WATERMASTERS
HOWARD H. HAILE
RICHARD A. RHONE
THOMAS M. STETSON

MAILING ADDRESS:
100 N. BRAND BLVD.
SUITE 600
GLENDALE, CA 91203

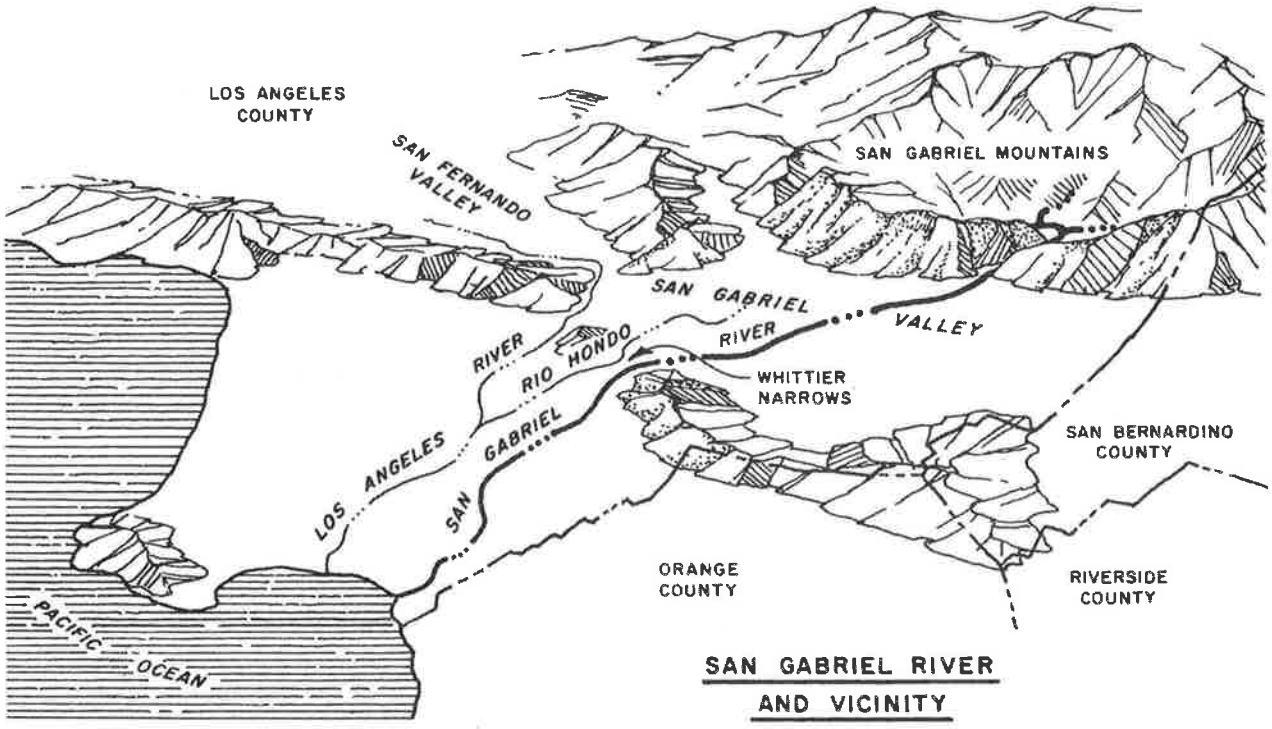
TWENTY-NINTH ANNUAL REPORT

OF THE

SAN GABRIEL RIVER WATERMASTER

FOR

1991-92



SAN GABRIEL RIVER AND VICINITY

City of Long Beach, et al., vs. San Gabriel Valley Water Co., et al.
Case No. 722647 — Los Angeles County

February 26, 1993

SAN GABRIEL RIVER WATERMASTER

FOR
CITY OF LONG BEACH ET AL VS SAN GABRIEL VALLEY WATER CO. ET AL
CASE NO. 722647 - LOS ANGELES COUNTY

WATERMASTERS
HOWARD H. HAILE
RICHARD A. RHONE
THOMAS M. STETSON

MAILING ADDRESS:
100 N. BRAND BLVD.
SUITE 600
GLENDALE, CA 91203
TELEPHONE: (213) 245-1883
(818) 244-0117

February 26, 1993

To: Clerk of Superior Court of Los Angeles County and All Parties

Re: Watermaster Report for 1991-92 Water Year

Gentlemen:

We have the honor of submitting the Twenty-Ninth Annual Report of the San Gabriel River Watermaster for water year 1991-92, in accordance with the Judgment in Case No. 722647 entered September 24, 1965. A complete summary of Watermaster Findings is contained in this report.

The year 1991-92 was the first year of above average rainfall following five consecutive years of below average rainfall in the San Gabriel River watershed. The average precipitation at the four stations used to represent San Gabriel Valley rainfall for 1991-92 was 22.8 inches or 123 percent of annual average. The 1991-92 water year was the thirteenth year in the second Long-Term Accounting Period. The 13-year average rainfall was 18.14 inches or 98 percent of long-term average.

The ten-year average rainfall from 1982-83 through 1991-92 amounted to 17.2 inches, which, according to the Judgment, established the Lower Area Annual Entitlement at 88,700 acre-feet for 1991-92.

The principal findings of the Watermaster under annual accounting for the year 1991-92 are as follows:

		Acre-Feet
1.	Lower Area Annual Entitlement	88,700
2.	Usable Water received by Lower Area	105,990
3.	Credit for Water Year 1991-92	17,290
4.	Accrued Debit of Upper Area as of September 30, 1991	34,384
5.	Amount of Make-up Water received by Lower Area in 1991-92	14,735
6.	Accrued Debit of Upper Area as of September 30, 1992	2,359
7.	Amount of Make-up Water required to be delivered prior to October 1, 1993	786

The majority of the data required by the Watermaster is furnished by the Los Angeles County Department of Public Works. The cooperation and assistance furnished by the County and other public agencies are gratefully acknowledged.

Sincerely,

SAN GABRIEL RIVER WATERMASTER

By: Thomas M. Stetson
Thomas M. Stetson

Howard H. Haile
Howard H. Haile

Richard A. Rhone
Richard A. Rhone

Enclosure

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

TABLE OF CONTENTS (Cont'd)

TABLES

FIGURES

PLATES
(following text)

APPENDIX

CHAPTER I. ACTIVITIES OF WATERMASTER

This report covers the twenty-ninth year of operation under the Judgment in Case No. 722647 (the Long Beach case). Parties to the Judgment are listed on page A-1 of the Appendix. The Judgment declared that the Lower Area of the San Gabriel River System, the area downstream of Whittier Narrows, is entitled to receive an annual average of 98,415 acre-feet of Usable Water from the Upper Area, the area upstream of Whittier Narrows. The first twelve Annual Watermaster Reports described the history of the litigation, the Judgment and related activities.

The activities of the Watermaster include administration of operations under the Judgment, performance of field inspections, collection of data and maintenance of records, analyses of data, preparation of the annual report presenting the required determinations and findings, and maintenance of records of transfers of defendant's water rights. All operations and reports are based on the "Water Year," which is from October 1 through September 30.

Administration

The official office and depository of records of the Watermaster is at 100 North Brand Boulevard, Suite 600, Glendale, California, and such records are available for inspection at that office upon the request of any Party.

An audit of income and expenditures of the Watermaster for the water year 1991-92 was performed by the firm of Blazey & Company, CPA. Presented in Table 1 is the

TABLE 1

STATEMENT OF INCOME AND EXPENDITURES FOR THE WATER YEAR 1991-92

Carried forward from year 1990-91		$ (3,642.13)
Income		64,000.00
Interest Income		1,070.80
		$ 61,428.67
Expenditures:		
1. Administrative fees and general operating expenses	$ 11,518.05	
2. Collection of data, field inspections and maintenance of records	17,942.34	
3. Calculations and preparation of Watermaster Report for water year 1990-91	37,150.57	
4. Printing and reproduction costs	1,509.66	
Total expenditures	68,120.62	
Deficit	($ 6,691.95)	

Statement of Income and Expenditures for the water year 1991-92 based on the Blazey Company's letter of December 17, 1992, which is presented in the Appendix.

The tentative budget for the current water year (1992-93) was transmitted to the Parties on July 6, 1992. Following a period of 15 days after filing of the tentative budget, there being no objections thereto, the tentative budget became the final budget. The 1992-93 annual budget and proration of costs for payment thereof are shown in Table 2.

Watermaster Personnel

The Judgment provided for the appointment of a three-member Watermaster, one to represent the Upper Area, one to represent the Lower Area, and the third to represent both areas. On November 12, 1965, the three-member Watermaster was appointed and certified by the Court, namely Thomas M. Stetson representing the Upper Area, Max Bookman representing the Lower Area, and M. E. Salsbury representing both areas. Mr. Salsbury elected to conclude his years of service in 1985 and upon nomination from Upper San Gabriel Valley Municipal Water District (Upper District) and Central Basin Municipal Water District (Central Municipal), the Court appointed Howard H. Haile as his replacement effective February 7, 1985. Mr. Bookman elected to conclude his years of service in 1986 and upon nomination by the Lower Area Parties, the Court on January 14, 1986, appointed Richard A. Rhone to replace Mr. Bookman. This appointment was effective in February 1986.

The staff work for this report was directed by Bassam Hasbini for Bookman-Edmonston Engineering, Inc. and Steve Johnson and Kevin Smead for Stetson Engineers Inc.

TABLE 2

WATERMASTER BUDGET
FOR
WATER YEAR 1992-93

1.	Administrative fees of Watermaster and general operating expenses	$10,000
2.	Hydrologic analyses, collection of data and field inspection	15,000
3.	Calculations and preparation of Watermaster Report for Water Year 1991-92	35,000
4.	Printing and reproduction costs	2,000
5.	Contingencies	3,000
	Total	$65,000
	Estimated deficiency from 1991-92	7,000
	To be financed for 1992-93	$72,000

Proration for Payment Purposes

Upper San Gabriel Valley Municipal Water District	50.0%	$36,000.00
Central Basin Municipal Water District	41.2%	29,664.00
City of Long Beach	7.125%	5,130.00
City of Compton	1.675%	1,206.00
Total		$72,000.00

Data Collection

The Watermaster collects data on streamflow, rainfall, water quality, ground water levels, export of ground water through Whittier Narrows, reclaimed water, imported replenishment water and other information as required. The principal source of data is the Los Angeles County Department of Public Works (hereinafter County). Copies of appropriate records were obtained from the County and many conferences were held between County personnel and Watermaster personnel in order that the Watermaster would be fully informed on the facts necessary to make the determinations required by the Judgment. Other data were obtained from the Metropolitan Water District of Southern California, the County Sanitation Districts of Los Angeles County, the Water Replenishment District of Southern California, the Upper San Gabriel Valley Municipal Water District, the San Gabriel Valley Municipal Water District, the Central Basin Municipal Water District, the San Gabriel Valley Water Company, Main San Gabriel Basin Watermaster, the U. S. Army Corps of Engineers, and the U. S. Geological Survey.

