

FOURTEENTH ANNUAL REPORT

OF THE

SAN GABRIEL RIVER WATERMASTER

FOR

1976-77

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

February 28, 1978

SAN GABRIEL RIVER WATERMASTER

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

WATERMASTERS
MAX BOOKMAN
M. E. SALSBURY
THOMAS M. STETSON

February 28, 1978

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

Re: Watermaster Report for 1976-77 Water Year

Gentlemen:

We have the honor of submitting the Fourteenth Annual Report of the San Gabriel River Watermaster for water year 1976-77, in accordance with the Judgment in Case No. 722647 entered September 24, 1965.

Rainfall in San Gabriel Valley during the 1976-77 water year was 78 percent of the long-time average of 18.52 inches. The ten-year average rainfall from 1967-68 through 1976-77 amounted to 15.9 inches, which, according to the Judgment, established the Lower Area Annual Entitlement at 78,700 acre-feet for 1976-77.

The principal findings of the Watermaster for the water year 1976-77 are as follows:

	<u>Acre-feet</u>
1. Lower Area Annual Entitlement	78,700
2. Usable Water received by Lower Area	70,116
3. Debit for Water Year 1976-77 (1-2)	8,584
4. Accrued Debit of Upper Area as of September 30, 1976	51,339
5. Make-up Water delivered during 1976-77	26,901
6. Accrued Debit of Upper Area as of September 30, 1977 (4-5+3)	33,022
7. Minimum Amount of Make-up Water required to be delivered prior to October 1, 1978 (1/3 of 6)	11,007

A complete summary of Watermaster findings is contained in Chapter V of this report.

The majority of the data required by the Watermaster is furnished by the Los Angeles County Flood Control District. The cooperation and assistance furnished by that district and other public agencies are gratefully acknowledged.

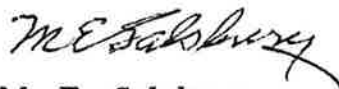
Very truly yours,

SAN GABRIEL RIVER WATERMASTER

By:



Max Bookman



M. E. Salsbury



Thomas M. Stetson

Enclosure

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CHAPTER I. ACTIVITIES OF WATERMASTER

This report covers the fourteenth 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 average of 98,415 acre-feet of Usable Water per year from the Upper Area, the area upstream of Whittier Narrows. This average annual entitlement is based on long-term average annual rainfall for the San Gabriel Valley, determined under the Judgment to be 18.52 inches. Prior Watermaster reports have 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 defendants' water rights. All operations and reports are based on the "Water Year," which is from October 1 to September 30.

Administration

The official office and depository of records of the Watermaster is at 102 North Brand Boulevard, Glendale, California, and such records are available for inspection at the request of any party.

The Watermaster budgeted \$22,000 for expenditure during the water year 1976-77. An audit of expenditures of the Watermaster for that water year was obtained. This audit was performed by the firm of R. J. Galletly, CPA. Presented in Table 1 is the Statement of Income and Expenditures for the water year 1976-77 based on Mr. Galletly's

TABLE 1
STATEMENT OF INCOME AND EXPENDITURES
FOR THE WATER YEAR 1976-77

Carried forward from year 1975-76		\$ 2,331.46
Income		20,000.00
Interest income		49.32
		<u>\$22,380.78</u>
Expenditures:		
Administrative fees and general operating expenses	\$ 2,580.30	
Collection of data, field inspections and maintenance of records	5,096.40	
Calculations and preparation of Watermaster Report for water year 1975-76	11,774.74	
Printing and reproduction costs	<u>633.61</u>	
Total expenditures		<u>20,085.05</u>
Balance		<u><u>\$ 2,295.73</u></u>

letter of January 16, 1978. His letter is presented on page A-2 of the appendix.

A tentative budget of \$22,000 for the water year 1977-78 was transmitted to the parties on July 21, 1977. After fifteen days, there being no objections thereto, the tentative budget became the final budget and is set forth in Table 2.

Data Collection

The Watermaster collects data on stream flow, rainfall, water quality, ground water levels, export of ground water through Whittier Narrows, reclaimed water, replenishment water and other information as required. The principal source of data is the Los Angeles County Flood Control District. Copies of appropriate records were obtained from the District and many conferences were held between Flood Control District personnel and Watermaster personnel in order that the Watermaster would be fully informed on the facts necessary to make 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 Central and West Basin Water Replenishment District, the Upper San Gabriel Valley Municipal Water District, the City of Pomona, the San Gabriel Valley Water Company, and the U. S. Geological Survey.

Field Inspections

On December 16, 1976, staff personnel of the Watermaster inspected water supply facilities and measuring stations in the vicinity of Whittier Narrows. On March 7, 1977, an inspection was made of all rainfall stations used by Watermaster. Other field inspections were made by Watermaster personnel throughout the year.

TABLE 2
WATERMASTER BUDGET
FOR WATER YEAR 1977-78

1.	Administrative fees of Watermaster and general operating expenses	\$ 3,000
2.	Hydrologic analyses, collection of data and field inspection	5,000
3.	Calculations and preparation of Watermaster Report for Water Year 1976-77	11,000
4.	Printing and reproduction costs	1,000
5.	Contingencies	<u>2,000</u>
	TOTAL	\$22,000
	Less estimated carry over from 1976-77	<u>2,000</u>
	To be financed for 1977-78	\$20,000

Proration for Payment Purposes

Upper San Gabriel Valley Municipal Water District,	50%	\$10,000
Central Basin Municipal Water District	41.2%	8,240
City of Long Beach	7.125%	1,425
City of Compton	1.675%	<u>335</u>
TOTAL		\$20,000

Delivery of Make-up Water

The Upper San Gabriel Valley Municipal Water District was required during the 1976-77 water year to deliver to Lower Area not less than 26,449 acre-feet of Make-up Water. A part of this requirement was satisfied by payment of \$86,758.00 to Central Basin Municipal Water District as reimbursement for 12,394 acre-feet of Reclaimed Water. In addition, the Upper District purchased 14,511 acre-feet of State and Colorado River water, which was released to stream channels for delivery to the Lower Area as Make-up Water. This water was delivered during the period of January 10, 1977 to March 2, 1977 by the Metropolitan Water District of Southern California to the San Gabriel River. The Los Angeles County Flood Control District took control of the water discharged into the river and spread it in the Lower Area. The scheduling of this delivery was coordinated through the Watermaster. The estimated evaporation loss of this water was 4 acre-feet, leaving a net surface delivery of 14,507 acre-feet and a total credit for Make-up Water delivery for the year of 26,901 acre-feet.

