SANTA ANA RIVER WATERMASTER

FOR

ORANGE COUNTY WATER DISTRICT

VS. CITY OF CHINO et al.

CASE NO. 117628 - COUNTY OF ORANGE

TWENTY-FIFTH

ANNUAL REPORT

OF THE

SANTA ANA RIVER WATERMASTER

FOR WATER YEAR

OCTOBER 1, 1994 - SEPTEMBER 30, 1995

APRIL 30, 1996

SANTA ANA RIVER WATERMASTER

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

WATERMASTER
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April 30, 1996

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

Re: Watermaster Report for Water Year October 1, 1994 - September 30, 1995

Gentlemen:

We have the honor of submitting herewith the Twenty-fifth 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 and are available upon request from the office of the Secretary of the Watermaster.

The principal findings of the Watermaster for the water year 1994-95 are as follows:

<u>At Prado</u>

1	Base Flow at Prado	123,468 acre-feet
2	Annual Weighted TDS in Base and Storm Flows	415 mg/L
3	Annual Adjusted Base Flow	152,792 acre-feet
4	Cumulative Adjusted Base Flow	2,508,394 acre-feet
5	One-half Lake Elsinore discharge reaching Prado and Recharging Orange County Groundwater Basin	1,762 acre-feet
6	Cumulative Entitlement of OCWD	1,050,000 acre-feet
7	Cumulative Credit	1,458,394 acre-feet
8	One-third of Cumulative Debit	0 acre-feet
9	Minimum Required Base Flow in 1995-96	34,000 acre-feet

At Riverside Narrows

1	Base Flow at Riverside Narrows	45,562 acre-feet
2	Annual Weighted TDS in Base Flow	646 mg/L
3	Annual Adjusted Base Flow,	45,562 acre-feet
4	Cumulative Adjusted Base Flow	919,637 acre-feet
5	Cumulative Entitlement of CBMWD and WMWD	381,250 acre-feet
6	Cumulative Credit	538,387 acre-feet
7	One-third of Cumulative Debit	0 acre-feet
8	Minimum Required Base Flow in 1994-95	12,420 acre-feet

The above findings show that at the end of the 1994-95 water year, Chino Basin Municipal Water District and Western Municipal Water District have a cumulative credit of 1,458,394 acre-feet to their Base Flow obligation at Prado Dam. San Bernardino Valley Municipal Water District has a cumulative credit of 538,387 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 1994-95.

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: Harvey O. Banks
Harvey O. Banks

Donald L. Harriger
Donald L. Harriger

William J. Carroll
William J. Carroll

William R. Mills Jr.
William R. Mills Jr.

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7 Discharge of Santa Ana River at Riverside Narrows since 1934-35

APPENDICES

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

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)

B Daily Precipitation Data at San Bernardino County Hospital

C Santa Ana River Watermaster Financial Statements with Report on Examination by Orange County Water District Controller

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CHAPTER I

WATERMASTER ACTIVITIES AND WATER CONDITIONS

This is the Twenty-fifth Annual Report of the Santa Ana River Watermaster required by the Stipulated Judgment for water year 1994-95 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). This Stipulated Judgment became effective on October 1, 1970, and contains a declaration of rights of the entities in the Lower Area of the Santa Ana River Basin downstream of Prado Dam as against those in the Upper Area, and provides a physical solution to implement the provisions of the Judgment. The physical solution accomplishes, in general, a regional intrabasin allocation of the surface flow of the Santa Ana River System. All defendants and cross-defendants were dismissed except the four major public water districts within the Santa Ana River Basin, namely, San Bernardino Valley Municipal Water District (SBVMWD), Western Municipal Water District (WMWD), Chino Basin Municipal Water District (CBMWD), and Orange County Water District (OCWD). The boundaries of these districts are shown on Plate 1. This arrangement leaves to each of the major hydrologic units in the watershed the determination and regulation of individual rights therein and the development and implementation of its own basin management plan. Beginning at the Twentieth Annual Report, it was decided to include a short history of the litigation and summary of judgment in the report at 5-year intervals. Since this is the Twenty-fifth Annual Report, this history is included in the subsequent sections.

In order to administer the provisions of the Judgment, the court appointed a Watermaster composed of five persons. Since August 15, 1985, the Santa Ana River Watermaster Committee has consisted of Harvey O. Banks, William J. Carroll, William R. Mills, Jr., Donald L. Harriger, and Robert L. Reiter. In 1994-95, Mr. Banks continued to serve as chairman and Mr. Reiter continued to serve as secretary/treasurer.

The time for submission of the annual report is seven months after the end of the water year. The items to be reported upon are listed in the letter of transmittal of this report.

History of Litigation

The complaint in this case was filed by Orange County Water District on October 18, 1963 seeking an adjudication of water rights against more than 2,500 water users in the area tributary to Prado Dam within the Santa Ana River watershed. Thirteen cross-complaints were filed in 1968 extending the adjudication to include an additional 1,500 water users in the area downstream from Prado Dam. Thus, there were involved in this case some 4,000 parties. It became obvious that every effort should be made to arrive at a settlement and physical solution in order to avoid the enormous and unwieldy litigation that would be involved.

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

further this objective. Among other things, they provided guidance for the formation and activities of an engineering committee to provide them with 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 jointly undertake the compilation of basic data. Liaison was established with the Department of Water Resources, State of California, on request for information to be obtained from the State's studies for use by the parties. 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.

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. This list of basic information was in response to a request from the attorneys' committee at a meeting held April 17, 1964. Special assignments were made on selected items to individual engineers to provide information 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 their 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 and the historical supply and disposal of water passing Prado Dam segregated into the components of flow and designating the amount of supply which was usable by the downstream area. On December 11, 1964, this 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 of 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 State 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. This terminated the many years of controversy over water rights along the Santa Ana River involving the issues and parties embraced in Orange County Water District versus City of Chino, et al.

Summary of Judgment

Provisions of the Judgment became effective on October 1, 1970. The Judgment does not define water rights of the individual claimants. Instead, it provides for a regional allocation of water supply of the Santa Ana River system and established entitlements and obligations among the four existing major public water districts overlying the aggregate of substantially all of the major areas of water use in the watershed. These 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 which are 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) 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 with its boundaries, and embraced within the upper potion 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.

A physical solution under the Stipulated Judgment provides, in general, that SBVMWD shall be responsible for delivery of an average annual amount of Base Flow at Riverside Narrows and CBMWD and WMWD shall jointly be responsible for an average annual amount of Base Flow at Prado Dam. Essential to the understanding of the provisions of the Judgment is the definition of certain important terms. The total surface flow passing a point of measurement is divided into components, which are defined in the Judgment as follows:

"(1) Storm Flow - That portion of the total surface flow passing a point of measurement, which originates from precipitation and runoff without having first percolated to ground water storage in the zone of saturation, calculated in accordance with procedures referred to in Exhibit B.

(2) Base Flow - That portion of the total surface flow passing a point of measurement which remains after deduction of storm flow.

(3) Adjusted Base Flow - Actual base flow in each year adjusted for quality as provided. . . ."

The Judgment sets forth a declaration of rights. Briefly stated, the Judgment provides that the water users in the area downstream from Prado Dam have rights, as against the upstream users, to receive an average annual supply of 42,000 acre-feet of Base Flow at Prado Dam, together with the right to all Storm Flow reaching Prado Dam. Water users in the area upstream of Prado Dam, as against the downstream users, have the right to divert, pump, extract, conserve, store and use all surface and ground water supplies originating within the upper area, so long as the lower area receives the water to which it is entitled.

The physical solution set forth in the Judgment requires that SBVMWD shall be responsible for an average annual Adjusted Base Flow of 15,250 acre-feet at Riverside Narrows subject each year to the following:

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

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

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

(4) All cumulated 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 accumulated 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.

The obligations under the physical solution for meeting the Adjusted Base Flow of 42,000 acre-feet at Prado Dam for the benefit of the downstream users as shared by CBMWD and WMWD are as follows:

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

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

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

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

The accounting provided for under the Judgment allows for credits to be earned when the average annual Adjusted Base Flow exceeds 15,250 acre-feet at Riverside Narrows and 42,000 acre-feet at Prado Dam. Debits accrue when the average annual Adjusted Base Flow falls below the above quantities at the respective locations. The adjustment of Base Flow for water quality is to provide an incentive to maintain a better quality of water as a result of implementation of the physical solution. That is, when the water quality is improved over a certain amount, the quantitative amount of the obligation is decreased; but when that water quality is impaired beyond a specified limit, the quantity of the obligation is increased. This is one of the first comprehensive adjudications in Southern California which includes provisions applicable to the quality of water in addition to the determination of quantitative rights.

Stream Flow and Water Quality Measurements

Stream flow measurements and water quality data required by the Watermaster are, for the most part, furnished by the U.S. Geological Survey (USGS). The financing of the cooperative monitoring program with the USGS is shared by the parties to the Judgment. These costs are set forth in Table 1.

The USGS measured and computed the mean daily discharges of the Santa Ana River below Prado Dam and at the Metropolitan Water District of Southern California (MWDSC) Upper Feeder Crossing (Riverside Narrows). Discharge data have also been provided for the Santa Ana River at E Street in San Bernardino and for several smaller streams tributary to Prado Reservoir; namely, Chino Creek at Schaefer Avenue, Cucamonga Creek near Mira Loma, and Temescal Wash in the City of Corona (Appendix A).

The 1994-95 daily mean discharge record for the USGS gaging station, "Santa Ana River below Prado," is considered by the USGS to be a "good" record. Extremes for this period saw a maximum daily mean discharge of 5,690 cfs on March 8, 1995 and a minimum daily mean discharge of 128 cfs on September 4, 1995. Maximum daily mean discharges are mitigated to a large extent by the utilization of storage in the reservoir behind Prado Dam, upstream of the USGS gaging station.

The 1994-95 daily mean discharge record for the USGS gaging station, "Santa Ana River at MWD Crossing", is considered by the USGS to be "fair except for the period from January through May and estimated daily discharges, which are poor." Extremes for this period were a maximum daily mean discharge of 9,690 cfs on March 8, 1995 and a minimum daily mean discharge of 128 cfs on September 4, 1995.

As discussed in Chapter II, Nontributary Flow due to release of State Water Project water from the OC-59 turnout into San Antonio Creek totaled 3,094 acre-feet. In addition, the Arlington Desalter operated during the first three months of the 1994-95 water year and discharged 1,201 acre-feet of product water into a channel tributary to the Santa Ana River. Also discussed in Chapter II, discharge from Lake Elsinore occurred, of which 14,697 acre-feet were calculated to have reached Prado Dam.

Precipitation during 1994-95 totaled 25.14 inches as measured at the San Bernardino County Hospital and reported by the National Oceanic and Atmospheric Administration (Appendix B). This rainfall total was 140% of the 26-year base period (1934-35 through 1959-60) average of 17.98 inches. Plate 2 shows annual precipitation from 1934-35 through 1994-95.

Compilation and Analysis of Basic Data

The Watermaster has established procedures for compiling and analyzing the basic data necessary to carry out the provisions of the Stipulated Judgment. Determinations were made of the Base Flow, Storm Flow, Nontributary Flow, and relationships between

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

October 1, 1994 to September 30, 1995

USGS GAGING STATION NAME	Total Cost	USGS Share	Parties Share
Santa Ana River at MWD Crossing (Riverside Narrows)			
Surface Water Gage	$15,300	$7,650	$7,650
Water Quality Monitoring/TDS Sampling	$5,950	$2,975	$2,975
Chino Creek at Schaefer	$10,900	$5,450	$5,450
Cucamonga Creek at Mira Loma	$10,900	$5,450	$5,450
Santa Ana River below Prado Dam			
Surface Water Gage	$13,500	$6,750	$6,750
Water Quality Monitoring/TDS Samples	$13,200	$6,600	$6,600
Water Quality Conductance Program	$1,250	$0	$1,250
TOTAL COST	$71,000		
TOTAL USGS SHARE OF COST		$34,875	
TOTAL PARTIES SHARE OF COST			$36,125

COST DISTRIBUTION AMONG PARTIES		
Chino Basin Municipal Water District	20%	$7,225
Orange County Water District	40%	$14,450
San Bernardino Valley Municipal Water District	20%	$7,225
Western Municipal Water District	20%	$7,225
TOTAL COST SHARED BY PARTIES		$36,125

electrical conductivity (EC) and total dissolved solids (TDS). These determinations are explained in detail in Chapters II and III.

Administration Costs

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 district which nominated such member. All other Watermaster administrative costs and expenses are borne by the parties, with OCWD paying 40% of the cost and WMWD, SBVMWD, and CBMWD each paying 20% of the cost. The Stipulated Judgment further provides that the Watermaster may from time to time, at its discretion, require advances of operating funds from the parties.

At its meeting on March 31, 1994, the Watermaster adopted a budget for the fiscal year 1994-95 in the amount of $16,000. Table 2 shows the items and amount included in said budget. The expenses for the fiscal year 1994-95 are also shown. The budget for fiscal year 1995-96 was adopted on April 10, 1995. A financial review was performed by OCWD and is contained in Appendix C.

TABLE 2

SANTA ANA RIVER WATERMASTER BUDGET AND EXPENSES

Budget Item	July 1, 1994 to June 30, 1995 Budget	July 1, 1994 to June 30, 1995 Expenses	July 1, 1995 to June 30, 1996 Budget
Administration	$ 1,250.00	$ 0.00	$ 0.00
Support Engineering Services	9,000.00	2,830.00(1)	11,500.00
Reproduction of Annual Report	5,750.00	0.00(1)	2,500.00
TOTAL	$16,000.00	$2,830.00	$14,000.00

(1) Expenses appear low becasue they were paid after June 30, 1995 and will be expensed in 1995-96.

Summary of Findings

A summary of findings by the Watermaster for the period 1970-71 through 1994-95 is presented in Table 3. Note that the Base Flow obligations at both Prado Dam and Riverside Narrows as provided for in the Stipulated Judgment have been met and cumulative credits have been established.

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[4]	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[4]	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[11]	111,151[11]	514	128,379	1,064,040
1991-92	16.54	193,225[11]	106,948[11]	499	124,869	1,146,909
1992-93	30.92	568,677[11]	128,068[11]	368	163,499	1,268,408
1993-94	11.62	158,241[11]	111,186[11]	611	119,432	1,345,840
1994-95	25.14	424,017[4,11]	123,468[5,11]	415	152,792[5]	1,458,394[6]

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	69,722[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[11]	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[11]	31,278[11]	677	31,278	508,075
1994-95	25.14	243,411[11]	45,562[11]	646	45,562	538,387

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 Lake Elsinore 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 and 14,697 acre-feet in 1994-95.
(5) Excludes water discharged from Lake Elsinore.
(6) Includes a credit for a portion of Lake Elsinore 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).

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, Exchange Water, Storm Flow and Base Flow and 2) the Adjusted Base Flow at Prado credited to CBMWD and WMWD.

Flow at Prado

During the 1994-95 water year, the flow of the Santa Ana River as measured at the USGS gaging station below Prado Dam amounted to 429,270 acre-feet. There was no storage behind the dam at the beginning or end of the water year. Inflow to the reservoir included 123,468 acre-feet of Base Flow and 284,651 acre-feet of Storm Flow. Of the nontributary flow due to State Water Project released to San Antonio Creek at turnout OC-59, 3,047 acre-feet were determined to have reached Prado Reservoir during 1994-95. Nontributary flows due to the Arlington Desalter and Exchange programs totaled 1,201 acre-feet and 2,206 acre-feet, respectively. The monthly components of flow of the Santa Ana River at Prado Dam for 1994-95 are listed in Table 4 and are shown graphically on Plate 3. Historical Base and Storm Flows of the Santa Ana River below Prado during the period 1934-35 through 1994-95 are presented on Plate 4.

Exchange Programs

Occasionally, the parties to the Judgment have agreed to exchange surface water and pumped groundwater. These Exchange Waters are delivered via the Santa Ana River and are effectively Nontributary Water. Because these exchanges are delivered upstream of Prado Dam for the benefit of OCWD, the amount of Exchange Water reaching Prado Dam is excluded from the computation of Base Flow and Base Flow quality. This section describes past and current exchange programs. A monthly summary of the 1994-95 Exchange Water deliveries is contained in Appendix D.

Releases of Exchange Water from Riverside Canal

In 1993, OCWD and WMWD entered into an agreement to participate in MWDSC's Demonstration Local Storage (DLS) Program. The agreement provides for delivery of MWDSC water to WMWD with WMWD causing a like amount of groundwater, pumped from the basins above the Riverside Narrows, to be delivered to OCWD via the Riverside Canal and into the Santa Ana River. Because the mechanism is identical to the Drought Emergency Exchange Program, waters discharged to the river under these two programs are combined and termed Exchange Waters.

The Drought Emergency Exchange Program is more fully described in Chapter II of the Twenty-first Annual Report (1990-91). No water under the Drought Emergency Exchange Program was delivered during 1994-95.

TABLE 4

COMPONENTS OF FLOW AT PRADO DAM

FOR WATER YEAR 1994-95
(acre-feet)

	USGS Measured Outflow	Storage Change (1)	Computed Inflow	Lake Elsinore Flows at Prado Dam (2)	Exchange Water (3)	San Antonio Creek (4)	Arlington Desalter	Storm Flow	Base Flow
1994									
October	10,939	0	10,939	0	577	253	546	705	8,858
November	13,373	0	13,373	0	879	2,062	512	940	8,979
December	13,628	231	13,859	0	750	732	143	1,651	10,584
1995									
January	99,475	7,367	106,842	48	0	0	0	95,115	11,679
February	33,792	94	33,886	1,280	0	0	0	21,390	11,216
March	124,788	17,648	142,436	6,908	0	0	0	122,622	12,907
April	37,194	170	37,364	3,624	0	0	0	21,380	12,359
May	27,453	-2,440	25,013	2,072	0	0	0	11,091	11,849
June	27,174	-6,860	20,314	464	0	0	0	9,529	10,321
July	24,149	-16,210	7,939	301	0	0	0	219	7,419
August	8,598	0	8,598	0	0	0	0	0	8,598
September	8,707	0	8,707	0	0	0	0	9	8,699
Total	429,270	0	429,270	14,697	2,206	3,047	1,201	284,651	123,468

(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) Exchange Water pumped from the San Bernardino, Colton, and Riverside groundwater basins and discharged into the Santa Ana River less an estimated loss of 5% for evapotranspiration.

(4) State Water Project water released into San Antonio Creek from turnout OC-59 during 1994-95 and calculated to have reached Prado Dam in the 1994-95 water year.

During the 1994-95 water year, WMWD delivered 2,206 acre-feet to the Santa Ana River upstream of Prado Dam under the DLS Program. This amount reflects an agreed upon 5% decrease in flow to compensate for evapotranspiration losses between the point of delivery and replenishment basins in Orange County.

Chino Basin Groundwater Storage Program

The Sixteenth Annual Report (1985-86) described a program proposed by MWDSC to store State Water Project water in the Chino Basin for its future use. The project was never implemented. In the 1991-92 water year, a small, modified project, now called the "Mini Conjunctive Use Project" was implemented. Through that Project, MWDSC delivered 4,806 acre-feet of surface water to purveyors who normally pump groundwater in exchange for and in-lieu of their pumping the groundwater. MWDSC may at some future date remove this water from the basin. Storage of this quantity of water should have no impact on the rising groundwater and, therefore, has no impact on the base flow in the Santa Ana River. Should a larger scale project of this nature be implemented, the Watermaster will evaluate its effect at that time.

Discharge of Groundwater from San Bernardino Basin Area to Santa Ana River

This program is referenced in Table 3, footnote (8) and was also described in the Sixteenth Annual Report (1985-86). Under this program, no groundwater was pumped from San Bernardino Basin and discharged to the Santa Ana River during 1994-95.

Ontario/MWDSC Exchange Program

The Sixteenth Annual Report (1985-86) presented a description of this program and its implications with respect to the responsibilities and activities of the Watermaster. This program is also referenced in Table 3, footnote (9). During 1994-95, MWDSC did not deliver any Colorado River Exchange Water to the City of Ontario.