The collected data are summarized in a daily operation computer model. This model, developed by Watermaster personnel, aids in the efficiency and accuracy of the analyses.

Field Inspections

During the 1991-92 water year, Watermaster staff made several field inspections of gaging stations and other facilities in the area. Facilities inspected included spreading grounds in the San Gabriel Valley, stream gaging stations, imported water delivery points and river channels.

Preparation of Annual Report

One of the required functions of the Watermaster is the preparation of the annual report presenting the findings required by the Judgment. The Judgment provides that a report be prepared and submitted within five months after the end of each water year, and copies of the report are to be filed with the Court and furnished to each of the Parties. Copies are also furnished to others upon request.

Stream Gaging Stations

The County and the U. S. Geological Survey operate the stream gaging stations on the San Gabriel River System, data from which are essential for determinations required of the Watermaster.

Plate 1, entitled "Stream Gaging Stations, Rio Hondo - San Gabriel River System," shows the general vicinity of the Whittier Narrows area. Plate 2, entitled "Map of Whittier Narrows," shows in greater detail certain features in Whittier Narrows including wells used for calculating subsurface flow.

The accuracy of measuring some of the higher surface water flows is at times questionable. Also, physical changes occur in the channel sections at several of the stream gaging stations. These problems and their resolutions are discussed in the following sections.

Rio Hondo Above Mission Bridge, Station F64-R

In August of 1978, the flow recorder at this station was removed due to high maintenance costs and very poor control caused by a shifting sand bottom at the station. Also, the use of Whittier Narrows Reservoir for storage of storm waters for conservation purposes causes frequent backwater at the station. The recorder was reinstalled at this station in 1985. The County hydrographer schedules periodic current meter measurements. Using these measurements, the recorder chart, and upstream measurements, a record of flow was developed. For periods when reservoir storage causes backwater, the record of upstream stations was used to calculate the flow. During water year 1991-92, 32 current meter measurements were made at this station. The record produced was considered to be reasonably accurate.

Mission Creek at San Gabriel Boulevard, Station F83

The recorder was removed from this station during water year 1977-78 because of construction work by the Los Angeles County Road Department. The designation of the station was changed from "F83-R" to "F83", a non-recording station. The channel has also been realigned making reestablishment of the station difficult. Historically, the great majority of the water carried in Mission Creek was rising water. During the 1991-92 water year, there was apparently no flow at this station.

Whittier Narrows Flood Channel, Station F337-R

Since construction work in 1978-79 removed a levee which directed flow past the station, the rating curve at this station is questionable. Poor communication exists between the channel and the stilling well. In addition, the station is subject to backwater from the Rio Hondo side of Whittier Narrows Reservoir. However, water entering the

Flood Channel crosses over a stabilizer weir. By using the record of water surface elevations on the San Gabriel River side of Whittier Narrows Reservoir, the flow in the Flood Channel was estimated by Watermaster staff. Historically, these estimates were prepared by applying an appropriate weir formula. During 1981-82 a flow measurement was made at the weir by County personnel. This measurement confirmed the calculations of flow by the weir formula. When appropriate flow balances are made, the Watermaster considers the use of the stabilizer weir a better means of determining flow than the existing station. County personnel, with Watermaster concurrence, discontinued station F337-R in December 1987.

San Gabriel River at Florence Avenue, Station F262C-R

This recording station replaced F262B-R beginning with water year 1988-89. The former station was discontinued during the summer of 1988 because the County constructed a rubber dam in the channel. The recording gage is now located about 5,100 feet further downstream at the beginning of the lined portion of the San Gabriel River. The County, with Watermaster concurrence, relocated this station to provide a more accurate measurement of flow to the ocean.

Rio Hondo Spreading Grounds Intake (Headworks)

The County constructed a low level intake to the Rio Hondo East Side Spreading Grounds in 1987. This intake supplements the original higher level intake and allows water to be diverted into the spreading grounds when the radial gates are raised. The spreading grounds inflow data are used to verify other records of inflow and to make adjustments.

Metering of the new intake was provided by means of an acoustical meter. The meter has not always operated successfully and there are periods of time during which the records of spreading grounds inflow are not accurate. The County has assured Watermaster that it would take whatever steps were necessary to provide accurate measurements at the new low level intake. To date this has not been done. The other spreading grounds intakes are equipped with Parshall Flumes.

Memorandum of Understanding (1982)

On May 13, 1982, a Memorandum of Understanding was executed by representatives of Upper and Lower Area Parties. A copy of the Memorandum of Understanding is appended to the Nineteenth Annual Watermaster Report. That document recognizes the need for a continuing cooperative working relationship between the Upper and Lower Area Parties. The purpose of the agreement was to institute under present conditions certain practical accommodations which are not intended to constitute interpretations of or additions to the Judgment. That Memorandum of Understanding is still in effect.

Transfer of Water Rights, Change of Address and Change of Name of Parties

During the 1991-92 water year there were no transfers of water rights reported to the Watermaster. However, two parties filed with the Watermaster and the Court a notice of change of address. Copies of the notices are in the appendix to this report. The parties and their new addresses are:

Central Basin Municipal Water District
17140 South Avalon Boulevard, Suite 210
Carson, California 90746-1218

Southern California Water Company
630 East Foothill Blvd.
San Dimas, California 91773-9016

CHAPTER II. LOWER AREA ANNUAL ENTITLEMENT

The Lower Area Annual Entitlement for the water year 1991-92 is based on the average annual rainfall which occurred in the 10-year period ending September 30, 1992, and the corresponding entitlement shown in Table A of the Judgment. Four precipitation stations are utilized to determine the annual precipitation for San Gabriel Valley. The four stations are located at San Dimas, Walnut, El Monte and Pasadena.

A review of the records showed that no record of rainfall was indicated for Station 95 (San Dimas Fire Station) for the storm of March 20 through 23. The fire captain stated that the fire station office was being moved at that time and the rainfall record was not maintained. Watermaster staff synthesized the record for that period from other adjacent rainfall stations in the San Gabriel Valley and determined that 4.65 inches should be added to the measured rainfall for the station, making the total annual rainfall for Station 95 equal to 24.67 inches.

Precipitation during the 1991-92 water year at the four stations was as follows:

Station Number	Location	Depth of Precipitation in Inches
95	114 East First Street, San Dimas	24.67
102D	700 Fairway Drive, Walnut	17.91
108D	3615 North Santa Anita Avenue, El Monte	18.02
610B	City Hall, Pasadena	30.61
	Four Station Average Rainfall	22.80

Table 3 presents the calculation of the 10-year average rainfall in the San Gabriel Valley for the water years 1982-83 through 1991-92.

TABLE 3

AVERAGE ANNUAL RAINFALL IN SAN GABRIEL VALLEY 1982-83 THROUGH 1991-92

Water Year	Annual Precipitation (inches)
1982-83	39.3
1983-84	10.6
1984-85	14.6
1985-86	22.0
1986-87	9.1
1987-88	14.9
1988-89	11.2
1989-90	12.4
1990-91	15.1
1991-92	22.8
Total	172.0
10-Year Average	17.2

Based on the 10-year average rainfall of 17.2 inches, the Lower Area Annual Entitlement for the 1991-92 water year is 88,700 acre-feet, determined from Table A of the Judgment.

CHAPTER III. USABLE WATER RECEIVED BY LOWER AREA

Presented in this Chapter is the determination of the quantity of Usable Water received by the Lower Area during the water year 1991-92. Also included is a discussion of the quality of water received by the Lower Area.

Surface Flow

The items to be included in Surface Flow through Whittier Narrows are set forth in Section III.A of Exhibit B of the Judgment. The measured flows and estimated flows are described below. The Judgment provides for adjustments to the measured flows where applicable. Some measurements in water year 1991-92 were found to be unreliable, questionable, or in error and appropriate adjustments were made. These adjustments are discussed later in this chapter.

Rio Hondo Above Mission Bridge, Station F64-R

As discussed in Chapter I, the recorder at Station F64-R was reinstalled in 1985. It had previously been removed as it had been unreliable due to backwater and other conditions. A County hydrographer continued making periodic current meter measurements at the station. From the recorder data the County has developed a record for the 1991-92 water year. At times when the station was subject to backwater, the record appeared to be erroneous. From analyses prepared by Watermaster staff it was apparent that the record for substantial periods of the year was suspect. For the months of October, December, January, February, and March it was decided to calculate the flow at F64-R as the sum of Alhambra Wash (F81D-R), releases to Alhambra Wash from Cen B-36 and Rio Hondo at Garvey Avenue (E326). For the period from May 14 to July 31,

the flow of Rio Hondo at Lower Azusa Road (F192B-4) was substituted for Garvey Avenue as releases of water from the San Gabriel Canyon were in the channel, and under those conditions the Lower Azusa Road station was a better record. Using the synthesized record, the total flow at Station F64-R for the 1991-92 water year was 94,409 acre-feet.

Additional work in balancing all inflow stations with the outflow stations and the amount of water spread indicated some inconsistencies during days of very high flow. In these cases, appropriate adjustments were made, which are described later in this Chapter.

Mission Creek at San Gabriel Boulevard, Station F83

As stated in Chapter I, the recorder at this station has been removed. In the past, weekly visits to this station were made by a County hydrographer and, unless the station was dry, a flow measurement was made. There was no record of Station F83 being measured by a hydrographer during 1991-92. It is determined, however, based on other observations, that there was no flow at Station F83 for the 1991-92 water year. Because of lower water levels in 1991-92 there was no rising water at this station.

Rio Hondo By-Pass Channel (Zone I Ditch), Station F313B-R

The measured flow at Station F313B-R for the 1991-92 water year was recorded by the County to be 17,613 acre-feet.

Whittier Narrows Flood Channel

The Whittier Narrows Flood Channel is used to convey storm waters from the San Gabriel River side of Whittier Narrows Reservoir to the Rio Hondo side. As stated in Chapter I, the stream gaging station F337-R was discontinued in 1987.

It has been determined that a better estimate of the flow can be made by utilizing the stabilizing weir at the entrance to the Flood Channel and the record of water surface elevations from the recorder on the San Gabriel River side of the Whittier Narrows Dam. The flow through the Flood Channel for the 1991-92 water year was determined to be 38,247 acre-feet. Again, as there were several days of extremely high flows, a balance of the flows was made and an overall adjustment to recorded inflow was made, as discussed later in this chapter.