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 other interested parties upon request.

Stream Gaging Stations

The Los Angeles County Flood Control District 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. Except for the station on the San Gabriel River below Parkway (F263C-R), all stations utilized by the Watermaster were apparently

operating in a satisfactory manner during 1976-77. The problems noted at the Parkway station are discussed in Chapter III.

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.

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

In the event of a change in ownership of the water rights or change of address of any of the Defendants, the Judgment requires that the Watermaster shall be notified in writing of such changes along with certain specified information. The Watermaster is then required to advise all parties.

During the 1976-77 water year, the Watermaster was not advised of any change of ownership of water rights or change of address.

On February 21, 1977, the Watermaster was advised that the name of the corporation formerly known as Suburban Water Systems was changed to Southwest Suburban Water. The address remained the same and the Court and all parties were advised by letter from the Watermaster dated February 28, 1977.

CHAPTER II. LOWER AREA ANNUAL ENTITLEMENT

The Lower Area Annual Entitlement for the water year 1976-77 is based on the average annual rainfall which occurred in the 10-year period ending with water year 1976-77 and the corresponding entitlement shown in Table A of the Judgment. Four precipitation stations are utilized to determine the average annual precipitation for San Gabriel Valley. The four stations are located at San Dimas, Walnut, El Monte and Pasadena.

Precipitation during the 1976-77 water year at the four stations was as follows:

<u>Station Number</u>	<u>Location</u>	<u>Depth of Precipitation, in Inches</u>
95	114 East First Street, San Dimas	16.32
102C	19711 East Valley Blvd., Walnut	12.93
108D	3615 North Santa Anita Ave., El Monte	12.98
610B	City Hall, Pasadena	<u>15.64</u>
	Average rainfall	14.47

Table 3 presents the calculation of the 10-year average rainfall in the San Gabriel Valley for the water years 1967-68 through 1976-77.

TABLE 3
AVERAGE ANNUAL RAINFALL
IN SAN GABRIEL VALLEY
1967-68 through 1976-77

<u>Water Year</u>	<u>Rainfall, in Inches</u>
1967-68	15.0
1968-69	30.5
1969-70	11.1
1970-71	13.3
1971-72	8.5
1972-73	22.4
1973-74	16.8
1974-75	14.9
1975-76	12.1
1976-77	<u>14.5</u>
Total	159.1
10-year average	15.9

Based on the 10-year average rainfall of 15.9 inches, the Lower Area Annual Entitlement for the water year 1976-77 is 78,700 acre-feet, determined from Table A of the Judgment.

CHAPTER III. USABLE WATER

Presented in this chapter is the determination of the quantity of Usable Water Received by the Lower Area during the water year 1976-77. 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 flow, adjustments thereto as provided for in the Judgment, and estimated flows are described below.

Rio Hondo above Mission Bridge, Station F64-R

The measured flow at Station F64-R for the water year 1976-77 was 27,490 acre-feet.

Mission Creek at San Gabriel Boulevard, Station F83-R

During water year 1976-77 there was no measurable flow at Station F83-R.

Rio Hondo By-pass Channel, Station F313-R

The measured flow at Station F313-R for the water year 1976-77 was 5,638 acre-feet.

Whittier Narrows Flood Channel, Station E337-R

The Whittier Narrows Flood Channel is used to convey storm waters from the San Gabriel side of Whittier Narrows Reservoir to the Rio Hondo side. During water year 1976-77, the flow at Station E337-R was 4,039 acre-feet.

Sycamore Canyon

The determination of runoff from Sycamore Canyon, which flows through Whittier Narrows, is based on precipitation at Potrero Heights (Station 170F). Sycamore Canyon is located in the Merced Hills northwesterly of Whittier Narrows and enters the Rio Hondo below Station F64-R, Rio Hondo above Mission Bridge. During the water year 1976-77, precipitation at that station was 9.92 inches. Referring to Table 6 of Exhibit B of the Judgment, the runoff from Sycamore Canyon was determined to be 35 acre-feet.

San Gabriel River below Parkway Bridge, Station F263C-R

The flow reported at the San Gabriel River below Parkway Bridge for the 1976-77 water year was 16,275 acre-feet. The Flood Control District has experienced problems at this gaging station caused by poor communication at low flows and a high incidence of vandalism. Analyses made by Watermaster and Flood Control District personnel of daily flows indicated agreement with the exception of a 7-day period from July 1 through July 7. During that period, the recorder was not operating. It is known that during this period reclaimed water was being released to the San Gabriel River above Whittier Narrows Dam. By correlation with release of reclaimed water during June 1977, Watermaster estimates that during the 7-day period in July an additional 120 acre-feet of flow occurred at Parkway Bridge. Thus, the total flow at Parkway Bridge for the 1976-77 water year was 16,395 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 or Rio Hondo. Of the total production of 10,214 acre-feet of Reclaimed Water during the 1976-77 water year, 7,191 acre-feet was delivered to Rio Hondo. This flow was delivered below the F64-R gage and must therefore be added as Surface Flow.

The balance of the Reclaimed Water from the Whittier Narrows Plant in the amount of 3,023 acre-feet was delivered to the San Gabriel River and accounted for in the flows at Parkway Bridge.

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

Prior to November of 1972, all reclaimed water delivered to the San Gabriel River was delivered above the gaging station near Parkway Bridge. In November of 1972, the Central and West Basin Water Replenishment District began purchasing and taking delivery of treated effluent from the San Jose Creek Water Reclamation Plant.

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. Treated effluent from this plant is carried in a pipeline which generally parallels the San Gabriel River to a point south of Florence Avenue where the effluent 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 pipeline so that reclaimed water can be delivered to either the San Gabriel River Spreading Grounds or the unlined portion of the San Gabriel River for ground water recharge.

During the 1976-77 water year, 12,705 acre-feet of reclaimed water from the San Jose Creek Water Reclamation Plant was delivered to the Spreading Grounds or unlined portion of the river for replenishment purposes. The water is metered by use of a propeller meter in the turnout facility. The balance of the treated effluent was delivered to the lined channel of the San Gabriel River and was not used for ground water replenishment. The amount of reclaimed water delivered for ground water replenishment has been included as Surface Flow but is deducted in calculating Usable Water.

Summary of Surface Flow

A total of 73,493 acre-feet of surface water flowed through Whittier Narrows during the water year 1976-77. Table 4 shows the components and the total Surface Flow.