Nontributary Flow

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.

Releases to San Antonio Creek

During the 1994-95 water year, 3,094 acre-feet of State Water Project water were released into San Antonio Creek from the Rialto reach of the Foothill Feeder at turnout OC-59 near Upland. Total monthly deliveries and daily flow rates were provided by OCWD Forebay Operations. Water losses between OC-59 and Prado Dam were calculated per the procedures set forth in the Twelfth Annual Report (1981-82), Appendix C. Using these

procedures, 3,047 acre-feet of the water released from OC-59 reached Prado Dam and 47 acre-feet (1.5%) were 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 which is designed to eliminate 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 which reduces salinity. The capacity of the facility is approximately 6 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 product water from this facility would be excluded from the computation of Santa Ana River Base Flow and Base Flow quality. During the 1994-95 water year, 1,201 acre-feet of water discharged from the Arlington Desalter was determined to have reached Prado Dam. Daily discharge rates and electrical conductance of product water were provided by OCWD Operations. A summary of Arlington Desalter discharges is contained in Appendix F.

Lake Elsinore Discharge

During the 1994-95 water year, Lake Elsinore discharges totaled 26,816 acre-feet as reported by the Riverside County Flood Control and Water Conservation District. These flows resulted from natural spill from the lake due to high water conditions. To determine the amount of Lake Elsinore discharge reaching Prado Dam, discharge data from Lee Lake were compared to discharge data from Lake Elsinore. The lesser of the daily measured discharges was assumed to represent the volume of Lake Elsinore outflow reaching the Santa Ana River watershed. Lee Lake spill was provided by Elsinore Valley Municipal Water District. As in the Thirteenth Annual Report (1982-83), the assumption was made that 5 percent of these discharges were lost due to evapotranspiration before reaching Prado Dam. As shown in Table 4, the total Lake Elsinore discharge passing through Prado Dam in 1994-95 was calculated to be 14,697 acre-feet. Because Lake Elsinore discharge was not envisioned during the formulation of the Judgment, it is removed from Santa Ana River flows at Prado Dam. A summary of Lake Elsinore and Lee Lake discharges is shown in Appendix G.

Storm Flow

Portions of storm flows are retained behind Prado Dam for regulation of downstream flows and for water conservation purposes. The U.S. Army Corps of Engineers (ACOE) owns Prado Dam and operates it according to a release schedule utilizing a debris 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 U.S. Fish and Wildlife Service to be used to develop vireo habitat by the removal of a non-native plant, *Arundo donax*. Storm flows captured within the reservoir are released following the storm to downstream groundwater recharge facilities. Monthly and annual quantities of Storm Flow are shown in Table 4.

During the 1994-95 water year, the maximum volume of water stored in Prado Reservoir reached 33,370 acre-feet on March 6, 1995. The maximum daily mean flow released from Prado Dam to the Santa Ana River was 5,690 cfs on the same day.

During the year, construction continued on elements of the Santa Ana River Mainstem flood control project, including the Seven Oaks Dam, located on the Santa Ana River above the community of Mentone.

Base Flow

The Base Flow is affected by Nontributary Flow releases to San Antonio Creek, discharges from the Arlington Desalter, and discharges from Lake Elsinore. The general procedure used by the Watermaster to separate the 1994-95 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 4.

Wastewater Effluent Discharges

A portion of the Base Flow at Prado is made up of treated wastewater effluent discharged from a number of wastewater treatment plants located above Prado Dam. During the 1994-95 water year, about 140,390 acre-feet of effluent were discharged above Prado Dam by major agencies as shown in Table 5.

Water Quality Adjustments

The flow-weighted average total dissolved solids (TDS) for the total flow passing Prado Dam, including Nontributary Flow released above Riverside Narrows, Exchange Water, Arlington Desalter discharge and Lake Elsinore discharge, was found to be 427 mg/L. This determination was based on records from a continuous monitoring device, operated by the USGS for electrical conductivity (EC) of the Santa Ana River flow below Prado Dam. This record was supplemented by twenty-three (23) grab samples for EC collected by the USGS and analyzed for TDS.

TABLE 5

WASTEWATER EFFLUENT DISCHARGED ABOVE PRADO BY MAJOR AGENCIES (acre-feet)

Year	Redlands	San Bernardino	Colton	Rialto	Riverside	Corona	CBMWD #1	CBMWD #2	CBMWD CCWRF *	Total
1970-71	2,650	17,860	2,520	2,270	18,620	3,190	–	–	–	47,110
1971-72	2,830	16,020	2,230	2,400	19,010	3,230	6,740	–	–	52,460
1972-73	2,810	18,670	2,530	2,260	19,060	3,340	10,380	–	–	59,050
1973-74	2,770	17,680	2,530	2,320	19,560	3,510	11,440	2,320	–	61,950
1974-75	2,540	16,750	1,980	2,320	19,340	4,020	14,960	2,280	–	64,190
1975-76	2,450	17,250	2,540	2,240	19,580	4,700	15,450	2,950	–	67,160
1976-77	3,170	17,650	3,260	2,330	18,770	5,010	14,640	3,380	–	68,210
1977-78	3,280	18,590	3,810	2,380	20,310	5,200	14,650	4,060	–	72,280
1978-79	3,740	19,040	3,850	3,050	21,070	5,390	15,040	5,070	–	76,250
1979-80	4,190	20,360	4,190	2,990	22,910	5,360	14,410	5,520	–	79,930
1980-81	4,410	20,550	3,930	3,370	24,180	5,590	17,270	5,260	–	84,560
1981-82	4,420	23,340	3,780	3,470	25,640	5,410	19,580	5,360	–	91,000
1982-83	4,530	24,160	3,600	3,620	25,020	5,860	20,790	4,290	–	91,870
1983-84	5,150	22,080	3,700	3,830	26,090	6,200	20,950	3,950	–	91,950
1984-85	4,990	23,270	3,830	4,070	27,750	6,250	25,160	4,280	–	99,600
1985-86	5,200	24,720	4,010	4,720	28,820	5,900	28,240	2,660	–	104,270
1986-87	5,780	26,810	4,170	5,350	30,340	6,170	27,160	5,000	–	110,780
1987-88	6,060	27,880	5,240	6,040	34,660	6,050	31,290	5,500	–	122,720
1988-89	5,250	27,640	5,550	6,280	35,490	8,080	35,510	6,180	–	129,980
1989-90	6,360	28,350	5,810	6,260	33,210	9,140	34,760	5,730	–	129,620
1990-91	6,690	27,570	5,670	6,290	32,180	9,110	36,840	6,100	–	130,450
1991-92	6,230	25,060	5,660	6,360	32,660	9,010	40,360	5,780	1,550	132,670
1992-93	6,880	25,550	6,210	6,460	34,100	9,600	41,510	5,640	4,720	140,670
1993-94	6,440	23,800	5,830	6,540	32,640	7,790	37,310	5,430	7,010	132,790
1994-95	6,720	26,330	5,500	6,820	33,950	7,340	39,680	5,360	8,690	140,390

* CCWRF = Carbon Canyon Water Reclamation Facility

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

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

$$TDS = EC \times 0.612186$$

(where the units of TDS and EC are mg/L and microsiemens/cm, 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 5 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 427 mg/L represents the quality of the total flow including releases to San Antonio Creek, Exchange Water, Arlington Desalter discharge, and Lake Elsinore discharge. 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 Exchange Water

The City of Riverside continued to pump groundwater which was discharged into the Riverside Canal for delivery to OCWD. The amount of water discharged to the Santa Ana River during the 1994-95 water year was 2,206 acre-feet. Using monthly TDS grab samples collected from Riverside Canal at the Tava Lanes turnout and monthly flow values, a flow-weighted average TDS of 474 mg/L was calculated. A summary of Exchange Water quality is contained in Appendix D.

Adjustment for Flow to San Antonio Creek

During the 1994-95 water year, 3,047 acre-feet of the water released from OC-59 was calculated to have reached Prado Dam. Based on monthly TDS analyses and monthly flow rates, a yearly flow-weighted average TDS of 319 mg/L was calculated for State Water Project water delivered from OC-59 to San Antonio Creek. A summary of this calculation is contained in Appendix E.

Adjustment for Arlington Desalter

During the 1989-90 water year, Arlington Desalter began to discharge product water into a storm channel tributary to the Santa Ana River. The amount of product water discharged to the Santa Ana River during the 1994-95 water year totaled 1,201 acre-feet. Using daily EC, a 0.61 conversion factor, and daily flow values, a flow-weighted average TDS of 419 mg/L was calculated. A summary of these calculations is contained in Appendix F.

Adjustment for Lake Elsinore Discharges

During the 1994-95 water year, discharge from Lake Elsinore determined to have reached Prado Dam totaled 14,697 acre-feet. Using monthly EC converted to TDS and monthly discharge volumes, a flow-weighted average TDS of 780 mg/L was calculated. A summary of these calculations is contained in Appendix G.

Flow Component	Annual Flow (acre-feet)	Average TDS (mg/L)	Annual Flow x Average TDS (acre-feet x mg/L)
1. Measured Outflow	429,270	427	183,298,290
2. Less Exchange Water	2,206	474	1,045,644
3. Less Nontributary Flow			
San Antonio Creek	3,047	319	971,993
4. Less Arlington Desalter	1,201	419	503,219
5. Less Lake Elsinore	14,697	780	11,463,660
6. Measured Outflow less lines 2, 3, 4, and 5	408,119		169,313,774
Average TDS in total Base and Storm Flow		169,313,774 ÷ 408,119 = 415 mg/L	

After adjusting for Exchange Water, Nontributary Flow, Arlington Desalter discharges, Lake Elsinore discharges, the weighted average annual TDS of Storm Flow and Base Flow for 1994-95 is 415 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 subjected 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 415 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:

$$(123,468 \text{ ac-ft}) + \frac{35}{42,000} (123,468 \text{ ac-ft}) (700 - 415) = 152,792 \text{ ac-ft}$$

Entitlement and Credit or Debit

Paragraph 5(c) of the Stipulated Judgment states that "CBMWD and WMWD shall be responsible for an average annual Adjusted Base Flow of 42,000 acre-feet at Prado. CBMWD 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 Watermasters agreed that Lake Elsinore discharges were not envisioned during the formation of the Judgment. Because of the current water year's occurrence of Lake Elsinore water at Prado Dam, the Watermaster decided to credit one-half of the amount of Lake Elsinore flow recharging the groundwater basin in Orange County against the Base Flow obligation at Prado Dam. Of the 14,697 acre-feet of Lake Elsinore discharge reaching Prado Dam, 11,172 acre-feet were determined to have passed the gage in the Santa Ana River at Ball Road and were considered lost to the ocean. Therefore, a net amount of 3,525 acre-feet of Lake Elsinore discharge was calculated to have recharged the Orange County groundwater basin in 1994-95. One half of such amount (1,762 acre-feet) has been considered a credit against the Upper Area Base Flow obligation at Prado Dam and is credited to the Cumulative Adjusted Base Flow.

The Watermaster's findings concerning flow at Prado for 1994-95 required under the Stipulated Judgment are as follows:

1.	Measured Outflow at Prado	429,270 acre-feet
2.	Base Flow at Prado	123,468 acre-feet
3.	Annual Weighted TDS of Base and Storm Flow	415 mg/L
4.	Annual Adjusted Base Flow	152,792 acre-feet
5.	One-half Lake Elsinore discharge reaching Prado and Recharging Orange County Groundwater Basin	1,762 acre-feet
6.	Cumulative Adjusted Base Flow	2,508,394 acre-feet
7.	Cumulative Entitlement of OCWD	1,050,000 acre-feet
8.	Cumulative Credit	1,458,394 acre-feet
9.	One-Third of Cumulative Debit	0 acre-feet
10.	Minimum Required Base Flow in 1995-96	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 245,617 acre-feet, measured at the USGS gaging station near the MWDSC Upper Feeder Crossing. Separated into its components, Base Flow was 45,562 acre-feet, Storm Flow was 199,985 acre-feet, Nontributary Flow of 2,206 acre-feet was in the form of Exchange Water. Included in Base Flow are 2,136 acre-feet of wastewater from Rubidoux Community Services District which 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 1994-95 water year are listed in Table 6 and graphically shown on Plate 6. The components of flow of the Santa Ana River at Riverside Narrows during the period 1934-35 through 1994-95 are presented on Plate 7.

Release of Exchange Water

During water year 1994-95, 2,206 acre-feet of Exchange Water was delivered to the Santa Ana River upstream of the Riverside Narrows.

Base Flow

Based on the hydrograph shown on Plate 6 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 1994-95, in the amount of 2,136 acre-feet, has been added to the stream flow as measured at the gaging station

TABLE 6

COMPONENTS OF FLOW AT RIVERSIDE NARROWS

FOR WATER YEAR 1994-95
(in acre-feet)

	USGS Measured Flow	Storm Flow	Exchange Water [1]	RCSD Waste Water	Base Flow [2]
1994					
October	3,818	384	577	184	3,042
November	5,316	917	879	174	3,693
December	6,258	1,966	750	185	3,727
1995					
January	50,584	46,772	0	187	3,999
February	20,093	16,698	0	165	3,560
March	111,060	106,555	0	181	4,686
April	16,889	12,438	0	159	4,610
May	13,696	9,331	0	175	4,540
June	8,553	4,686	0	173	4,040
July	3,590	227	0	185	3,548
August	3,078	0	0	185	3,263
September	2,682	11	0	183	2,854
Total	245,617	199,985	2,206	2,136	45,562

(1) Exchange Water pumped from the San Bernardino, Colton and Riverside Groundwater Basins and discharged into the Santa Ana River Above Riverside Narrows.

(2) Base Flow includes Rubidoux Wastewater discharged below Riverside Narrows and excludes Exchange Water

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 658 mg/L. The Base Flow quality resulting from exclusion of the Nontributary Flow and inclusion of the Rubidoux waste water is shown in the following table as 646 mg/L.

Flow Component	Annual Flow (acre-feet)	Average TDS (mg/L)	Annual Flow x Average TDS (ac-ft x mg/L)
1. Base Flow including Nontributary Flow	45,632	637	29,067,584
2. Less Nontributary Flow MWD Exchange Water	2,206	474	1,045,644
3. Plus Rubidoux Wastewater	2,136	658	1,405,488
4. Base Flow less line 2 plus line 3	43,426	645	28,021,940
Average TDS of Base Flow	29,427,428 ÷ 45,562 = 646 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 the weighted average annual TDS in the Base Flow as follows:

If the Weighted Average TDS in Base Flow ate Riverside Narrows is:	Then the Adjusted Base 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	$Q + \frac{11}{15,250} Q (TDS - 700)$

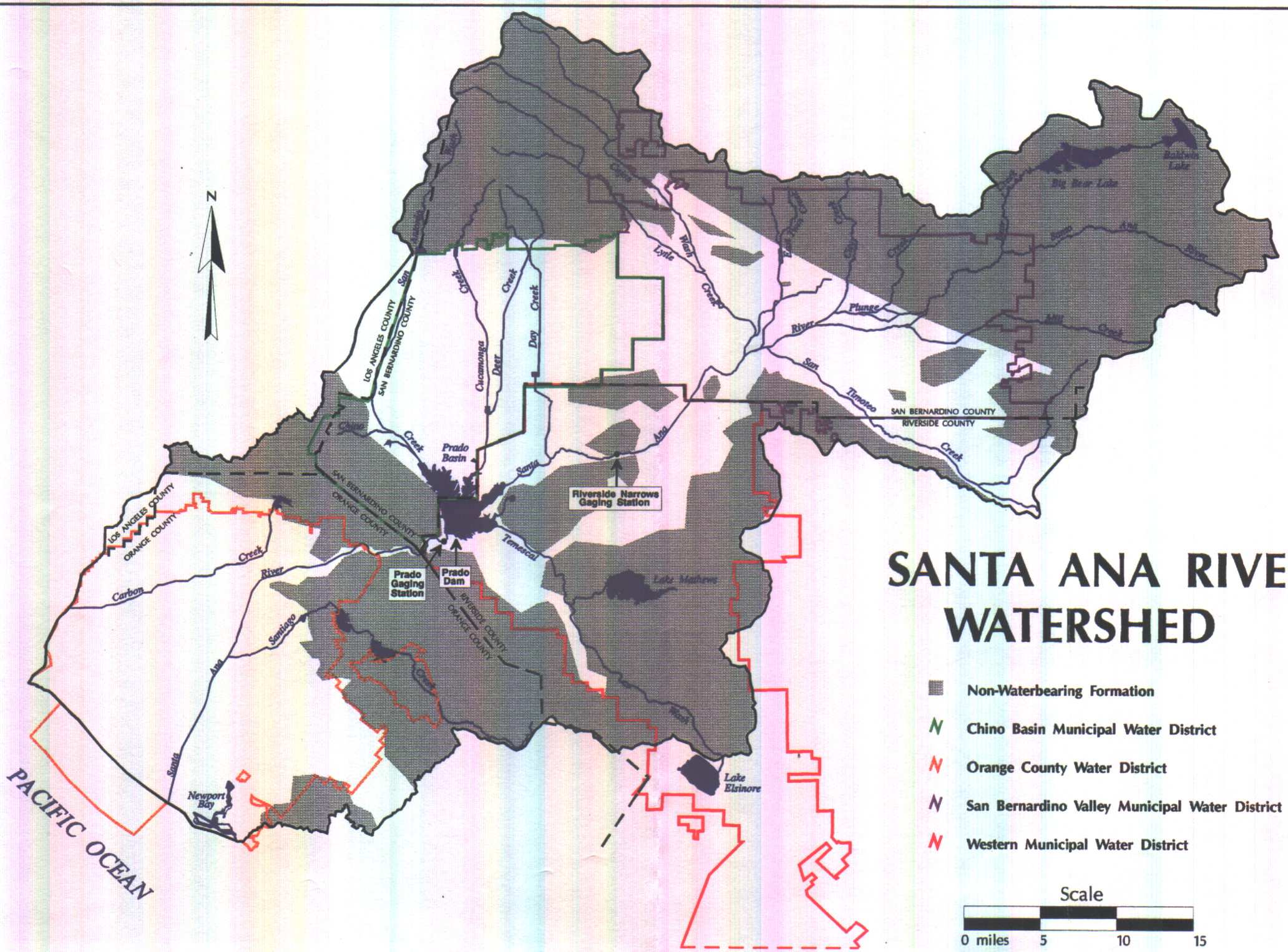
From the previous subsection, the weighted average annual TDS in the Base Flow at Riverside Narrows for the water year 1994-95 was 646 mg/L. Therefore, no adjustment is necessary, and the Adjusted Base Flow for 1994-95 is 45,562 acre-feet.