Sycamore Canyon

The determination of runoff from Sycamore Canyon, which flows through Whittier Narrows, is based on a correlation with precipitation at Potrero Heights (Station 170F). Sycamore Canyon is located in the La Merced Hills northwesterly of Whittier Narrows and enters the Rio Hondo below Station F64-R, Rio Hondo above Mission Bridge. During the 1991-92 water year, precipitation at Station 170F was 18.42 inches. Referring to Table 6 of Exhibit B of the Judgment, the runoff from Sycamore Canyon was determined to be 170 acre-feet.

San Gabriel River Below Parkway Bridge, Station F263C-R

The flow at the San Gabriel River below Parkway Bridge for the 1991-92 water year was recorded by the County to be 30,460 acre-feet.

Reclaimed Water Delivered to Rio Hondo Below Station F64-R

Water from the Whittier Narrows Water Reclamation Plant is delivered to either the San Gabriel River, Rio Hondo below Station F64-R, or to the Rio Hondo Bypass Channel (Zone I Ditch). The total water production from this plant was 13,485 acre-feet during the 1991-92 water year, of which 40 acre-feet was used by a commercial nursery near the plant site. The balance of 13,445 acre-feet was delivered to stream channels. Of this quantity, 9,640 acre-feet was delivered directly to Rio Hondo below the F64-R gage and must, therefore, be added as Surface Flow.

Reclaimed water from the Whittier Narrows Plant can also be delivered to the Zone I Ditch. In 1984, the location of the gaging station on the Zone I Ditch was moved from upstream of the point of delivery to downstream of the point of delivery. Thus, reclaimed water now delivered to the Zone I Ditch is included with the water measured at Station F313B-R. During the 1991-92 water year, no flow was delivered to the Zone I Ditch.

The balance of the Reclaimed Water from the Whittier Narrows Plant, in the amount of 3,805 acre-feet, was delivered to the San Gabriel River and accounted for in the recorded flows at the Parkway Bridge Station, F263C-R.

Reclaimed Water Delivered to San Gabriel River Below Station F263C-R

The San Jose Creek Water Reclamation Plant is located near the intersection of San Gabriel River and San Jose Diversion Channel, as shown on Plate 1. Reclaimed Water from this plant is carried in an outfall pipeline which generally parallels the San Gabriel River to a point south of Florence Avenue, where the flow can be released to the lined channel of the San Gabriel River. At the San Gabriel River Spreading Grounds

Headworks, there is a turnout from this outfall pipeline so that Reclaimed Water can be delivered to the San Gabriel River Spreading Grounds or the unlined portion of the San Gabriel River for ground water recharge. This outlet is located immediately downstream of Station F263C-R.

During the 1991-92 water year, 16,832 acre-feet of reclaimed water from the San Jose Creek Water Reclamation Plant was delivered via this outfall pipeline to the San Gabriel River Spreading Grounds Headworks for replenishment purposes. This water was metered by a propeller meter in the turnout facility.

The flow in the San Jose Creek outfall pipeline not diverted for replenishment use is delivered to the lined portion of the San Gabriel River. During the 1991-92 water year, such flow amounted to approximately 34,400 acre-feet, and is not included as Surface Flow.

A second turnout for replenishment purposes from the San Jose Plant was first used in December 1986 to provide the option of releasing reclaimed water directly to the San Jose Diversion Channel. For the 1991-92 water year, 14,494 acre-feet of reclaimed water was released through this turnout and purchased by the Lower Area. The operation of this metered turnout allows San Jose Plant reclaimed water to be diverted to the Rio Hondo via the Zone I Ditch or at the San Gabriel River below Parkway Bridge.

Adjustments to Surface Flow

The quantity of Surface Flow is, for the most part, based upon stream flow measurements made by the County. In essence, the method set forth in the Judgment is to measure the surface inflow to the Lower Area through Whittier Narrows and deduct that portion which leaves the Montebello Forebay at its lower end. The difference in these measurements represents a determination of the quantity of Surface Flow which infiltrates to the Montebello Forebay.

High runoff conditions occur during and following certain storms. The frequency of hydrographic measurements at stream gaging stations during 1991-92 was less than in prior years. Certain inconsistencies can result from the inflow minus outflow calculations. While the stream gaging measurements may be within the accuracy of normal stream gaging measurements, the amount of Usable Surface Flow on some days is only a small portion of the total flow. Inaccuracies in the gaging of total flow will affect the determination of Usable Surface Flow. It also should be noted that storm runoff through Whittier Narrows has increased as a result of urbanization which tends to produce higher peak flows of a shorter duration, making the measuring program less reliable. The storm measurement problem is also affected by backwater at gaging station F64-R caused by the increased use of Whittier Narrows Reservoir for water conservation and flood control.

Accordingly, the Watermaster, after evaluating the available data, determined that for certain periods of time adjustments should be made in the quantities of Surface Flow as derived from the measurements. An alternative method of determining Surface Flow for the Rio Hondo was outlined in the Fifth Annual Watermaster Report. In this method, an adjustment is made by first determining the amount delivered to Rio Hondo Spreading Grounds and adding thereto the estimated amount of water infiltrated in the Rio Hondo

portion of the Whittier Narrows Reservoir. This is compared to the measured inflow minus the outflow and a determination is made as to the most reliable quantities.

Changes in the method of determining Surface Flow can be made under the terms of the Judgment. Reference is made to Exhibit B of the Judgment, Article III, Section A entitled, "Surface Water Measurements and Calculations," which reads in part:

> "In the event that any of the aforementioned gaging stations are inoperative for any reason and for any period of time the Watermaster shall estimate the quantity that would have been measured at the station had it been operative. The estimate shall be based on correlation to nearby operative measuring stations or on other reasonable engineering methods."

The Watermaster considers that stations are inoperative for the purposes of the Judgment when the measurements obtained are not of sufficient accuracy to produce reasonable results. For the 1991-92 water year, it was decided to apply the alternative method during certain periods of time to the Rio Hondo side of Whittier Narrows.

Presented in Table 4 is an adjustment to Rio Hondo inflow. This table presents a summary of the calculations utilizing the alternative method. Analysis of the daily inflow and outflow data indicated that the alternative method should be applied during 30 non-consecutive days of the 1991-92 water year. These days were December 27-30; January 5-9; February 6-16; March 2-3, 20-23, 26-28; and April 1. The unadjusted inflow in the Rio Hondo as set forth in Table 4 was 85,707 acre-feet during those 30 days. The outflow during the same 30 days (calculated on a daily basis from stream gaging measurements as provided in the Judgment) was 32,340 acre-feet. (This latter value is water from San Gabriel Valley since local inflow below Whittier Narrows has been deducted.) In making the adjustment, the unusable outflow as measured at Stewart and Gray Road was accepted.

TABLE 4

ADJUSTMENT TO RIO HONDO INFLOW

Item	Amounts in Acre-Feet for 30 days [a] of the Water Year 1991-92	
A. UNADJUSTED INFLOW		
Rio Hondo Above Mission Bridge, F64-R	46,418	
Mission Creek at San Gabriel Boulevard, F83	0	
Rio Hondo By-Pass Channel (Zone 1 Ditch)	586	
Whittier Narrows Flood Channel	38,068	
Sycamore Canyon	150	
Ungaged Reclaimed Water	485	
Total Unadjusted Inflow		85,707
B. ADJUSTED INFLOW		
Infiltration		
Spreading grounds infiltration	25,402	
Reservoir area infiltration	1,071	
Total infiltration		26,473
Change in Reservoir Storage		+ 2,319
Outflow at Stewart and Gray Road		32,340
Total Adjusted Inflow		61,132
C. ADJUSTMENT		
Adjustment to Rio Hondo Inflow		- 24,575

[a] Days adjusted were December 27-30; January 5-9; February 6-16; March 2-3, 20-23, 26-28; and April 1.

The infiltration during the 30 days was calculated to be 26,473 acre-feet. This included the amount delivered to the spreading grounds and the water infiltrated in the Whittier Narrows Reservoir westerly of Rosemead Boulevard. In addition, the amount of water stored on the Rio Hondo side of the Reservoir increased by 2,319 acre-feet during those 30 days. The inflow is therefore adjusted by adding the quantity of infiltration (26,473 acre-feet) to the outflow (32,340 acre-feet) and adding the increase in storage (2,319 acre-feet) to determine the adjusted inflow in the amount of 61,132 acre-feet.

As determined, the adjustment to the Rio Hondo inflow is minus 24,575 acre-feet. As discussed above, the adjustment relies on the spreading grounds inflow and estimated infiltration in Whittier Narrows Reservoir. These latter values provide a more accurate determination of Usable Water during high flows than taking the difference between high storm flow measurements of inflow and outflow. Until water year 1986-87 all inflow to the Rio Hondo Spreading Grounds was measured by flumes. In that year, a low level intake was constructed and an acoustical meter installed to serve the Rio Hondo Eastside Grounds. This meter is sometimes inoperative, and in some cases, it was necessary to use estimates of spreading grounds inflow.

Summary of Surface Flow

A total of 182,796 acre-feet of surface water flowed through Whittier Narrows during the 1991-92 water year. Table 5 shows the components and the total Surface Flow.

TABLE 5

SUMMARY OF SURFACE FLOW THROUGH WHITTIER NARROWS FOR WATER YEAR 1991-92

	Amount in Acre-Feet
Rio Hondo above Mission Bridge, Station F64-R	94,409
Mission Creek at San Gabriel Boulevard, Station F83	0
Rio Hondo By-Pass Channel, Station F313B-R	17,613
Whittier Narrows Flood Channel	38,247
Sycamore Canyon	170
San Gabriel River below Parkway Bridge, Station F263C-R	30,460
Reclaimed Water From Whittier Narrows Plant Delivered to Rio Hondo below Station F64-R	9,640
Reclaimed Water from San Jose Plant Delivered to San Gabriel River below Station F263C-R	16,832
Adjustment to Rio Hondo Inflow (Table 4)	- 24,575
Total Surface Flow	182,796

Subsurface Flow

The method utilized to determine Subsurface Flow through Whittier Narrows is set forth in Exhibit B of the Judgment. The data used for computing Subsurface Flow are the spring and fall ground water elevations in Whittier Narrows.

The Subsurface Flow for any year is the average of the six spring and fall computations of Subsurface Flow for the three years ending with the year of calculation. Shown in the following tabulation is the result of the calculation of Subsurface Flow for the 1991-92 water year which amounted to 22,700 acre-feet.

Time	Subsurface Flow in Acre-Feet
Spring 1990	32,100
Fall 1990	25,200
Spring 1991	20,300
Fall 1991	16,700
Spring 1992	18,900
Fall 1992	22,900
Subsurface Flow 1991-92	22,700

Export to Lower Area

The Watermaster is required to determine the amount of water which is pumped from ground water or diverted from surface streams in the Upper Area and transported in conduits through Whittier Narrows.