TABLE 4
SUMMARY OF SURFACE FLOW THROUGH WHITTIER NARROWS
FOR WATER YEAR 1976-77

	<u>Amount in acre-feet</u>
Rio Hondo above Mission Bridge, Station F64-R	27,490
Mission Creek at San Gabriel Boulevard, Station F83-R	0
Rio Hondo By-pass Channel, Station F313-R	5,638
Whittier Narrows Flood Channel, Station E337-R	4,039
Sycamore Canyon	35
San Gabriel River at Parkway Bridge, Station F263C-R	16,395
Reclaimed Water from Whittier Narrows Plant Delivered to Rio Hondo below Station F64-R	7,191
Reclaimed Water from San Jose Plant Delivered to San Gabriel River below Station F263C-R	<u>12,705</u>
Total Surface Flow	73,493

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 levels 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 calculations of Subsurface Flow for the water year 1976-77 which amounted to 31,700 acre-feet.

<u>Time</u>	<u>Subsurface Flow in acre-feet</u>
Spring 1975	28,200
Fall 1975	24,300
Spring 1976	31,800
Fall 1976	35,600
Spring 1977	39,600
Fall 1977	<u>30,900</u>
Subsurface Flow 1976-77	31,700

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 water year 1976-77, 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 total export for each of the four exporters in water year 1976-77, as shown by reports filed with the Main San Gabriel Basin Watermaster, is shown below.

<u>Exporter</u>	<u>Export to Lower Area in acre-feet</u>
California Domestic Water Company	15,125
San Gabriel Valley Water Company	1,560
Southwest Suburban Water	9,196
City of Whittier	<u>7,507</u>
Total	33,388

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 replenishment water from The Metropolitan Water District of Southern California. This imported water may be delivered at four connections: (1) San Gabriel River below Ramona Boulevard (M335-R), (2) Alhambra Wash (M340-R), (3) Live Oak Wash (F311-R), and (4) a connection on the Foothill Feeder at San Dimas Wash (M382-R). All connections are metered and delivered amounts are recorded by the Metropolitan Water District. During water year 1976-77, the amount of imported water purchased for replenishment by or on behalf of the Lower Area Parties was 3,727 acre-feet delivered at San Dimas Wash (M382-R), and 12,513 acre-feet delivered at San Gabriel River below Ramona Boulevard. This is in addition to water purchased by the Upper Area for delivery as Make-up Water which is discussed in a later section of this chapter.

As reported in the Thirteenth Annual Report, in May of 1976 a test of the Live Oak Wash (F311-R) connection was made. During the test 38 acre-feet of imported water was released through the connection and was paid for by the Lower Area as replenishment water. This water was placed in storage in Puddingstone Reservoir and was in storage at the end of the 1975-76 water year. The Flood Control District did not want to release the water from Puddingstone Reservoir until it could be released with storm waters. The Flood Control District released the 38 acre-feet of water along with stored storm water from May 10 through May 13, 1977. This water flowed to the Lower Area and was spread. Thus, the total delivery of Lower Area Replenishment Water was 16,278 acre-feet.

Provision is made in the Judgment for the deduction of evaporation losses upstream of Whittier Narrows from releases of replenishment water. The calculated amount of evaporation during the 1976-77 water year was 29 acre-feet for the San Dimas Wash releases, 10 acre-feet for the San Gabriel River releases, and 0 acre-feet for the Puddingstone releases for a total calculated amount of evaporation of 39 acre-feet for the Lower Area.

The net amount of Lower Area Replenishment water after deducting evaporation losses amounted to 16,239 acre-feet.

Reclaimed Water

During 1976-77 Reclaimed Water used for replenishment of the Montebello Forebay came from three separate treatment plants, each of which is operated by the Los Angeles County Sanitation Districts.

Whittier Narrows Water Reclamation Plant

The total amount of Reclaimed Water produced at the Whittier Narrows Water Reclamation Plant during 1976-77 was 10,214 acre-feet. During storm periods, 56 acre-feet of such reclaimed water delivered to the Rio Hondo or San Gabriel River was included in the outflow from the Montebello Forebay. Therefore, a total of 10,158 acre-feet of such reclaimed water was spread in the Montebello Forebay during 1976-77.

Pomona Water Reclamation Plant

County Sanitation District No. 21 owns and operates a sewage treatment and water reclamation plant near the City of Pomona. A portion of the reclaimed water is sold for agricultural, landscaping and other uses. During 1976-77, 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. A study was conducted in water year 1975-76 to verify the factors utilized in determining the portion of Pomona Plant effluent generated in San Gabriel Valley. As a result of the study, it was concluded that the factors had not changed from those developed for the Fifth Annual Watermaster Report.

The total production at the Pomona Water Reclamation Plant during the 1976-77 water year was 7,895 acre-feet. The total sales were 1,294 acre-feet, resulting in 6,601 acre-feet of reclaimed water discharged to San Jose Creek. Of this quantity, 5,203 acre-feet percolated and commingled with ground water in the San Gabriel Valley above Whittier Narrows. In addition, 203 acre-feet wasted to the ocean leaving 1,195 acre-feet as the net amount percolated in the Montebello Forebay. The portion of this Reclaimed Water which was generated in the watershed of the San Gabriel River system was calculated to be 657 acre-feet.

San Jose Creek Water Reclamation Plant

As discussed earlier in this chapter, the Central and West Basin Water Replenishment District purchases reclaimed water from the San Jose Creek Water Reclamation Plant. During the 1976-77 water year, 12,705 acre-feet of Reclaimed Water from the San Jose Creek Water Reclamation Plant was delivered to the Lower Area for replenishment. The total plant production in 1976-77 was approximately 32,600 acre-feet. The portion not diverted for replenishment entered the San Gabriel River below Florence Avenue where the San Gabriel River is a lined channel.

Summary of Reclaimed Water

The total amount of reclaimed water which should be deducted from the inflow is 23,520 acre-feet for the water year 1976-77. This is comprised of 10,158 acre-feet from the Whittier Narrows Water Reclamation Plant, 657 acre-feet from the Pomona Water Reclamation Plant which originated within the San Gabriel River Watershed, and 12,705 acre-feet from the San Jose Creek Water Reclamation Plant.

