [2] (cfs)
1	11.88	11.76	0.00	0.00
2	11.88	11.76	0.00	0.00
3	11.88	11.76	0.00	0.00
4	11.88	11.76	0.00	0.00
5	11.88	11.76	0.00	0.00
6	11.88	11.76	0.00	0.00
7	11.88	11.76	0.00	0.00
8	11.88	11.76	0.00	0.00
9	11.88	11.76	0.00	0.00
10	11.88	11.76	0.00	0.00
11	11.88	11.76	0.00	0.00
12	11.88	11.76	0.00	0.00
13	11.88	11.76	0.00	0.00
14	11.88	11.76	0.00	0.00
15	11.88	11.76	0.00	0.00
16	11.88	11.76	0.00	0.00
17	11.88	11.76	0.00	0.00
18	11.88	11.76	0.00	0.00
19	11.88	11.76	0.00	0.00
20	11.88	11.76	0.00	0.00
21	11.88	11.76	0.00	0.00
22	11.88	11.76	0.00	0.00
23	11.88	11.76	0.00	0.00
24	11.88	11.76	0.00	0.00
25	11.88	11.76	0.00	0.00
26	11.88	11.76	0.00	0.00
27	11.88	11.76	0.00	0.00
28	11.88	11.76	0.00	0.00
29	11.88	11.76	0.00	0.00
30	11.88	11.76	0.00	0.00
Total in cfs-days	356	353	0	0
Total in AF	707	700	0	0

(1) Adjusted for a 1% evapotranspiration losses.
(2) Adjusted for a 2% evapotranspiration loss between Riverside Narrows and Prado.

TABLE D-2 (continued)
HIGH GROUNDWATER MITIGATION PROJECT WATER
DISCHARGED TO THE SANTA ANA RIVER

WATER YEAR 1999-00
December 1999

Day	Discharged Above Riverside Narrows (cfs)	Percolated In Colton and Riverside Basins [1] (cfs)	Flow At Riverside Narrows (cfs)	Flow At Prado Dam [2] (cfs)
1	11.88	11.76	0.00	0.00
2	15.44	15.29	0.00	0.00
3	15.44	15.29	0.00	0.00
4	15.44	15.29	0.00	0.00
5	15.44	15.29	0.00	0.00
6	15.44	15.29	0.00	0.00
7	15.44	15.29	0.00	0.00
8	15.44	15.29	0.00	0.00
9	15.44	15.29	0.00	0.00
10	15.44	15.29	0.00	0.00
11	15.44	15.29	0.00	0.00
12	15.44	15.29	0.00	0.00
13	15.44	15.29	0.00	0.00
14	15.44	15.29	0.00	0.00
15	15.44	15.29	0.00	0.00
16	15.44	15.29	0.00	0.00
17	15.44	15.29	0.00	0.00
18	15.44	15.29	0.00	0.00
19	15.44	15.29	0.00	0.00
20	15.44	15.29	0.00	0.00
21	15.44	15.29	0.00	0.00
22	15.44	15.29	0.00	0.00
23	15.44	15.29	0.00	0.00
24	15.44	15.29	0.00	0.00
25	15.44	15.29	0.00	0.00
26	15.44	15.29	0.00	0.00
27	15.44	15.29	0.00	0.00
28	15.44	15.29	0.00	0.00
29	15.44	15.29	0.00	0.00
30	15.44	15.29	0.00	0.00
31	15.44	15.29	0.00	0.00
Total in cfs-days	460	455	0	0
Total in AF	912	903	0	0

(1) Adjusted for a 1% evapotranspiration losses.
(2) Adjusted for a 2% evapotranspiration loss between Riverside Narrows and Prado.

APPENDIX E

WATER QUALITY AND DISCHARGE OF WATER RELEASED BY MWDSC TO SAN ANTONIO CREEK NEAR UPLAND (CONNECTION OC-59)

WATER YEAR 1999-00

PREPARED BY

WILLIAM R. MILLS, JR.

TABLE E-1

NONTRIBUTARY WATER FROM OC-59

MONTHLY TOTALS

(acre-feet)

WATER YEAR 1999-00

Month	Released at OC-59	12-Hour Delay [1]	Evaporation Losses [2]	Calculated Flow at Prado
1999				
October	5,870	5,870	43	5,827
November	0	0	---	0
December	3,028	2,979	45	2,935
2000				
January	3,772	3,787	37	3,750
February	2,038	2,072	14	2,057
March	0	0	---	0
April	0	0	---	0
May	0	0	---	0
June	0	0	---	0
July	0	0	---	0
August	0	0	---	0
September	0	0	---	0
Total	14,709	14,709	140	14,569

(1) Released nontributary water is delayed 12 hours to reflect the estimated travel time between OC-59 and Prado Dam.

(2) Monthly evapotranspiration losses calculated per the procedures referenced in the Twelfth Annual Watermaster Report, Appendix C and shown in Table E-3.

TABLE E-2

NONTRIBUTARY WATER FROM OC-59
October 1999
(cfs)

Day	Released at OC-59	12-Hour Delay	Calculated Flow At Prado Dam [1]
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	20	10	10
12	68	44	44
13	137	103	102
14	198	168	166
15	191	194	193
16	171	181	180
17	173	172	171
18	165	169	167
19	151	158	157
20	166	158	157
21	199	183	181
22	201	200	199
23	201	201	199
24	199	200	198
25	201	200	199
26	202	202	200
27	203	203	201
28	114	158	157
29	0	57	56
30	0	0	0
31	0	0	0
Total (cfs-days)	2,960	2,960	2,938
(AF)	5,870	5,870	5,827

1) Includes the monthly evapotranspiration loss listed in Table E-1.

TABLE E-2

NONTRIBUTARY WATER FROM OC-59
November 1999
(cfs)

Day	Released at OC-59	12-Hour Delay	Calculated Flow At Prado Dam [1]
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
Total (cfs-days)	0	0	0
(AF)	0	0	0

(1) Includes the monthly evapotranspiration loss listed in Table E-1.

TABLE E-2

NONTRIBUTARY WATER FROM OC-59
December 1999
(cfs)

Day	Released at OC-59	12-Hour Delay	Calculated Flow At Prado Dam [1]
1	17	9	9
2	52	35	34
3	51	52	51
4	50	51	50
5	50	50	49
6	49	49	48
7	51	50	49
8	50	50	49
9	50	50	49
10	50	50	50
11	48	49	48
12	50	49	48
13	51	50	49
14	50	51	50
15	52	51	50
16	51	52	51
17	52	51	51
18	52	52	51
19	52	52	51
20	51	51	51
21	50	50	50
22	50	50	49
23	51	51	50
24	50	50	49
25	50	50	49
26	50	50	49
27	49	50	49
28	49	49	49
29	49	49	48
30	50	50	49
31	49	50	49
Total (cfs-days)	1,527	1502	1,480
(AF)	3,028	2979	2,935

(1) Includes the monthly evapotranspiration loss listed in Table E-1.

TABLE E-2

NONTRIBUTARY WATER FROM OC-59
January 2000
(cfs)

Day	Released at OC-59	12-Hour Delay	Calculated Flow At Prado Dam [1]
1	49	49	48
2	49	49	48
3	49	49	48
4	50	49	49
5	50	50	49
6	51	51	50
7	50	51	50
8	47	49	48
9	48	48	47
10	51	50	49
11	49	50	49
12	63	56	56
13	100	81	81
14	102	101	100
15	100	101	100
16	100	100	99
17	100	100	99
18	100	100	99
19	100	100	99
20	100	100	99
21	100	100	99
22	102	101	100
23	100	101	100
24	100	100	99
25	59	79	79
26	0	29	29
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
31	34	17	17
Total (cfs-days)	1,902	1909	1,891
(AF)	3,772	3787	3,750

(1) Includes the monthly evapotranspiration loss listed in Table E-1.