During the 1991-92 water year, there were four entities which transported water by pipeline through Whittier Narrows. All of the water exported through the Narrows was ground water produced in the San Gabriel Valley. The annual export for each of the four exporters is shown below:

Exporter	Acre-feet
California Domestic Water Company	13,918
San Gabriel Valley Water Company	151
Suburban Water Systems	7,785
City of Whittier	6,807
Total	28,661

The Judgment provides that the maximum annual allowance for export in the determination of Usable Water shall not exceed 23,395 acre-feet.

Lower Area Replenishment Water

The Lower Area purchases imported replenishment water from The Metropolitan Water District of Southern California. This imported water may be delivered at four Metropolitan connections: (1) Alhambra Wash (CenB-36); (2) San Gabriel River below Ramona Boulevard (CenB-37); (3) Foothill Feeder at San Dimas Wash (CenB-48); and (4) Upper Feeder at Thompson Creek (CenB-28). All connections are metered and delivered amounts are recorded by the Metropolitan Water District. These amounts are verified by personnel of the County.

During water year 1991-92 the total amount of imported water purchased from Metropolitan for replenishment was 43,103 acre-feet all of which was on behalf of the Lower Area.

MWD Connection	Imported Water (Acre-Feet)
Alhambra Wash (Cen B-36)	28,695
San Gabriel River: Ramona Blvd. (Cen B-37)	0
San Dimas Wash (Cen B-48)	0
Thompson Creek (Cen B-28)	14,408
Total	43,103

Provision is made in the Judgment for the deduction of evaporation losses upstream of Whittier Narrows occurring during conveyance of Lower Area Replenishment Water through San Gabriel Valley to Whittier Narrows. The total calculated amount of evaporation during the 1991-92 water year was 190 acre-feet.

Because of use of connection Cen B-36 during storm periods there were losses to the ocean of imported water during limited periods of time. Analysis of daily flows indicated these losses totalled 24 acre-feet which occurred on three days. After losses, the net amount of Lower Area Replenishment Water amounted to 42,889 acre-feet.

Reclaimed Water

Reclaimed Water used for replenishment of the Montebello Forebay came from three separate plants, each of which is operated by the County Sanitation Districts.

Whittier Narrows Water Reclamation Plant

The total amount of Reclaimed Water produced at the Whittier Narrows Water Reclamation Plant during the 1991-92 water year, and delivered to stream channels, was 13,445 acre-feet. During storm periods, 825 acre-feet of such Reclaimed Water delivered to the Rio Hondo was included as Surface Water outflow from the Montebello Forebay. Of this amount, 225 acre-feet was lost during storm operations. Therefore, a total of 12,620 acre-feet of such Reclaimed Water was purchased by the Water Replenishment District of Southern California and spread in the Montebello Forebay.

Pomona Water Reclamation Plant

County Sanitation District No. 21 owns and operates a water reclamation plant near the City of Pomona. A portion of the reclaimed water is sold for industrial,

agricultural, landscaping and other uses. During the 1991-92 water year a substantial quantity of reclaimed water from this plant reached Whittier Narrows. The plant facilities, discharge of effluent from the plant, and the method of determining the amount of discharge generated within the San Gabriel River system and reaching Whittier Narrows were described in the Fifth Annual Watermaster Report. Reclaimed Water is defined in the Judgment as water reclaimed from sewage generated in the watershed of the San Gabriel River System above Whittier Narrows. The area served by the Pomona Plant includes areas inside and outside of the San Gabriel River System. A study was conducted during 1985 to review the factors utilized in apportioning Pomona Plant effluent generated in the San Gabriel River System. As a result of the study, it was concluded that 70 percent of the effluent of the Pomona Plant originates from sewage generated within the San Gabriel River System. This apportionment will be reviewed periodically in the future.

The total production at the Pomona Water Reclamation Plant during the 1991-92 water year was 11,929 acre-feet. The majority of the effluent was delivered to the City of Pomona for resale. The undelivered portion, amounting to 4,078 acre-feet was delivered to San Jose Creek. It was determined that 253 acre-feet was wasted to the ocean, and that 1,719 acre-feet percolated in the Montebello Forebay. The portion of this Reclaimed Water which was generated within the watershed of the San Gabriel River System was calculated to be 1,474 acre-feet.

San Jose Creek Water Reclamation Plant

The Water Replenishment District of Southern California purchases Reclaimed Water from the San Jose Creek Water Reclamation Plant. During the 1991-92 water year,

31,326 acre-feet of Reclaimed Water from the San Jose Creek Water Reclamation Plant was delivered to the Lower Area for replenishment.

Summary of Reclaimed Water

The total amount of reclaimed water which should be deducted from the inflow is 45,420 acre-feet for the 1991-92 water year. This is comprised of 12,620 acre-feet from the Whittier Narrows Water Reclamation Plant, 1,474 acre-feet from the Pomona Water Reclamation Plant which originated within the San Gabriel River watershed, and 31,326 acre-feet from the San Jose Creek Water Reclamation Plant.

Make-Up Water by Surface Flow Delivery

During 1991-92, the Upper Area did not purchase any Make-Up Water by surface flow delivery. All Make-Up Water requirements were met by reimbursement for reclaimed water deliveries.

Recirculation of Measured Water

There was no recirculation of measured water as defined in Paragraph 3(1) (6) of the Judgment during the 1991-92 water year.

Unusable Surface Flow

The water from the San Gabriel Valley which leaves Montebello Forebay as surface flow is called Unusable Surface Flow and is determined in accordance with Exhibit B of the Judgment. Surface outflow from the Montebello Forebay is accounted for in the Rio Hondo at Stewart and Gray Road, Station F45B-R, and in the San Gabriel River at Florence Avenue, Station F262C-R. This surface outflow may be comprised of

water from the San Gabriel Valley and local storm water which enters the channels downstream of Whittier Narrows.

During the 1991-92 water year, measured surface outflow from the Montebello Forebay in the Rio Hondo at Station F45B-R was 41,164 acre-feet. This included water from the San Gabriel Valley and local inflow originating downstream of Whittier Narrows. The Local Storm Outflow on days when the radial gates at the Rio Hondo headworks were open was estimated by correlating the drainage areas of the unmeasured storm drains with the Montebello Storm Drain, which is equipped with a stream flow recorder. By analysis of flows on days when the radial gates were open, it was possible to segregate the flow at Stewart and Gray Road into Local Storm Outflow and Unusable Surface Flow. The total loss to the ocean on these days was determined to be 39,385 acre-feet. It was determined that the Local Storm Outflow was 6,706 acre-feet and the Unusable Surface Flow in the Rio Hondo was 32,679 acre-feet. Unusable Surface Flow includes 582 acre-feet of reclaimed water and 24 acre-feet of imported water which was previously deducted from Lower Area Replenishment Water. The total amount of Local Storm Inflow was calculated to be 10,370 acre-feet.

The total flow of the San Gabriel River at Florence Avenue, Station F262C-R, was 3,842 acre-feet for the 1991-92 water year. This flow consisted of Local Storm Inflow through storm drains located in the Montebello Forebay and surface inflow from the San Gabriel Valley. Most of the storm water in the San Gabriel River entering Whittier Narrows Reservoir in excess of the spreading capacity in the San Gabriel River below Whittier Narrows Dam was conveyed by the Flood Channel to the Rio Hondo. The Local Storm Inflow was calculated to be 6,554 acre-feet based on a correlation with the

Montebello Storm Drain. The Local Storm Outflow on the San Gabriel River was determined to be 1,929 acre-feet. Analyses of daily flows indicated a total Unusable Surface Flow from the Montebello Forebay in the San Gabriel River of 1,913 acre-feet during the 1991-92 water year.

The total Unusable Surface Flow passing through the Montebello Forebay in the Rio Hondo and San Gabriel River in the 1991-92 water year was 34,592 acre-feet.

Determination of Usable Water

Usable Water under the terms of the Judgment is defined as the sum of Surface Flow, Subsurface Flow and Export to Lower Area less the sum of Lower Area Replenishment Water, Reclaimed Water, Make-up Water by Surface Flow Delivery and Unusable Surface Flow. Table 6 presents the determination of Usable Water for the 1991-92 water year.

TABLE 6

USABLE WATER FOR WATER YEAR 1991-92

	Amount in Acre-Feet	
Surface Flow	182,796	
Subsurface Flow	22,700	
Export to Lower Area	23,395	
Subtotal		228,891
Less:		
Lower Area Replenishment Water	42,889	
Reclaimed Water	45,420	
Make-Up Water by Surface Flow Delivery	0	
Recirculation of Measured Water	0	
Unusable Surface Flow	34,592	
Subtotal		122,901
Usable Water		105,990

Quality of Water

The Judgment (Exhibit B, Section IV.E) provides that the Watermaster gather readily available data from public and private agencies relating to the quality of water. During the water year, quality data were obtained from the State Department of Water Resources, the County Sanitation Districts, Los Angeles County Department of Public Works, and the Metropolitan Water District. Ground water quality data were also obtained from programs of the Main San Gabriel Basin Watermaster, Central Basin Municipal Water District, Water Replenishment District of Southern California and the U.S. Environmental Protection Agency (EPA). Reference was also made to the Annual Report on Results of Water Quality Monitoring prepared for the Water Replenishment District of Southern California. In the last few years increasing concern has developed over the trace constituents found in drinking water. Table 7 includes these constituents for illustrating both the quality of different sources of water supply and the increasing quantity of regulated constituents. Shown in Figures 1, 2 and 3 are graphical trends of salinity, hardness and nitrogen of the sources of imported and reclaimed water for recharge in the San Gabriel River System. These figures are from the aforementioned report prepared for the Water Replenishment District of Southern California.