Make-up Water by Surface Flow Delivery

During 1976-77, the Upper Area purchased 14,511 acre-feet of Metropolitan Water District replenishment water for delivery to the Lower Area as Make-up Water. This water was delivered from Metropolitan's Middle Feeder to Alhambra Wash. The evaporation of Make-up Water was determined to be 4 acre-feet, resulting in a net delivery of Make-up Water of 14,507 acre-feet from that source.

Recirculation of Measured Water

During the water year 1976-77, there was no recirculation of measured water as defined in Paragraph 3 (1) (6) of the Judgment.

Unusable Surface Flow

The water from San Gabriel Valley which flows past Montebello Forebay 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 F262B-R. This surface outflow may be comprised of water from the San Gabriel Valley and of local storm water which enters the channels downstream of Whittier Narrows.

During water year 1976-77, measured surface outflow from the Montebello Forebay in the Rio Hondo at Station F45B-R was 5,020 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 opened 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. It was determined that the Local Storm Outflow was 2,910 acre-feet and the Unusable Surface Flow in the Rio Hondo was 2,110 acre-feet. The total amount of Local Storm Inflow was calculated to be 2,940 acre-feet.

The total flow of the San Gabriel River at Florence Avenue, Station F262B-R, was measured to be 3,171 acre-feet. This flow consisted of Local Storm Inflow through storm drains located in the Montebello Forebay and of water from the San Gabriel Valley. The Local Storm Inflow was calculated to be 1,685 acre-feet based on a correlation with the Montebello Storm Drain.

The gaging station at Florence Avenue has been relocated upstream at a distance of 1,400 feet from the location used in the Judgment. An adjustment in the surface outflow calculations has been made by the Watermaster to allow for infiltration in the 1,400 feet of channel between the present location of the station and the original location. Analyses of daily flows, in accordance with provisions in the Judgment (along with an adjustment to allow for the moving of the gaging station), indicated a total outflow from the Montebello Forebay in the San Gabriel River of San Gabriel Valley water in the amount of 2,096 acre-feet during 1976-77.

The total Unusable Surface Flow passing through the Montebello Forebay in the Rio Hondo and San Gabriel River in water year 1976-77 was 4,206 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, Recirculation of Measured Water and Unusable Surface Flow. Table 5 presents the determination of Usable Water for water year 1976-77.

TABLE 5
USABLE WATER FOR WATER YEAR 1976-77

<u>Item</u>	<u>Amount in acre-feet</u>
Surface Flow	73,493
Subsurface Flow	31,700
Export to Lower Area	<u>23,395</u>
Subtotal of inflow	128,588
Less:	
Lower Area Replenishment Water	16,239
Reclaimed Water	23,520
Make-up Water by Surface Flow Delivery	14,507
Recirculation of Measured Water	0
Unusable Surface Flow	<u>4,206</u>
Subtotal	58,472
Usuable Water	70,116

Quality of Water Supply

The Judgment (Exhibit B, Section IV. E) provides that the Water-master 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, Los Angeles County Sanitation Districts, Los Angeles County Flood Control District, and the Metropolitan Water District. Table 6 is illustrative of the quality of the different sources of water supply.

TABLE 6

MINERAL ANALYSES REPRESENTATIVE OF SOURCES
OF WATER PASSING THROUGH WHITTIER NARROWS
WATER YEAR 1976-77

	Untreated State Project Water ^(a)	Untreated Colorado River Water ^(c)	Whittier Narrows Water Recla- mation Plant	San Jose Creek Water Recla- mation Plant	Pomona Water Recla- mation Plant	Storm Flow ^(g)	Sub- surface Flow ^(h)
Date	2-11-77	2-1-77	5-2-77	5-2-77	5-9-77	1-6-77	3-8-77
pH	8.49	8.30				7.0	7.7
EC x 10 ⁶	585	1,090	1,100	1,210	1,040	176	535
<u>CATIONS, mg/l</u>							
Calcium	23	82	48	61	50	18.3	36.0
Magnesium	17.0	31.0	16	17	12	1.8	1.7
Sodium	67	108	109	141	97		39.0
Potassium	3.2	4.7	11	12	10		9.0
<u>ANIONS, mg/l</u>							
Carbonate	5	0					0
Bicarbonate	100	154	306	293	251		168
Sulfate	47	299	101	94	93		30.0
Chloride	94	96	85	135	100		48.0
Nitrate as NO ₃	1.1	0.2	2.7	18.1	8.4	5.4	0.2
Fluoride	0.12	0.35	0.98	0.46	0.54		0.5
Total dissolved solids	321 ^(b)	709 ^(b)	567 ^(e)	705 ^(d)	527 ^(d)		249 ⁽ⁱ⁾
Total hardness as CaCO ₃	127	332	190	230	185	53	98
Boron	0.19	0.14	0.89	0.91	0.59		0.1 ^(f)
<u>TRACE CONSTITUENTS, mg/l</u>							
Arsenic	0.002 ^(f)	0.003	0.002	0.002	0.002	0.004 ^(f)	0.005
Barium	0.042	0.082	0.12	0.14	0.10	0.02	0.10
Cadmium	0.0001 ^(f)	0.0001 ^(f)	0.001	0.003	0.001	0.004	0.003
Chromium, Total	0.0003	0.0003	0.01	0.02	0.02	0.144	0.01 ^(f)
Lead	0.002	0.0001 ^(f)	0.03	0.05	0.01 ^(f)	0.128	0.02
Mercury	0.0002 ^(f)	0.0002 ^(f)	0.0001 ^(f)	0.0001 ^(f)	0.0001 ^(f)	0.00036 ^(f)	0.0001 ^(f)
Selenium			0.002 ^(f)	0.003	0.002 ^(f)	0.0004 ^(f)	0.001
Silver	0.002 ^(f)	0.002 ^(f)	0.002	0.001 ^(f)	0.001 ^(f)	0.002	0.001 ^(f)
<u>NUTRIENTS as N, mg/l</u>							
Ammonia			20.0	6.7	14.7		0.08 ^(f)
Nitrate			1.58	0.626	3.22		0.014
Organic Nitrogen			1.6	1.7	1.0		0.00

(a) Sampled at Lake Silverwood. Trace analyses reported are first quarter averages.

(b) By summation, including one-half of bicarbonates plus silica.

(c) Sampled at Lake Mathews. Trace analyses reported are first quarter averages.

(d) By evaporation at 180°C.

(e) By evaporation at 103°C.

(f) Actual amount is less than value shown.

(g) At Rio Hondo Headworks.

(h) Well No. 25/11W-5G4 (LACFCD no. 2947U as shown on Plate 2). Sample for trace analyses taken in September 1977.