TABLE E-2

NONTRIBUTARY WATER FROM OC-59
February 2000
(cfs)

Day	Released at OC-59	12-Hour Delay	Calculated Flow At Prado Dam [1]
1	94	64	64
2	97	96	95
3	100	99	98
4	99	100	99
5	101	100	99
6	102	101	101
7	99	100	100
8	101	100	99
9	98	100	99
10	99	99	98
11	37	68	67
12	0	18	18
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
Total (cfs-days)	1,027	1044	1,037
(AF)	2,038	2072	2,057

(1) Includes the monthly evapotranspiration loss listed in Table E-1.

TABLE E-3

EVAPOTRANSPIRATION LOSSES OF STATE WATER FROM OC-59
WATER YEAR 1999-00
SUM OF ALL CHANNEL REACHES
(acre-feet)

Month	State Water Released with 12-hour delay	Rialto Pipeline to Los Serranos Road	Los Serranos to Prado Dam w/o vegetation	Los Serranos to Prado Dam w/ vegetation	Total Evapo-transpiration	Percent of Monthly Release
1999						
October	5,870	14.4	21.5	7.5	43.4	0.74%
November	0	---	---	---	---	---
December	2,979	16.0	20.6	8.2	44.9	1.51%
2000						
January	3,787	9.1	13.9	14.3	37.2	0.98%
February	2,072	3.9	8.2	2.2	14.3	0.69%
March	0	---	---	---	---	---
April	0	---	---	---	---	---
May	0	---	---	---	---	---
June	0	---	---	---	---	---
July	0	---	---	---	---	---
August	0	---	---	---	---	---
September	0	---	---	---	---	---
Total	14,709	43.4	64.2	32.3	139.8	
				Percent of Annual Releases =		0.95%

TABLE E-3.1

EVAPOTRANSPIRATION LOSSES OF STATE WATER FROM OC-59
WATER YEAR 1999-00
RIALTO PIPELINE TO LOS SERRANOS ROAD

Month	State Water Released with 12-hour delay (AF)	Days of Evaporation	Evapo-transpiration (in) (a)	Computed Evaporation Losses (b)	
				(AF)	(% of release)
[1]	[2]	[3]	[4]	[5]	[6]
1999					
October	5,870	18	5.29	14.4	0.24%
November	0	0	---	---	---
December	2,979	31	3.43	16.0	0.54%
2000					
January	3,787	26	2.31	9.1	0.24%
February	2,072	11	2.21	3.9	0.19%
March	0	0	---	---	---
April	0	0	---	---	---
May	0	0	---	---	---
June	0	0	---	---	---
July	0	0	---	---	---
August	0	0	---	---	---
September	0	0	---	---	---

(a) At UCR Evapotranspiration Station #44
(b) Evaporation losses=[4]/(days/month)x[3]x(Pan Factor of 1.0)x(area of 56.1 acres)x(1 foot/12 inches)

TABLE E-4

CALCULATION OF WEIGHTED TDS OF
OC-59 RELEASES

WATER YEAR 1999-00

Month	Calculated OC-59 Flow at Prado (acre-feet)	TDS at Release [1] (mg/L)	Adjusted TDS [2] (mg/L)	Flow x Adjusted TDS
1999				
October	5,827	202	354	2,062,743
November	0	-	-	-
December	2,935	246	379	1,112,217
2000				
January	3,750	286	424	1,590,041
February	2,057	285	425	874,306
March	0	-	-	-
April	0	-	-	-
May	0	-	-	-
June	0	-	-	-
				-
July	0	-	-	-
August	0	-	-	-
September	0	-	-	-
Total	14,569			5,639,307
		Yearly Flow Weighted TDS =	387	

Notes:

(1) Monthly average TDS values for State Water Project water at Silverwood Lake.

(2) Monthly average values for TDS of OC-59 water arriving at Prado Dam calculated per procedures outlined in Appendix Table E-5

TABLE E-5

TDS ADJUSTMENT OF OC-59 DISCHARGE
WATER YEAR 1999-00

This section describes the methodology used to adjust TDS concentrations in flows of OC-59 water as it arrived at Prado Dam. Because no direct TDS measurements were available as the water arrived at Prado, the adjusted TDS concentrations of OC-59 water were estimated from mass balance calculations using flows and TDS values of the Prado flow components for selected periods.

OC-59 flow was delivered during the months of October 1999, December 1999, January 2000, and February 2000. Flow rates in October and December were fairly regular and averaged 164 and 49 cfs, respectively. Flows during January and February 2000 averaged 75 and 88 cfs, respectively, but were irregular and were interrupted by storm flows. It was questioned whether the resultant TDS of the OC-59 water arriving at Prado may vary as a function of flow rate. Additionally, the TDS of the OC-59 supply water (Silverwood Lake) increased substantially from 202 mg/L in October 1999, to 285 mg/L in February 2000. Therefore, these factors were taken into consideration in calculating the TDS of OC-59 water when it reached Prado Dam.

The first step in calculating the TDS quality of OC-59 water reaching Prado consisted of estimating the TDS of the base flow, qbf. Because there were no months without nontributary flow or storm flow, qbf was estimated using data from June and July 2000, the months with the least interference of non-base flows and relatively constant TDS concentrations of total Santa Ana River flow below Prado. During June and July 2000, only Arlington Desalter flows mixed with base flows at Prado. August 2000 flows also had no other known interference, but these were not used in the qbf calculation because they exhibited fluctuating TDS values. The TDS of the Santa Ana River base flow at Prado was estimated to be 589 mg/L, using the following formula:

1. Estimating the TDS of base flow, qbf, using June-July 2000 data:

Qp	=	total outflow at Prado	=	22,712 af
qp	=	total flow TDS at Prado	=	584 mg/L
Qbf	=	base flow at Prado	=	21,698 af
qbf	=	base flow TDS at Prado	=	Unknown
Qad	=	Arlington Desalter flow	=	1,014 af
qad	=	Arlington Desalter flow TDS	=	468 mg/L

qbf = (Qp*qp - Qad*qad - Q59*q59)/Qbf
= **589 mg/L**

Following estimation of base flow TDS, the quality of OC-59 water reaching Prado, q59, was calculated for the two OC-59 discharge periods in which no storm flow interference occurred: October 11 through 29, 1999 and December 1 through 30, 1999.

TABLE E-5

TDS ADJUSTMENT OF OC-59 DISCHARGE
WATER YEAR 1999-00

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2. Calculating OC-59 TDS for 10/11/99 - 10/29/99 Period of Release:

$$Qp*qp = Qbf*qbf + Qad*qad + Q59*q59$$

Qp	=	total outflow at Prado	=	12,377 af
qp	=	total flow TDS at Prado	=	474 mg/L
Qbf	=	base flow at Prado	=	6,269 af
qbf	=	base flow TDS at Prado (estimated in Step 1 above)	=	589 mg/L
Qad	=	Arlington Desalter flow	=	281 af
qad	=	Arlington Desalter flow TDS	=	388 mg/L
Q59	=	OC-59 flow reaching Prado	=	5,827 af
q59	=	OC-59 flow TDS reaching Prado	=	Unknown

q59 = (Qp*qp - Qbf*qbf - Qad*qad)/Q59
= **354 mg/L**

It should be noted that the average TDS of the OC-59 source water at the point of discharge, based on Silverwood Lake data, was 202 mg/L during the October 1999 period, indicating an increase of 152 mg/L by the time the water reached Prado. The average OC-59 discharge during this period was 164 cfs.