TABLE 7

WATER QUALITY ANALYSIS REPRESENTATIVE OF WATER SOURCES PASSING THROUGH WHITTIER NARROWS WATER YEAR 1991–92(a)

		IMPORTED WATER		RECLAIMED WATER			RUNOFF WATER	
CATEGORY	DRINKING WATER STANDARDS	UNTREATED STATE PROJECT WATER (b)	UNTREATED COLORADO RIVER WATER (c)	WHITTIER NARROWS PLANT	SAN JOSE CREEK PLANT	POMONA PLANT	STORM FLOW (d)	SUBSURFACE FLOW (e)
DATE		4–6–92	4–6–92	4–13–92	4–13–92	4–13–92	2–7–92	6–17–92
pH	6.5–8.5	8.0	8.2	7.0	6.9	7.1	7.1	8.0
EC x 10^6 (umho/cm)		604	1047	1130	1160	998	233	739
CATIONS								
Calcium		26	75	52	66	63	27	97
Magnesium		14	30	16	20	15	2	16
Sodium		76	96	131	134	103	17	47
Potassium		4	5	11	13	11	3	4
ANIONS								
Carbonate		0	0	0	0	0	0	0
Bicarbonate		96	159	285	285	260	52	189
Sulfate	250	83	256	164	147	105	37	117
Chloride	250	86	82	110	149	112	18	72
Nitrate as NO3	45	1.8	0.8					
Floride	1.8	0.17	0.30	0.76	0.60	0.38	0.2	0.25
Total Dissolved Solids (f)	500–1500	353	633	589	655	596	144	496
Total Hardness as CaCO3		121	311	192	246	216	78	309
Boron				0.47	0.60	0.41	ND	0.24
INORGANIC TRACE CONSTITUENTS								
Arsenic	0.05	0.001	0.002	0.002	0.002	0.002	ND	ND
Barium	1	0.044	0.188	0.03	0.06	0.04	ND	0.14
Cadmium	0.01	0.002	ND	ND	0.004	ND	ND	ND
Chromium, Total	0.05	ND	ND	ND	0.02	ND	ND	ND
Lead	0.05	ND	ND	ND	ND	ND	ND	ND
Mercury	0.002	ND	ND	0.0001	0.0006	0.0008	ND	ND
Selenium	0.01	ND	0.002	0.006	0.001	ND	ND	ND
Silver	0.05	ND	ND	ND	ND	ND	ND	ND
NUTRIENTS as N								
Ammonia				21.0	12.2	12.0	1.6	ND
Nitrate				1.1	2.19	2.57	1.87	2.5
Nitrite				0.14	1.36	0.95	0.16	ND
Organic Nitrogen				1.7	1.6	1.05		ND

(a) All constituents in mg/l unless noted. ND = None Detected.
(b) Sampled at Lake Silverwood. Trace inorganics sampled 11/89; Purgeable organics in 3/92; Non–purgeable organics in 5/92.
(c) Sampled at Lake Mathews. Trace inorganics sampled 11/89; Purgeable organics in 3/92; Non–purgeable organics in 5/92.
(d) At San Gabriel Spreading Grounds.
(e) Well No. 2S/11W–5G (LACFCD No. 2947LM). Sample taken by County. Other Samples show no detected volatile organics.
(f) By evaporation at 180° C.

TABLE 7 (con't)

WATER QUALITY ANALYSIS REPRESENTITIVE OF WATER SOURCES PASSING THROUGH WHITTIER NARROWS FOR THE WATER YEAR 1991–92(a)

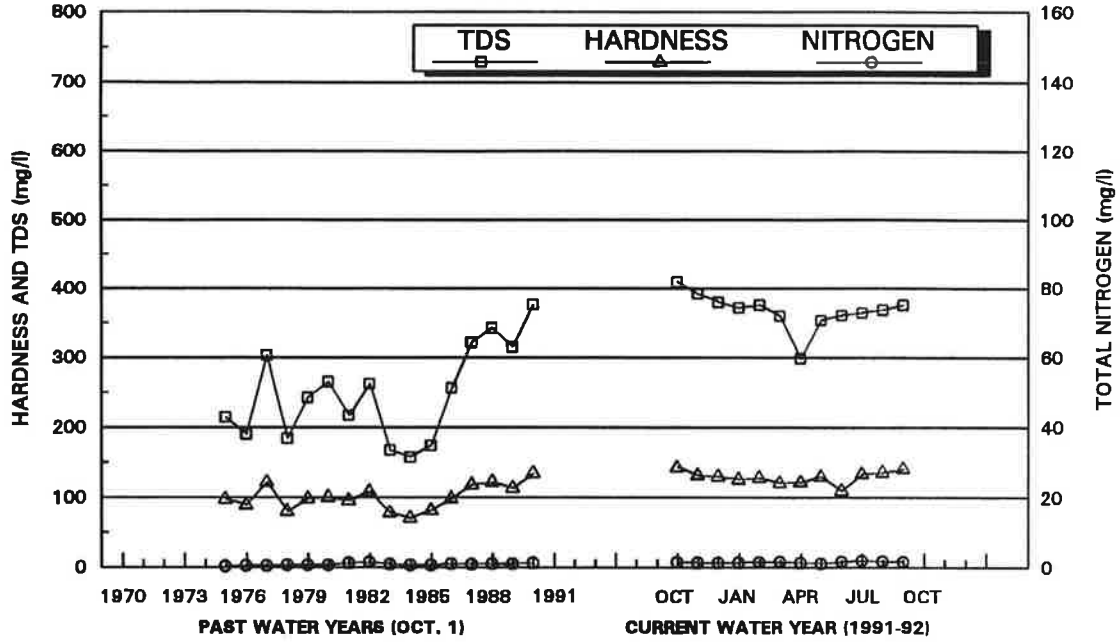
		IMPORTED WATER		RECLAIMED WATER			RUNOFF WATER	
CATEGORY	DRINKING WATER STANDARDS	UNTREATED STATE PROJECT WATER (b)	UNTREATED COLORADO RIVER WATER (c)	WHITTIER NARROWS PLANT	SAN JOSE CREEK PLANT	POMONA PLANT	STORM FLOW (d)	SUBSURFACE FLOW (e)
DATE		4–6–92	4–6–92	4–13–92	4–13–92	4–13–92	2–7–91	6–17–92
PURGEABLE ORGANICS, ug/l								
Methylene Chloride	40	ND	ND	ND	ND	ND	ND	ND
Chloroform	100 (g)	ND	ND	6.7	5.6	4.7	ND	ND
Bromodichloromethane	100 (g)	ND	ND	0.6	0.8	0.7	ND	ND
Dibromochloromethane	100 (g)	ND	ND	ND	ND	ND	ND	ND
Bromoform	100 (g)	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.5	ND	ND	ND	ND	ND	ND	ND
1,1–Dichloroethane	5	ND	ND	ND	ND	ND	ND	ND
1,2–Dichloroethane	0.5	ND	ND	ND	ND	ND	ND	ND
1,1,1–Trichloroethane	200	ND	ND	ND	ND	ND	ND	ND
1,1,2–Trichloroethane	32	ND	ND	ND	ND	ND	ND	ND
1,1–Dichloroethylene	6	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	5	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	5	ND	ND	0.3	2.6	0.7	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	100	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	30	ND	ND	ND	ND	ND	ND	ND
O–Dichlorobenzene	130 (h)	ND	ND	ND	3.1	ND	ND	ND
M–Dichlorobenzene	130 (h)	ND	ND	ND	ND	ND	ND	ND
P–Dichlorobenzene	5	ND	ND	1.5	2.7	1.0	ND	ND
Trans–1,2–Dichloroethylene	10	ND	ND	ND	ND	ND	ND	ND
Bromomethane		ND	ND	ND	ND	ND	ND	ND
Chloroethane		ND	ND	ND	ND	ND	ND	ND
2–Chloroethylvinylether				ND	ND	ND	ND	ND
Chloromethane		ND	ND	ND	ND	ND	ND	ND
1,2–Dichloropropane	5	ND	ND	ND	ND	ND	ND	ND
Cis–1,3–Dichloropropene	0.5(i)	ND	ND	ND	ND	ND	ND	ND
Trans–1,3–Dichloropropene	0.5(i)	ND	ND	ND	ND	ND		ND
1,1,2,2–Techrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	0.5	ND	ND	ND	ND	ND	ND	ND
								ND
NON–PURGEABLE ORGANICS, ug/l								
Bis(2–ehtylhexyl)phthalate	4	ND	ND	ND	ND	ND		ND
1,2,4–Trichlorobenzene				ND	ND	ND		ND
2,4,6–Trichlorophenol				ND	ND	ND		ND
2,4,5–Trichlorophenol				ND	ND	ND		ND
2,3,4–Trichlorophenol				ND	ND	ND		ND
2,3,6–Trichlorophenol				ND	ND	ND		ND
3,4,5–Trichlorophenol				ND	ND	ND		ND
Pentachlorophenol	30			ND	ND	ND		ND
Phenanthrene				ND	ND	ND		ND
Fluoranthene				ND	ND	ND		ND
Atrazine	3			ND	ND	ND		ND
Simazine	10			ND	ND	ND		ND
Phenylacetic Acid				ND	ND	ND		ND
Phenol	1			ND	ND	ND		ND
CHLORINATED HYDROCARBONS, ug/l								
DDT				ND	ND	ND	ND	ND
BHC	0.3–0.7			ND	ND	ND	ND	ND
Lindane	4			0.05	0.04	0.05	ND	ND
Heptachlor	0.01			ND	ND	ND	ND	ND
Heptachlor Epoxide	0.01			ND	ND	ND	ND	ND
Aldrin	0.05			ND	ND	ND	ND	ND
Dieldrin	0.05			ND	ND	ND	ND	ND
Endrin	0.2			ND	ND	ND	ND	ND
Toxaphene	5			ND	ND	ND	ND	ND
Aroclor 1242				ND	ND	ND	ND	ND
Aroclor 1254				ND	ND	ND	ND	ND

(g) Total Trihalomethanes is not to exceed 100 ug/l.
(h) Sum not to exceed 130.0 ug/l.
(i) Sum not to exceed 0.5 ug/l.