(i) By summation, including one half of bicarbonates.

CHAPTER IV. ACCRUED DEBIT OR CREDIT, MAKE-UP WATER AND LONG-TERM ACCOUNTING

Under 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 District to deliver Make-up Water during the ensuing water year.

The Judgment also requires a long-term accounting each 15 to 25 years. Data to assist in such long-term accounting are presented in this chapter. These findings are presented together with a summary of operations which include Usable Water received, Annual Entitlement, Accrued Debit or Credit and Make-up Water deliveries for each year since the effective date of the Judgment.

Delivery of Make-up Water during 1976-77

By letter dated October 1, 1976, the Upper San Gabriel Valley Municipal Water District requested of Central Basin Municipal Water District a statement of the total number of acre-feet of reclaimed water purchased and the cost thereof for the 1975-76 water year. By an amended letter dated February 1, 1977, Central Basin Municipal Water District advised Upper District of the purchase of Reclaimed Water during 1975-76. Copies of those letters are included in the appendix to this report.

The Upper District elected to pay Central Municipal for reclaimed water. Accordingly, prior to October 1, 1977, the Upper District reimbursed Central Municipal in the amount of \$86,758 for 12,394 acre-feet at \$7 per acre-foot.

In addition to the delivery of reclaimed water as Make-up Water, the Upper Area made a direct surface delivery of replenishment water. During the months of January, February and March 1977, the Upper Area purchased 14,511 acre-feet of replenishment water from the Metropolitan Water District and made deliveries thereof to the Alhambra Wash. As

indicated earlier, it was determined that 4 acre-feet of this water evaporated leaving a net delivery of Make-up Water by direct surface delivery of 14,507 acre-feet.

The total amount of Make-up Water delivered by the Upper District during 1976-77 was 26,901 acre-feet.

Adjustment of Prior Year Determinations

At the time the Watermaster reports are prepared, final published figures on stream flow measurements for the water year are not available. Therefore, the Watermaster has adopted a procedure of adjusting previous findings, if required, when final published figures become available.

Most data utilized by Watermaster are compiled by the Los Angeles County Flood Control District and are subsequently published.

Adjustment for 1974-75

In the Thirteenth Annual Report, two adjustments were made in information for water year 1974-75. After the issuance of the Thirteenth Annual Report, the Los Angeles County Flood Control District published its Hydrologic Report for 1974-75. Review of that report indicates that all numbers reported agree with those in the Watermaster report except as discussed following.

Rainfall measurements at San Dimas (Station 95) have been revised to 15.91 inches instead of the 15.96 inches used in the Thirteenth Annual Report. While this change does not affect the determination of the Annual Entitlement, it will have an effect on the long-term accounting by changing the previously reported 14.89 inches of average rainfall to 14.88 inches. The annual rainfall for 1974-75 is therefore corrected to 14.88 inches in Table 9 of the Fourteenth Annual Report.

The Flood Control District revised the flow of Rio Hondo at Mission Bridge (Station F64-R) to 15,990 acre-feet from the 16,000 acre-feet

presented in the Thirteenth Annual Report. It also revised the flow of the San Gabriel River below Parkway Bridge (Station F263C-R) from 38,070 acre-feet to 38,190 acre-feet. The greatest portion of this latter change was a revision of the flow for March 6, 1976 from 497 cfs to 546 cfs. The foregoing adjustments are reflected in Table 7, Revised Summary of Findings for Water Year 1974-75.

Adjustment for 1975-76

The Flood Control District has not published its report on hydrologic data for 1975-76. The only adjustment required at this time is in the Accrued Debit of the Upper Area as of September 30, 1976 as affected by the adjustments for 1974-75 as shown in Table 7. Thus, the Accrued Debit as of September 30, 1975 is revised from 37,673 to 37,563 acre-feet and the Accrued Debit as of September 30, 1976 is revised from 51,449 to 51,339 acre-feet. When published data are available for 1975-76, a comparison of the data published by the Watermaster will be reviewed and any necessary revisions will be made.

Accrued Debit as of September 30, 1977

The Lower Area Annual Entitlement as heretofore determined for 1976-77 was 78,700 acre-feet. The Usable Water received was 70,116 acre-feet, which results in a debit for the water year of 8,584 acre-feet. The Accrued Debit as of September 30, 1977 is the summation of the Accrued Debit as of September 30, 1976, 51,339 acre-feet less the credit for Make-up Water of 26,901 acre-feet, plus the debit of 8,584 acre-feet for 1976-77, or 33,022 acre-feet.

TABLE 7
REVISED
SUMMARY OF FINDINGS
FOR WATER YEAR 1974-75*

	<u>Quantities in Acre-feet</u>	
1. Rainfall 1974-75, (14.89) 14.88 inches		
2. 10-year average rainfall, 17.7 inches		
3. Lower Area Annual Entitlement		92,500
4. Surface Flow through Whittier Narrows (112,673)	112,783	
5. Subsurface Flow through Whittier Narrows	25,600	
6. Water exported through Whittier Narrows	23,395	
7. Total flow through Whittier Narrows (161,668)	161,778	
8. Lower Area Replenishment Water (70,269)	71,359	
9. Reclaimed Water	24,511	
10. Make-up Water (Surface Flow delivery)	0	
11. Recirculation of Measured Water	0	
12. Unusable Surface Flow (8,570)	7,129	
13. Usable Water received by Lower Area (58,318)		58,779
14. Debit for water year 1974-75 (34,182)		33,721
15. Accrued Debit of Upper Area as of September 30, 1974		6,676
16. Amount of Make-up Water Delivered during water year 1974-75		
Payment for Reclaimed Water	2,834	2,834
Surface Flow Delivery	0	0
Total		2,834
17. Adjusted Accrued Debit of Upper Area as of September 30, 1974		3,842
18. Accrued Debit of Upper Area as of September 30, 1975 (38,024)		37,563

*Quantities in 1974-75 Watermaster report shown in parentheses.

Requirement for Make-up Water for 1977-78

In accordance with the provisions of the Judgment, Make-up Water amounting to at least one-third of the Accrued Debit, plus that portion of the remaining Accrued Debit, if any, in excess of 25,000 acre-feet, must be delivered during water year 1977-78. Therefore, Upper District must deliver a minimum of 11,007 acre-feet of Make-up Water to the Lower Area prior to October 1, 1978.