3. Calculating OC-59 TDS for the 12/1/99 - 12/30/99 Period of Release:

$$Qp*qp = Qbf*qbf + Qad*qad + Q59*q59$$

Qp	=	total outflow at Prado	=	16,068 af
qp	=	total flow TDS at Prado	=	545 mg/L
Qbf	=	base flow at Prado	=	12,657 af
qbf	=	base flow TDS at Prado (estimated in Step 1 above)	=	589 mg/L
Qad	=	Arlington Desalter flow	=	476 af
qad	=	Arlington Desalter flow TDS	=	387 mg/L
Q59	=	OC-59 flow reaching Prado	=	2,935 af
q59	=	OC-59 flow TDS reaching Prado	=	Unknown

q59 = (Qp*qp - Qbf*qbf - Qsf*qsf - Qad*qad)/Q59
= **379 mg/L**

TABLE E-5

TDS ADJUSTMENT OF OC-59 DISCHARGE
WATER YEAR 1999-00

It should be noted that the average TDS of the OC-59 source water at the point of discharge, based on Silverwood Lake data, was 246 mg/L during the December 1999 period, indicating an increase of 133 mg/L by the time the water reached Prado. The average OC-59 discharge during this period was 49 cfs.

4. Estimating the Adjusted TDS of OC-59 Discharge During Periods of Storm Flow

Because the remaining periods of OC-59 discharge had irregular flow (an average of 50 cfs January 1-12, 97 cfs January 13-25, and 88 cfs January 31 – February 11, 2000), the adjusted TDS of the OC-59 water during these periods could not be calculated using the formulas used in Steps 2 and 3 above. Instead, the OC-59 water adjusted TDS for the remaining periods was interpolated based on the flow-TDS change relationship developed from the October 1999 and December 1999 periods (Steps 2 and 3 above) described below.

As shown on Figure E-1, the average flows of OC-59 discharges were plotted against calculated change in TDS for the October and December 1999 periods, as described in Steps 2 and 3 above. Using the average OC-59 discharges for the three remaining periods during January and February 2000, the changes in TDS for these periods were interpolated on the graph. The resultant changes in TDS for January 1-12, January 13-25, and January 31 - February 11, 2000 were interpolated as 133, 141, and 140 mg/L, respectively. When added to the initial TDS concentration estimates based on Silverwood Lake data, the resultant adjusted TDS values for the three periods were 419, 427, and 425 mg/L, respectively. When flow-weighted, the resultant TDS for January was 424 mg/L.

The adjusted TDS of OC-59 water at Prado for the four months calculated are summarized as follows:

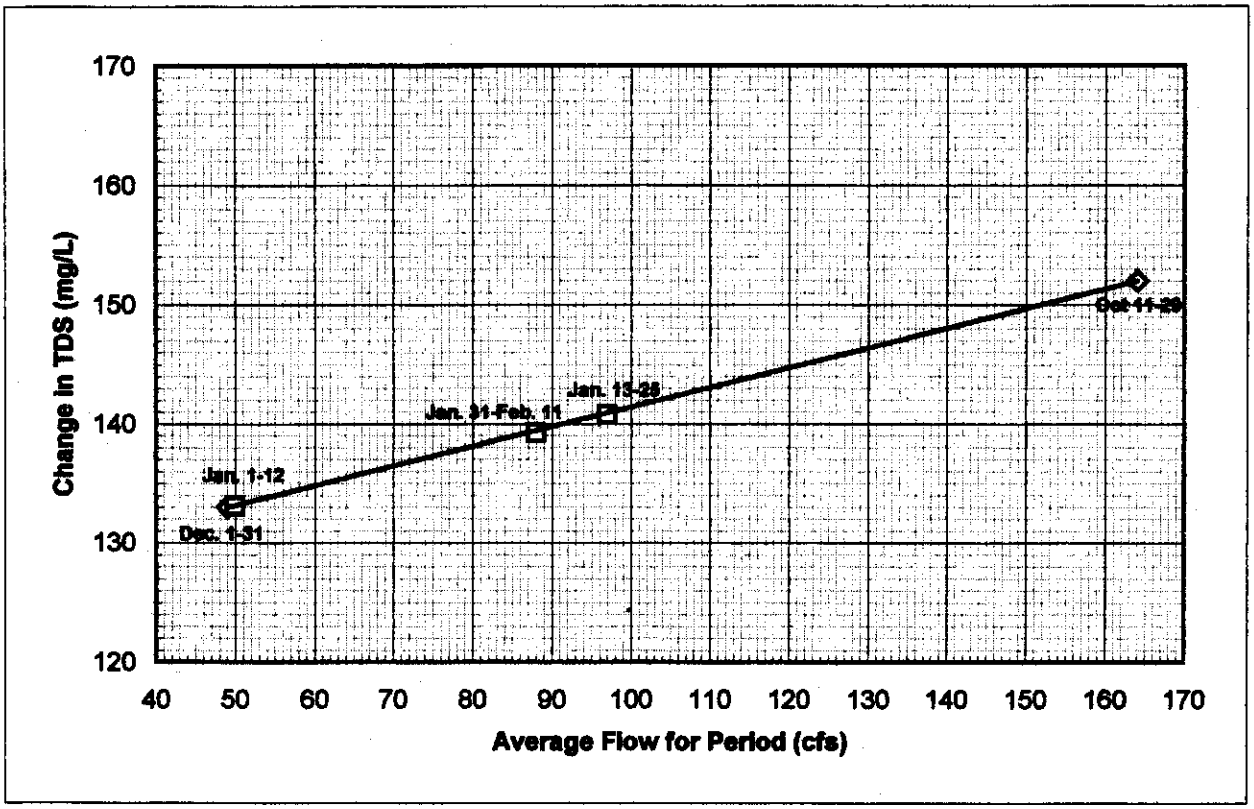
Period	Adjusted TDS (mg/L)
October 1999	354
December 1999	379
January 2000	424
February 2000	425

Figure E-1

OC-59 Flow Calculations for January & February 2000

	Avg. OC-59 Flow (cfs)	TDS @Silver-wood Lake (mg/L)	Calc OC-59 TDS @ Prado (mg/L)	Change in Oct & Dec TDS from release point to Prado (mg/L)	Change from Graph (mg/L)
October 11-29,1999	164	202	354	152	
December 1-31, 1999	49	246	379	133	
January 1-12, 2000	50	286	419		133
January 13-25, 2000	97	286	427		141
January 31 - February 1-11, 2000	88	285	424		139

NOTE: "q59" for Oct & Dec calculated using average qbf from 8/1/00 - 7/31/00 = 589 mg/L.



d:\watermater\wm00\oc59 calc.xls

APPENDIX F

WATER QUALITY AND DISCHARGE FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN

WATER YEAR 1999-00

PREPARED BY

WILLIAM R. MILLS, JR.

TABLE F-1

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

OCTOBER 1999

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	6	13	733	451	2,925
2	6	13	735	452	2,933
3	6	13	737	453	2,941
4	6	13	737	453	2,934
5	7	14	671	413	2,952
6	8	16	565	348	2,846
7	3	6	700	431	1,360
8	5	9	674	415	1,977
9	8	16	566	348	2,873
10	8	16	544	335	2,756
11	8	16	543	334	2,751
12	8	16	544	335	2,756
13	8	16	544	335	2,751
14	8	16	544	335	2,751
15	8	16	546	336	2,761
16	8	16	546	336	2,756
17	8	16	631	388	3,034
18	7	14	786	484	3,428
19	8	15	665 [2]	409	3,084
20	6	11	617	380	2,103
21	3	6	708	436	1,247
22	2	3	535 [2]	329	540
23	8	16	561	345	2,826
24	8	17	608	374	3,121
25	9	18	666	410	3,647
26	9	18	660	406	3,601
27	9	18	658	405	3,584
28	9	17	618	380	3,237
29	8	17	600	369	3,091
30	8	16	528	325	2,610
31	7	14	329	202	1,407
Total	223	441			83,581
			Monthly Flow Weighted TDS	376	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