Entitlement and Credit or Debit

Paragraph 5(b) of the 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 at Riverside Narrows 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 at Riverside Narrows for 1994-95 required under the Stipulated Judgment are as follows:

1.	Base Flow at Riverside Narrows	45,562 acre-feet
2.	Annual Weighted TDS of Base Flow	646 mg/L
3.	Annual Adjusted Base Flow	45,562 acre-feet
4.	Cumulative Adjusted Base Flow	919,637 acre-feet
5.	Cumulative Entitlement of CBMWD and WMWD	381,250 acre-feet
6.	Cumulative Credit	538,387 acre-feet
7.	One-Third of Cumulative Debit	0 acre-feet
8.	Minimum Required Base Flow in 1995-96	12,420 acre-feet



SANTA ANA RIVER WATERSHED

- Non-Waterbearing Formation
- N Chino Basin Municipal Water District
- N Orange County Water District
- N San Bernardino Valley Municipal Water District
- N Western Municipal Water District

Scale

0 miles 5 10 15

PRECIPITATION AT SAN BERNARDINO SINCE 1934-35

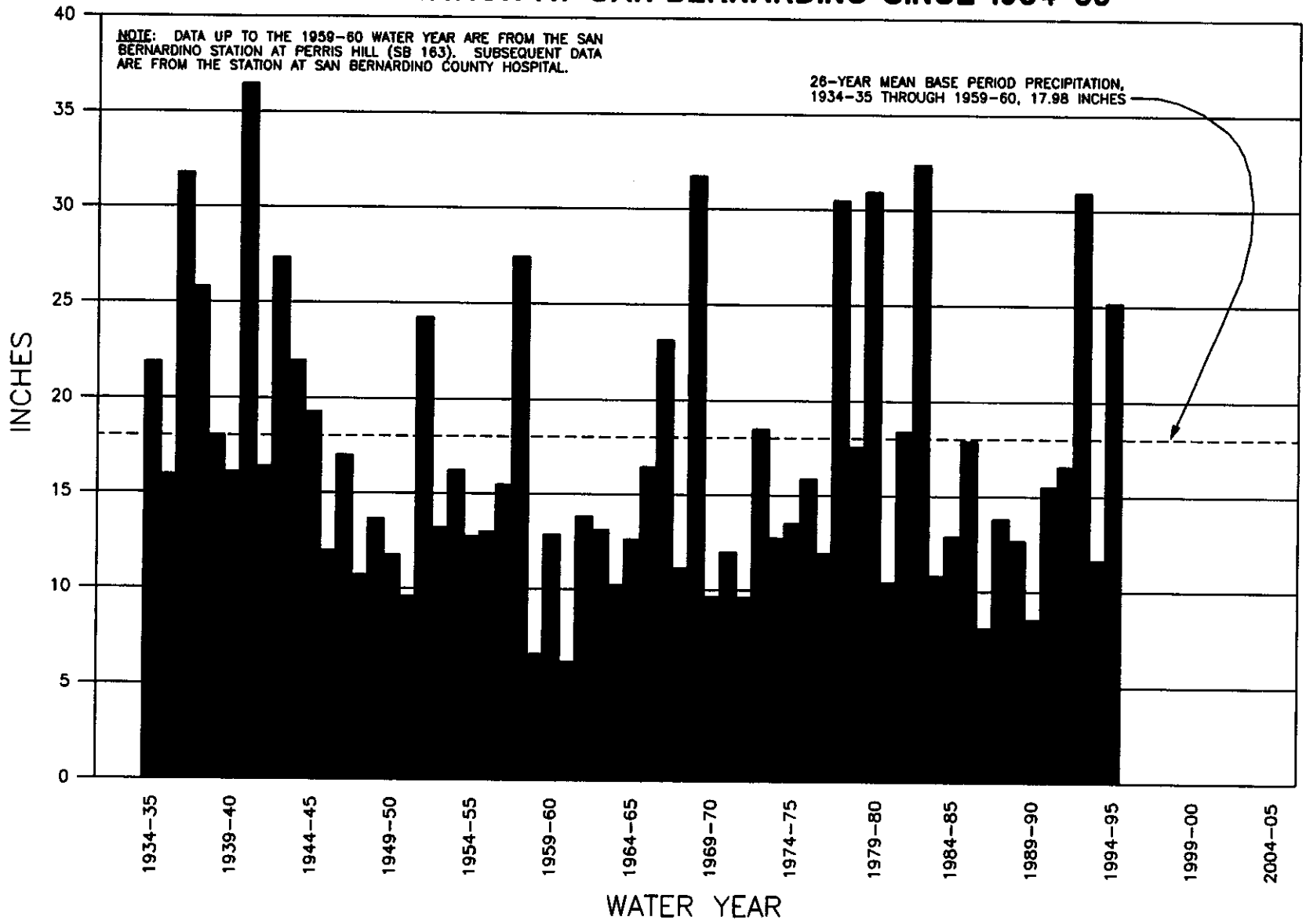
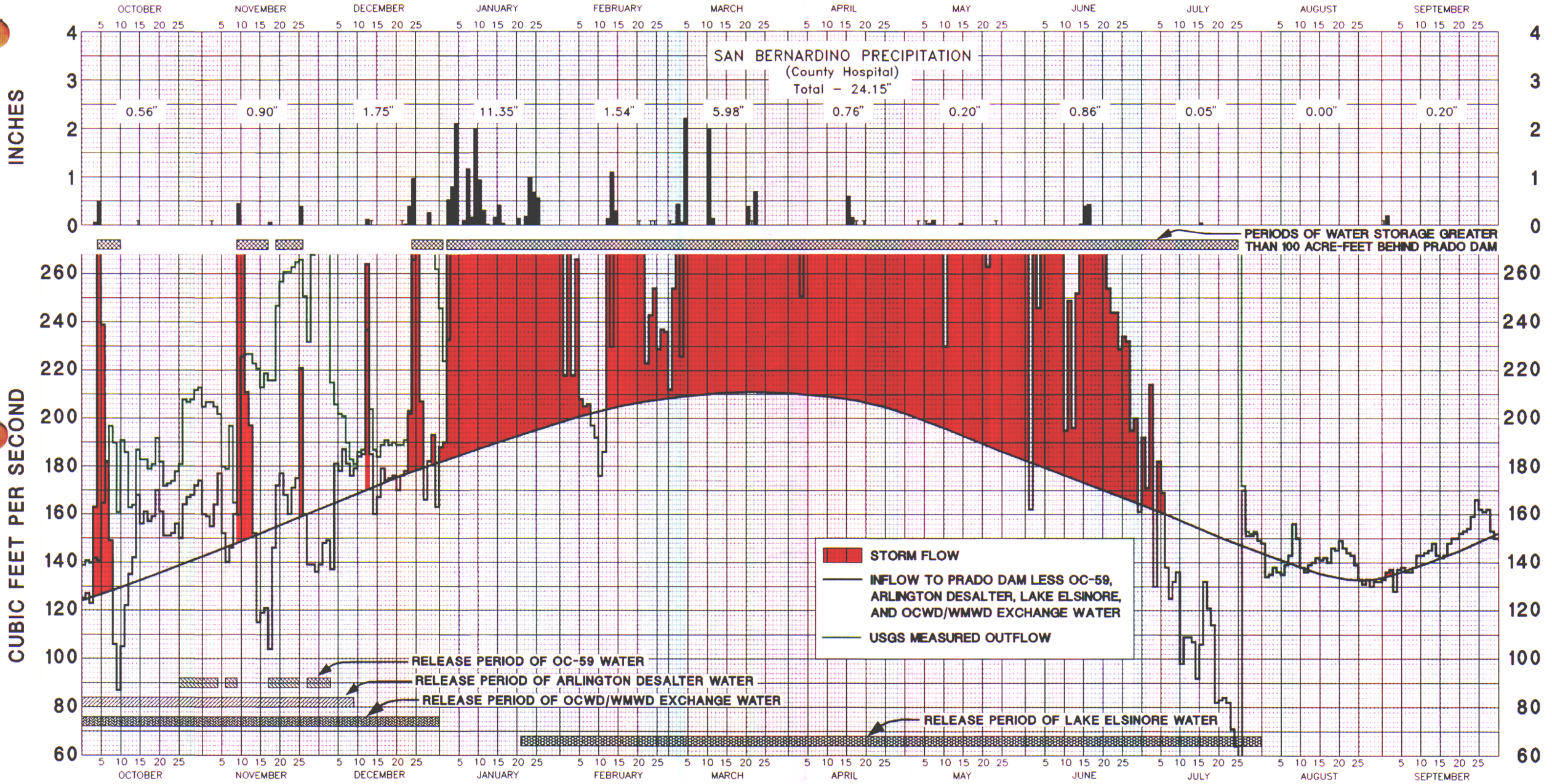


PLATE 2



DISCHARGE OF SANTA ANA RIVER AT PRADO DAM & SAN BERNARDINO PRECIPITATION
WATER YEAR 1994-95

PLATE 3

DISCHARGE OF SANTA ANA RIVER AT PRADO SINCE 1934-35

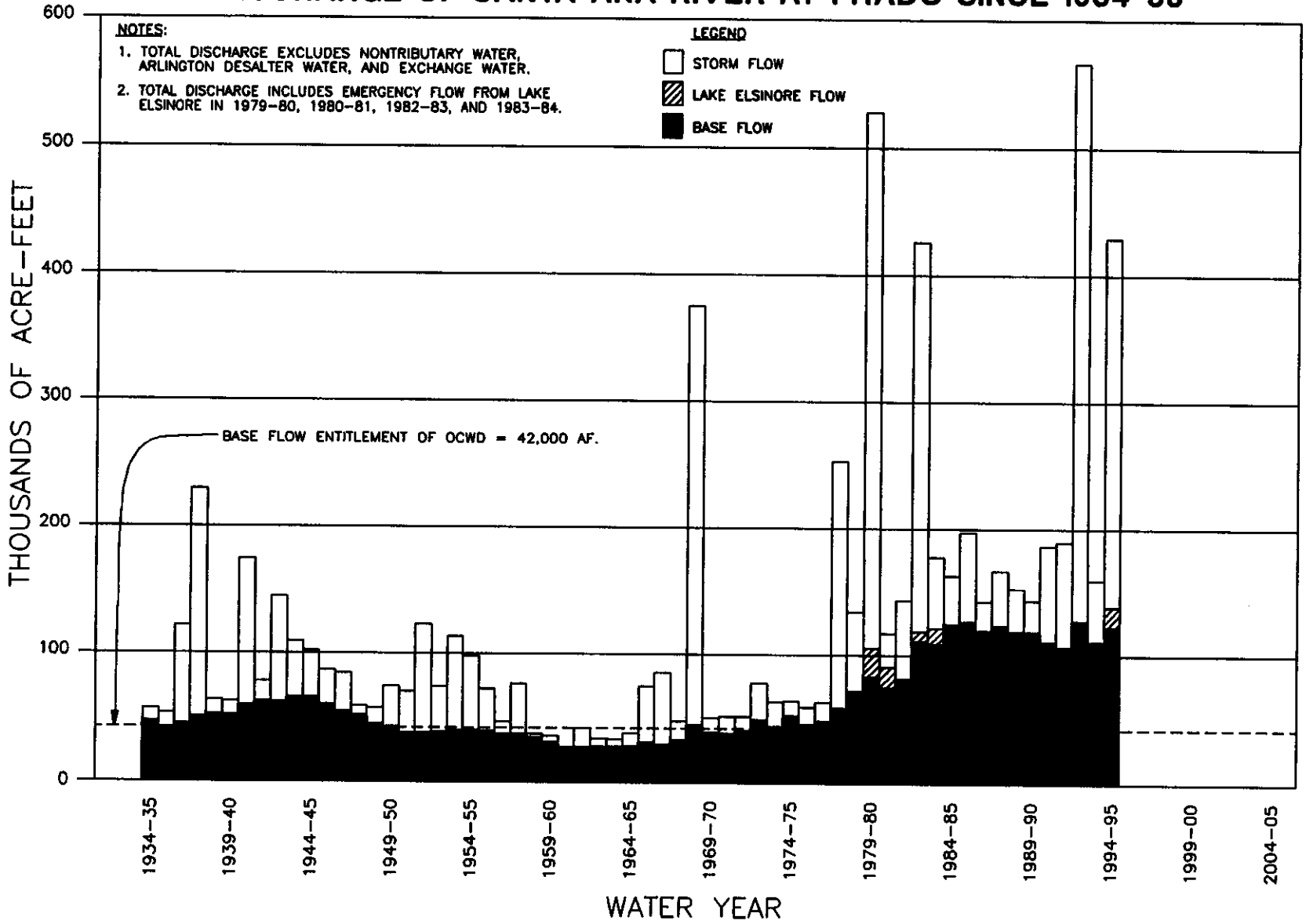
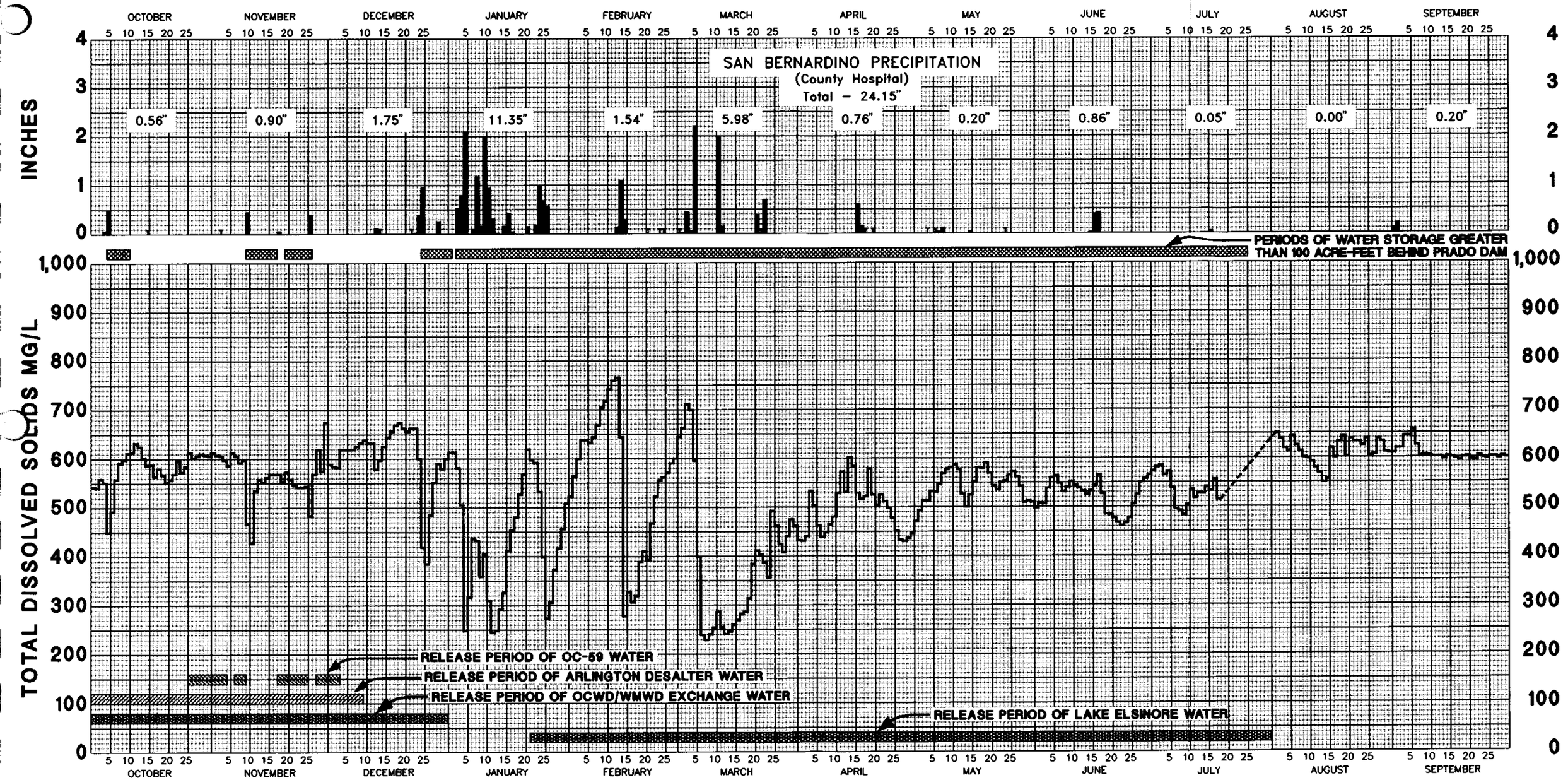
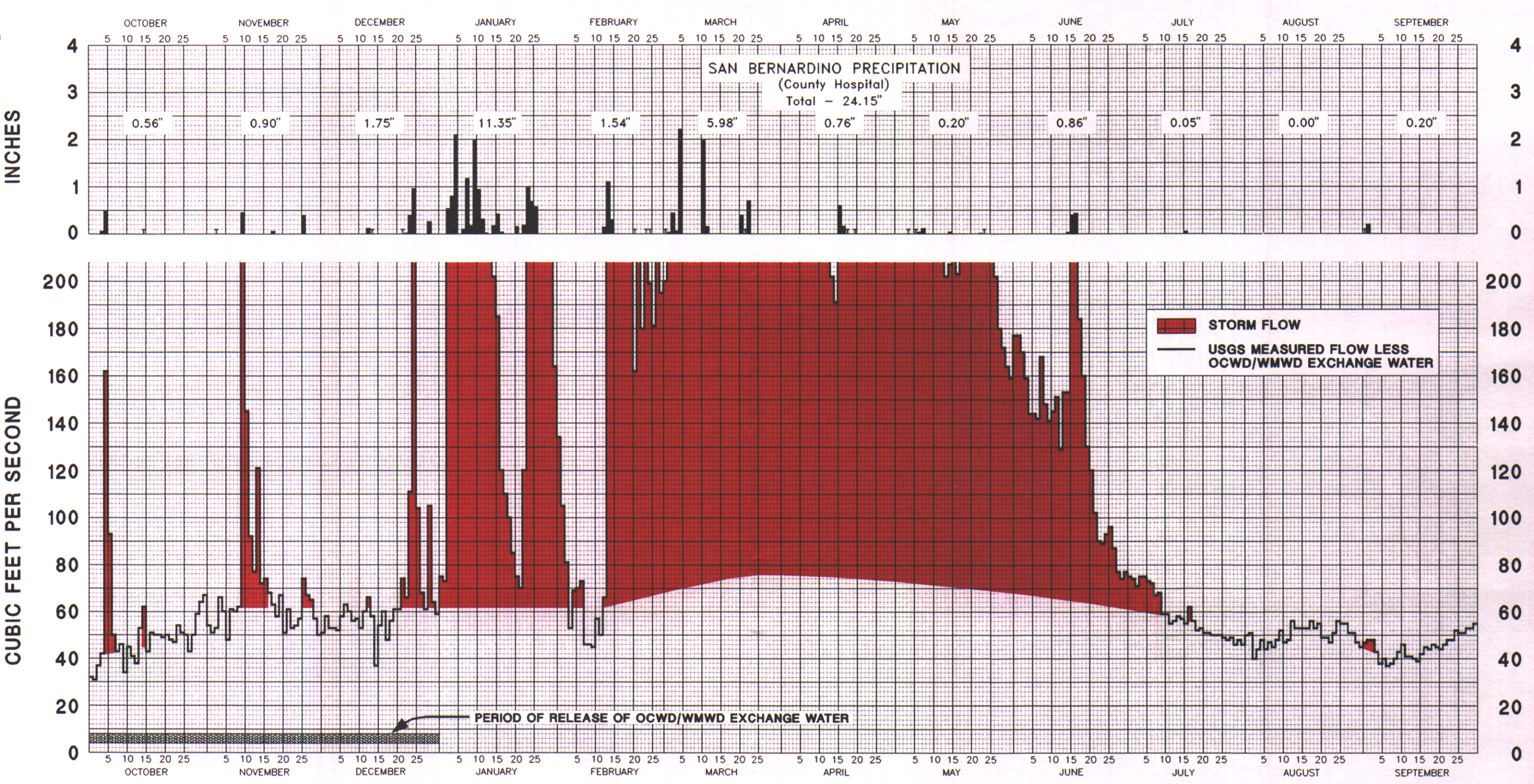


