

SEVENTH ANNUAL REPORT

OF THE

SAN GABRIEL RIVER WATERMASTER

FOR

1969-70

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

February 26, 1971

SAN GABRIEL RIVER WATERMASTER

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

February 26, 1971

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

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

Re: Watermaster Report for 1969-70 Water Year

Gentlemen:

We have the honor of submitting the seventh annual report of the San Gabriel River Watermaster, for the water year 1969-70, in accordance with the Judgment in Case No. 722647, entered September 24, 1965.

Rainfall in San Gabriel Valley during the 1969-70 water year was only 60 percent of the longtime average. In spite of this less than average rainfall, the Usable Water received by the Lower Area for the 1969-70 water year was 2,761 acre-feet greater than its Annual Entitlement. The amount of Usable Water received was the second largest since Watermaster service began in 1963-64. The amount of Usable Water exceeded that of 1966-67, a year in which rainfall was 135 percent of the average.

The annual runoff at Whittier Narrows for the water year 1969-70 reflected the increased amounts of rising water resulting from the unusually large amount of runoff to the San Gabriel Valley received in 1968-69.

The principal Watermaster findings for the water year 1969-70 are as follow:

	<u>Acre-feet</u>
Lower Area Annual Entitlement	84,000
Usable Water Received by Lower Area	86,761
Accrued Credit of Upper Area as of September 30, 1970	80,989

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

Clerk of Superior Court of
Los Angeles County and
All Parties

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February 26, 1971

We again gratefully acknowledge the cooperation and data furnished by the Los Angeles County Flood Control District and others.

Very truly yours,

SAN GABRIEL RIVER WATERMASTER

By:

Max Bookman
Max Bookman

M. E. Salsbury
M. E. Salsbury

Thomas M. Stetson
Thomas M. Stetson

Encl.

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CHAPTER I. INTRODUCTION

The natural water supply of the San Gabriel River in Los Angeles County, similar to conditions which prevail throughout Southern California, is inadequate to meet the water needs. As part of the solution to this problem, the entitlement to water for use in the coastal portion of the watershed had to be established. This was accomplished when the Court issued a Judgment which contains a declaration of rights and a physical solution. The Court also appointed the San Gabriel River Watermaster to administer and enforce the provisions of the Judgment.

The Judgment referred to above was entered September 24, 1965 and made effective as of October 1, 1963 in the case of City of Long Beach, et al., v. San Gabriel Valley Water Co., et al, (Case No. 722647). This case, hereinafter referred to as the Long Beach Case, divided the water supply of the San Gabriel River between the San Gabriel Valley (called the Upper Area) located upstream of Whittier Narrows and the coastal plain (called the Lower Area) located downstream of Whittier Narrows. It was stipulated in the Judgment that the Lower Area was entitled to receive an average annual usable supply of 98,415 acre-feet, corresponding to an average rainfall in the Upper Area of 18.52 inches per year.

Since annual rainfall varies widely, the Judgment included, for operational purposes, a formula for determining the annual entitlement of the Lower Area to usable supply. Under this formula, the annual entitlement each year depends on the ratio of (1) the average annual rainfall in San Gabriel Valley during the ten years ending with the year for which the entitlement is calculated to (2) the long-term average annual rainfall of 18.52 inches. A table expressing this relationship, designated as Table A, is included in the Judgment.

The utilization of a ten-year moving average of rainfall instead of the actual rainfall occurring in the year under consideration is for the purposes of avoiding extreme variations in the annual entitlement to usable supply under the Judgment. The use of ten-year average rainfall can introduce a time lag in the obligation of the Upper Area following a sustained series of dry or wet years, but over a long-term period of years it will result in the Lower Area receiving an average annual entitlement of 98,415 acre-feet. For example, during a series of dry years the obligation of the Upper Area decreases, but with the commencement of a series of wet years the full effect is not immediately felt because of the prior dry years being included in the ten-year average.

Thus, when the San Gabriel River Watermaster service commenced operation in 1963-64, the ten-year average rainfall for San Gabriel Valley (1954-55 through 1963-64) amounted to only 14.4

inches. This reflected the general drought conditions which had prevailed. There did occur two above-normal years, 1957-58 and 1961-62, when rainfall was 30.2 inches and 22.4 inches, respectively. The driest year of record occurred in 1960-61, when only 5.9 inches of rainfall was received. In fact, the three consecutive years 1958-59, 1959-60, and 1960-61 represented the driest three-year period of recorded rainfall in this area.