NOVEMBER 1999

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	8	16	490	301	2,394
2	9	18	655	403	3,618
3	9	18	651	401	3,577
4	9	18	654	402	3,600
5	9	18	654	402	3,594
6	9	18	580	357	3,187
7	9	18	653	402	3,582
8	9	18	653	402	3,582
9	9	18	660 [2]	406	3,620
10	9	18	660 [2]	406	3,626
11	9	18	660	406	3,608
12	9	18	630	388	3,432
13	9	18	610	375	3,317
14	9	18	610	375	3,323
15	7	14	610	375	2,614
16	0	0	-	0	0
17	0	0	-	0	0
18	0	0	-	0	0
19	0	0	-	0	0
20	0	0	-	0	0
21	0	0	-	0	0
22	0	1	215 [2]	132	35
23	1	2	920 [2]	566	569
24	4	8	950 [2]	584	2,420
25	7	13	728	448	3,019
26	7	13	729	449	2,988
27	7	13	729	449	2,965
28	7	13	729	449	2,962
29	6	13	754	464	2,969
30	6	13	740	455	2,956
Total	176	348			71,556
			Monthly Flow Weighted TDS	407	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

DECEMBER 1999

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	6	13	743	457	2,970
2	5	10	760	467	2,292
3	7	15	673	414	3,093
4	8	17	602	370	3,142
5	8	17	602	370	3,142
6	8	17	601	370	3,132
7	8	17	601	370	3,134
8	8	17	601	370	3,132
9	8	17	600	369	3,123
10	8	17	601	369	3,126
11	5	10	601	369	1,824
12	4	7	219	135	481
13	7	15	423	260	1,932
14	8	16	654	402	3,185
15	9	17	629	387	3,364
16	9	17	631	388	3,373
17	9	17	631	388	3,368
18	9	17	630	387	3,360
19	9	17	629	387	3,358
20	8	16	626	385	3,154
21	8	16	630	387	3,212
22	8	17	609	375	3,161
23	9	17	607	374	3,261
24	9	17	608	374	3,263
25	9	17	607	374	3,260
26	9	17	607	373	3,258
27	9	17	606	373	3,256
28	9	17	606	373	3,250
29	9	17	606	373	3,252
30	9	17	605	372	3,246
31	9	17	605	373	3,250
Total	249	494			93,353
			Monthly Flow Weighted TDS	375	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

JANUARY 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	9	17	604	371	3,240
2	9	17	605	372	3,246
3	9	17	604	372	3,244
4	9	17	603	371	3,237
5	9	17	603	371	3,235
6	9	17	604	371	3,239
7	9	17	604	372	3,242
8	9	17	603	371	3,236
9	7	14	602	371	2,561
10	2	4	786	483	880
11	4	8	656	403	1,580
12	6	12	619	381	2,392
13	6	13	265	163	1,032
14	6	13	264	163	1,027
15	6	12	264	162	996
16	0	0	0	0	0
17	2	4	386	238	523
18	7	14	401	247	1,736
19	1	3	596	367	487
20	4	9	624	384	1,693
21	9	17	596	366	3,132
22	9	17	595	366	3,125
23	9	17	592	364	3,106
24	7	13	601	370	2,495
25	8	17	585	360	3,045
26	9	17	594	366	3,118
27	9	17	594	365	3,111
28	9	17	593	365	3,109
29	9	17	593	365	3,106
30	9	17	593	365	3,105
31	9	17	592	364	3,098
Total	214	425			74,378
			Monthly Flow Weighted TDS	347	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

FEBRUARY 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	9	17	591	364	3,097
2	7	13	457	281	1,851
3	4	9	283	174	764
4	5	11	403	248	1,358
5	9	18	654	402	3,651
6	9	18	652	401	3,637
7	9	17	624	384	3,273
8	9	17	595	366	3,136
9	9	17	600	369	3,173
10	9	17	600	369	3,171
11	9	17	598	368	3,163
12	9	17	598	368	3,163
13	9	17	597	367	3,157
14	9	17	599	368	3,165
15	9	17	598	368	3,163
16	9	17	598	368	3,158
17	9	17	596	367	3,152
18	9	17	597	367	3,155
19	9	17	597	367	3,155
20	9	17	595	366	3,145
21	9	18	636	391	3,489
22	9	18	673	414	3,802
23	7	14	669	412	2,946
24	0	0	0	0	0
25	0	0	0	0	0
26	0	0	0	0	0
27	0	0	0	0	0
28	0	1	767	472	147
29	4	7	689	424	1,541
Total	192	382			70,610
			Monthly Flow Weighted TDS	367	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE E-3.2

EVAPOTRANSPIRATION LOSSES OF STATE WATER FROM OC-59
WATER YEAR 1999-00
LOS SERRANOS ROAD TO PRADO DAM (WITHOUT VEGETATION COVER)

Month	State Water Released with 12-hour delay (AF)	Days of Evaporation (+7 days) (a)	Evapo-transpiration (in) (b)	Average Wetted Area (AF) (c)	Computed Evaporation Losses (d)	
					(AF)	% of release)
[1]	[2]	[3]	[4]	[5]	[6]	[7]
1999						
October	5,870	21	5.29	72	21.5	0.37%
November	0	4	---	---	---	---
December	2,979	31	3.43	72	20.6	0.69%
2000						
January	3,787	31	2.31	72	13.9	0.37%
February	2,072	18	2.21	72	8.2	0.40%
March	0	0	---	---	---	---
April	0	0	---	---	---	---
May	0	0	---	---	---	---
June	0	0	---	---	---	---
July	0	0	---	---	---	---
August	0	0	---	---	---	---
September	0	0	---	---	---	---

(a) Period of delivery plus 7 days after stoppage of delivery.
(b) At UCR Evapotranspiration Station #44
(c) Equals 1/2 of 144 acres if the maximum flow rate of the month is less than 200 cfs and 1/2 of 369 acres if the maximum flow rate is greater or equal to 200 cfs.
(d) Evaporation losses=[3]x[4]/(days/month)x[5]x(1 foot/12 inches)

TABLE E-3.3

EVAPOTRANSPIRATION LOSSES OF STATE WATER FROM OC-59
WATER YEAR 1999-00
LOS SERRANOS ROAD TO PRADO DAM (WITH VEGETATION COVER)

Month	State Water Released with 12-hour delay (AF)	Days of Evaporation (a)	Evapo-transpiration (in) (b)	Normal Evaporation (in) (c)	Average Wetted Area (AF) (d)	Computed Evaporation Losses (e)	
						(AF)	% of release)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1999							
October	5,870	21	5.29	3.5	72	7.5	0.13%
November	0	4	---	---	---	---	---
December	2,979	31	3.43	2.1	72	8.2	0.28%
		0					
2000		0					
January	3,787	31	2.31	2.8	72	14.3	0.38%
February	2,072	18	2.21	1.6	72	2.2	0.11%
March	0	0	---	---	---	---	---
April	0	0	---	---	---	---	---
May	0	0	---	---	---	---	---
June	0	0	---	---	---	---	---
July	0	0	---	---	---	---	---
August	0	0	---	---	---	---	---
September	0	0	---	---	---	---	---

(a) Period of delivery plus 7 days after stoppage of delivery.
(b) At UCR Evapotranspiration Station #44
(c) Referenced in the 1983 report "Nontributary Losses of State Water Released at OC-59 and Final Adjustments to Base Flows".
(d) Equals 1/2 of 144 acres if the maximum flow rate of the month is less than 200 cfs and 1/2 of 369 acres if the maximum flow rate is greater or equal to 200 cfs.
(e) Evaporation losses=[3]x([4]-[5])/(days/month)x[6]x(1 foot/12 inches)

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

MARCH 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	9	18	674	414	3,678
2	7	14	770	474	3,266
3	4	7	602	370	1,308
4	9	18	672	414	3,813
5	9	18	668	411	3,781
6	5	9	667	411	1,889
7	0	0	0	0	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	0	0	0	0	0
14	0	0	0	0	0
15	0	0	0	0	0
16	0	0	0	0	0
17	0	0	0	0	0
18	0	0	0	0	0
19	0	0	0	0	0
20	4	7	680	418	1,479
21	9	18	669	412	3,665
22	8	16	653	402	3,151
23	9	17	620	381	3,280
24	9	17	616	379	3,256
25	9	17	614	378	3,231
26	9	17	614	378	3,236
27	9	17	611	376	3,213
28	8	17	602	370	3,140
29	8	17	602	371	3,142
30	9	17	610	376	3,203
31	9	17	610	375	3,199
Total	139	277			54,929
			Monthly Flow Weighted TDS	394	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