CHAPTER V. SUMMARY OF FINDINGS
FOR WATER YEAR 1976-77

The Watermaster has made determinations as required in the Judgment and finds for the water year 1976-77 as follows:

1. Rainfall 1976-77, 14.47 inches		
2. 10-year average rainfall, 15.9 inches		
3. Lower Area Annual Entitlement		78,700
4. Surface Flow through Whittier Narrows	73,493	
5. Subsurface Flow through Whittier Narrows	31,700	
6. Water exported through Whittier Narrows	23,395	
7. Total flow through Whittier Narrows	128,588	
8. Lower Area Replenishment Water	16,239	
9. Reclaimed Water	23,520	
10. Make-up Water (Surface Flow delivery)	14,507	
11. Recirculation of Measured Water	0	
12. Unusable Surface Flow	4,206	
13. Usable Water received by Lower Area	70,116	
14. Debit for water year 1976-77	8,584	
15. Accrued Debit of Upper Area as of September 30, 1976		51,339
16. Amount of Make-up Water delivered during water year 1976-77		
a. Payment for Reclaimed Water	12,394	12,394
b. Surface flow delivery	14,507	<u>14,507</u>
Total		26,901
17. Adjusted Accrued Debit of Upper Area as of September 30, 1976		24,438
18. Accrued Debit of Upper Area as of September 30, 1977		33,022

CHAPTER VI. SUMMARY OF OPERATIONS AND LONG-TERM ACCOUNTING

Table 8 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 since the effective date of the Judgment.

The Watermaster is required from time to time, but not sooner than 15 years nor more than 25 years after September 30, 1963, to make a Long-term Accounting of the aggregate amount of Usable Water and Make-up Water received by the Lower Area. 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 multiplied by the number of years in the period and then adjusted by the ratio of the average annual rainfall for the period to 18.52 inches. A summary of items which will, in the future, be needed for Long-term Accounting is presented in Table 9.

TABLE 8
SUMMARY OF OPERATIONS UNDER JUDGMENT
(In acre-feet)

<u>Water Year</u>	<u>Entitlement</u>	<u>Water received by Lower Area*</u>			<u>Accrued Credit(+) or Debit(-)</u>
		<u>Usable</u>	<u>Make-up</u>	<u>Total</u>	
1963-64	67,200	40,975	0	40,975	-26,225
1964-65	68,000	34,741	13,257	47,998	-46,227
1965-66	70,300	71,272	21,017	92,289	-24,238
1966-67	78,700	80,653	14,735	95,388	- 7,550
1967-68	67,200	61,728	7,425	69,153	- 5,597
1968-69	84,000	162,228	5,597	167,825	+78,228
1969-70	84,000	86,761	0	86,761	+80,989
1970-71	90,200	71,922	0	71,922	+62,711
1971-72	79,500	53,869	0	53,869	+37,080
1972-73	87,100	78,475	0	78,475	+28,455
1973-74	92,500	57,369	0	57,369	- 6,676
1974-75	92,500	58,779	2,834	61,613	-37,563
1975-76	87,100	58,687	14,637	73,324	-51,339
1976-77	<u>78,700</u>	<u>70,116</u>	<u>26,901</u>	<u>97,017</u>	<u>-33,022</u>
Fourteen year Totals	1,127,000	987,575	106,403	1,093,978	-33,022

*Includes only Upper Area obligation under Judgment.

TABLE 9
DATA FOR LONG-TERM ACCOUNTING

: Rainfall, in inches:						
: Accumu-:			Water Received by Lower Area,			
: lated :			in acre-feet			
: Average :			:	:	:	Accumu-
Water :	Annual :	Annual :	:	:	:	lated
Year :	Amount:	Amount :	Usable :	Make-up :	Total :	Total
1963-63	9.45	9.45	40,975	0	40,975	40,975
1964-65	15.24	12.34	34,741	13,257	47,998	88,973
1965-66	19.61	14.77	71,272	21,017	92,289	181,262
1966-67	25.03	17.33	80,653	14,735	95,388	276,650
1967-68	15.03	16.87	61,728	7,425	69,153	345,803
1968-69	30.50	19.14	162,228	5,597	167,825	513,628
1969-70	11.06	17.99	86,761	0	86,761	600,389
1970-71	13.27	17.40	71,922	0	71,922	672,311
1971-72	8.53	16.41	53,869	0	53,869	726,180
1972-73	22.38	17.01	78,475	0	78,475	804,655
1973-74	16.80	16.99	57,369	0	57,369	862,024
1974-75	14.88	16.82	58,779	2,834	61,613	923,637
1975-76	12.07	16.45	58,687	14,637	73,324	996,961
1976-77	14.47	16.31	70,116	26,901	97,017	1,093,978