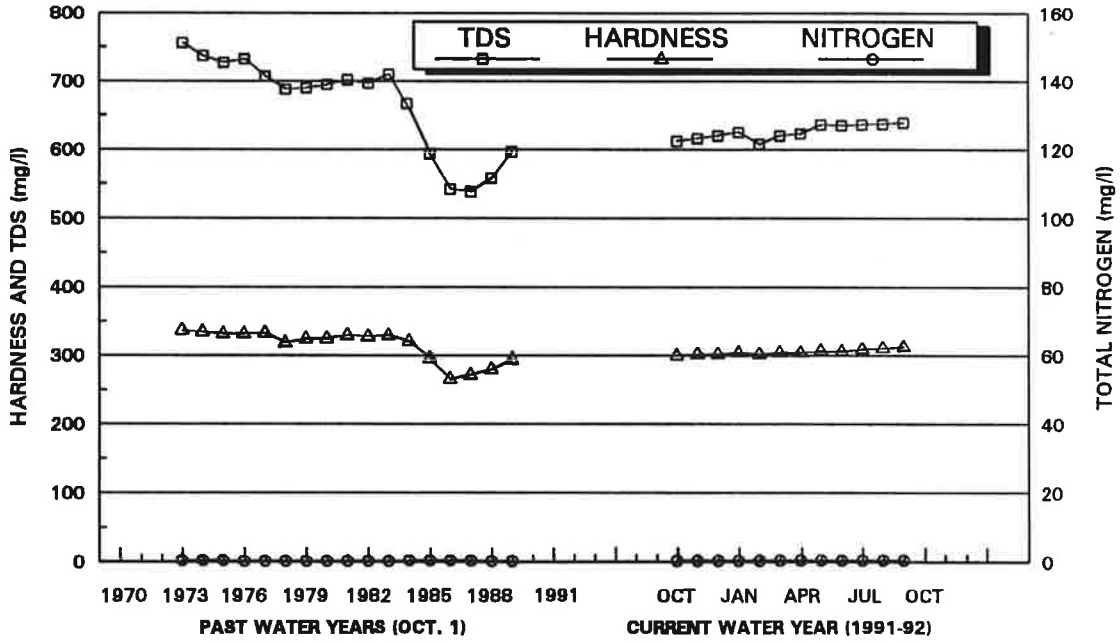
FIGURE 1

UNTREATED STATE PROJECT WATER

EAST BRANCH



UNTREATED COLORADO RIVER WATER



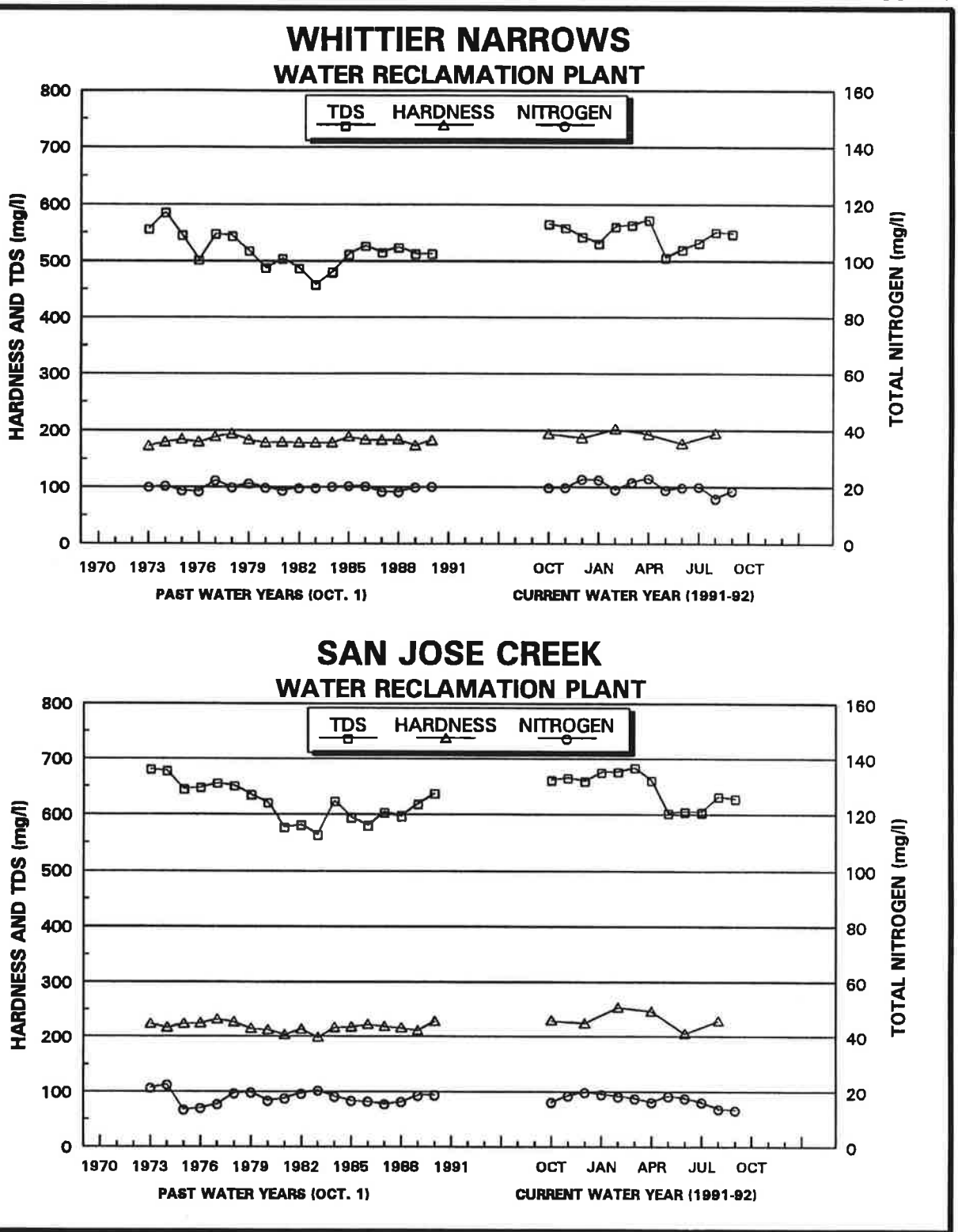
SELECTED WATER QUALITY PARAMETERS

OF IMPORTED WATER

SAN GABRIEL RIVER WATERMASTER

FEBRUARY 1993

FIGURE 2

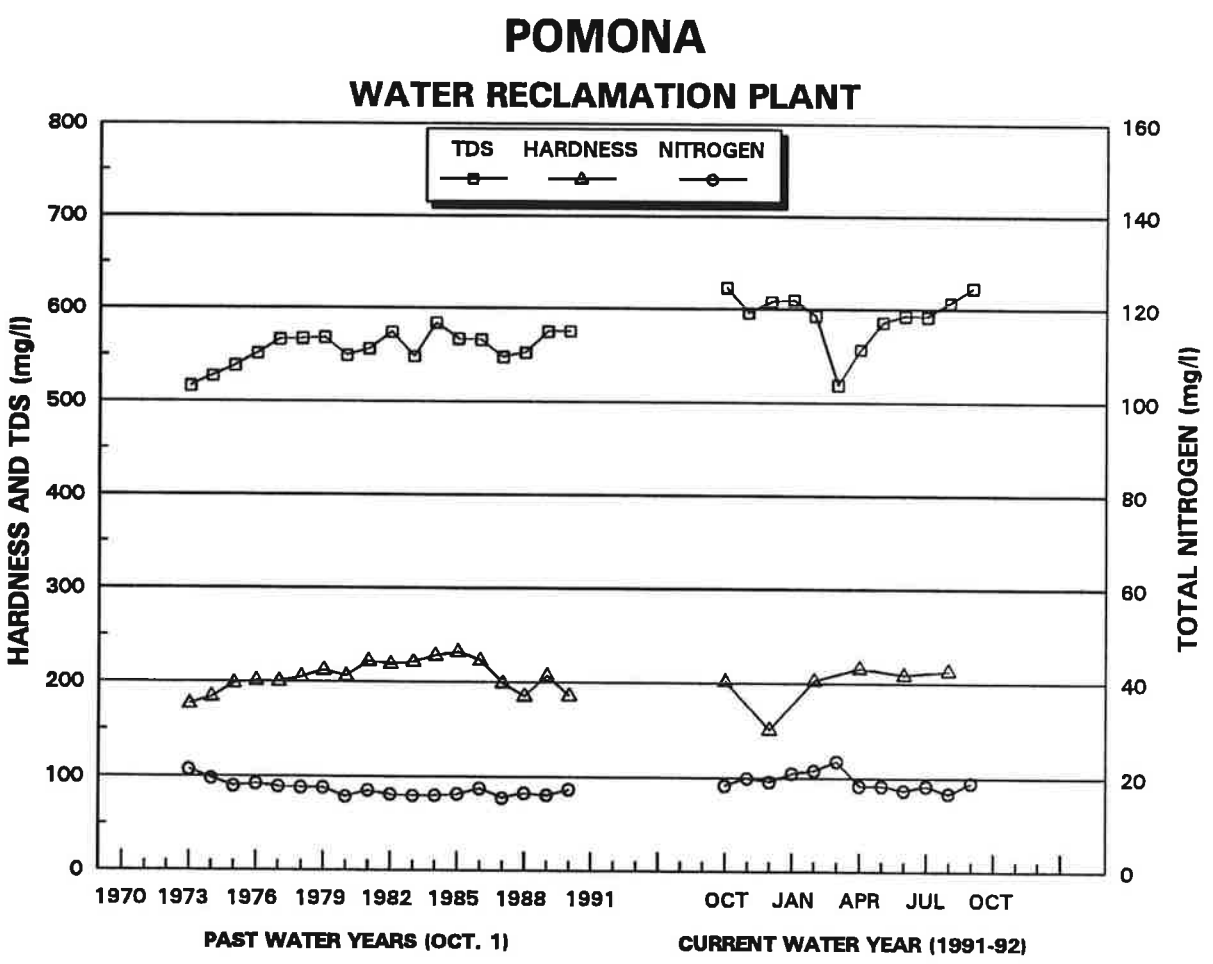


SELECTED WATER QUALITY PARAMETERS
OF RECLAIMED WATER

SAN GABRIEL RIVER WATERMASTER

FEBRUARY 1993

FIGURE 3



SELECTED WATER QUALITY PARAMETERS
OF RECLAIMED WATER

SAN GABRIEL RIVER WATERMASTER

FEBRUARY 1993

CHAPTER IV. ANNUAL ACCOUNTING AND MAKE-UP WATER REQUIREMENTS

Under the terms of the Judgment, the Watermaster is required to annually determine the Accrued Debit or Credit of the Upper Area and the obligations, if any, of the Upper Area to deliver Make-up Water during the ensuing water year.

Delivery of Make-up Water During 1991-92

Because of the existence of an Accrued Debit at the end of 1990-91, the Upper Area was obligated to deliver 11,461 acre-feet of Make-up Water to the Lower Area during the 1991-92 water year. This delivery was accomplished by making payments under provisions of the Judgment for Reclaimed Water.

By letter dated September 23, 1992, the Upper Area enclosed payment in the amount of $105,264.73 for Reclaimed Water, which credited the Upper Area with 14,735 acre-feet of Make-up Water delivered during the 1991-92 water year for the 1990-91 debit.

Accrued Debit as of September 30, 1991

The Lower Area Annual Entitlement as heretofore determined for the 1991-92 water year was 88,700 acre-feet. The Usable Water received was 105,990 acre-feet, which resulted in a credit to the Upper Area for the water year of 17,290 acre-feet. As of September 30, 1991, there was an Accrued Debit of 34,384 acre-feet. During 1991-92, 14,735 acre-feet of Make-up water was delivered to the Lower Area. The Accrued Debit as of September 30, 1992 is thus 2,359 acre-feet.

Requirement for Make-up Water Delivery in 1992-93

Because of the existence of an Accrued Debit on September 30, 1992, the Upper Area is under obligation to deliver Make-up Water to the Lower Area during 1992-93. Paragraph 5(f) of the Judgment outlines the procedure for such deliveries. The Upper Area's obligation to provide Make-up Water during water year 1992-93 will be an amount not less than the sum of: (1) one-third of the Accrued Debit of the Upper Area; and (2) that portion of such Accrued Debit of Upper Area over 25,000 acre-feet which remains after deducting said one-third. The calculation for the required delivery of Make-up Water (in acre-feet) is as follows:

2,359	Accrued Debit
- 786	One-Third of Debit
1,573	Remaining Debit
0	Balance to reduce Accrued Debit to 25,000 acre-feet.
786	Required Delivery of Make-up Water during 1992-93

Summary

Table 8 presents a summary of the findings of the Watermaster for the 1991-92 water year.