APRIL 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	9	17	610	375	3,198
2	8	16	604	372	3,021
3	8	17	604	372	3,151
4	7	15	608	374	2,797
5	8	15	602	370	2,829
6	5	10	635	390	2,024
7	8	17	609	375	3,172
8	8	17	608	374	3,166
9	8	17	608	374	3,166
10	8	17	608	374	3,164
11	8	17	610	375	3,132
12	9	17	587	361	3,077
13	9	17	587	361	3,079
14	9	17	586	360	3,070
15	9	17	586	361	3,070
16	9	17	585	360	3,064
17	9	17	585	360	3,064
18	9	17	585	360	3,064
19	8	15	417	256	1,923
20	7	15	363	224	1,667
21	9	17	593	365	3,130
22	9	17	603	371	3,203
23	9	17	605	372	3,213
24	9	18	630	388	3,429
25	7	13	707	435	2,899
26	9	19	704	433	4,105
27	9	19	699	430	4,055
28	9	19	696	428	4,031
29	9	19	695	428	4,021
30	9	19	694	427	4,013
Total	251	497			93,995
			Monthly Flow Weighted TDS	375	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

MAY 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	9	19	694	427	4,008
2	9	18	704	433	3,856
3	9	18	706	435	3,951
4	9	19	709	436	4,135
5	9	19	708	436	4,129
6	2	3	703	433	682
7	4	7	704	433	1,521
8	9	19	703	432	4,082
9	9	19	705	434	4,068
10	3	6	720	443	1,366
11	0	0	1,200	738	88
12	1	3	518	319	462
13	9	18	705	434	4,020
14	9	18	699	430	3,976
15	9	18	697	429	3,968
16	8	15	702	432	3,304
17	5	10	714	439	2,212
18	4	7	849	522	1,964
19	7	15	842	518	3,813
20	7	15	835	514	3,784
21	7	15	834	513	3,783
22	7	15	833	513	3,776
23	7	13	851	523	3,406
24	8	17	783	482	4,015
25	9	19	701	431	4,048
26	9	19	701	431	4,043
27	9	19	701	431	4,044
28	9	19	700	431	4,034
29	9	19	699	430	4,027
30	9	19	700 [2]	431	4,033
31	4	9	611	376	1,626
Total	224	444			100,224
			Monthly Flow Weighted TDS	447	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

JUNE 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	9	17	624	384	3,325
2	8	17	630	387	3,260
3	9	17	604	372	3,174
4	9	17	604	371	3,168
5	9	17	604	372	3,171
6	9	18	652	401	3,600
7	1	2	702	432	344
8	9	19	699	430	4,039
9	9	19	698	430	4,033
10	9	19	697	429	4,023
11	9	19	698	429	4,022
12	9	19	703	432	4,048
13	9	17	727	447	3,907
14	3	6	709	436	1,215
15	9	18	707	435	4,058
16	9	18	706	435	4,052
17	9	18	705	434	4,042
18	9	18	703	433	4,023
19	9	18	704	433	4,026
20	3	5	803	494	1,348
21	3	7	733	451	1,549
22	9	19	708	435	4,062
23	9	18	706	434	4,047
24	8	16	778	478	3,927
25	8	16	771	474	3,933
26	9	18	702	432	4,009
27	9	18	701	431	4,008
28	8	16	725 [2]	446	3,563
29	10	19	741	456	4,378
30	10	19	740	455	4,365
Total	244	485			104,718
			Monthly Flow Weighted TDS	428	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

JULY 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	10	19	740	455	4,366
2	10	19	739	455	4,358
3	10	19	739	455	4,358
4	10	19	739	455	4,358
5	10	19	739	455	4,358
6	7	13	731	450	2,947
7	10	19	739 [2]	455	4,350
8	10	19	741	456	4,362
9	10	19	740	455	4,358
10	9	19	740	455	4,251
11	10	19	739	455	4,348
12	9	19	711	437	4,092
13	10	19	736	453	4,346
14	8	16	728	448	3,593
15	9	19	712	438	4,118
16	9	19	710	437	4,105
17	9	19	709	436	4,096
18	9	19	706	434	4,070
19	9	19	704	433	4,048
20	7	14	740	455	3,204
21	8	15	785	483	3,691
22	4	7	724	445	1,682
23	1	2	893	550	555
24	8	17	753	463	3,894
25	9	18	688	423	3,805
26	9	18	682	420	3,771
27	9	18	679	418	3,751
28	9	18	674	415	3,709
29	9	18	687	422	3,814
30	9	18	693	426	3,868
31	9	18	686	422	3,807
Total	267	529			118,432
			Monthly Flow Weighted TDS	444	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

AUGUST 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	9	17	702	432	3,735
2	9	18	683	420	3,783
3	9	18	683	420	3,779
4	9	18	683	420	3,778
5	9	18	683	420	3,776
6	9	18	682	420	3,772
7	9	18	680	418	3,760
8	9	18	681	419	3,766
9	9	18	682	420	3,770
10	9	18	681	419	3,763
11	9	18	681	419	3,759
12	4	8	670	412	1,624
13	9	18	685	421	3,787
14	9	18	685	421	3,783
15	9	18	685	422	3,785
16	9	18	684	421	3,775
17	9	18	684	421	3,776
18	9	18	667	410	3,638
19	9	17	659	406	3,576
20	9	17	659	405	3,573
21	9	17	659	406	3,575
22	9	17	672	413	3,571
23	9	18	673	414	3,688
24	9	18	686	422	3,791
25	9	18	686	422	3,794
26	9	18	685	422	3,788
27	9	18	686	422	3,792
28	9	18	686	422	3,790
29	9	18	680	418	3,743
30	9	17	659	405	3,573
31	8	15	718	442	3,397
Total	271	537			113,259
			Monthly Flow Weighted TDS	419	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1999-00

SEPTEMBER 2000

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L) [1]	Outflow X TDS
1	8	16	704	433	3,421
2	9	17	644	397	3,480
3	9	17	644	396	3,479
4	9	17	645	397	3,481
5	9	17	645	397	3,480
6	9	18	684	421	3,850
7	7	14	728	448	3,208
8	5	10	738	454	2,201
9	10	19	732	450	4,325
10	10	19	732	451	4,328
11	10	19	731	450	4,316
12	9	18	726	447	4,033
13	9	18	654	402	3,574
14	9	18	655	403	3,577
15	9	18	655	403	3,572
16	9	18	654	403	3,570
17	9	18	654	402	3,568
18	9	17	652	401	3,513
19	9	17	663	408	3,495
20	9	17	650	400	3,519
21	9	17	648	399	3,509
22	9	17	649	399	3,512
23	9	17	649	399	3,511
24	9	17	647	398	3,503
25	9	17	646	398	3,496
26	9	17	648	398	3,502
27	9	17	648	399	3,503
28	9	17	648	399	3,503
29	9	17	647	398	3,499
30	9	17	647	398	3,496
Total	260	516			107,026
			Monthly Flow Weighted TDS	411	

1. TDS = EC x 0.615251
2. EC interpolated from the relationship between EC and the blend ratio of the reverse osmosis product water to the total flow discharged.

TABLE F-2

QUALITY OF WATER DISCHARGED
FROM THE ARLINGTON DESALTER
TO THE ARLINGTON VALLEY DRAIN

WATER YEAR 1999-00

Month	Discharge (acre-feet)	Weighted TDS (mg/L)	Discharge X TDS
1999			
October	441	376	165,781
November	348	407	141,930
December	494	375	185,164
2000			
January	425	347	147,526
February	382	367	140,052
March	277	394	108,951
April	497	375	186,435
May	444	447	198,791
June	485	428	207,705
July	529	444	234,907
August	537	419	224,645
September	516	411	212,283
Total	5,376		2,154,169
	Yearly Flow Weighted TDS =	401	

APPENDIX G

WATER QUALITY AND DISCHARGE FROM THE SAN JACINTO WATERSHED

WATER YEAR 1999-00

PREPARED BY

WILLIAM R. MILLS, JR.