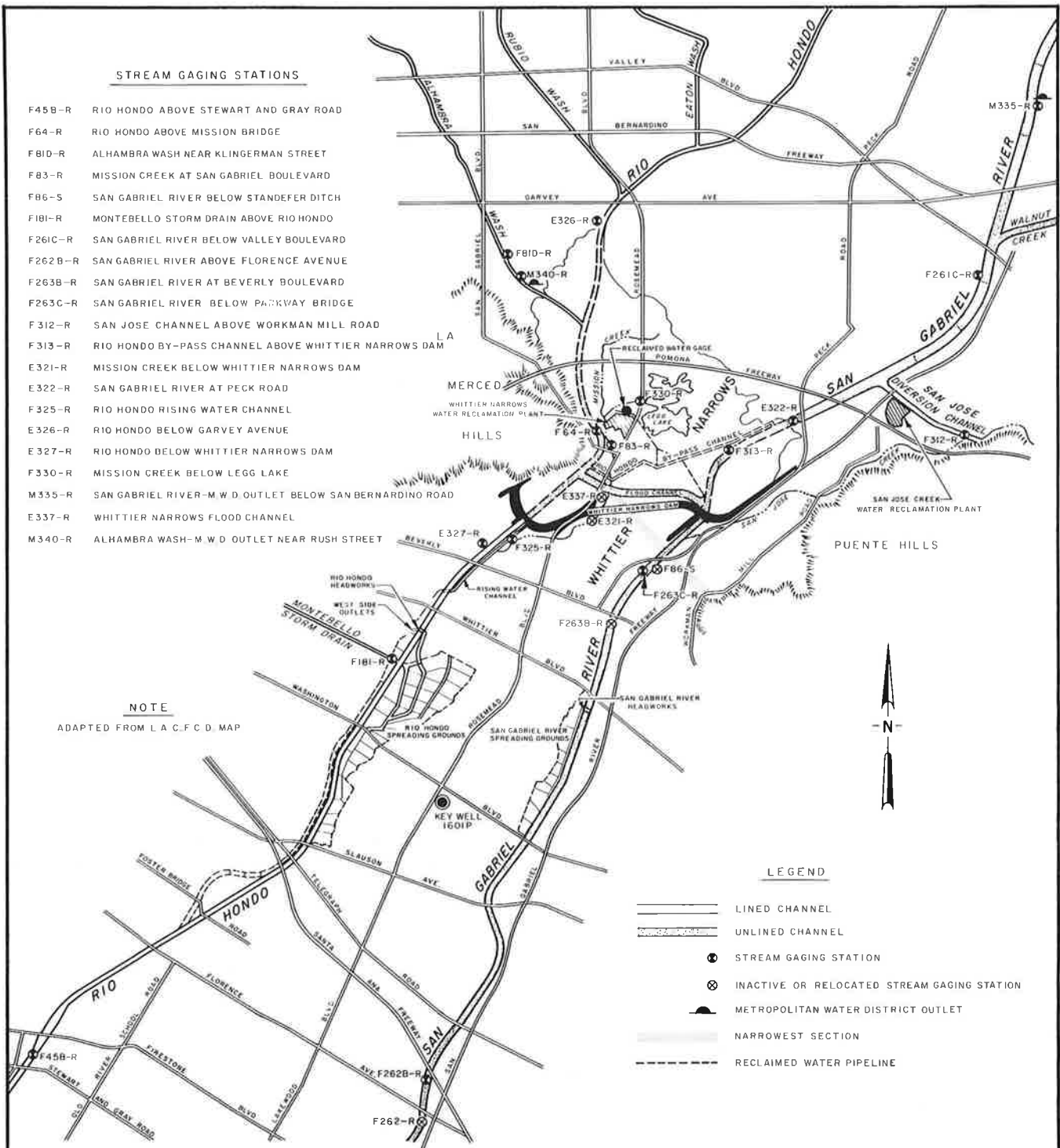
Thus far under the Watermaster operation, rainfall has averaged 16.31 inches for the fourteen-year period. The Lower Area has received under the Judgment 1,093,978 acre-feet, which is an average for the fourteen-year period of 78,140 acre-feet per year.

STREAM GAGING STATIONS

- F45B-R RIO HONDO ABOVE STEWART AND GRAY ROAD
- F64-R RIO HONDO ABOVE MISSION BRIDGE
- F81D-R ALHAMBRA WASH NEAR KLINGERMANN STREET
- F83-R MISSION CREEK AT SAN GABRIEL BOULEVARD
- F86-S SAN GABRIEL RIVER BELOW STANDEFER DITCH
- F181-R MONTEBELLO STORM DRAIN ABOVE RIO HONDO
- F261C-R SAN GABRIEL RIVER BELOW VALLEY BOULEVARD
- F262B-R SAN GABRIEL RIVER ABOVE FLORENCE AVENUE
- F263B-R SAN GABRIEL RIVER AT BEVERLY BOULEVARD
- F263C-R SAN GABRIEL RIVER BELOW PARKWAY BRIDGE
- F312-R SAN JOSE CHANNEL ABOVE WORKMAN MILL ROAD
- F313-R RIO HONDO BY-PASS CHANNEL ABOVE WHITTIER NARROWS DAM
- E321-R MISSION CREEK BELOW WHITTIER NARROWS DAM
- E322-R SAN GABRIEL RIVER AT PECK ROAD
- F325-R RIO HONDO RISING WATER CHANNEL
- E326-R RIO HONDO BELOW GARVEY AVENUE
- E327-R RIO HONDO BELOW WHITTIER NARROWS DAM
- F330-R MISSION CREEK BELOW LEGG LAKE
- M335-R SAN GABRIEL RIVER-M.W.D. OUTLET BELOW SAN BERNARDINO ROAD
- E337-R WHITTIER NARROWS FLOOD CHANNEL
- M340-R ALHAMBRA WASH-M.W.D. OUTLET NEAR RUSH STREET

NOTE

ADAPTED FROM L.A.C.F.C.D. MAP



LEGEND

- LINED CHANNEL
- - - UNLINED CHANNEL
- STREAM GAGING STATION
- ⊗ INACTIVE OR RELOCATED STREAM GAGING STATION
- ▲ METROPOLITAN WATER DISTRICT OUTLET
- NARROWEST SECTION
- - - RECLAIMED WATER PIPELINE