PLATE 4



DISSOLVED SOLIDS IN SANTA ANA RIVER BELOW PRADO DAM
WATER YEAR 1994-95

PLATE 5



DISCHARGE OF SANTA ANA RIVER AT RIVERSIDE NARROWS & SAN BERNARDINO PRECIPITATION
WATER YEAR 1994-95

PLATE 6

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

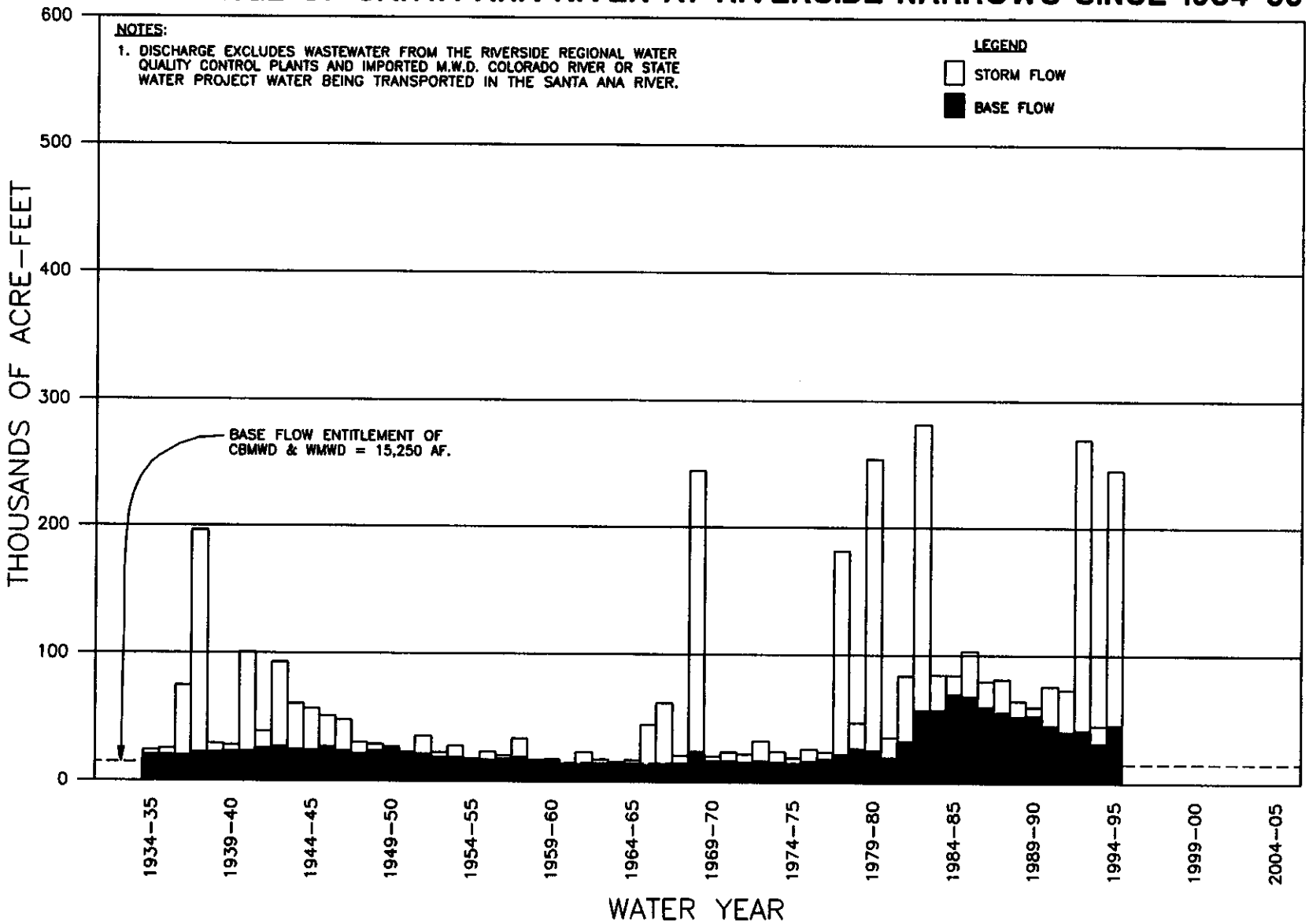


PLATE 7

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

TWENTY-FIFTH ANNUAL REPORT

OF THE

SANTA ANA RIVER WATERMASTER

FOR WATER YEAR

OCTOBER 1, 1994 - SEPTEMBER 30, 1995

APRIL 30, 1996

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Note: Totals at the bottom of appendix tables may not appear to add arithmetically because of the hidden rounding of data values to zero decimal places.

APPENDIX A

USGS FLOW MEASUREMENTS OF THE SANTA ANA RIVER BELOW PRADO, AT MWD CROSSING, AND E STREET, AND OF TEMESCAL CREEK ABOVE MAIN STREET (AT CORONA)

WATER YEAR 1994-95

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 448 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.--No estimated daily discharge. Records good. 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, and return flow from irrigated areas. During the current year, the California Water Project released 3,150 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; 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,260 ft^3/s, Mar. 6, gage height, 6.80 ft; minimum daily, 128 ft^3/s, Sept. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	139	205	280	246	442	433	1090	433	462	442	148	133
2	141	207	270	224	442	430	1070	455	461	431	134	136
3	140	207	279	233	436	301	499	497	459	439	135	137
4	142	203	215	325	433	228	251	551	455	446	136	128
5	141	202	206	2080	431	456	452	513	458	427	136	137
6	145	180	202	2500	427	5360	659	453	461	454	135	138
7	182	179	201	2450	423	5490	692	540	465	448	139	136
8	197	197	190	2480	419	5690	651	604	470	441	143	136
9	190	165	183	3170	413	3760	648	584	466	432	156	138
10	181	160	161	3390	409	1960	644	485	464	452	150	143
11	191	226	186	5000	396	4710	598	340	463	463	138	143
12	186	227	187	5190	387	5210	544	389	462	462	136	144
13	163	227	237	4950	287	3790	523	446	424	458	139	145
14	164	223	204	3140	230	1550	524	447	434	450	140	148
15	187	221	187	735	1630	1550	525	429	456	441	142	143
16	183	213	184	434	3640	1540	1060	395	455	437	141	142
17	183	219	189	335	1460	1000	1600	380	461	450	142	143
18	179	216	191	409	448	852	874	369	457	453	140	148
19	181	216	189	457	429	858	601	370	457	449	146	150
20	192	247	190	621	419	1350	600	373	458	454	145	150
21	182	257	189	346	425	2250	598	374	457	448	149	152
22	172	261	189	346	422	2660	593	373	457	435	146	153
23	173	261	191	345	425	3660	588	419	457	417	144	154
24	174	263	202	1030	427	2180	472	449	457	416	143	159
25	178	265	266	2390	435	404	395	451	457	384	139	166
26	181	266	291	3410	431	774	387	453	457	367	133	162
27	208	251	291	1660	436	1100	396	454	455	172	131	161
28	207	232	286	657	434	1150	402	452	453	153	133	162
29	208	268	280	651	---	808	407	450	453	152	130	153
30	212	278	273	515	---	595	409	455	448	153	132	150
31	213	---	262	433	---	797	---	458	---	148	132	---
TOTAL	5515	6742	6871	50152	17036	62914	18752	13841	13700	12175	4335	4390
MEAN	178	225	222	1618	608	2029	625	446	457	393	140	146
MAX	213	278	291	5190	3640	5690	1600	604	470	463	156	166
MIN	139	160	161	224	230	226	251	340	424	149	130	128
AC-FT	10940	13370	13630	99480	33790	124800	37190	27450	27170	24150	8600	8710

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. Elevation of gage is 685 ft above sea level, from topographic map. Gage moved to left bank at present datum on June 17, 1993 (formerly on right bank). Prior to Oct. 1, 1984, water-stage recorder at site 300 ft upstream on left bank at different datum.
REMARKS.--Records fair except for period from January through May and estimated daily discharges, which are poor. Flow partly regulated by Big Bear Lake (station 11049000). Natural streamflow affected by ground-water withdrawals, diversions for irrigation, and return flows from irrigated areas. 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, 30,700 ft^3/s, Mar. 6, 1995, gage height, 14.47 ft, on basis of area-velocity study; maximum gage height, 20.23 ft, 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 and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 25	1115	2,260	9.25	Feb. 14	1945	7,250	11.94
Jan. 4	2015	7,000	12.22	Mar. 6	0100	*30,700	*14.47
Jan. 10	2045	25,200	14.37	Mar. 11	1045	11,900	10.61
Jan. 25	1945	3,570	9.84	Mar. 23	1145	2,540	8.32

Minimum daily, 35 ft^3/s, Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	65	e75	75	134	200	502	287	177	75	50	47
2	35	66	74	73	105	233	459	273	177	74	51	48
3	44	71	68	283	81	420	427	258	170	71	40	48
4	49	75	68	1790	53	405	399	253	159	75	44	43
5	165	66	68	2380	69	5890	367	238	144	75	48	38
6	94	67	73	247	70	9540	336	248	144	73	44	40
7	51	81	68	520	73	3000	312	238	142	72	47	37
8	47	80	61	1330	46	2330	301	243	168	67	45	38
9	49	83	58	900	46	1970	282	252	148	68	48	40
10	45	315	59	5590	45	1920	267	240	141	59	52	43
11	55	165	55	4710	57	6280	258	224	145	58	47	46
12	53	112	62	1250	50	2550	230	223	151	55	48	41
13	56	97	68	541	66	1640	232	211	129	56	56	41
14	66	132	60	256	2760	1270	202	202	153	58	53	40
15	71	86	60	202	1950	946	191	207	153	57	53	39
16	61	88	73	e185	1370	632	307	209	369	55	53	42
17	64	82	72	e120	709	792	232	203	263	62	53	45
18	63	77	64	e110	299	981	234	208	184	56	56	44
19	62	73	69	e100	251	1240	272	232	160	52	53	46
20	61	78	74	e85	216	1250	237	227	130	53	55	45
21	62	62	80	e75	162	1500	233	218	120	51	49	44
22	60	72	87	e70	300	1500	241	218	102	51	49	46
23	60	64	81	120	180	1590	242	225	90	50	47	48
24	66	65	125	656	244	1320	254	232	89	50	51	48
25	63	68	906	1440	199	1370	244	234	93	50	56	52
26	62	87	120	987	181	1190	217	225	96	49	55	51
27	56	78	81	402	219	1070	240	202	87	48	55	51
28	58	e76	74	315	195	912	259	180	77	49	51	53
29	66	e75	119	285	---	753	264	172	74	46	51	53
30	71	e74	80	262	---	574	274	164	77	48	47	55
31	74	---	73	164	---	525	---	159	---	46	45	---
TOTAL	1975	2680	3155	25503	10130	55893	8515	6905	4312	1810	1552	1352
MEAN	63.1	89.3	102	823	362	1806	284	223	144	58.4	50.1	45.1
MAX	165	315	906	5590	2760	9540	502	287	369	75	56	55
MIN	35	62	55	70	45	200	191	159	74	46	40	37
AC-FT	3820	5320	6260	50590	20090	111100	16890	13700	8550	3590	3080	2680

e Estimated.

SANTA ANA RIVER BASIN

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, 1.8 mi downstream from San Timoteo Creek, 2.8 mi south of San Bernardino, and 25 mi downstream from Big Bear Lake.
DRAINAGE AREA.--341 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1939 to September 1954, October 1958 to current year.
GAGE.--Water-stage recorder. 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 864.50 ft above sea level. Nov. 11, 1950, to Sept. 30, 1954, water-stage recorder on both banks 0.4 mi upstream at datum 864.50 ft above sea level. Oct. 1, 1958, to Sept. 30, 1976, water-stage recorder on right bank 0.4 mi upstream at datum 854.50 ft above sea level. Oct. 1, 1976, to Sept. 30, 1977, gage was removed for channel construction. Oct. 1, 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). Natural flow of stream affected by ground-water withdrawals and diversion for domestic use and irrigation upstream from station. Effluent from sewage reclamation plants 1.0 mi upstream has caused sustained flow past gage since 1967. 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, 11.8 ft, site and datum then in use; no flow for many days many years prior to 1967.
EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*), from rating curve extended above 5,930 ft^3/s on basis of critical-depth computations:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 25	0930	1,110	4.60	Feb. 14	unknown	unknown	unknown
Jan. 4	unknown	unknown	unknown	Mar. 5	unknown	*unknown	*unknown
Jan. 7	2215	1,420	4.76	Mar. 11	unknown	unknown	unknown
Jan. 18	1000	6,870	6.36	June 18	unknown	unknown	unknown
Jan. 25	1645	3,040	5.21				

Minimum daily, 38 ft^3/s, Aug. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	38	35	38	48	e118	e400	e250	188	44	46	32
2	38	35	35	41	46	e85	e370	e240	173	41	42	33
3	38	37	34	e100	44	e125	e388	e226	174	44	37	34
4	38	38	33	e720	43	e130	e300	e225	165	43	35	37
5	68	35	34	e1500	45	e5180	e250	e220	158	47	34	38
6	58	38	33	e150	45	e4800	e240	e240	150	46	34	36
7	40	34	34	e120	48	e2100	e235	e235	140	48	36	37
8	37	34	33	e800	48	e1500	e230	e230	172	48	33	37
9	38	35	37	e480	48	e1100	e220	e226	171	47	38	35
10	38	e38	34	e2000	49	e800	e200	e222	164	47	38	35
11	36	e38	35	e1800	38	e2800	e210	e220	148	47	32	35
12	35	37	36	e700	38	e1500	e205	e210	186	51	31	36
13	38	38	38	e250	38	e1100	e200	e200	127	48	31	38
14	34	35	38	e228	e2000	e850	e195	e190	128	46	33	37
15	33	34	37	e250	e1200	e600	e190	e185	121	43	33	36
16	35	34	38	e300	e700	e760	e210	e180	e250	54	34	38
17	37	33	37	e150	e500	e700	e210	e170	e170	56	32	38
18	38	38	37	e120	e830	e750	e200	e160	e130	47	38	38
19	35	33	37	e120	e510	e600	e215	175	e100	38	36	37
20	35	32	37	e100	e280	e820	e210	165	e84	39	37	36
21	33	34	35	e83	e280	e1180	e208	152	e78	41	40	36
22	34	33	35	e70	e200	e1C00	e200	170	e72	38	48	37
23	36	36	38	e50	e190	e800	e185	182	e70	42	44	37
24	38	33	81	e400	e188	e750	e180	184	e68	37	36	36
25	35	32	e270	e450	e170	e690	e178	194	e58	36	35	36
26	35	e72	e47	e800	e150	e680	e188	172	e48	42	35	38
27	35	35	48	e200	e150	e700	e190	188	e42	38	34	40
28	36	33	48	e150	e183	e900	e220	178	40	37	34	41
29	38	35	e106	78	---	e450	e250	186	38	36	34	38
30	38	---	e43	72	---	e420	e260	158	42	34	38	43
31	38	---	40	88	---	e410	---	155	---	38	38	---
TOTAL	1143	1142	1480	12405	7383	33830	6981	6078	3683	1347	1108	1110
MEAN	36.8	38.1	47.7	400	264	1095	230	196	123	43.5	35.7	37.0
MAX	68	88	270	3000	2000	5180	400	350	280	58	48	61
MIN	33	32	33	33	38	85	178	150	38	34	38	32
AC-FT	2270	2270	2940	24610	14640	67080	13850	12050	7330	2670	2200	2200

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.--December 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, CA).

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

REMARKS.--No estimated daily discharges. Records fair. 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,720 ft^3/s, Mar. 1, 1983, gage height, 11.67 ft; 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.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,600 ft^3/s, Jan. 4, gage height, 6.51 ft; minimum daily, 2.6 ft^3/s, Dec. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1994 TO SEPTEMBER 1995
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	9.9	12	4.5	42	58	349	89	66	22	6.4	6.4
2	14	12	12	5.6	38	60	329	89	65	22	8.4	6.4
3	12	12	12	70	35	69	311	89	62	22	8.1	6.1
4	17	11	13	685	34	59	298	94	54	22	9.0	7.2
5	22	12	16	152	32	611	288	99	49	21	7.4	6.5
6	13	12	16	45	34	577	275	108	44	20	8.2	6.9
7	13	12	17	279	35	215	268	95	41	20	8.5	6.7
8	14	12	16	124	36	156	254	93	37	19	7.6	6.3
9	13	12	13	45	37	144	240	87	32	17	7.7	5.6
10	13	52	2.6	842	37	146	218	90	29	15	7.8	5.1
11	13	12	3.6	633	38	889	201	108	27	14	8.0	5.3
12	13	10	3.9	329	38	425	188	120	27	12	6.8	5.4
13	14	10	17	155	42	285	176	128	24	11	6.7	5.0
14	14	11	4.7	92	470	280	164	132	21	11	8.0	5.9
15	13	11	4.0	66	334	285	157	134	30	11	7.9	4.8
16	12	11	3.9	49	130	292	219	137	95	17	8.4	5.6
17	12	7.9	3.9	36	92	314	149	122	38	12	8.7	6.3
18	12	10	4.8	28	74	339	238	107	21	12	8.3	6.4
19	13	10	4.6	25	68	369	144	106	23	12	8.2	7.3
20	12	10	4.4	24	65	408	131	104	22	11	8.4	7.3
21	13	10	6.7	48	66	478	126	102	23	16	10	9.3
22	12	10	7.6	23	65	435	117	104	23	18	10	9.8
23	12	9.6	8.3	42	65	576	113	99	22	25	9.0	8.4
24	11	11	11	120	64	498	110	97	21	20	9.4	7.6
25	11	11	64	450	61	451	110	93	22	7.9	9.3	8.7
26	13	12	8.1	257	61	426	109	85	23	7.2	9.1	9.6
27	13	11	6.8	127	61	413	108	82	23	7.4	11	9.6
28	12	11	6.8	84	59	408	106	81	22	6.5	11	8.4
29	12	10	7.8	63	---	400	98	78	22	5.7	10	9.5
30	12	12	4.8	51	---	385	91	76	22	6.0	10	8.9
31	11	---	5.0	45	---	365	---	71	---	6.1	7.6	---
TOTAL	404	367.4	321.3	4999.1	2211	10816	5685	3099	1030	448.8	264.9	212.3
MEAN	13.0	12.2	10.4	161	79.0	349	189	100	34.3	14.5	8.55	7.08
MAX	22	52	64	842	470	889	349	137	95	25	11	9.8
MIN	11	7.9	2.6	4.5	32	58	91	71	21	5.7	6.4	4.8
AC-FT	801	729	637	9920	4390	21450	11280	6150	2040	890	525	421

APPENDIX B

DAILY PRECIPITATION DATA
AT SAN BERNARDINO COUNTY HOSPITAL

WATER YEAR 1994-95

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION — NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

RECEIVED '94 NOV -7 AM 10:53

S.B.V.M.W.D.

WS FORM B-91 (7-89)

Station	SAN BDNO. CO. MED. CTR.
Month / Year	OCT 19 94
State	CAL.
County	SAN BDNO.
River	
Time (local) of observation: River	
Temp.	4 PM
Precipitation	4 PM
Standard time in use	DAY SAVINGS
Type of river gage	
Elevation of river gage zero	Ft.
Flood stage	Ft.
Normal pool stage	Ft.

Date	Max.	Min.	At Obsn.	Precipitation 24-hr amounts: Rain, melted snow, etc. (ins. and hundredths)	Remarks (Special observations, etc.)
1	82	65	80		
2	83	55	80		
3	74	60	70		
4	65	59	60	.06	LIGHT MIST
5	69	56	67	.50	DRIZZLES
6	71	53	71		LIGHT RAIN
7	83	56	81		
8	90	53	87		
9	92	51	90		
10	90	58	87		
11	86	54	82		
12	82	56	73		
13	72	57	69		
14	72	50	68		
15	69	50	65	TR	LIGHT SHOWER
16	72	49	70		
17	75	45	74		
18	76	47	73		
19	78	46	73		
20	78	47	72		
21	80	47	77		
22	79	47	73		
23	77	42	77		
24	78	55	77		
25	72	50	70		
26	75	57	73		
27	85	51	80		
28	81	51	71		
29	64	51	62		
30	78	50	75		
31	85	49	83		
Sum				.56	

Precipitation: Draw a straight line (——) through hours precipitation was observed, and a waved line (~~~) through hours precipitation probably occurred unobserved.

Weather (Calendar Day): Mark "X" for all types occurring each day. Fog / Ice Pellets / Glaze / Thunder / Hail / Damaging Winds

River Stage: Condition / Gage reading at ___ A.M. / Tendency

COPIES TO: DILWORTH, DIRECTORS, FLETCHER, FULLER, GRIZEL, REITER, TINCHER, VAN GELDER, FILE

Check bar (for wire-weight) Normal ck. bar — Reading / Date

Condition of river at gage:
A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
D. Ice gorge above gage.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.
H. Pool stage.

Observer: R. L. Storm

Supervising office:

Station index no. 04 7736

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

RECEIVED
'94 DEC -7 A9:44
S.B.V.M.W.D.