No discharges into the Santa Ana River watershed from
Lake Elsinore or Lee Lake occurred during the 1999-00 water year.

APPENDIX H

WATER QUALITY AND DISCHARGE OF THE SANTA ANA RIVER BELOW PRADO DAM

WATER YEAR 1999-00

PREPARED BY

WILLIAM R. MILLS, JR

TABLE H-1

WATER QUALITY SAMPLES BELOW PRADO DAM
FOR WATER YEAR 1999-00

Date	EC (microsiemens/cm)	TDS (mg/L)	Source
10/01/99	964	582	USGS
10/18/99	757	454	OCWD*
10/18/99	759	453	USGS
11/05/99	996	613	USGS
11/15/99	979	602	OCWD*
11/18/99	959	592	USGS
12/06/99	918	550	USGS
12/13/99	910	530	OCWD*
12/15/99	897	546	USGS
01/12/00	935	559	USGS
01/19/00	884	510	OCWD*
01/20/00	873	524	USGS
02/04/00	881	521	USGS
02/14/00	747	442	OCWD*
02/18/00	740	450	USGS
03/09/00	644	388	USGS
03/20/00	832	508	OCWD*
03/21/00	942	579	USGS
04/11/00	1010	620	USGS
04/17/00	1000	612	OCWD*
04/21/00	600	365	USGS
05/02/00	981	604	USGS
05/15/00	1010	616	OCWD*
05/24/00	988	609	USGS
06/09/00	1000	601	USGS
06/19/00	981	604	OCWD*
06/20/00	1010	607	USGS
07/06/00	992	600	USGS
07/21/00	1010	599	USGS
07/24/00	978	612	OCWD*
08/04/00	1000	598	USGS
08/18/00	988	596	USGS
08/21/00	978	628	OCWD*
09/01/00	972	584	USGS
09/14/00	970	598	USGS
09/15/00	958	614	OCWD*

* Not used in calculation of the best fit equation TDS = EC x 0.605585

TABLE H-2

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

OCTOBER 1999

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	197	953	577	113,693
2	199	939	569	113,160
3	204	941	570	116,250
4	213	942	570	121,508
5	211	950	575	121,389
6	205	960	581	119,179
7	202	950	575	116,212
8	197	944	572	112,619
9	198	936	567	112,232
10	200	929	563	112,518
11	200	975	590	118,089
12	225	971	588	132,305
13	258	927	561	144,835
14	319	857	519	165,557
15	355	753	456	161,882
16	351	751	455	159,633
17	340	758	459	156,071
18	346	756	458	158,406
19	333	753	456	151,850
20	329	765	463	152,417
21	347	730	442	153,401
22	365	715	433	158,042
23	367	717	434	159,353
24	373	727	440	164,217
25	372	743	450	167,381
26	375	750	454	170,321
27	376	769	466	175,101
28	377	793	480	181,046
29	232	916	555	128,694
30	195	954	578	112,657
31	195	956	579	112,893
Total	8,656			4,342,912
Monthly Flow Weighted TDS			502	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

NOVEMBER 1999

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	191	974	590	112,659
2	193	982	595	114,774
3	197	981	594	117,033
4	201	982	595	119,532
5	201	982	595	119,532
6	204	977	592	120,698
7	211	936	567	119,601
8	237	916	555	131,468
9	230	934	566	130,092
10	225	928	562	126,446
11	217	941	570	123,659
12	217	939	569	123,396
13	214	941	570	121,949
14	218	954	578	125,945
15	221	961	582	128,615
16	182	959	581	105,698
17	174	958	580	100,946
18	163	959	581	94,663
19	155	955	578	89,642
20	158	943	571	90,228
21	161	955	578	93,112
22	161	948	574	92,429
23	162	949	575	93,101
24	209	945	572	119,606
25	230	944	572	131,485
26	229	950	575	131,745
27	227	948	574	130,319
28	224	946	573	128,326
29	237	946	573	135,773
30	241	952	577	138,941
Total	6,090			3,511,410
Monthly Flow Weighted TDS			577	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

DECEMBER 1999

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	237	960	581	137,783
2	275	931	564	155,045
3	291	917	555	161,598
4	278	940	569	158,251
5	270	932	564	152,389
6	269	913	553	148,730
7	271	894	541	146,717
8	268	888	538	144,119
9	265	883	535	141,704
10	265	889	538	142,667
11	262	890	539	141,210
12	264	899	544	143,727
13	266	887	537	142,883
14	266	907	549	146,105
15	273	896	543	148,131
16	276	904	547	151,096
17	272	922	558	151,871
18	272	892	540	146,929
19	272	890	539	146,600
20	277	878	532	147,282
21	280	873	529	148,029
22	273	883	535	145,982
23	268	873	529	141,685
24	266	870	527	140,144
25	265	881	534	141,383
26	265	871	527	139,778
27	266	860	521	138,534
28	267	900	545	145,522
29	278	953	577	160,440
30	284	930	563	159,947
31	286	927	561	160,554
Total	8,387			4,576,835
Monthly Flow Weighted TDS			546	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

JANUARY 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	307	869	526	161,560
2	308	895	542	166,935
3	351	882	534	187,478
4	361	857	519	187,354
5	336	907	549	184,553
6	304	890	539	163,847
7	289	882	534	154,362
8	287	919	557	159,725
9	288	922	558	160,805
10	292	911	552	161,093
11	294	915	554	162,908
12	293	930	563	165,016
13	326	870	527	171,756
14	337	850	515	173,470
15	335	837	507	169,803
16	334	851	515	172,128
17	333	874	529	176,251
18	334	875	530	176,982
19	334	869	526	175,769
20	333	879	532	177,259
21	332	897	543	180,346
22	330	918	556	183,456
23	331	910	551	182,408
24	334	875	530	176,982
25	357	706	428	152,633
26	401	585	354	142,061
27	405	635	385	155,741
28	390	753	456	177,842
29	350	830	503	175,922
30	274	854	517	141,704
31	323	767	464	150,028
Total	10,203			5,228,176
Monthly Flow Weighted TDS			512	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

FEBRUARY 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	372	810	491	182,475
2	359	844	511	183,490
3	301	856	518	156,033
4	309	874	529	163,548
5	315	894	541	170,539
6	322	912	552	177,838
7	325	927	561	182,448
8	337	918	556	187,347
9	341	870	527	179,659
10	340	825	500	169,867
11	320	663	402	128,481
12	296	723	438	129,600
13	299	670	406	121,317
14	298	727	440	131,198
15	288	733	444	127,841
16	289	750	454	131,260
17	406	806	488	198,169
18	464	764	463	214,677
19	360	822	498	179,205
20	301	845	512	154,027
21	1,480	620	375	555,685
22	3,780	480	291	1,098,773
23	1,950	436	264	514,868
24	1,400	460	279	389,997
25	630	451	273	172,065
26	572	497	301	172,158
27	484	564	342	165,310
28	462	609	369	170,386
29	513	645	391	200,379
Total	17,913			6,708,638
Monthly Flow Weighted TDS			375	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