TABLE 8

SUMMARY OF FINDINGS FOR WATER YEAR 1991-92

		Quantities In Acre-Feet
1.	Rainfall 1991-92, 22.8 inches	
2.	Ten-year average rainfall, 17.2 inches	
3.	Lower Area Annual Entitlement	88,700
4.	Surface flow through Whittier Narrows	182,796
5.	Subsurface Flow through Whittier Narrows	22,700
6.	Water exported through Whittier Narrows	23,395
7.	Total Flow through Whittier Narrows	228,891
8.	Lower Area Replenishment Water	42,889
9.	Reclaimed Water	45,420
10.	Make-up Water (Surface Flow Delivery)	0
11.	Recirculation of Measured Water	0
12.	Unusable Surface Flow	34,592
13.	Usable Water Received by Lower Area	105,990
14.	Credit for Water Year 1991-92	17,290
15.	Accrued Debit of Upper Area as of September 30, 1991	34,384
16.	Amount of Make-up Water delivered during Water Year 1991-92	
	a. Payment for Reclaimed Water	14,735
	b. Surface Flow Delivery	0
	Total	14,735
17.	Adjusted Accrued Debit of Upper Area as of September 30, 1991	19,649
18.	Accrued Debit of Upper Area as of September 30, 1992	2,359
19.	Required Make-up Water to be delivered during Water Year 1992-93	786

CHAPTER V. LONG-TERM ACCOUNTING

Long-term Accounting is required by paragraph 5(h) of the Judgment. The first Long-term Accounting period under the Judgment included the 16 water years from 1963-64 through 1978-79. The second Long-term Accounting period began October 1, 1979. The first and second Long-term Accounting periods are discussed in this Chapter.

The Watermaster is required from time to time, but not sooner than 15 years nor more than 25 years after September 30, 1963 and after the close of each Long-term Accounting period, to make a Long-term Accounting of the aggregate amount of Usable Water and Make-up Water received by the Lower Area. A Long-term Accounting is to be made sooner than 25 years if the average annual rainfall for a period of 15 or more years is at least 18 inches but not more than 19 inches.

The amount of such water received during the Long-term Accounting period is compared to a theoretical amount comprised of the base period annual entitlement (98,415 acre-feet) multiplied by the number of years in the period and then adjusted by the ratio of the average annual rainfall for the period to the long-term average annual rainfall (18.52 inches).

First Long-term Accounting

As reported in the Sixteenth Annual Report, the First Long-term Accounting under the Judgment occurred as of September 30, 1979 for the period of 16 water years 1963-64 through 1978-79. The rainfall for the period averaged 18.16 inches resulting in a total entitlement of 1,544,031 acre-feet for the 16-year period. The amount of Usable Water and Make-up Water received was 1,376,090 acre-feet resulting in a Long-term Accounting Debit of 167,941 acre-feet.

Make-up Water Deliveries

The Judgment provides that the debit under Long-term Accounting be made up over a three-year period. Representatives of the Upper Area and Lower Area agreed that Make-up Water for the first Long-term Accounting Period could be delivered over a five-year period, requiring not less than one-fifth be delivered each year. Use of credit for Reclaimed Water, however, was limited to the first three years of the repayment period.

During the five years 1979-80 through 1983-84, the Upper Area delivered 167,941 acre-feet of Make-up Water to the Lower Area. Thus, the Make-up Water delivery for the First Long-term Accounting Period was fully satisfied. A detailed description of the deliveries is contained in the Twenty-Second Annual Report.

Second Long-term Accounting

Table 9 is a summary of operations under the Judgment showing Lower Area Annual Entitlement, Usable Water and Make-up Water received by the Lower Area and the Accrued Debit or Credit of Upper Area for each year of operation during the Second Long-term Accounting period commencing October 1, 1979.

As previously mentioned, Long-term Accounting is to be made sooner than the 25th year if the average rainfall for a period of 15 or more years is at least 18 inches but not more than 19 inches. Shown in Table 10 are the data which will be used for the Second Long-term Accounting period. As shown on Table 10, the annual rainfall for the first thirteen years of operation under the second Long-term Accounting period has averaged 18.14 inches.

TABLE 9

SUMMARY OF OPERATIONS
UNDER JUDGMENT IN LONG-TERM ACCOUNTING PERIOD

(In Acre-Feet)

Water Year	Entitlement	Water Received by Lower Area			Accrued Credit (+) or Debit (-)
		Usable	Make-Up	Total	
1979-80	107,600	137,175	0	137,175	+29,575
1980-81	105,700	85,917	0	85,917	+ 9,792
1981-82	111,900	94,823	0	94,823	- 7,285
1982-83	122,200	185,014	7,285	192,299	+62,814
1983-84	118,600	99,725	0	99,725	+43,939
1984-85	118,100	90,965	0	90,965	+16,804
1985-86	123,900	119,457	0	119,457	+12,361
1986-87	121,000	63,192	0	63,192	- 45,447
1987-88	106,300	85,251	20,447	105,698	- 46,049
1988-89	98,800	70,280	21,190	91,470	- 53,379
1989-90	81,800	67,709	28,279	95,988	- 39,191
1990-91	85,600	75,572	14,835	90,407	- 34,384
1991-92	88,700	105,990	14,735	120,725	- 2,359
Totals	1,390,200	1,281,070	106,771	1,387,841	

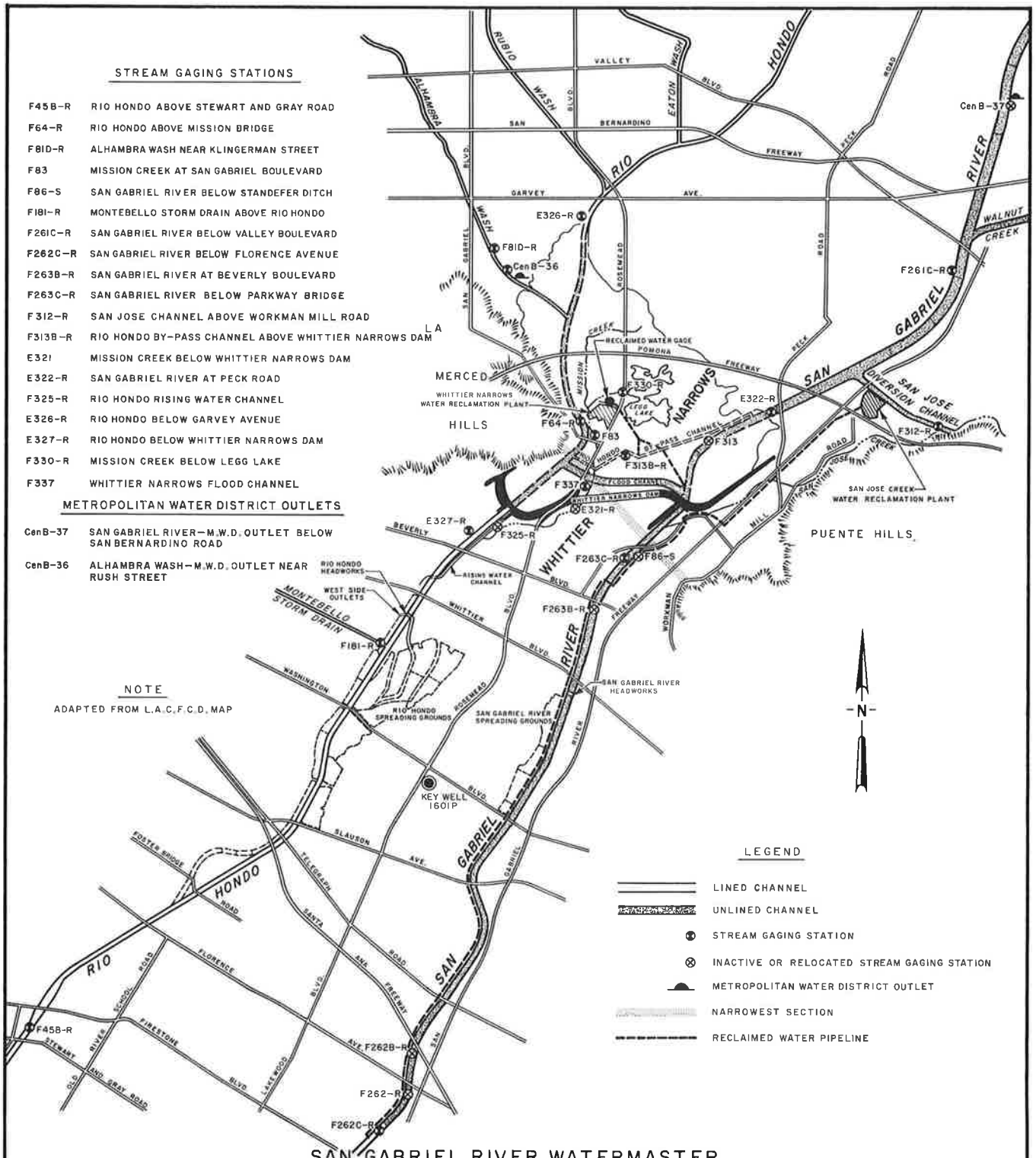
TABLE 10

DATA FOR SECOND LONG-TERM ACCOUNTING PERIOD

Number of Years	Water Year	Rainfall in Inches		Water Received by Lower Area in Acre-Feet				Long-Term Accounting Formula[a] in Acre-Feet
		Amount	Accumulated Average Annual Amount	Usable	Make-Up	Total	Accumulated Total	
1	1979-80	34.85	34.85	137,175	0	137,175	137,175	185,192
2	1980-81	10.31	22.58	85,917	0	85,917	223,092	239,980
3	1981-82	18.88	21.35	94,823	0	94,823	317,915	340,361
4	1982-83	39.26	25.82	185,014	7,285	192,299	510,214	548,828
5	1983-84	10.56	22.77	99,725	0	99,725	609,939	604,997
6	1984-85	14.58	21.41	90,965	0	90,965	700,904	682,635
7	1985-86	21.96	21.48	119,457	0	119,457	820,361	799,011
8	1986-87	9.06	19.93	63,192	0	63,192	883,553	847,262
9	1987-88	14.88	19.37	85,251	20,447	105,698	989,251	926,387
10	1988-89	11.15	18.55	70,280	21,470	91,470	1,080,721	985,744
11	1989-90	12.35	17.99	67,709	28,279	95,988	1,176,709	1,051,585
12	1990-91	15.12	17.75	75,572	14,835	90,407	1,267,116	1,131,879
13	1991-92	22.80	18.14	105,990	14,735	120,725	1,387,841	1,253,144

[a] The figures shown are for informational purposes only. The second long-term accounting will be determined in accordance with paragraph 5(h) of the Judgment.