STATION: SAN BDNO. CO. MED. CTR. | NOV. 19 94

STATE: CAL.

COUNTY: SAN BDNO.

RIVER:

TIME (local) OF OBSERVATION: RIVER: | TEMP. 4PM | PRECIPITATION 4PM

STANDARD TIME IN USE: PACIFIC STAND

TYPE OF RIVER GAGE: | ELEVATION OF RIVER GAGE ZERO: Ft. | FLOOD STAGE: Ft. | NORMAL POOL STAGE: Ft.

DATE	TEMPERATURE F. 24 HRS. ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (Ins. and hundredths)	Snow, ice pellets, hail (Ins. and tenths)	At Ob. Snow, ice pellets, hail, ice on ground (Ins.)	REMARKS (Special observations, etc.)
1	78	58	67				
2	60	49	60				
3	61	46	58	TR.			LIGHT RAIN
4	63	43	57				
5	67	39	65				
6	73	43	67				
7	63	40	61				
8	63	52	61				
9	67	42	67				
10	53	42	51	.45			LIGHT TO HEAVY RAIN
11	61	36	57				
12	59	36	51				
13	65	37	64				
14	67	35	54				
15	71	36	61				
16	59	42	51				
17	58	35	51				
18	54	35	50	.06			STEADY LIGHT RAIN
19	58	35	50				
20	60	32	53				
21	65	35	54				
22	67	41	61				
23	72	37	68				
24	73	37	67				
25	61	37	54				
26	53	47	47	.39			STEADY LIGHT RAIN
27	62	36	54				
28	67	35	57				
29	69	38	58				
30	75	38	70				
31							
SUM				.90			

Precipitation: Draw a straight line (——) through hours precipitation was observed, and a waved line (~~~) through hours precipitation probably occurred unobserved. A.M. NOON P.M.

WEATHER (Calendar Day): Mark 'X' for all types occurring each day. Fog | Ice Pellets | Glaze | Thunder | Hail | Damaging Winds | Time of observation if different from above

RIVER STAGE: CONDITION | GAGE READING AT A.M. | TENDENCY

COPIES TO:
DILWORTH ☐
DIRECTORS ☐
FLETCHER ☐
FULLER ☑
GRIZEL ☐
REITER ☐
TINCHER ☑
VAN GELDER ☐
☑
☐
FILE ☐

CONDITION OF RIVER AT GAGE
A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
D. Ice gorge above gage.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.
H. Pool stage.

CHECK BAR (For wire-weight) NORMAL CK. BAR
READING | DATE

OBSERVER: R. L. Stearns

SUPERVISING OFFICE

STATION INDEX NO. 04 7723 6

STATION (Climatological): SAN F UO. CO. MED. CTR. (River Station, if different)
MONTH: DEC 19 94
STATE: CALIF.
COUNTY: SAN BDNO,
RIVER:
TIME (local) OF OBSERVATION RIVER: | TEMP. 4PM | PRECIPITATION 4PM
STANDARD TIME IN USE: PACIFIC STAND.
TYPE OF RIVER GAGE: | ELEVATION OF RIVER GAGE ZERO: Ft. | FLOOD STAGE: Ft. | NORMAL POOL STAGE: Ft.

WS FORM B-91

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

DATE	TEMPERATURE F. 24 HRS. ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (Ins. and hundredths)	Snow, ice pellets (Ins. and tenths)	At Ob. Snow, ice pellets, hail, ice on ground (Ins.)	WEATHER (Calendar Day) Fog	Ice Pellets	Glaze	Thunder	Hail	Damaging Winds	Time of observation if different from above	RIVER STAGE CONDITION	GAGE READING AT A.M.	TENDENCY	REMARKS (Special observations, etc.)
1	73	41	70														
2	68	38	60														
3	63	42	62														
4	63	40	55														
5	66	49	62														LIGHT RAIN
6	60	50	59														
7	62	48	60														
8	58	40	56														
9	64	30	60														
10	62	30	60														
11	59	31	53														
12	61	44	55														
13	57	45	55	.12													LIGHT TO MODERATE
14	60	36	58	TR.													
15	60	36	56														
16	68	37	65														
17	76	39	67														
18	71	40	68														
19	74	41	70														
20	76	54	75														
21	76	41	72														
22	67	41	67	TR.													LIGHT SPRINKLES
23	64	51	62	.02													LIGHT "
24	55	52	51	.39													LIGHT RAIN
25	53	46	50	.96													STEADY
26	70	57	65														
27	67	43	63														
28	57	43	56														HEAVY SHOWERS
29	57	40	55	.26													
30	61	38	57														
31	61	38	57														
SUM				1.75													

PRECIPITATION: Draw a straight line (——) through hours precipitation was observed, and a waved line (~~~) through hours precipitation probably occurred unobserved. A.M. NOON P.M.

CHECK BAR (For wire-weight) NORMAL CK. BAR
READING | DATE

CONDITION OF RIVER AT GAGE

A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
D. Ice gorge above gage.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.
H. Pool stage.

OBSERVER: R. L. Stamm

SUPERVISING OFFICE:

STATION INDEX NO. 04 7723 6

STATION (Climatological) SAN B. CO. MED. CTR. (River Station, if different)

MONTH JAN 19 95

STATE CALIF.

COUNTY SAN BERNARDINO

RIVER

TIME (local) OF OBSERVATION RIVER TEMP. 4PM PRECIPITATION 4PM

STANDARD TIME IN USE PACIFIC DAY.

TYPE OF RIVER GAGE

ELEVATION OF RIVER GAGE ZERO Ft.

FLOOD STAGE Ft.

NORMAL POOL STAGE Ft.

WS FORM B-91 89)

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

DATE	TEMPERATURE F. 24 HRS. ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (Inc. and hundredths)	Snow, ice pellets (Inc. and tenths)	At Ob Snow, ice pellets hail, ice on ground (Inc.)	WEATHER (Calendar Day) Mark 'X' for all types occurring each day. Fog	Ice Pellets	Glaze	Thunder	Hail	Damaging Winds.	Time of observation if different from above	RIVER STAGE CONDITION	GAGE HEADING AT ___ A.M.	TENDENCY	REMARKS (Special observations, etc.,)
1	61	43	54														
2	52	44	52														
3	52	44	52	.53													LIGHT TO HEAVY
4	49	44	40	.80													STEADY MOSTLY ALL DAY
5	56	46	52	2.10													
6	57	45	52														
7	54	44	52	.10													LIGHT TO HEAVY
8	61	49	59	1.17													LIGHT RAIN
9	63	53	63	.17													LIGHT TO HEAVY
10	57	51	53	2.00													
11	57	51	54	.94													LIGHT RAIN
12	60	49	60	.31													STEADY LIGHT
13	57	49	57	.02													LIGHT DRIZZLE
14	58	41	50														LIGHT RAIN
15	58	49	51	.17							X						LIGHT RAIN - HAIL
16	57	42	52	.42													HEAVY AT TIMES
17	59	38	54	.04													
18	62	33	57														
19	65	35	55														
20	67	35	58														LIGHT RAIN
21	59	34	54	.15													LIGHT RAIN
22	60	42	58														LIGHT RAIN
23	58	49	53	.18													STEADY LIGHT RAIN
24	62	38	52	1.00													LIGHT TO HEAVY
25	62	54	56	.68													LIGHT TO HEAVY
26	56	48	50	.57													" " "
27	55	48	51														
28	65	48	58														
29	73	45	68														
30	73	46	68														
31	79	47	28														
Sum			SUM	11.35			Fog	Ice Pel.	Glaze	Thund	Hail	Dam. Winds					

Draw a straight line (——) through hours precipitation was observed, and a waved line (~~~) through hours precipitation probably occurred unobserved.

A.M. NOON P.M.

CONDITION OF RIVER AT GAGE

A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
D. Ice gorge above gage.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.
H. Pool stage.

CHECK BAR (For wire-weight) NORMAL CK. BAR

READING DATE

OBSERVER R. L. Storm

SUPERVISING OFFICE

STATION INDEX NO. 04 7723 6

SAN BDNO CO. MED. CENTER | FEB | 19 73

STATE: CALI. | COUNTY: SAN BDNO | RIVER:

TIME (local) OF OBSERVATION: RIVER: | TEMP. 4 PM | PRECIPITATION 4 PM | STANDARD TIME IN USE: PAC. DAYLIGHT

TYPE OF RIVER GAGE: | ELEVATION OF RIVER GAGE ZERO Ft. | FLOOD STAGE Ft. | NORMAL POOL STAGE Ft.

(7-57) NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

DATE	TEMPERATURE F. 24 HRS. ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (Inc. and hundredths)	Snow, sleet (Inches and tenths)	At Ob. Snow, ice pellets, hail, ice on ground (Inch.)	Draw a straight line (——) through hours precipitation was observed, and a waved line (~~~) through hours precipitation probably occurred unobserved. A.M. NOON P.M.	WEATHER (Calendar Day) Mark 'X' for all types occurring each day. Fog	Ice Pellets	Glaze	Thunder	Hail	Damaging Winds	If time of observation is different from above	RIVER STAGE CONDITION	GAGE READING AT ___ A.M.	TENDENCY	REMARKS (Special observations, etc.,)
1	85	47	78															
2	84	47	83															
3	84	47	82															
4	83	46	81															
5	84	48	72															
6	78	47	73															
7	78	48	67															
8	57	48	57					X										
9	64	49	63															
10	62	42	57															
11	57	51	57															
12	60	47	59															
13	60	44	55	.14														LIGHT DRIZZLES
14	59	54	56	1.10														LIGHT TO HEAVY
15	68	52	68	.30														
16	70	44	67															
17	74	47	73															
18	81	47	49															
19	86	53	79															
20	86	51	78															
21	63	50	63	TR														LIGHT DRIZZLE
22	67	49	63															
23	66	47	65															
24	71	50	67	TR				X										LIGHT DRIZZLE
25	63	50	61	TR				X										" "
26	70	56	66															
27	70	55	62															
28	61	53	60															
29																		
30																		
31																		
Tot.			SUM	1.54			CHECK BAR (For wire-weight) NORMAL CK. BAR											

CONDITION OF RIVER AT GAGE

A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
D. Ice gorge above gage.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.
H. Pool stage.

READING	DATE

OBSERVER: R. L. Storm

SUPERVISING OFFICE:

STATION INDEX NO. 04 7723 6

STATION (Climatological): SB cs mal Ctr (River Station, if different)
MONTH: March 19 95
STATE: Ca
COUNTY: SB
RIVER:
TIME (local) OF OBSERVATION: RIVER — TEMP. 4 pm — PRECIPITATION 4 pm
STANDARD TIME IN USE: PD Aylight
TYPE OF RIVER GAGE — ELEVATION OF RIVER GAGE ZERO Ft. — FLOOD STAGE Ft. — NORMAL POOL STAGE Ft.

FORM B-91 (7-89)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

DATE	TEMPERATURE F. 24-HRS ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (ins. and hundredths)	Snow, ice pellets, hail (ins. and tenths)	AT OB. Snow, ice pellets, hail, ice on ground (ins.)	REMARKS (Special observations, etc.)
1	57	51	50	TR.			
2	59	51	55	,03			
3	52	53	57	,44			Light to med
4	64	52	54	,06			Light Drizzle
5	60	52	56	2,27			Steady
6	71	49	62				
7	71	43	67				
8	74	53	67				
9	75	43	70				
10	65	43	61				Light Drizzle
11	64	53	61	2,00			Heavy Rain
12	67	47	60	,15			
13	71	46	68				
14	79	53	71				
15	80	50	78				
16	81	50	79				
17	70	56	69				
18	74	55	73				
19	68	56	64				
20	69	58	65				
21	53	48	54	,39			
22	61	40	58	TR.			
23	50	46	50	,70			
24	60	41	56				
25	63	39	55				
26	69	39	68				
27	71	41	67				
28	70	47	65				
29	72	43	70				
30	74	43	73				
31	72	42	74				
			SUM	5.98			

Precipitation: Draw a straight line (——) through hours precipitation was observed, and a waved line (~~~) through hours precipitation probably occurred unobserved. A.M. — NOON — P.M.

WEATHER (Calendar Day): Mark "X" for all types occurring each day. Fog — Ice Pellets — Glaze — Thunder — Hail — Damaging Winds — Time of observation if different from above

RIVER STAGE: CONDITION — GAGE READING AT ___ A.M. — TENDENCY

CHECK BAR (For wire-weight) NORMAL CK. BAR — READING — DATE

CONDITION OF RIVER AT GAGE

A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.

OBSERVER: R. L. Storm

SUPERVISING OFFICE

STATION INDEX NO.

WS FORM B-91 (7-89)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

STATION (Climatological): SAN BDNO. CO. MED. CTR. (River Station, if different)
MONTH: APRIL 19 95
STATE: CALIF.
COUNTY: SAN BDNO
RIVER:
TIME (local) OF OBSERVATION RIVER: | TEMP. 4 PM | PRECIPITATION 4 PM
STANDARD TIME IN USE: PAC. STANDARD
TYPE OF RIVER GAGE: | ELEVATION OF RIVER GAGE ZERO: Ft. | FLOOD STAGE: Ft. | NORMAL POOL STAGE: Ft.

DATE	TEMPERATURE F. 24 HRS. ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (ins. and hundredths)	Snow, ice pellets (ins. and tenths)	At Ob. Snow, ice pellets, hail, ice on ground (ins.)	REMARKS (Special observations, etc.)
1	75	46	74				
2	78	46	60				
3	84	49	82				
4	84	49	82				
5	83	48	78				
6	65	52	64				
7	64	53	64				
8	69	55	68				
9	70	46	69				
10	76	55	69				
11	80	46	79				
12	82	48	81				
13	75	55	72				
14	67	44	66				
15	62	45	61				
16	47	41	44	.60			STEADY LIGHT - MOD.
17	59	42	56	.16			LIGHT RAIN
18	54	48	53	TR			
19	60	43	53				
20	54	42	54	TR			LIGHT
21	71	43	68				
22	81	42	80				
23	84	50	83				
24	87	48	81				
25	82	51	80				
26	82	50	79				
27	71	50	70				
28	71	50	68				
29	74	56	70				
30	75	57	73				
31							
SUM							

PRECIPITATION: Draw a straight line (——) through hours precipitation was observed, and a waved line (~~~) through hours precipitation probably occurred unobserved. A.M. NOON P.M.

WEATHER (Calendar Day): Mark "X" for all types occurring each day. Fog | Ice Pellets | Glaze | Thunder | Hail | Damaging Winds | Time of observation if different from above

RIVER STAGE: CONDITION | GAGE READING AT ___ A.M. | TENDENCY

CONDITION OF RIVER AT GAGE
A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.

CHECK BAR (For wire-weight) NORMAL CK. BAR
READING | DATE

OBSERVER: R. L. Storm

SUPERVISING OFFICE

STATION INDEX NO.

STATION (Climatological) SAN B. CO. MED. CTR. (River Station, if different)

MONTH MAY 19 85

STATE CALIF. COUNTY SAN BDNO. RIVER

TIME (local) OF OBSERVATION RIVER TEMP 4PM PRECIPITATION 4PM STANDARD TIME IN USE PAC. STANDARD

TYPE OF RIVER GAGE ELEVATION OF RIVER GAGE ZERO Ft. FLOOD STAGE Ft. NORMAL POOL STAGE Ft.

WS FORM B-91

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

DATE	TEMPERATURE F. 24 HRS. ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (Inches and hundredths)	Snow, ice pellets (Inches and tenths)	At Ob. Snow, ice pellets, hail, ice on ground (Inches)	Draw a straight line (——) through hours precipitation was observed, and a wavy line (~~~) through hours precipitation probably occurred unobserved. A.M. NOON P.M.	WEATHER (Calendar Day) Mark 'X' for all types occurring each day. Fog	Ice Pellets	Glaze	Thunder	Hail	Damaging Winds	Time of observation if different from above	RIVER STAGE CONDITION	GAGE READING AT ___ A.M.	TENDENCY	REMARKS (Special observations, etc.)
1	80	59	77															
2	73	56	71															
3	74	52	71															
4	66	52	63	TR														LIGHT MIST
5	61	49	56															LIGHT RAIN
6	56	44	52	TR.														
7	59	49	57	.04														LIGHT RAIN
8	65	50	63	.11														" "
9	75	46	72															
10	75	46	73															
11	71	46	70															
12	64	45	64															LIGHT MIST
13	64	52	62															
14	66	49	62															LIGHT MIST
15	69	49	64	.04														
16	61	51	61															
17	70	51	70															
18	79	52	77															
19	86	52	84															
20	78	53	76															
21	71	54	70															
22	65	53	62															LIGHT RAIN
23	58	52	56	.01														
24	62	52	62	TR														
25	66	54	62															
26	79	48	62															
27	77	53	76															
28	81	54	80															
29	90	53	90															
30	93	55	90															MODERATE FOG
31	94	59	91					X										
			SUM	.20														

CONDITION OF RIVER AT GAGE

A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
D. Ice gorge above gage.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.
H. Pool stage.

CHECK BAR (Raw water—weight) NORMAL CK. BAR

READING	DATE

OBSERVER K. L. Stevens

SUPERVISING OFFICE

STATION INDEX NO. 04 7723 6

STATION (Climatological) SAN BDN. CO. HED. CTR. (River Station, if different)

STATE CALIF. COUNTY SAN BDNO.

TIME (local) OF OBSERVATION RIVER TEMP. 4PM PRECIPITATION 4PM

TYPE OF RIVER GAGE ELEVATION OF RIVER GAGE ZERO Ft. FLOOD STAGE Ft.

MONTH JUNE 19 95 RIVER

STANDARD TIME IN USE PAC. STANDARD NORMAL POOL STAGE Ft.

WS FORM B-91 (7

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

DATE	TEMPERATURE F. 24 HRS. ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (Inc. and hundredths)	Snow, ice pellets (Inc. and tenths)	At Ob. Snow, ice pellets hail, ice on ground (Inc.)	Draw a straight line (——) through hours precipitation was observed, and a waved line (~~~) through hours precipitation probably occurred unobserved. A.M. NOON P.M.	WEATHER (Calendar Day) Mark "X" for all types occurring each day. Fog	Ice Pellets	Glaze	Thunder	Hail	Damaging Winds	Time of observation if different from above	RIVER STAGE CONDITION	GAGE READING AT ___ A.M.	TENDENCY	REMARKS (Special observations, etc.)
1	70	53	68	TR.														LIGHT MIST
2	63	55	61															
3	73	55	73															
4	85	54	80															
5	78	56	78															
6	80	56	75															
7	65	51	65															
8	73	49	71															
9	85	50	81															
10	93	55	92															
11	101	61	99															
12	97	63	95															
13	95	61	93															
14	83	57	80															
15	66	59	65	.03														LIGHT TO MED.
16	60	50	50	.40														LIGHT ENDWEALS
17	72	46	71	.43														
18	85	52	83															
19	85	55	83															
20	85	54	84															
21	83	55	83															
22	94	55	92															
23	96	56	95															
24	98	56	96															
25	91	61	87															
26	91	62	86															
27	95	56	93															
28	96	63	94															
29	88	61	82															
30	93	61	92															
31	[illegible]																	
Total			SUM	.86		X								X	X	X		

CHECK BAR (For microweight) NORMAL CK. BAR

READING	DATE

CONDITION OF RIVER AT GAGE

A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
D. Ice gorge above gage.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.
H. Pool stage.

OBSERVER R. L. Storm

SUPERVISING OFFICE

STATION INDEX NO. 04 7723 6

STATE: CALIF — COUNTY: SAN BDNO — RIVER:

STATION RIVER — TEMP. 4 PM — PRECIPITATION 4 PM — STANDARD TIME IN USE: PAC. STANDARD

ELEVATION OF RIVER GAGE ZERO Ft. — FLOOD STAGE Ft. — NORMAL POOL STAGE Ft.