SAN GABRIEL RIVER WATERMASTER

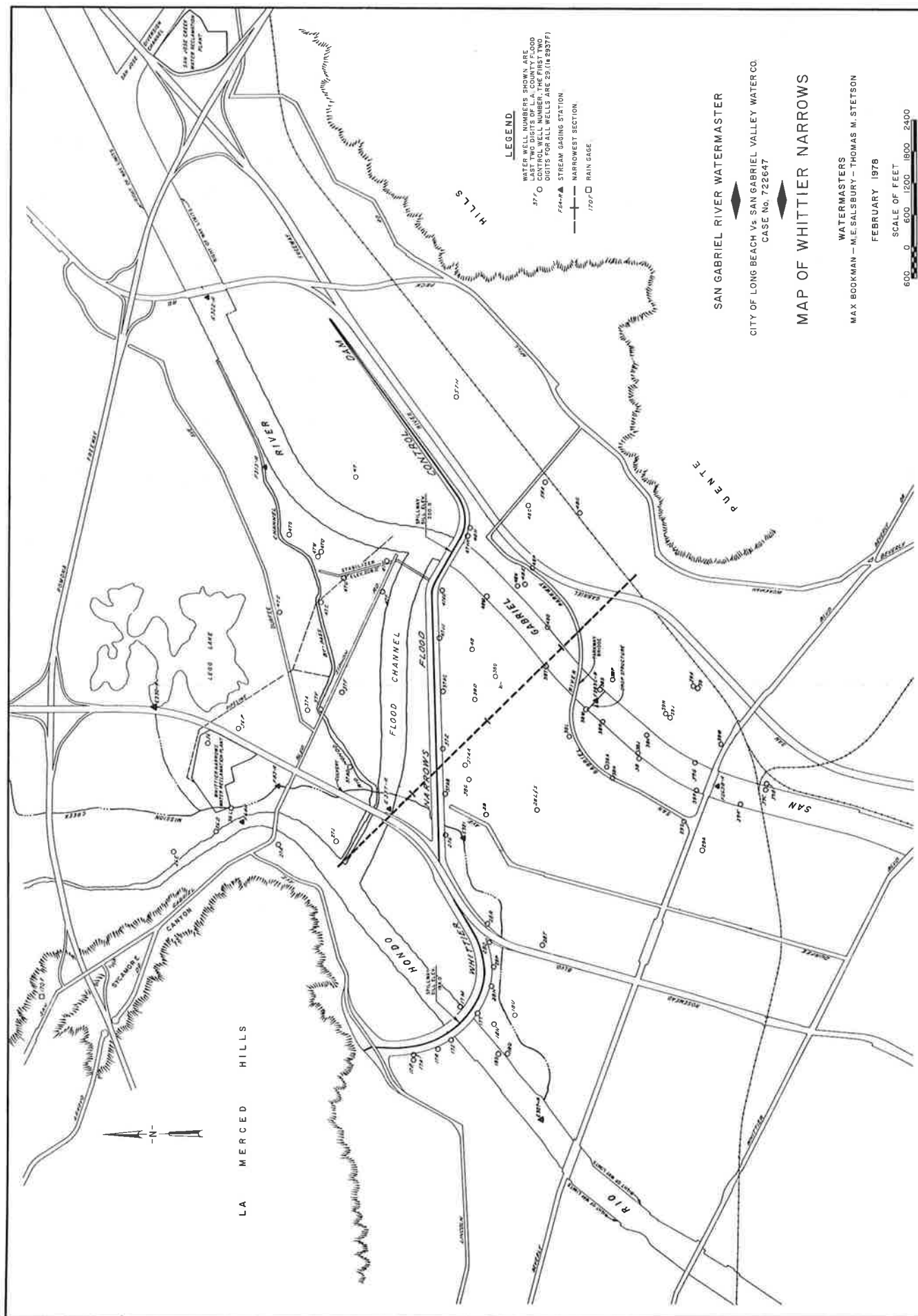
CITY OF LONG BEACH Vs. SAN GABRIEL VALLEY WATER CO.
CASE No. 722647

STREAM GAGING STATIONS
RIO HONDO - SAN GABRIEL RIVER SYSTEM

WATERMASTERS
MAX BOOKMAN - M.E. SALSBURY - THOMAS M. STETSON

FEBRUARY 1978

SCALE OF FEET
4000 0 4000 8000



APPENDIX

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

Plaintiffs

Board of Water Commissioners
of the City of Long Beach
Central Basin Municipal Water District
City of Compton

Defendants

San Gabriel Valley Water Company (also includes by merger
Vallecito Water Company)
Azusa Agricultural Water Company
Azusa Valley Water Company
California Cities Water Company
California-American Water Company, (successor to
California Water and Telephone Company)
Covina Irrigation Company
Cross Water Company
East Pasadena Water Company, Ltd.
Glendora Irrigation Company (now City of Glendora)
Southern California Water Company
Southwest Suburban Water (formerly known as Suburban
Water Systems)
Sunny Slope Water Company
City of Alhambra
City of Arcadia
City of Azusa
City of Covina
City of El Monte
City of Glendora
City of Monrovia
City of Monterey Park
City of South Pasadena
San Gabriel County Water District
Valley County Water District (formerly known as
Baldwin Park County Water District)

Intervenors

Upper San Gabriel Valley Municipal Water District
California Domestic Water Company

R. J. GALLETTY
CERTIFIED PUBLIC ACCOUNTANT
GLENDALE FEDERAL SAVINGS & LOAN BUILDING
401 NORTH BRAND BOULEVARD
GLENDALE 3, CALIFORNIA
CHAPMAN 5-2402

January 16, 1978

San Gabriel River Watermaster
Security Building
102 North Brand Boulevard
Glendale, California, 91203

In our opinion the accompanying statement of Income and Expenditures for the San Gabriel River Watermaster for the water year 1976 - 1977 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.



R. J. Galletly
Certified Public Accountant

SAN GABRIEL RIVER WATERMASTER
Statement of Income and Expenditures
For the Water Year 1976 - 1977

Carried forward from year 1975 - 1976		\$ 2,331.46
Income		20,000.00
Interest income		<u>49.32</u>
		22,380.78
Expenditures		
Administrative fees and general operating expenses	\$ 2,580.30	
Collection of data, field inspections and maintenance of records	5,096.40	
Calculations and preparation of Watermaster Reports for water years 1975 - 1976	11,774.74	
Printing and reproduction costs	<u>633.61</u>	
Total expenditures		<u>20,085.05</u>
Balance		\$ <u><u>2,295.73</u></u>



UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT

11310 Valley Boulevard

El Monte, California 91731

(213) 443-2297 — (213) 283-2400

Directors: Burton E. Jones, President • Conrad T. Reibold, Vice-President • Alfred W. Jorgensen, Sec'y-Treas. • Howard H. Hawkins • Travis L. Manning

October 1, 1976

Board of Directors
Central Basin Municipal Water District
7439 E. Florence Avenue
Downey, California 90240

Gentlemen

In accordance with provisions of Paragraph 5 (i) (2) of the judgment in the Long Beach Case, will you please furnish a statement as to the total number of acre feet of reclaimed water purchased and the cost per acre foot therefor, for the water year commencing October 1, 1975.

Frances L. Fiske

Frances L. Fiske
Deputy Secretary

CC: San Gabriel River Watermaster

DIRECTORS

Milo Dellmann
President

Claire S. Thompson, Jr.
Vice President

Frank H. Wheelock
Treasurer

Thomas W. Bewley
Leonis C. Malburg

Ralph B. Helm
Attorney



STAFF

John G. Joham, Jr.
Secretary

Charles D. Millam, Jr.
Asst. to the Secretary

Margaret Rutherford
Deputy Secretary

Gwendolyn Bebensee
Deputy Secretary

February 1, 1977

Board of Directors
Upper San Gabriel Valley
Municipal Water District
11310 Valley Boulevard
El Monte, CA 91713

JUDGMENT IN LONG BEACH CASE

We are transmitting amended corrected statement of the acre feet of reclaimed water purchased from the Whittier Narrows Water Reclamation plant for the water year commenced October 1, 1975, as follows:

October 1, 1975 through September 30, 1976

12,394.3 acre feet @ \$7 per acre foot

Margaret Rutherford
Deputy Secretary

cc: Max Bookman, Watermaster
M.E. Salsbury, Watermaster
Thomas M. Stetson, Watermaster