PLATE 1



SAN GABRIEL RIVER WATERMASTER

CITY OF LONG BEACH Vs. SAN GABRIEL VALLEY WATER CO.
CASE No. 722647

STREAM GAGING STATIONS
RIO HONDO – SAN GABRIEL RIVER SYSTEM

WATERMASTERS
HOWARD H. HAILE—RICHARD A. RHONE—THOMAS M. STETSON

SCALE OF FEET
4000 0 4000 8000

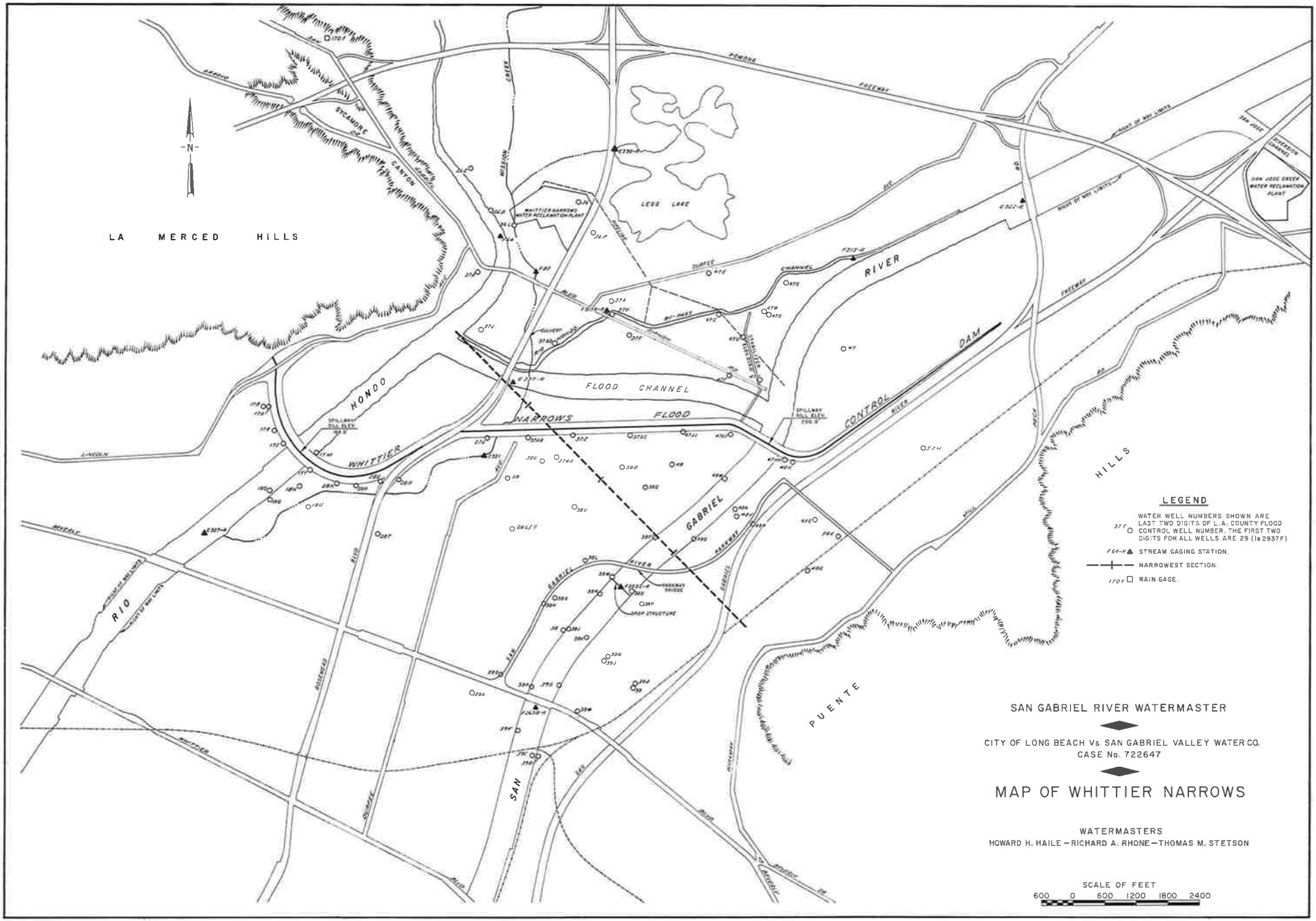

LA MERCED HILLS
SYCAMORE CANYON
POMONA FREEWAY
LEGG LAKE
WHITTIER NARROWS WATER RECLAMATION PLANT
SAN JOSE CREEK WATER RECLAMATION PLANT
SAN JOSE CREEK
RIVER
DAM
FLOOD CHANNEL
NARROWS FLOOD CONTROL
HONDO
WHITTIER
GABRIEL
RIO
SAN
HILLS
PUENTE
LEGEND
WATER WELL NUMBERS SHOWN ARE LAST TWO DIGITS OF L. A. COUNTY FLOOD CONTROL WELL NUMBER. THE FIRST TWO DIGITS FOR ALL WELLS ARE 29 (Ie 2937F)
STREAM GAGING STATION
NARROWEST SECTION
RAIN GAGE
SAN GABRIEL RIVER WATERMASTER
CITY OF LONG BEACH Vs. SAN GABRIEL VALLEY WATER CO.
CASE No. 722647
MAP OF WHITTIER NARROWS
WATERMASTERS
HOWARD H. HAILE – RICHARD A. RHONE – THOMAS M. STETSON
SCALE OF FEET
600 0 600 1200 1800 2400

PLATE 2

APPENDIX

BLAZEY & COMPANY

Certified Public Accountant

December 17, 1992

San Gabriel River Watermaster
Security Building
100 North Brand Boulevard, Suite 600
Glendale, California 91203

In our opinion, the accompanying statement of Income and Expenditures for the San Gabriel River Watermaster for the water year 1991-1992 presents fairly the results of its operations for the year in conformity with generally accepted accounting principles. Our examination was made in accordance with generally accepted auditing standards, and accordingly included tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Blazey & Company

Blazey & Company
Certified Public Accountant

SAN GABRIEL RIVER WATERMASTER
Statement of Income and Expenditures
For the Water Year 1991-1992

Shortage from year 1990-1991		$(3,642.13)
Income		64,000.00
Interest Income		1,070.80
		$61,428.67
Expenditures:		
Administrative fees and general operating expenses	$11,518.05	
Collection of data, field inspections and maintenance of records	17,942.34	
Calculations and preparation of Watermaster Reports for water years 1990-1991	37,150.57	
Printing and reproduction costs	1,509.66	
Total Expenditures		$68,120.62
Shortage		$6,691.95

Wayne K. Lemieux (CA Bar No. 43501)
Law Offices of Wayne K. Lemieux
200 N. Westlake Boulevard, Suite 102
Westlake Village, CA 91362
(805) 495-4770

Attorneys for CENTRAL BASIN
MUNICIPAL WATER DISTRICT

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

BOARD OF WATER COMMISSIONERS OF THE CITY OF LONG BEACH, ET AL.,	
Plaintiffs,	NO. 722647
v.	CHANGE OF DESIGNATION OF MAILING ADDRESS OF CENTRAL BASIN MUNICIPAL WATER DISTRICT
SAN GABRIEL VALLEY WATER COMPANY, ET AL.,	
Defendants.	

NOTICE IS HEREBY GIVEN that Plaintiff, CENTRAL BASIN MUNICIPAL WATER DISTRICT, hereby changes its designation of mailing address as follows:

Central Basin Municipal Water District
17140 South Avalon Boulevard
Suite 210
Carson, CA 90746-1218

Telephone: (310) 217-2222
Fax: (310) 217-2414

Pursuant to Paragraph 17 of the Judgment herein, a copy of this notice has been served by mail to the Watermaster herein.

DATED: March 24, 1992

LAW OFFICES OF WAYNE K. LEMIEUX

By Wayne Lemieux
Wayne K. Lemieux
Attorneys for CENTRAL BASIN MUNICIPAL WATER DISTRICT

PROOF OF SERVICE

STATE OF CALIFORNIA, COUNTY OF VENTURA

I am employed in the County of Ventura, State of California. I am over the age of 18 and not a party to the within action; my business address is 200 North Westlake Boulevard, Suite 102, Westlake Village, CA 91362.

On March 25, 1992, I served the foregoing document described as CHANGE OF DESIGNATION OF MAILING ADDRESS OF CENTRAL BASIN MUNICIPAL WATER DISTRICT on interested parties in this action by placing a true copy thereof enclosed in a sealed envelope addressed as follows:

San Gabriel River Watermaster
102 North Brand Boulevard, Room 604
Glendale, CA 91203

I deposited such envelope in the mail at Westlake Village, California. The envelope was mailed with postage thereon fully prepaid.

I am "readily familiar" with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with U.S. postal service on that same day with postage thereon fully prepaid at Westlake Village, California in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

Executed on March 25, 1992, at Westlake Village, CA.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Sharlene Marschall
Type or Print Name

Sharlene Marschall
Signature

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

BOARD OF WATER COMMISSIONERS OF THE CITY OF LONG BEACH, ET AL., Plaintiffs. vs. SAN GABRIEL VALLEY WATER COMPANY, ET AL., Defendants.	NO. 722647 CHANGE OF DESIGNATION OF MAILING ADDRESS OF DEFENDANT, SOUTHERN CALIFORNIA WATER COMPANY

NOTICE IS HEREBY GIVEN that Defendant, SOUTHERN CALIFORNIA WATER COMPANY, hereby changes its designation of mailing address as follows:

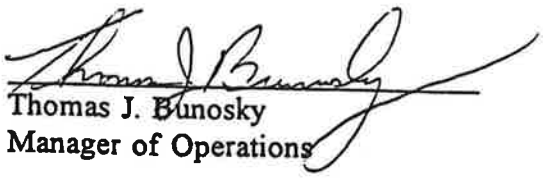
Southern California Water Company
630 East Foothill Boulevard
San Dimas, CA 91773-9016

Telephone: (714) 394-3600

Pursuant to Paragraph 17 of the Judgment herein, a copy of this notice has been served by mail on the Watermaster herein.

Dated this first day of July 1992.

SOUTHERN CALIFORNIA WATER COMPANY

By 
Thomas J. Bunosky
Manager of Operations

STATE OF CALIFORNIA)
)
COUNTY OF LOS ANGELES)

SS.

I am a resident of the County aforesaid; I am over the age of 18 years and not a party to the within action; my business address is 630 East Foothill Boulevard, San Dimas, California 91773-9016.

On July 1, 1992, I served the within Notice of Change of Address Designation of Southern California Water Company on the Watermaster in said action, by placing a true copy there of in a sealed envelope with postage thereon prepaid, in the United States mail at San Dimas, California, addressed as follows:

San Gabriel River Watermaster
100 North Brand Boulevard
Suite 600
Glendale, CA 91203

I certify under penalty of perjury that the foregoing is true and correct.

Executed on July 1, 1992, at San Dimas, California.