JULY 1995

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

Date	Temperature Max.	Temperature Min.	Temperature At Obsn.	Precipitation 24-hr amounts: Rain, melted snow, etc. (Ins. and hundredths)	Snow, ice pellets (Ins. and tenths)	Snow, ice pellets, hail, ice on ground (Ins.)	Weather (Calendar Day)	River Stage: Condition	Gage Reading at A.M.	Tendency	Remarks (Special observations, etc.)
1	96	51	88								
2	87	59	86								
3	83	54	85								
4	80	66	79								
5	96	55	94								
6	93	62	84								
7	97	62	96								
8	100	67	99								
9	98	65	96								
10	98	64	95								
11	96	64	95								
12	92	60	91								
13	92	58	92								
14	97	61	96								
15	98	65	96								
16	88	69	86	.05							LIGHT SHOWER
17	97	65	92								
18	96	64	96								
19	95	65	93								
20	94	60	92								
21	90	54	88								
22	80	59	82								
23	95	62	92								
24	94	63	91								
25	97	62	91								
26	105	62	103								
27	110	62	108								
28	108	72	103								
29	108	75	102								
30	101	70	99								
31	98	68	96								
Sum				.05							

CHECK BAR (For wire-weight) NORMAL CK. BAR — READING — DATE

CONDITION OF RIVER AT GAGE

A. Obstructed by rough ice. — E. Ice gorge below gage.
B. Frozen, but open at gage. — F. Shore ice.
C. Upper surface of smooth ice. — G. Floating ice.
D. Ice gorge above gage. — H. Pool stage.

OBSERVER: R. L. Stamm

SUPERVISING OFFICE

STATION INDEX NO. 04 7723 6

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

AUGUST 1995

STATE: CALIF
COUNTY: SAN BDNO
RIVER:
TIME (local) OF OBSERVATION RIVER:
TEMP. 4PM
PRECIPITATION 4PM
STANDARD TIME IN USE: PACIFIC
TYPE OF RIVER GAGE:
ELEVATION OF RIVER GAGE ZERO: Ft.
FLOOD STAGE: Ft.
NORMAL POOL STAGE: Ft.

DATE	TEMPERATURE F. 24 HRS. ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS		At Ob	WEATHER	RIVER STAGE	REMARKS
1	98	70	97						
2	100	69	98						
3	101	70	100						
4	98	67	90						
5	99	65	98						
6	102	63	98						
7	102	69	98						
8	104	71	101						
9	103	69	99						
10	96	68	92						
11	99	64	93						
12	101	67	99						
13	99	67	98						
14	98	65	95						
15	93	62	93						
16	93	59	91						
17	90	60	87						
18	92	60	92						
19	97	61	94						
20	97	63	93						
21	96	71	93						
22	98	70	93						
23	96	68	93						
24	99	64	94						
25	97	64	93						
26	97	61	96						
27	100	64	98						
28	101	67	100						
29	102	68	99						
30	103	66	100						
31	104	67	102						
SUM				—					

CONDITION OF RIVER AT GAGE
A. Obstructed by rough ice. B. Frozen, but open at gage. C. Upper surface of smooth ice. D. Ice gorge above gage. E. Ice gorge below gage. F. Shore ice. G. Floating ice. H. Pool stage.

CHECK BAR (For wire-weight) NORMAL CK. BAR — READING — DATE

OBSERVER: R. L. Starr (signature)

SUPERVISING OFFICE:

STATION INDEX NO. 04 7723 6

WS FORM B-91 (12-91)

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

RECORD OF RIVER AND CLIMATOLOGICAL OBSERVATIONS

STATION (Climatological): SAN BDNO. Co. MED. CTR.
MONTH: SEPT. 1995
STATE: CALI.
COUNTY: SAN BDNO.
RIVER:
TIME (local) OF OBSERVATION: RIVER — TEMP. 4PM — PRECIPITATION 4PM
STANDARD TIME IN USE: DAYLIGHT SAV.
TYPE OF RIVER GAGE:
ELEVATION OF RIVER GAGE ZERO: Ft
FLOOD STAGE: Ft
NORMAL POOL STAGE: Ft

DATE	TEMPERATURE F. 24 HRS ENDING AT OBSERVATION MAX.	MIN.	AT OBSN.	PRECIPITATION 24-HR AMOUNTS Rain, melted snow, etc. (ins. and hundredths)	Snow, ice pellets, hail (ins. and tenths)	At Ob. Snow, ice pellets, hail, ice on ground (ins.)	Fog	Ice Pellets	Glaze	Thunder	Hail	Damaging Winds	RIVER STAGE Condition	Gage Reading at ___ A.M.	Tendency	REMARKS (Special observations, etc.)
1	102	67	96	TR.												
2	105	73	88	.20								X				HEAVY DOWN POUR
3	102	73	95													
4	100	72	97													
5	103	71	101													
6	95	69	95													
7	96	68	95													
8	91	66	90													
9	89	65	88													
10	90	58	88													
11	96	58	94													
12	100	64	99													
13	102	65	99													
14	105	65	103													
15	103	66	102													
16	89	64	88													
17	92	61	88													
18	92	59	87													
19	95	59	93													
20	95	59	61													
21	95	57	87													
22	92	59	91													
23	92	59	89													
24	89	61	86													
25	87	61	85													
26	84	56	78													
27	84	58	82													
28	80	58	72													
29	77	59	72													
30	91	53	90													
31																
Sum			SUM	.20												

CHECK BAR (For wire-weight) NORMAL CK. BAR — READING — DATE

CONDITION OF RIVER AT GAGE
A. Obstructed by rough ice.
B. Frozen, but open at gage.
C. Upper surface of smooth ice.
D. Ice gorge above gage.
E. Ice gorge below gage.
F. Shore ice.
G. Floating ice.
H. Pool stage.

OBSERVER: R. L. Slocum

SUPERVISING OFFICE: NWSFO OXNARD, CA

STATION INDEX NO. 4-7723

ORANGE COUNTY WATER DISTRICT

April 8, 1996

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

Gentlemen:

I have reviewed the attached summary of transactions for the checking and savings accounts of the Santa Ana River Watermaster. As part of this review, I have compared the transactions on the attached summary with those shown on the original Bank of America Checking and Savings Account statements.

The transactions on the summary also match those found on original documents. The Checking and Savings Accounts balances as of June 30, 1995, are as shown.

Very truly yours,

ORANGE COUNTY WATER DISTRICT

Barbara Heatherly
Controller

BH:jlk

P.O. BOX 8300, FOUNTAIN VALLEY, CA 92728-8300 • 10500 ELLIS AVENUE, FOUNTAIN VALLEY, CA 92708
TELEPHONE (714) 378-3200 FAX (714) 378-3373

SANTA ANA RIVER WATERMASTER

FINANCIAL STATEMENTS

JUNE 30, 1995

SANTA ANA RIVER WATER MASTER

STATEMENT OF ASSETS AND LIABILITIES
ARISING FROM CASH TRANSACTIONS

June 30, 1995

ASSETS

Cash in checking account (Note 3)	$	12,878
Cash in savings account (Note 3)		2,210
TOTAL ASSETS	$	15,088

FUND BALANCE

Fund balance	$	15,088

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

SANTA ANA RIVER WATERMASTER

STATEMENT OF ASSETS AND LIABILITIES
ARISING FROM CASH TRANSACTIONS

June 30, 1995

	Actual	Budget	Over (Under) Budget
REVENUE COLLECTED:			
Water district contributions (Note 2):			
Orange County Water District	$ 2,000	$ 2,000	$ -
Chino Basin Municipal Water District	1,000	1,000	-
San Bernardino Valley Municipal Water District	1,000	1,000	-
Western Municipal Water District	1,000	1,000	-
Interest from Savings Account	44	-	44
TOTAL REVENUE COLLECTED	5,044	5,000	44
EXPENSES PAID:			
Professional Engineering Service	$ 2,830	$ 9,000	$(6,170)
Administrative Expenses:			
Office and Bank Service Charges	0	0	0
Auditing Services	0	1,250	(1,250)
Annual Reports	0	5,750	(5,750)
TOTAL EXPENSES PAID	2,830	16,000	(13,170)
EXCESS OF REVENUE COLLECTED OVER EXPENSES PAID	2,214	(11,000)	13,214
FUND BALANCE AT JULY 1, 1994	12,874		
FUND BALANCE AT JUNE 30, 1995	$15,088		

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

SANTA ANA RIVER WATERMASTER

NOTES TO FINANCIAL STATEMENTS

June 30, 1995

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 judgement 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, 1995 consisted of the following:

Bank of America:		
Checking account	$	12,878
Savings account		2,210
	$	15,088

All cash is fully insured by the FDIC.

See independent reviewer's report.

APPENDIX D

WATER QUALITY AND FLOW OF EXCHANGE GROUNDWATER DISCHARGED TO THE SANTA ANA RIVER ABOVE PRADO

WATER YEAR 1994-95

PREPARED BY

DONALD L. HARRIGER

TABLE D-1

MWDSC DEMONSTRATION PROGRAM
DISCHARGED TO THE SANTA ANA RIVER
ABOVE PRADO DAM

WATER YEAR 1994-95
(acre-feet)

Month	Discharged Below the Narrows	Discharged Above the Narrows [1]
1994		
October	0	577
November	0	879
December	0	750
1995		
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
Sub totals	0	2,206
Total		2,206

(1) Adjusted for a 5% transportation loss.

TABLE D-2

MWDSC DEMONSTRATION PROGRAM
DISCHARGED TO THE SANTA ANA RIVER
ABOVE PRADO DAM

WATER YEAR 1994-95

October 1994

Day	Discharged above Riverside Narrows [1] (cfs)
1	4
2	4
3	7
4	7
5	3
6	1
7	1
8	4
9	3
10	11
11	10
12	12
13	18
14	13
15	9
16	18
17	13
18	13
19	12
20	12
21	12
22	12
23	13
24	12
25	12
26	12
27	13
28	8
29	7
30	7
31	7
Total in CFS-DAYS	291
Total in AF	577

(1) Adjusted for 5% transportation loss

TABLE D-2

MWDSC DEMONSTRATION PROGRAM
DISCHARGED TO THE SANTA ANA RIVER
ABOVE PRADO DAM

WATER YEAR 1994-95
November 1994

Day	Discharged above Riverside Narrows [1] (cfs)
1	11
2	15
3	18
4	9
5	6
6	19
7	20
8	20
9	21
10	19
11	20
12	20
13	20
14	11
15	14
16	14
17	14
18	14
19	15
20	11
21	11
22	11
23	11
24	11
25	11
26	13
27	11
28	11
29	18
30	24
Total in CFS-DAYS	443
Total in AF	879

(1) Adjusted for 5% transportation loss

TABLE D-2

MWDSC DEMONSTRATION PROGRAM
DISCHARGED TO THE SANTA ANA RIVER
ABOVE PRADO DAM

WATER YEAR 1994-95
December 1994

Day	Discharged above Riverside Narrows [1] (cfs)
1	24
2	16
3	15
4	15
5	16
6	15
7	5
8	1
9	2
10	2
11	2
12	2
13	2
14	2
15	23
16	19
17	12
18	16
19	13
20	13
21	19
22	13
23	15
24	14
25	14
26	16
27	13
28	13
29	14
30	16
31	14
Total in CFS-DAYS	378
Total in AF	750

(1) Adjusted for 5% transportation loss

TABLE D-3

MWDSC EXCHANGE PROGRAM
DISCHARGED TO THE SANTA ANA RIVER
ABOVE PRADO DAM

WATER YEAR 1994-95

Month	Discharge [1] (acre-feet)	TDS (mg/L)	Discharge x TDS
1994			
October	577	636	366,784
November	879	449	394,788
December	750	379	284,318
1995			
January	0	0	0
February	0	0	0
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	2,206		1,045,891

$$\frac{1,045,891}{2,206} = 474 \text{ mg/L}$$

Flow Weighted TDS of Pumped Groundwater Releases to the river = 474 mg/L

(1) Flow adjusted for a 5% transportation loss (2,322 x 0.95 = 2,206).

APPENDIX E

WATER QUALITY AND DISCHARGE OF WATER RELEASED BY MWDSC TO SAN ANTONIO CREEK NEAR UPLAND

CONNECTION OC-59

WATER YEAR 1994-95

PREPARED BY

WILLIAM R. MILLS, JR.

TABLE E-1

NONTRIBUTARY WATER FROM OC-59

MONTHLY TOTALS

(acre-feet)

WATER YEAR 1994-95

Month	Released at OC-59	12-Hour Delay (1)	Evaporation Losses (2)	Calculated Flow at Prado
1994		Delay(1)		
October	292	267	5.36%	253
November	2,172	2,090	1.29%	2,063
December	630	738	0.76%	732
1995				
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	3,094	3,094		3,047

(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.

APPENDIX C

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

WATER YEAR 1994-95

TABLE E-2

NONTRIBUTARY WATER FROM OC-59
OCTOBER 1994
(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	21	11	10
27	25	23	22
28	25	25	24
29	25	25	24
30	25	25	24
31	25	25	24
Total (cfs-days)	147	135	127
(AF)	292	267	253

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

TABLE E-2 (continued)

NONTRIBUTARY WATER FROM OC-59
NOVEMBER 1994
(cfs)

Day	Released at OC-59	12 Hour Delay	Calculated Flow at Prado Dam(1)
1	25	25	25
2	25	25	25
3	25	25	25
4	21	23	23
5	0	11	10
6	0	0	0
7	20	10	10
8	25	23	22
9	20	23	22
10	0	10	10
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	66	33	32
19	81	73	72
20	81	81	80
21	81	81	80
22	81	81	80
23	81	81	80
24	81	81	80
25	66	73	72
26	0	33	32
27	0	0	0
28	101	50	50
29	108	105	103
30	108	108	107
Total (cfs-days)	1,095	1,053	1,040
(AF)	2172	2090	2,063

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

TABLE E-2 (continued)

NONTRIBUTARY WATER FROM OC-59
DECEMBER 1994
(cfs)

Day	Released at OC-59	12 Hour Delay	Calculated Flow at Prado Dam(1)
1	108	108	108
2	108	108	108
3	101	105	104
4	0	50	50
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
31	0	0	0
Total (cfs-days)	318	372	369
(AF)	630	738	732

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

TABLE E-3

EVAPOTRANSPIRATION LOSSES OF STATE WATER FROM OC-59
WATER YEAR 1994-95
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
1994						
October	267.0	3.78	10.52	1.71	14.30	5.36%
November	2,089.5	9.92	16.97	1.29	26.88	1.29%
December	737.5	1.24	4.39	0.00	5.63	0.76%
Total	3,094.0	14.94	31.87	3.00	46.81	
					Percent of Annual Releases =	1.51%

TABLE E-3.1

EVAPOTRANSPIRATION LOSSES OF STATE WATER FROM OC-59
WATER YEAR 1994-95
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]
1994					
October	267.0	6	4.18	3.78	1.42%
November	2,089.5	21	3.03	9.92	0.47%
December	737.5	4	2.06	1.24	0.17%

(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-3.2
EVAPOTRANSPIRATION LOSSES OF STATE WATER FROM OC-59
WATER YEAR 1994-95
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]
1994						
October	267.0	13	4.18	72	10.52	3.94%
November	2,089.5	28	3.03	72	16.97	0.81%
December	737.5	11	2.06	72	4.39	0.59%

(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 1994-95
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]
1994							
October	267.0	13	4.18	3.5	72	1.71	0.64%
November	2,089.5	28	3.03	2.8	72	1.29	0.06%
December	737.5	11	2.06	2.1	72	0.00	0.00%

(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 E-4

CALCULATION OF WEIGHTED TDS FOR
STATE WATER PROJECT WATER ARRIVING AT
PRADO DAM FROM RELEASES AT OC-59

Month	Total Flow (acre-feet)	Weighted Average TDS ($Mg/L_{(1,2)}$)	Flow x TDS
1994			
October	253	273	68,987
November	2,063	340	701,290
December	732	275	201,265
Total	3,047		971,541
Yearly Flow Weighted TDS =		319	

Notes:

(1) Daily TDS values for State Water Project water arriving at Prado were calculated based on mass balance using known flow and quality components. Calculations were derived from the procedures referenced in the Twelfth Annual Report of the Santa Ana River Watermaster, Appendix C.

(2) Due to a lack of OC-59 TDS samples, the TDS value for October is represented by the September sample collected at the Devil's Canyon entrance to the OC-59 pipeline. Likewise, the TDS value for December is represented by the December sample collected at the Devil's Canyon entrance to the OC-59 pipeline.

APPENDIX F

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

WATER YEAR 1994-95

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 1994-95

OCTOBER 1994

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L)(1)	Outflow X TDS
1	10	20	791	483	4,795
2	10	20	791	483	4,795
3	10	20	791	483	4,787
4	7	14	779	475	3,464
5	8	15	524	320	2,424
6	8	15	526	321	2,433
7	8	15	526	321	2,433
8	8	15	526	321	2,433
9	8	15	526	321	2,428
10	8	15	516	315	2,363
11	8	17	619	378	3,162
12	9	19	743	453	4,251
13	9	19	742	453	4,238
14	9	19	742	453	4,238
15	9	19	742	453	4,238
16	9	19	743	453	4,244
17	9	19	743	453	4,244
18	9	19	746	455	4,247
19	9	19	745	454	4,241
20	9	18	745	454	4,234
21	9	18	746	455	4,240
22	9	18	747	456	4,246
23	9	18	748	456	4,244
24	9	18	708	432	4,017
25	9	18	746	455	4,233
26	9	18	712	434	3,912
27	9	18	709	432	3,876
28	9	18	709	432	3,876
29	9	18	709	432	3,876
30	9	18	709	432	3,876
31	9	18	709	432	3,849
Total	275	546			117,942
Monthly Flow Weighted TDS				428	

1. TDS = EC x 0.61

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER
TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1994-95

NOVEMBER 1994

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L)(1)	Outflow X TDS
1	9	18	680	415	3,704
2	9	18	680	415	3,730
3	9	17	680	415	3,608
4	9	17	693	423	3,651
5	9	18	727	443	3,961
6	9	17	703	429	3,757
7	9	17	695	424	3,681
8	9	17	693	423	3,671
9	9	17	692	422	3,665
10	9	17	698	426	3,697
11	9	17	699	426	3,696
12	9	17	698	426	3,691
13	9	17	697	425	3,685
14	9	18	715	436	3,861
15	9	17	710	433	3,821
16	8	17	674	411	3,494
17	9	17	730	445	3,894
18	9	17	705	430	3,761
19	8	17	672	410	3,477
20	8	17	668	407	3,444
21	8	17	669	408	3,449
22	8	16	718	438	3,613
23	8	16	633	386	3,209
24	8	17	634	387	3,226
25	8	17	634	387	3,226
26	8	17	636	388	3,237
27	8	17	635	387	3,232
28	8	17	635	387	3,226
29	8	16	634	387	3,214
30	9	18	692	422	3,737
Total	258	512			107,318
Monthly Flow Weighted TDS				416	

1. TDS = EC x 0.61

TABLE F-1 (continued)

SUMMARY OF DISCHARGE AND WEIGHTED TDS
FROM THE ARLINGTON DESALTER
TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1994-95

DECEMBER 1994

Day	Arlington Discharge (cfs)	Arlington Discharge (acre-feet)	Daily Mean EC (microsiemens/cm)	Computed TDS (mg/L)(1)	Outflow X TDS
1	9	18	684	417	3,720
2	7	14	458	279	2,032
3	7	14	446	272	1,962
4	8	16	538	328	2,585
5	9	18	738	450	4,188
6	9	18	724	442	4,033
7	9	18	724	442	4,026
8	8	16	741	452	3,617
9	5	10	781	476	2,470
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
31	0	0	-	-	0
Total	72	143			28,634
Monthly Flow Weighted TDS				398	

1. TDS = EC x 0.61

TABLE F-2

QUALITY OF WATER DISCHARGED
FROM THE ARLINGTON DESALTER
TO THE ARLINGTON VALLEY DRAIN
WATER YEAR 1994-95

Month	Discharge (acre-feet)	Weighted TDS (mg/L)	Discharge X TDS
1994			
October	546	428	233,934
November	512	416	212,861
December	143	398	56,795
1995			
January	0	-	0
February	0	-	0
March	0	-	0
April	0	-	0
May	0	-	0
June	0	-	0
July	0	-	0
August	0	-	0
September	0	-	0
Total	1,201		503,590
	Yearly Flow Weighted TDS =	419	

APPENDIX G

WATER QUALITY AND DISCHARGE FROM LAKE ELSINORE

WATER YEAR 1994-95

PREPARED BY

WILLIAM R. MILLS, JR.