MARCH 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	505	643	389	196,642
2	500	677	410	204,990
3	506	709	429	217,256
4	500	768	465	232,545
5	325	892	540	175,559
6	475	783	474	225,232
7	483	648	392	189,538
8	496	656	397	197,043
9	510	654	396	201,987
10	503	625	378	190,381
11	502	646	391	196,386
12	501	665	403	201,760
13	498	677	410	204,170
14	449	685	415	186,257
15	386	722	437	168,772
16	385	771	467	179,759
17	383	795	481	184,391
18	381	833	504	192,196
19	381	855	518	197,272
20	385	869	526	202,607
21	388	926	561	217,579
22	416	906	549	228,242
23	427	927	561	239,708
24	376	946	573	215,404
25	324	952	577	186,791
26	324	957	580	187,772
27	384	971	588	225,801
28	420	982	595	249,767
29	420	988	598	251,293
30	419	992	601	251,710
31	418	992	601	251,109
Total	13,370			6,449,922
Monthly Flow Weighted TDS			482	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

APRIL 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	416	999	605	251,671
2	415	1,010	612	253,831
3	413	1,010	612	252,608
4	401	1,020	618	247,696
5	390	1,040	630	245,625
6	396	1,030	624	247,006
7	382	1,040	630	240,587
8	311	1,040	630	195,870
9	279	1,020	618	172,337
10	291	1,010	612	177,987
11	256	1,010	612	156,580
12	246	1,010	612	150,464
13	236	1,000	606	142,918
14	247	1,020	618	152,571
15	250	1,040	630	157,452
16	250	1,030	624	155,938
17	222	969	587	130,272
18	206	613	371	76,472
19	300	580	351	105,372
20	378	577	349	132,082
21	393	625	378	148,747
22	389	713	432	167,963
23	384	791	479	183,943
24	387	849	514	198,973
25	396	879	532	210,794
26	395	921	558	220,309
27	397	936	567	225,030
28	348	948	574	199,785
29	309	972	589	181,886
30	304	993	601	182,809
Total	9,987			5,565,578
Monthly Flow Weighted TDS			557	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

MAY 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	361	981	594	214,462
2	382	979	593	226,475
3	322	1,020	618	198,898
4	221	1,020	618	136,511
5	235	1,010	612	143,736
6	242	1,010	612	148,017
7	223	999	605	134,910
8	225	997	604	135,848
9	218	999	605	131,885
10	216	993	601	129,891
11	217	1,000	606	131,412
12	215	1,010	612	131,503
13	202	1,020	618	124,775
14	211	1,030	624	131,612
15	220	1,040	630	138,558
16	230	1,020	618	142,070
17	234	1,020	618	144,541
18	223	998	604	134,775
19	216	1,020	618	133,422
20	206	1,030	624	128,493
21	205	1,000	606	124,145
22	214	985	597	127,651
23	207	1,000	606	125,356
24	206	978	592	122,006
25	216	975	590	127,536
26	230	964	584	134,270
27	220	957	580	127,500
28	201	953	577	116,002
29	199	950	575	114,486
30	211	987	598	126,117
31	213	999	605	128,861
Total	7,141			4,315,724
Monthly Flow Weighted TDS			604	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

JUNE 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	203	990	600	121,704
2	213	974	590	125,636
3	208	969	587	122,057
4	208	975	590	122,813
5	209	999	605	126,441
6	204	1,000	606	123,539
7	199	1,010	612	121,716
8	204	996	603	123,045
9	213	992	601	127,958
10	223	975	590	131,669
11	218	943	571	124,492
12	212	927	561	119,012
13	206	930	563	116,018
14	210	934	566	118,779
15	212	925	560	118,755
16	207	942	570	118,085
17	205	922	558	114,462
18	201	983	595	119,653
19	210	983	595	125,011
20	210	969	587	123,230
21	203	958	580	117,770
22	196	931	564	110,505
23	195	941	570	111,122
24	195	963	583	113,720
25	199	960	581	115,691
26	197	960	581	114,528
27	193	951	576	111,151
28	196	940	569	111,573
29	203	941	570	115,681
30	198	956	579	114,630
Total	6,150			3,580,446
Monthly Flow Weighted TDS			582	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

JULY 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	198	962	583	115,349
2	192	964	584	112,086
3	187	970	587	109,847
4	186	979	593	110,273
5	187	981	594	111,093
6	190	977	592	112,415
7	193	938	568	109,631
8	196	937	567	111,217
9	195	940	569	111,004
10	195	950	575	112,185
11	188	947	573	107,816
12	190	955	578	109,883
13	190	963	583	110,804
14	193	968	586	113,138
15	195	964	584	113,838
16	194	964	584	113,254
17	190	966	585	111,149
18	190	973	589	111,954
19	182	983	595	108,343
20	176	990	600	105,517
21	183	993	601	110,046
22	177	988	598	105,902
23	178	980	593	105,638
24	181	973	589	106,651
25	176	959	581	102,213
26	182	961	582	105,918
27	182	986	597	108,673
28	179	975	590	105,690
29	181	978	592	107,199
30	192	979	593	113,831
31	194	977	592	114,781
Total	5,812			3,407,339
Monthly Flow Weighted TDS			586	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

AUGUST 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	204	974	590	120,327
2	201	977	592	118,923
3	185	998	604	111,809
4	171	989	599	102,416
5	182	977	592	107,681
6	184	923	559	102,848
7	186	881	534	99,235
8	188	861	521	98,025
9	185	851	515	95,340
10	181	852	516	93,388
11	174	872	528	91,884
12	175	889	538	94,214
13	172	893	541	93,015
14	177	897	543	96,148
15	179	923	559	100,053
16	176	935	566	99,655
17	170	942	570	96,978
18	172	963	583	100,307
19	175	939	569	99,513
20	176	917	555	97,737
21	181	893	541	97,882
22	181	904	547	99,088
23	185	892	540	99,934
24	183	896	543	99,297
25	177	930	563	99,685
26	179	968	586	104,931
27	185	951	576	106,544
28	182	941	570	103,714
29	180	958	580	104,427
30	204	962	583	118,845
31	202	959	581	117,313
Total	5,652			3,171,155
Monthly Flow Weighted TDS			561	

1. TDS = EC x 0.605585

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

SEPTEMBER 2000

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	197	969	587	115,602
2	198	953	577	114,270
3	199	939	569	113,160
4	194	920	557	108,085
5	194	909	550	106,792
6	169	903	547	92,416
7	185	911	552	102,062
8	186	917	555	103,290
9	182	933	565	102,832
10	180	939	569	102,356
11	190	935	566	107,582
12	182	959	581	105,698
13	164	950	575	94,350
14	169	947	573	96,920
15	171	947	573	98,067
16	177	926	561	99,257
17	180	902	546	98,323
18	185	899	544	100,718
19	183	894	541	99,075
20	181	915	554	100,294
21	189	918	556	105,070
22	204	900	545	111,185
23	253	830	503	127,167
24	228	866	524	119,571
25	214	859	520	111,322
26	159	890	539	85,696
27	136	934	566	76,924
28	132	957	580	76,500
29	123	1,020	618	75,977
30	126	1,030	624	78,593
Total	5,430			3,029,153
Monthly Flow Weighted TDS			558	

1. TDS = EC x 0.605585

TABLE H-3

ANNUAL SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

FOR WATER YEAR 1999-00

Month	Monthly Flow (cfs-days)	Monthly Weighted TDS (mg/L)	Monthly Flow x TDS
1999			
October	8,656	502	4,342,912
November	6,090	577	3,511,410
December	8,387	546	4,576,835
2000			
January	10,203	512	5,228,176
February	17,913	375	6,708,638
March	13,370	482	6,449,922
April	9,987	557	5,565,578
May	7,141	604	4,315,724
June	6,150	582	3,580,446
July	5,812	586	3,407,339
August	5,652	561	3,171,155
September	5,430	558	3,029,153
Total	104,791		53,887,289
	Yearly Flow Weighted TDS =	514	

APPENDIX I

WATER QUALITY AND FLOW OF WASTEWATER FROM RUBIDOUX COMMUNITY SERVICES DISTRICT DISCHARGED BELOW THE RIVERSIDE NARROWS GAGING STATION