TABLE G-1

SUMMARY OF LAKE ELSINORE DISCHARGE
WATER YEAR 1994-95

JANUARY 1995

Day	Lake Elsinore Outflow (cfs)	Lee Lake Outflow (cfs)	Lake Elsinore Outflow Reaching Santa Ana River Watershed (cfs) (1)	Lake Elsinore Outflow Assumed to Reach Prado Dam (cfs) (2)	Santa Ana River Flow at Ball Road (cfs) (3)	Lake Elsinore Outflow Recharged By OCWD (cfs) (4)
1	0	25	0	0	0	0
2	0	25	0	0	0	0
3	0	25	0	0	4	0
4	0	25	0	0	4	0
5	0	71	0	0	1,840	0
6	0	71	0	0	12	0
7	0	71	0	0	1,790	0
8	0	90	0	0	3,070	0
9	0	90	0	0	2,700	0
10	0	109	0	0	2,600	0
11	0	109	0	0	4,100	0
12	0	109	0	0	4,380	0
13	0	71	0	0	4,970	0
14	0	41	0	0	3,830	0
15	0	41	0	0	3,080	0
16	0	41	0	0	305	0
17	0	17	0	0	209	0
18	0	17	0	0	68	0
19	0	17	0	0	110	0
20	0	17	0	0	106	0
21	0	23	0	0	57	0
22	0	23	0	0	46	0
23	0	23	0	0	2	0
24	0	23	0	0	39	0
25	0	23	0	0	906	0
26	1	31	1	1	3,030	0
27	4	31	4	4	2,880	0
28	3	31	3	3	1,830	0
29	7	31	7	6	218	0
30	6	28	6	5	176	0
31	5	22	5	5	64	0
Total	25	1,373	25	24	42,426	0

(1) The lesser of the daily measured outflows from Lee Lake and Lake Elsinore was assumed to represent the volume of Lake Elsinore outflow reaching the Santa Ana River watershed.

(2) By the time Lake Elsinore outflow entering the Santa Ana River watershed has reached Prado Dam, 5% evapotranspiration losses were assumed.

(3) Flow of the Santa Ana River at Ball Road collected and provided by OCWD Forebay Operations.

(4) When the Santa Ana River flow at Ball Road is greater than the Lake Elsinore outflow reaching Prado Dam, it is assumed that no Lake Elsinore outflow could be recharged by OCWD. When Lake Elsinore outflow reaching Prado Dam was greater than the Santa Ana River flow at Ball Road, Elsinore outflow recharged by OCWD was calculated as the difference between the two.

TABLE G-1

SUMMARY OF LAKE ELSINORE DISCHARGE
WATER YEAR 1994-95

FEBRUARY 1995

Day	Lake Elsinore Outflow (cfs)	Lee Lake Outflow (cfs)	Lake Elsinore Outflow Reaching Santa Ana River Watershed (cfs) (1)	Lake Elsinore Outflow Assumed to Reach Prado Dam (cfs) (2)	Santa Ana River Flow at Ball Road (cfs) (3)	Lake Elsinore Outflow Recharged By OCWD (cfs) (4)
1	5	19	5	5	0	5
2	5	19	5	5	2	3
3	6	17	6	6	0	5
4	6	15	6	6	1	4
5	6	12	6	6	1	5
6	6	12	6	6	0	6
7	6	12	6	6	0	6
8	7	12	7	6	0	6
9	7	12	7	6	0	6
10	7	15	7	6	0	6
11	7	15	7	6	1	6
12	7	15	7	6	1	5
13	7	18	7	6	2	4
14	3	19	3	3	209	0
15	10	38	10	10	866	0
16	57	43	43	41	3,220	0
17	39	47	39	37	1,970	0
18	58	47	47	44	36	8
19	73	47	47	44	9	35
20	49	54	49	46	6	40
21	49	54	49	46	2	44
22	49	54	49	46	0	46
23	59	62	59	56	0	56
24	59	43	43	41	0	41
25	59	43	43	41	0	41
26	40	43	40	38	0	38
27	40	43	40	38	0	38
28	40	43	40	38	0	38
Total	762	873	679	645	6,327	493

(1) The lesser of the daily measured outflows from Lee Lake and Lake Elsinore was assumed to represent the volume of Lake Elsinore outflow reaching the Santa Ana River watershed.

(2) By the time Lake Elsinore outflow entering the Santa Ana River watershed has reached Prado Dam, 5% evapotranspiration losses were assumed.

(3) Flow of the Santa Ana River at Ball Road collected and provided by OCWD Forebay Operations.

(4) When the Santa Ana River flow at Ball Road is greater than the Lake Elsinore outflow reaching Prado Dam, it is assumed that no Lake Elsinore outflow could be recharged by OCWD. When Lake Elsinore outflow reaching Prado Dam was greater than the Santa Ana River flow at Ball Road, Elsinore outflow recharged by OCWD was calculated as the difference between the two.

TABLE G-1

SUMMARY OF LAKE ELSINORE DISCHARGE
WATER YEAR 1994-95

MARCH 1995

Day	Lake Elsinore Outflow (cfs)	Lee Lake Outflow (cfs)	Lake Elsinore Outflow Reaching Santa Ana River Watershed (cfs) (1)	Lake Elsinore Outflow Assumed to Reach Prado Dam (cfs) (2)	Santa Ana River Flow at Ball Road (cfs) (3)	Lake Elsinore Outflow Recharged By OCWD (cfs) (4)
1	40	41	40	38	0	38
2	40	25	25	24	0	24
3	40	47	40	38	23	15
4	40	47	40	38	2	36
5	40	47	40	38	1,710	0
6	45	71	45	43	4,560	0
7	53	62	53	50	4,170	0
8	83	31	31	30	5,210	0
9	114	62	62	59	3,900	0
10	95	153	95	90	1,330	0
11	97	265	97	92	5,350	0
12	131	164	131	124	4,990	0
13	106	119	106	101	4,540	0
14	205	79	79	75	1,250	0
15	152	79	79	75	1,290	0
16	276	79	79	75	1,300	0
17	288	79	79	75	884	0
18	284	79	79	75	503	0
19	340	140	140	133	506	0
20	322	140	140	133	918	0
21	301	245	245	233	2,150	0
22	372	245	245	233	2,150	0
23	308	365	308	292	3,240	0
24	283	199	199	189	2,510	0
25	285	199	199	189	268	0
26	310	187	187	178	341	0
27	255	187	187	178	615	0
28	361	187	187	178	817	0
29	292	176	176	167	601	0
30	255	143	143	136	432	0
31	327	109	109	104	421	0
Total	6,136	4,055	3,666	3,483	55,981	112

(1) The lesser of the daily measured outflows from Lee Lake and Lake Elsinore was assumed to represent the volume of Lake Elsinore outflow reaching the Santa Ana River watershed.

(2) By the time Lake Elsinore outflow entering the Santa Ana River watershed has reached Prado Dam, 5% evapotranspiration losses were assumed.

(3) Flow of the Santa Ana River at Ball Road collected and provided by OCWD Forebay Operations.

(4) When the Santa Ana River flow at Ball Road is greater than the Lake Elsinore outflow reaching Prado Dam, it is assumed that no Lake Elsinore outflow could be recharged by OCWD. When Lake Elsinore outflow reaching Prado Dam was greater than the Santa Ana River flow at Ball Road, Elsinore outflow recharged by OCWD was calculated as the difference between the two.

TABLE G-1

SUMMARY OF LAKE ELSINORE DISCHARGE
WATER YEAR 1994-95

APRIL 1995

Day	Lake Elsinore Outflow (cfs)	Lee Lake Outflow (cfs)	Lake Elsinore Outflow Reaching Santa Ana River Watershed (cfs) (1)	Lake Elsinore Outflow Assumed to Reach Prado Dam (cfs) (2)	Santa Ana River Flow at Ball Road (cfs) (3)	Lake Elsinore Outflow Recharged By OCWD (cfs) (4)
1	330	109	109	104	533	0
2	178	100	100	95	525	0
3	167	100	100	95	334	0
4	269	88	88	84	3	81
5	158	88	88	84	3	80
6	160	88	88	84	114	0
7	192	88	88	84	160	0
8	178	79	79	75	147	0
9	169	79	79	75	154	0
10	199	79	79	75	166	0
11	126	71	71	67	142	0
12	150	62	62	59	107	0
13	145	62	62	59	70	0
14	137	62	62	59	109	0
15	128	62	62	59	110	0
16	145	78	78	74	536	0
17	106	75	75	71	1,270	0
18	109	71	71	67	378	0
19	160	66	66	63	110	0
20	82	60	60	57	114	0
21	115	54	54	52	191	0
22	112	50	50	48	87	0
23	106	47	47	44	67	0
24	103	41	41	39	73	0
25	100	36	36	34	5	29
26	96	33	33	31	0	31
27	92	30	30	28	0	28
28	86	25	25	24	0	24
29	83	21	21	20	0	20
30	80	18	18	17	13	4
Total	4,263	1,924	1,924	1,827	5,521	297

(1) The lesser of the daily measured outflows from Lee Lake and Lake Elsinore was assumed to represent the volume of Lake Elsinore outflow reaching the Santa Ana River watershed.

(2) By the time Lake Elsinore outflow entering the Santa Ana River watershed has reached Prado Dam, 5% evapotranspiration losses were assumed.

(3) Flow of the Santa Ana River at Ball Road collected and provided by OCWD Forebay Operations.

(4) When the Santa Ana River flow at Ball Road is greater than the Lake Elsinore outflow reaching Prado Dam, it is assumed that no Lake Elsinore outflow could be recharged by OCWD. When Lake Elsinore outflow reaching Prado Dam was greater than the Santa Ana River flow at Ball Road, Elsinore outflow recharged by OCWD was calculated as the difference between the two.

TABLE G-1

SUMMARY OF LAKE ELSINORE DISCHARGE
WATER YEAR 1994-95

MAY 1995

Day	Lake Elsinore Outflow (cfs)	Lee Lake Outflow (cfs)	Lake Elsinore Outflow Reaching Santa Ana River Watershed (cfs) (1)	Lake Elsinore Outflow Assumed to Reach Prado Dam (cfs) (2)	Santa Ana River Flow at Ball Road (cfs) (3)	Lake Elsinore Outflow Recharged By OCWD (cfs) (4)
1	86	36	36	34	5	29
2	70	36	36	34	0	34
3	68	36	36	34	35	0
4	75	36	36	34	111	0
5	73	36	36	34	117	0
6	70	36	36	34	80	0
7	68	36	36	34	98	0
8	66	36	36	34	190	0
9	64	36	36	34	194	0
10	60	36	36	34	142	0
11	60	36	36	34	39	0
12	56	36	36	34	38	0
13	54	36	36	34	92	0
14	54	36	36	34	98	0
15	56	36	36	34	104	0
16	52	36	36	34	68	0
17	54	36	36	34	57	0
18	52	36	36	34	5	29
19	50	36	36	34	5	29
20	48	36	36	34	0	34
21	47	36	36	34	0	34
22	47	36	36	34	0	34
23	45	36	36	34	0	34
24	44	36	36	34	0	34
25	41	36	36	34	0	34
26	39	36	36	34	0	34
27	36	36	36	34	0	34
28	34	36	34	32	0	32
29	32	36	32	30	0	30
30	30	36	30	28	0	28
31	28	36	28	26	0	26
Total	1,658	1,121	1,100	1,045	1,478	515

(1) The lesser of the daily measured outflows from Lee Lake and Lake Elsinore was assumed to represent the volume of Lake Elsinore outflow reaching the Santa Ana River watershed.

(2) By the time Lake Elsinore outflow entering the Santa Ana River watershed has reached Prado Dam, 5% evapotranspiration losses were assumed.

(3) Flow of the Santa Ana River at Ball Road collected and provided by OCWD Forebay Operations.

(4) When the Santa Ana River flow at Ball Road is greater than the Lake Elsinore outflow reaching Prado Dam, it is assumed that no Lake Elsinore outflow could be recharged by OCWD. When Lake Elsinore outflow reaching Prado Dam was greater than the Santa Ana River flow at Ball Road, Elsinore outflow recharged by OCWD was calculated as the difference between the two.

(5) Daily Lee Lake overflow values were calculated from a May estimated spillage of 2151.7 acre-feet.

TABLE G-1

SUMMARY OF LAKE ELSINORE DISCHARGE
WATER YEAR 1994-95

JUNE 1995

Day	Lake Elsinore Outflow (cfs)	Lee Lake Outflow (cfs)	Lake Elsinore Outflow Reaching Santa Ana River Watershed (cfs) (1)	Lake Elsinore Outflow Assumed to Reach Prado Dam (cfs) (2)	Santa Ana River Flow at Ball Road (cfs) (3)	Lake Elsinore Outflow Recharged By OCWD (cfs) (4)
1	26	18	18	17	0	17
2	24	18	18	17	0	17
3	22	18	18	17	0	17
4	22	18	18	17	0	17
5	22	17	17	16	3	13
6	21	6	6	6	1	5
7	20	6	6	6	0	6
8	19	6	6	6	0	6
9	19	6	6	6	0	6
10	18	6	6	6	1	5
11	18	6	6	6	1	5
12	18	6	6	6	0	6
13	18	6	6	6	0	6
14	17	6	6	6	0	6
15	17	6	6	6	0	6
16	16	6	6	6	150	0
17	16	6	6	6	25	0
18	16	6	6	6	0	6
19	15	6	6	6	0	6
20	15	6	6	6	0	6
21	15	6	6	6	0	6
22	14	6	6	6	1	5
23	14	6	6	6	1	5
24	13	6	6	6	1	5
25	13	6	6	6	1	5
26	12	6	6	6	1	5
27	12	6	6	6	1	5
28	12	6	6	6	1	5
29	12	6	6	6	0	6
30	12	6	6	6	0	6
Total	505	246	246	234	188	209

(1) The lesser of the daily measured outflows from Lee Lake and Lake Elsinore was assumed to represent the volume of Lake Elsinore outflow reaching the Santa Ana River watershed.

(2) By the time Lake Elsinore outflow entering the Santa Ana River watershed has reached Prado Dam, 5% evapotranspiration losses were assumed.

(3) Flow of the Santa Ana River at Ball Road collected and provided by OCWD Forebay Operations.

(4) When the Santa Ana River flow at Ball Road is greater than the Lake Elsinore outflow reaching Prado Dam, it is assumed that no Lake Elsinore outflow could be recharged by OCWD. When Lake Elsinore outflow reaching Prado Dam was greater than the Santa Ana River flow at Ball Road, Elsinore outflow recharged by OCWD was calculated as the difference between the two.

TABLE G-1

SUMMARY OF LAKE ELSINORE DISCHARGE
WATER YEAR 1994-95

JULY 1995

Day	Lake Elsinore Outflow (cfs)	Lee Lake Outflow (cfs)	Lake Elsinore Outflow Reaching Santa Ana River Watershed (cfs) (1)	Lake Elsinore Outflow Assumed to Reach Prado Dam (cfs) (2)	Santa Ana River Flow at Ball Road (cfs) (3)	Lake Elsinore Outflow Recharged By OCWD (cfs) (4)
1	11	8	8	8	0	8
2	11	8	8	8	0	8
3	10	8	8	8	0	8
4	10	8	8	8	0	8
5	9	8	8	8	0	8
6	9	8	8	8	0	8
7	9	8	8	8	0	8
8	9	8	8	8	0	8
9	8	8	8	8	0	8
10	8	8	8	8	0	8
11	7	8	7	7	0	7
12	6	8	6	6	0	6
13	6	8	6	6	0	6
14	6	8	6	5	0	5
15	5	8	5	5	0	5
16	5	8	5	5	0	5
17	5	8	5	4	0	4
18	4	8	4	4	0	4
19	4	8	4	4	0	4
20	4	8	4	4	0	4
21	3	8	3	3	0	3
22	3	8	3	3	0	3
23	3	8	3	3	0	3
24	3	8	3	3	0	3
25	2	8	2	2	0	2
26	2	8	2	2	0	2
27	2	8	2	2	0	2
28	2	8	2	2	0	2
29	1	8	1	1	0	1
30	1	8	1	1	0	1
31	0	8	0	0	0	0
Total	170	260	160	152	0	152

(1) The lesser of the daily measured outflows from Lee Lake and Lake Elsinore was assumed to represent the volume of Lake Elsinore outflow reaching the Santa Ana River watershed.

(2) By the time Lake Elsinore outflow entering the Santa Ana River watershed has reached Prado Dam, 5% evapotranspiration losses were assumed.

(3) Flow of the Santa Ana River at Ball Road collected and provided by OCWD Forebay Operations.

(4) When the Santa Ana River flow at Ball Road is greater than the Lake Elsinore outflow reaching Prado Dam, it is assumed that no Lake Elsinore outflow could be recharged by OCWD. When Lake Elsinore outflow reaching Prado Dam was greater than the Santa Ana River flow at Ball Road, Elsinore outflow recharged by OCWD was calculated as the difference between the two.

TABLE G-2

SUMMARY OF LAKE ELSINORE DISCHARGE
WATER YEAR 1994-95

MONTHLY TOTALS

Month	Lake Elsinore Outflow (cfs)	Lee Lake Outflow (cfs)	Lake Elsinore Outflow Reaching Santa Ana River Watershed (cfs)	Lake Elsinore Outflow Assumed to Reach Prado Dam (cfs)	Santa Ana River Flow at Ball Road (cfs)	Lake Elsinore Outflow Recharged By OCWD (cfs)
1994						
October	0	NA	0	0	17	0
November	0	NA	0	0	36	0
December	0	NA	0	0	55	0
1995						
January	25	1,373	25	24	42,426	0
February	762	873	679	645	6,327	493
March	6,136	4,055	3,666	3,483	55,981	112
April	4,263	1,924	1,924	1,827	5,521	297
May	1,658	1,121	1,100	1,045	1,478	515
June	505	246	246	234	188	209
July	170	260	160	152	0	152
August	0	260	0	0	0	0
September	0	260	0	0	0	0
Total (cfs)	13,520	10,370	7,800	7,410	111,921	1,777
(acre-feet)	26,816	20,569	15,471	14,697	221,993	3,525

NA : Data do not exist during this time period.

TABLE G-3

SUMMARY OF FLOW-WEIGHTED AVERAGE TDS
OF LAKE ELSINORE DISCHARGE
CALCULATED TO REACH PRADO DAM
WATER YEAR 1994-95

Month	Monthly Flow (cfs)	Monthly Flow (acre-feet)	TDS (mg/L) (1, 2)	Monthly Flow x TDS
1994				
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
1995				
January	24	48	872	41,856
February	645	1,280	872	1,116,211
March	3,483	6,908	746	5,151,365
April	1,827	3,625	775	2,807,974
May	1,045	2,073	817	1,694,117
June	234	464	860	398,688
July	152	301	860	258,801
August	0	0	0	0
September	0	0	0	0
Total		14,697		11,469,012
		Yearly Flow Weighted TDS =	780	

(1) TDS values were converted from monthly averaged EC values collected at the Lake Elsinore Outlet by the Riverside County Flood Control & Water Conservation District. The conversion factor used was TDS=EC x 0.61 .

(2) Because EC and TDS data were not collected for the months of January and July 1995, the February TDS was used for January and the June TDS was used for July.

APPENDIX H

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

WATER YEAR 1994-95

PREPARED BY

WILLIAM R. MILLS, JR.

TABLE H-1

WATER QUALITY SAMPLES BELOW PRADO DAM
FOR WATER YEAR 1994-95

Date	EC (microsiemens/cm)	TDS (mg/L)	Source
10/04	1,010	598	USGS
10/27	960	600	USGS
11/10	990	608	USGS
11/22	900	552	USGS
12/15	1,020	632	USGS
12/29	995	622	USGS
01/18	770	470	USGS
02/01	850	510	USGS
02/16	542	332	USGS
03/08	364	226	USGS
03/23	682	410	USGS
04/11	885	548	USGS
04/20	834	512	USGS
05/03	859	528	USGS
05/23	866	510	USGS
06/06	895	548	USGS
06/19	807	488	USGS
07/06	868	524	USGS
07/18	931	578	USGS
08/02	1,020	642	USGS
08/23	1,010	622	USGS
09/07	1,000	604	USGS
09/21	981	604	USGS

TABLE H-2

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

OCTOBER 1994

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	139	884	541	75,223
2	141	880	539	75,960
3	140	912	558	78,164
4	142	898	550	78,064
5	141	733	449	63,271
6	165	803	492	81,112
7	182	910	557	101,390
8	197	964	590	116,259
9	190	975	597	113,407
10	161	996	610	98,168
11	191	1,000	612	116,928
12	186	1,030	631	117,283
13	163	1,020	624	101,782
14	164	981	601	98,491
15	187	956	585	109,442
16	183	959	587	107,437
17	183	920	563	103,068
18	179	946	579	103,664
19	181	925	566	102,495
20	192	899	550	105,668
21	182	908	556	101,167
22	172	927	567	97,609
23	173	970	594	102,731
24	174	933	571	99,384
25	178	952	583	103,739
26	181	999	612	110,695
27	208	982	601	125,043
28	207	986	604	124,948
29	208	995	609	126,698
30	212	992	607	128,745
31	213	988	605	128,831
Total Monthly Flow Weighted TDS	5,515		580	3,196,864

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

NOVEMBER 1994

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	205	1,000	612	125,498
2	207	992	607	125,709
3	207	989	605	125,329
4	205	973	596	122,110
5	202	955	585	118,097
6	180	1,000	612	110,193
7	179	989	605	108,376
8	197	965	591	116,380
9	165	974	596	98,384
10	160	761	466	74,540
11	226	698	427	96,571
12	227	872	534	121,179
13	227	910	557	126,459
14	223	900	551	122,866
15	221	916	561	123,928
16	213	927	567	120,877
17	219	926	567	124,148
18	216	928	568	122,711
19	216	903	553	119,406
20	247	935	572	141,381
21	257	910	557	143,172
22	261	890	545	142,205
23	261	883	541	141,086
24	263	884	541	142,328
25	265	887	543	143,897
26	266	788	482	128,319
27	251	927	567	142,442
28	232	1,010	618	143,447
29	268	938	574	153,894
30	276	1,100	673	185,860
Total	6,742			3,810,791
Monthly Flow Weighted TDS			565	

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

DECEMBER 1994

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	280	960	588	164,556
2	270	952	583	157,356
3	279	950	582	162,260
4	215	1,010	618	132,936
5	206	1,010	618	127,371
6	202	1,010	618	124,898
7	201	1,010	618	124,280
8	190	1,020	624	118,642
9	183	1,030	631	115,391
10	181	1,040	637	115,238
11	186	1,030	631	117,283
12	187	1,030	631	117,913
13	237	942	577	136,673
14	204	973	596	121,514
15	187	1,020	624	116,768
16	184	1,050	643	118,274
17	189	1,070	655	123,802
18	191	1,090	667	127,451
19	189	1,100	673	127,273
20	190	1,080	661	125,621
21	189	1,070	655	123,802
22	189	1,080	661	124,959
23	191	1,080	661	126,282
24	202	979	599	121,065
25	266	683	418	111,221
26	291	628	384	111,876
27	291	789	483	140,557
28	286	899	550	157,402
29	280	962	589	164,898
30	273	945	579	157,935
31	262	978	599	156,864
Total	6,871			4,072,362
Monthly Flow Weighted TDS			593	

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

JANUARY 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	246	999	612	150,447
2	224	1,000	612	137,130
3	233	948	580	135,222
4	325	823	504	163,744
5	2,080	404	247	514,432
6	2,500	517	317	791,250
7	2,450	711	435	1,066,397
8	2,480	707	433	1,073,383
9	3,170	586	359	1,137,209
10	3,390	660	404	1,369,705
11	5,000	505	309	1,545,770
12	5,190	400	245	1,270,898
13	4,950	406	249	1,230,310
14	3,140	477	292	916,920
15	735	531	325	238,927
16	434	672	411	178,543
17	335	740	453	151,761
18	409	783	479	196,051
19	457	859	526	240,322
20	621	925	566	351,655
21	346	1,010	618	213,935
22	346	973	596	206,097
23	345	964	590	203,601
24	1,030	868	531	547,319
25	2,390	651	399	952,494
26	3,410	446	273	931,049
27	1,660	499	305	507,098
28	657	608	372	244,541
29	651	678	415	270,205
30	515	743	455	234,250
31	433	829	508	219,748
Total	50,152			17,390,415
Monthly Flow Weighted TDS			347	

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

FEBRUARY 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	442	851	521	230,269
2	442	920	563	248,939
3	436	977	598	260,774
4	433	1,040	637	275,680
5	431	1,040	637	274,406
6	427	1,030	631	269,246
7	423	1,050	643	271,902
8	419	1,090	667	279,591
9	413	1,150	704	290,758
10	409	1,170	716	292,949
11	396	1,210	741	293,335
12	387	1,240	759	293,776
13	287	1,250	765	219,622
14	230	1,050	643	147,843
15	1,630	454	278	453,030
16	3,640	533	326	1,187,714
17	1,460	499	305	446,002
18	448	520	318	142,615
19	429	635	389	166,769
20	419	669	410	171,602
21	425	640	392	166,515
22	422	762	466	196,857
23	425	852	522	221,673
24	427	906	555	236,832
25	435	917	561	244,198
26	431	931	570	245,646
27	436	963	590	257,037
28	434	978	599	259,844
Total	17,036			8,045,424
Monthly Flow Weighted TDS			472	

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

MARCH 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	433	1,050	643	278,330
2	430	1,080	661	284,299
3	301	1,160	710	213,751
4	226	1,140	698	157,724
5	456	970	594	270,782
6	5,360	650	398	2,132,856
7	5,490	389	238	1,307,391
8	5,690	374	229	1,302,769
9	3,780	391	239	904,799
10	1,960	415	254	497,952
11	4,710	466	285	1,343,663
12	5,210	416	255	1,326,828
13	3,790	393	241	911,833
14	1,550	402	246	381,453
15	1,550	424	260	402,329
16	1,540	439	269	413,874
17	1,000	460	282	281,606
18	852	466	285	243,057
19	858	512	313	268,931
20	1,350	626	383	517,358
21	2,250	670	410	922,870
22	2,660	658	403	1,071,497
23	3,660	631	386	1,413,819
24	2,180	580	355	774,048
25	404	802	491	198,353
26	774	753	461	356,795
27	1,100	693	424	466,669
28	1,150	666	408	468,873
29	808	720	441	356,145
30	595	775	474	282,294
31	797	752	460	366,910
Total	62,914			20,119,860
Monthly Flow Weighted TDS			320	

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

APRIL 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	1,090	704	431	469,767
2	1,070	703	430	460,492
3	499	718	440	219,335
4	251	869	532	133,529
5	452	821	503	227,177
6	659	753	461	303,783
7	692	714	437	302,474
8	651	730	447	290,929
9	648	757	463	300,299
10	644	783	479	308,696
11	598	861	527	315,201
12	544	933	571	310,716
13	523	864	529	276,630
14	524	980	600	314,370
15	525	951	582	305,649
16	1,060	862	528	559,367
17	1,600	842	515	824,737
18	874	851	521	455,328
19	601	945	579	347,688
20	600	857	525	314,786
21	598	822	503	300,924
22	593	856	524	310,751
23	588	834	511	300,211
24	472	813	498	234,918
25	395	778	476	188,131
26	387	735	450	174,133
27	396	707	433	171,395
28	402	702	430	172,761
29	407	711	435	177,153
30	409	727	445	182,029
Total	18,752			9,253,360
Monthly Flow Weighted TDS			493	

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

MAY 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	433	768	470	203,579
2	455	804	492	223,950
3	497	837	512	254,663
4	551	837	512	282,332
5	513	867	531	272,283
6	453	866	530	240,159
7	540	891	545	294,547
8	604	927	567	342,768
9	584	940	575	336,066
10	485	948	580	281,471
11	340	956	585	198,985
12	389	940	575	223,852
13	446	858	525	234,264
14	447	816	500	223,296
15	429	857	525	225,072
16	395	900	551	217,632
17	380	946	579	220,069
18	369	944	578	213,246
19	370	962	589	217,901
20	373	928	568	211,905
21	374	886	542	202,856
22	373	872	534	199,117
23	419	897	549	230,086
24	449	902	552	247,934
25	451	921	564	254,284
26	453	934	572	259,017
27	454	916	561	254,586
28	452	884	541	244,610
29	450	832	509	229,202
30	455	837	512	233,142
31	458	832	509	233,277
Total	13,841			7,506,152
Monthly Flow Weighted TDS			542	

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

JUNE 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	462	811	496	229,375
2	461	828	507	233,676
3	459	825	505	231,820
4	455	878	537	244,562
5	458	911	558	255,427
6	461	918	562	259,076
7	465	894	547	254,492
8	470	866	530	249,172
9	466	881	539	251,331
10	464	901	552	255,933
11	443	887	543	240,553
12	462	878	537	248,325
13	424	868	531	225,304
14	434	854	523	226,898
15	456	870	533	242,866
16	455	888	544	247,348
17	461	921	564	259,923
18	457	859	526	240,322
19	477	791	484	230,982
20	458	789	483	221,221
21	457	778	476	217,660
22	457	764	468	213,744
23	457	752	460	210,386
24	457	761	466	212,904
25	457	778	476	217,660
26	457	824	504	230,530
27	455	856	524	238,434
28	453	897	549	248,756
29	453	909	556	252,084
30	449	922	564	253,432
Total	13,700			7,144,195
Monthly Flow Weighted TDS			521	

1. TDS = EC x0.612186

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

JULY 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	442	935	572	252,998
2	431	947	580	249,868
3	439	952	583	255,850
4	446	922	564	251,738
5	427	933	571	243,889
6	434	877	537	233,009
7	448	807	494	221,327
8	441	801	490	216,249
9	432	787	482	208,133
10	452	822	503	227,454
11	463	873	534	247,445
12	462	845	517	238,991
13	458	859	526	240,847
14	450	858	525	236,365
15	441	880	539	237,577
16	437	868	531	232,212
17	450	906	555	249,588
18	473	838	513	242,655
19	449	- - -	522	234,443
20	454	- - -	531	241,200
21	448	- - -	540	242,105
22	435	- - -	550	239,052
23	417	- - -	559	232,969
24	416	- - -	568	236,210
25	384	- - -	577	221,547
26	367	- - -	586	215,091
27	172	- - -	595	102,376
28	153	- - -	604	92,465
29	152	- - -	613	93,249
30	153	- - -	623	95,260
31	149	- - -	632	94,130
Total	12,175			6,626,294
Monthly Flow Weighted TDS			544	

1. TDS = EC x0.612186
2. Where EC data are missing (7/19-7/31/95), TDS values are estimates.

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

AUGUST 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	148	- - -	641	94,850
2	134	1,060	649	86,955
3	135	1,040	637	85,951
4	138	1,010	618	85,326
5	136	1,000	612	83,257
6	135	1,050	643	86,777
7	139	1,020	624	86,796
8	143	1,000	612	87,543
9	156	979	599	93,496
10	150	975	597	89,532
11	138	964	590	81,440
12	136	944	578	78,595
13	139	926	567	78,797
14	140	895	548	76,707
15	142	907	555	78,846
16	141	1,010	618	87,181
17	142	977	598	84,931
18	140	1,030	631	88,277
19	146	1,050	643	93,848
20	145	981	601	87,080
21	149	1,040	637	94,864
22	146	1,030	631	92,061
23	144	1,030	631	90,799
24	143	1,020	624	89,293
25	139	1,040	637	88,498
26	133	983	602	80,037
27	131	988	605	79,234
28	133	1,040	637	84,678
29	130	1,030	631	81,972
30	132	996	610	80,485
31	132	993	608	80,243
Total	4,335			2,658,350
Monthly Flow Weighted TDS			613	

1. TDS = EC x0.612186
2. Where EC data are missing (8/1/95), TDS values are estimates.

TABLE H-2 (continued)

SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

SEPTEMBER 1995

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS(1)	Outflow X TDS
1	133	994	609	80,932
2	136	1,010	618	84,090
3	137	1,010	618	84,708
4	128	1,050	643	82,278
5	137	1,050	643	88,063
6	138	1,070	655	90,395
7	136	1,020	624	84,922
8	136	984	602	81,925
9	138	986	604	83,299
10	143	985	603	86,229
11	143	980	600	85,792
12	144	980	600	86,392
13	145	981	601	87,080
14	148	972	595	88,067
15	143	982	601	85,967
16	142	978	599	85,018
17	143	974	596	85,266
18	148	968	593	87,704
19	150	978	599	89,808
20	150	980	600	89,991
21	152	971	594	90,354
22	153	969	593	90,761
23	154	983	602	92,674
24	159	977	598	95,099
25	166	974	596	98,981
26	162	980	600	97,191
27	161	980	600	96,591
28	162	976	597	96,794
29	153	982	601	91,979
30	150	978	599	89,808
Total Monthly Flow Weighted TDS	4,390		606	2,658,157

1. TDS = EC x0.612186

TABLE H-3

ANNUAL SUMMARY OF FLOW WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 1994-95

Month	Monthly Flow (cfs)	Monthly Weighted TDS (mg/L)	Monthly Flow x TDS
1994			
OCTOBER	5,515	580	3,196,864
NOVEMBER	6,742	565	3,810,791
DECEMBER	6,871	593	4,072,362
1995			
JANUARY	50,152	347	17,390,415
FEBRUARY	17,036	472	8,045,424
MARCH	62,914	320	20,119,860
APRIL	18,752	493	9,253,360
MAY	13,841	542	7,506,152
JUNE	13,700	521	7,144,195
JULY	12,175	544	6,626,294
AUGUST	4,335	613	2,658,350
SEPTEMBER	4,390	606	2,658,157
Total	216,423		92,482,223
Yearly Flow Weighted TDS =		427	

APPENDIX I

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

WATER YEAR 1994-95

PREPARED BY

DONALD L. HARRIGER

TABLE I-1

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

WATER YEAR 1994-95

Month	Discharge (acre-feet)	TDS (mg/L)	Discharge x TDS
1994			
October	184	652	119,715
November	174	628	109,276
December	185	619	114,245
1995			
January	187	682	127,819
February	165	694	114,499
March	181	667	120,566
April	159	663	105,600
May	175	639	111,857
June	173	681	117,872
July	186	665	123,368
August	185	667	123,104
September	183	646	118,356
Total	2,136		1,406,278

Flow weighted TDS = 658 mg/L

APPENDIX J

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

WATER YEAR 1994-95

PREPARED BY

DONALD L. HARRIGER

TABLE J-1

SANTA ANA RIVER AT RIVERSIDE NARROW

WATER YEAR 1994-94

Date Sampled	E.C. (microsiemens/cm)	TDS (mg/L)	Source of data
1994			
10/05/94	885	566	USGS
10/06/94	811	566	C of R
10/11/94	950	674	C of R
10/20/94	1,000	648	C of R
10/25/94	950	645	C of R
10/27/94	1,000	646	USGS
11/03/94	928	594	C of R
11/10/94	855	538	USGS
11/10/94	695	464 *	C of R
11/17/94	820	594	C of R
11/22/94	935	590	USGS
11/22/94	937	290 *	C of R
12/01/94	782	555	C of R
12/06/94	825	580	C of R
12/15/94	950	602	USGS
12/15/94	931	609	C of R
12/20/94	847	576	C of R
12/29/94	740	454 *	USGS
1995			
01/03/95	643	505 *	C of R
01/12/95	266	188 *	C of R
01/17/95	790	482 *	USGS
01/17/95	673	445 *	C of R
01/31/95	822	514 *	C of R
02/01/95	895	546 *	USGS
02/06/95	554	618 *	C of R
02/09/95	1,040	738 *	C of R

* Data not used in determining monthly averages, storm flow.
C of R City of Riverside
USGS U.S. Geological Survey

TABLE J-1

SANTA ANA RIVER AT RIVERSIDE NARROW

WATER YEAR 1994-94

Date Sampled	E.C. (microsiemens/cm)	TDS (mg/L)	Source of data
02/13/95	224	235 *	C of R
02/16/95	305	182 *	USGS
02/23/95	822	544 *	C of R
03/02/95	879	618 *	C of R
03/06/95	215	142 *	USGS
03/07/95	201	56 *	C of R
03/16/95	308	213 *	C of R
03/21/95	308	297 *	C of R
03/23/95	230	138 *	USGS
03/30/95	474	280 *	C of R
04/04/95	511	354 *	C of R
04/07/95	533	332 *	USGS
04/13/95	552	363 *	C of R
04/18/95	560	368 *	C of R
04/20/95	570	346 *	USGS
04/27/95	583	256 *	C of R
05/02/95	486	309 *	C of R
05/03/95	570	350 *	USGS
05/11/95	552	387 *	C of R
05/16/95	586	396 *	C of R
05/18/95	606	358 *	USGS
05/25/95	640	412 *	C of R
05/31/95	732	491 *	C of R
06/06/95	617	362 *	USGS
06/08/95	753	459 *	C of R
06/13/95	831	554 *	C of R
06/22/95	762	519 *	C of R
06/24/95	852	532 *	USGS

* Data not used in determining monthly averages, storm flow.
C of R City of Riverside
USGS U.S. Geological Survey

TABLE J-1

SANTA ANA RIVER AT RIVERSIDE NARROW

WATER YEAR 1994-94

Date Sampled	E.C. (microsiemens/cm)	TDS (mg/L)	Source of data
06/27/95	863	577 *	C of R
07/05/95	874	602 *	C of R
07/06/95	868	619 *	C of R
07/07/96	914	564 *	USGS
07/11/95	1,046	697	C of R
07/20/95	1,049	700	C of R
07/24/95	1,052	697	C of R
07/27/96	1,060	664	USGS
08/03/95	1,031	714	C of R
08/04/95	1,110	700	USGS
08/08/95	1,076	690	C of R
08/10/95	1,100	694	USGS
08/17/95	1,040	596	C of R
08/22/95	1,050	719	C of R
08/31/95	1,034	684	C of R
09/01/95	1,090	672	USGS
09/05/95	1,054	722	C of R
09/14/95	995	697	C of R
09/19/95	1,034	723	C of R
09/22/95	1,070	676	USGS
09/28/95	1,039	704	C of R

* Data not used in determining monthly averages, storm flow.
C of R City of Riverside
USGS U.S. Geological Survey

TABLE J-2

FLOW WEIGHTED TDS OF BASE FLOW AT RIVERSIDE NARROWS
(Including Nontributary Flow
Discharged Above the Narrows)

WATER YEAR 1994-95

Month	Flow [1] (acre-feet)	TDS [2] (mg/L)	Flow x TDS
1994			
October	3,434	624	2,143,501
November	4,399	579	2,546,847
December	4,292	584	2,508,156
1995			
January	3,812	599 *	2,285,228
February	3,395	614 *	2,085,709
March	4,505	629 *	2,835,914
April	4,451	644 *	2,868,638
May	4,365	659 *	2,878,501
June	3,867	674 *	2,608,049
July	3,363	690	2,318,844
August	3,078	685	2,109,546
September	2,671	699	1,866,785
Total	45,632		29,055,719

$$\text{Flow weighted TDS} = \frac{29{,}055{,}719}{45{,}632} = 637 \text{ mg/L}$$

(1) Total Flow minus Storm Flow from Table 6

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

* Data are straight line estimates during storm flow periods