WATER YEAR 1999-00

PREPARED BY

DONALD L. HARRIGER

TABLE I-1

QUANTITY AND QUALITY OF WASTEWATER FROM RUBIDOUX
DISCHARGED BELOW THE
RIVERSIDE NARROWS GAGING STATION

WATER YEAR 1999-2000

Month	Discharge (acre -feet)	TDS (mg/L)	Discharge xTDS
1999			
October	188	685	129,033
November	183	727	133,194
December	189	696	131,767
2000			
January	189	698	132,145
February	177	704	124,608
March	188	828	155,970
April	180	676	121,984
May	190	644	122,534
June	181	688	124,783
July	191	628	120,086
August	191	580	110,908
September	189	644	121,549
Total	2,239		1,528,561
	Flow weighted TDS =	683	mg/L

APPENDIX J

WATER QUALITY AND DISCHARGE OF THE SANTA ANA RIVER AT RIVERSIDE NARROWS

WATER YEAR 1999-00

PREPARED BY

DONALD L. HARRIGER

TABLE J-1

WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
FOR WATER YEAR 1999-00

Date Sampled	E.C. (microsiemens/cm)	TDS (mg/L)	Source of Data	Ratio	Average
1999					
10/05/99	1055	724 *	C. of R.	0.69	
10/06/99	1020	624	USGS	0.61	
10/14/99	1066	650	C. of R.	0.61	
10/14/99	911	561	USGS **	0.62	
10/19/99	1057	620	C. of R.	0.59	
10/19/99	899	533	USGS	0.59	
10/28/99	1126	648	C. of R.	0.58	606
11/01/99	913	560	USGS	0.61	
11/02/99	1059	736 *	C. of R.	0.69	
11/11/99	1046	626	C. of R.	0.6	
11/12/99	900	544	USGS	0.6	
11/16/99	1068	688	C. of R.	0.64	
11/16/99	930	563	USGS **	0.61	
11/25/99	1045	696 *	C. of R.	0.67	
11/30/99	1062	628	C. of R.	0.59	602
12/03/99	890	---	USGS	---	
12/09/99	1056	692	C. of R.	0.66	
12/14/99	1049	696	C. of R.	0.66	
12/14/99	891	546	USGS **	0.61	
12/21/99	992	603	USGS	0.61	
12/23/99	1086	678	C. of R.	0.62	
12/28/99	1035	640	C. of R.	0.62	643

* Storm flow; data not used in determining monthly averages.
** NAWQA Data
C.of R. City of Riverside
USGS U.S. Geological Survey

TABLE J-1

WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
FOR WATER YEAR 1999-00

Date Sampled	E.C. (microsiemens/cm)	TDS (mg/L)		Source of Data		Ratio	Average
2000							
01/06/00	1035	672		C. of R.		0.65	
01/06/00	1020	634		USGS		0.62	
01/11/00	1027	564		C. of R.		0.55	
01/12/00	872	545		USGS	**	0.63	
01/18/00	931	550		USGS		0.59	
01/20/00	1037	642		C. of R.		0.62	
01/25/00	800	476	*	C. of R.		0.6	
01/25/00	675	412	*	USGS		0.61	
01/26/00	637	379	*	USGS		0.59	
01/31/00	669	415	*	USGS	**	0.62	601
02/02/00	1014	728	*	C. of R.		0.72	
02/03/00	893	544		USGS		0.61	
02/10/00	835	474	*	C. of R.		0.57	
02/12/00	310	211	*	USGS		0.68	
02/15/00	875	541		USGS		0.62	
02/16/00	928	564		C. of R.		0.61	
02/16/00	823	515		USGS	**	0.63	
02/21/00	287	177	*	USGS	**	0.62	
02/25/00	823	644	*	C. of R.		0.78	*541**
03/01/00	981	732	*	C. of R.		0.75	
03/01/00	891	545	*	USGS		0.61	
03/06/00	883	540	*	C. of R.		0.61	
03/10/00	828	508	*	USGS		0.61	
03/15/00	1026	620	*	C. of R.		0.6	

* Storm flow; data not used in determining monthly averages.
** NAWQA Data
C.of R. City of Riverside
USGS U.S. Geological Survey

TABLE J-1

WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
FOR WATER YEAR 1999-00

Date Sampled	E.C. (microsiemens/cm)	TDS (mg/L)		Source of Data		Ratio	Average
03/16/00	902	559	*	USGS	**	0.62	
03/22/00	980	660		C. of R.		0.67	*660**
04/04/00	914	552	*	USGS		0.6	
04/07/00	972	636		C. of R.		0.65	
04/11/00	925	558		USGS	**	0.6	
04/12/00	990	608		C. of R.		0.61	
04/18/00	383	252	*	USGS		0.66	
04/21/00	926	580	*	C. of R.		0.63	
04/21/00	926	580	*	C. of R.		0.63	
04/26/00	950	644	*	C. of R.		0.68	
04/26/00	950	644	*	C. of R.		0.68	601
05/01/00	876	537	*	USGS		0.61	
05/05/00	1004	620		C. of R.		0.62	
05/10/00	1026	608		C. of R.		0.59	
05/10/00	941	577		USGS	**	0.61	
05/18/00	904	555		USGS		0.61	
05/19/00	1002	656		C. of R.		0.65	
05/25/00	988	576		C. of R.		0.58	599
06/01/00	895	544		USGS		0.61	
06/02/00	1009	592		C. of R.		0.59	
06/05/00	1035	604		C. of R.		0.58	
06/07/00	1021	580		C. of R.		0.57	
06/13/00	962	585		USGS	**	0.61	
06/16/00	1037	696		C. of R.		0.67	

* Storm flow; data not used in determining monthly averages.
** NAWQA Data
C.of R. City of Riverside
USGS U.S. Geological Survey

TABLE J-1

WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
FOR WATER YEAR 1999-00

Date Sampled	E.C. (microsiemens/cm)	TDS (mg/L)		Source of Data		Ratio	Average
06/19/00	907	557		USGS		0.61	
06/21/00	1037	604		C. of R.		0.58	
06/30/00	982	592		C. of R.		0.6	595
07/03/00	905	547		USGS		0.6	
07/05/00	1026	624		C. of R.		0.61	
07/12/00	925	570		USGS	**	0.62	
07/14/00	1045	612		C. of R.		0.59	
07/18/00	920	565		USGS		0.61	
07/19/00	1042	596		C. of R.		0.57	
07/27/00	1044	724	*	C. of R.		0.69	586
08/02/00	904	551		USGS		0.61	
08/03/00	1038	604		C. of R.		0.58	
08/15/00	927	570		USGS	**	0.61	
08/16/00	935	570		USGS		0.61	
08/17/00	1064	616		C. of R.		0.58	
08/25/00	1032	632		C. of R.		0.61	
08/30/00	997	544		C. of R.		0.55	584
09/01/00	891	549		USGS		0.62	
09/12/00	914	551		USGS	**	0.6	
09/13/00	933	570		USGS		0.61	557

* Storm flow; data not used in determining monthly averages.
** NAWQA Data
C.of R. City of Riverside
USGS U.S. Geological Survey

TABLE J-2

ANNUAL SUMMARY OF FLOW WEIGHTED TDS AT RIVERSIDE NARROWS
FOR WATER YEAR 1999-00

	Month	Stream Flow [1] (acre-feet)	Monthly Average TDS [2] (mg/L)	Monthly Flow x TDS
1999	October	5,042	606	3,055,440
	November	4,832	602	2,906,287
	December	5,270	643	3,386,026
2000	January	5,379	601	3,233,778
	February	5,068	601 [3]	3,045,727
	March	5,863	601 [3]	3,523,746
	April	6,288	601	3,777,288
	May	5,215	599	3,121,773
	June	4,867	595	2,895,583
	July	4,491	586	2,629,981
	August	4,366	584	2,548,897
	September	4,580	557	2,549,440
	Total	61,260		36,673,966

Yearly Flow Weighted TDS = 599

(1) USGS measured flow minus storm flow.

(2) TDS based on water quality data from Table J-1.

(3) EC from the previous and following months used due to storm flow.