Since 1963-64 the ten-year moving average rainfall has been gradually increasing. Above-normal rainfall occurred in 1965-66, 1966-67, and 1968-69, amounting to 19.6 inches, 25.0 inches and 30.5 inches, respectively. The moving average has increased from 14.4 inches during the ten years ending 1963-64 to 16.6 inches during the ten years ending 1969-70. Accordingly, the Lower Area Annual Entitlement increased from 67,200 acre-feet to 84,000 acre-feet between 1963-64 and 1969-70.

When the Usable Water received by the Lower Area is less than the Lower Area Annual Entitlement, the Upper Area must provide Make-up Water in accordance with the Judgment. One method by which the Upper Area can provide Make-up Water is by payment to the Central Basin Municipal Water District for Reclaimed Water previously purchased for replenishment. During the period 1963-64 through 1969-70 the Upper Area paid for 55,542 acre-feet of Reclaimed Water at a cost of \$844,467.83. Another method, which has

been utilized by the Upper Area, is to purchase replenishment water and deliver it to the Lower Area. In water year 1965-66, a quantity of 6,489 acre-feet of replenishment water was delivered. In view of the above-normal supply received during 1968-69, the Upper Area, as determined herein, now has an Accrued Credit of 80,989 acre-feet.

History of Litigation

On May 12, 1959, a complaint was filed in the Superior Court in and for the County of Los Angeles, Case No. 722647, by the City of Long Beach, the Central Basin Municipal Water District, and the City of Compton. The purpose of the suit was to determine the rights of the parties to waters of the San Gabriel River System and to provide for protection against interference with the rights of the Lower Area Parties. The parties to the action are as follow:

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
Azusa Agricultural Water Company

DEFENDANTS (Continued)

Azusa Valley Water Company
California Cities Water Company
California Water and Telephone Company
(now California-American Water Company)
Covina Irrigating Company
Cross Water Company
East Pasadena Water Company, Ltd.
Glendora Irrigating Company
(now City of Glendora)
Southern California Water Company
Suburban Water Systems
Sunny Slope Water Company
Vallecito 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
Baldwin Park County Water District
San Gabriel County Water District

INTERVENORS

Upper San Gabriel Valley Municipal Water District
California Domestic Water Company

In an effort to reach a physical solution, two negotiating committees of five members each were appointed, one to represent the plaintiffs and one to represent the defendants. Attorneys, engineers and geologists were utilized as advisors to the negotiating committees and on September 26, 1961, a "Statement of Principles for Settlement" was executed. There followed a period of study and negotiations

in order to arrive at a fair and equitable physical solution to the problem.

On August 24, 1964, the Upper San Gabriel Valley Municipal Water District intervened in the action to assume the responsibilities of the Upper Area under the terms of a judgment. In order to reimburse the District for its expenses in so doing, a Reimbursement Contract was entered into early in 1965 by the District and all of the defendants and certain other producers of water from the Upper Area. The other producers were the City of Whittier and intervenor California Water Company who export water from the Upper Area to the Lower Area.

A proposed Stipulation for Judgment and Judgment were approved by the negotiating committees on December 7, 1964, and thereafter were approved by all parties. On September 24, 1965, Judgment was entered by Judge Edmund Moor with an effective date of October 1, 1963.

The Judgment provided for the appointment of a three-man 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-man Watermaster was appointed and certified by the Court. The Upper Area is represented by Thomas M. Stetson, the Lower Area by Max Bookman, and both areas by M. E. Salsbury.

The Watermaster issued his report for the first and second years, 1963-64 and 1964-65, on February 28, 1966. Subsequent annual reports of the Watermaster have been issued in February of each year.

CHAPTER II. ACTIVITIES OF WATERMASTER

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 determination and findings; and maintain a record of the transfer of defendants' water rights. All operations and reports are based on the "water year," which is from October 1 to September 30.

The Judgment requires that the Watermaster make the following determinations each year:

1. The number of inches of depth of average rainfall on San Gabriel Valley.
2. The average annual rainfall on San Gabriel Valley for the ten consecutive water years ending with the year of calculation.
3. The Lower Area Annual Entitlement and the entitlement for the Long-term Accounting Period.
4. The amount of Surface Flow through Whittier Narrows.
5. The amount of Subsurface Flow.
6. The amount of Export to Lower Area.
7. The amount of Lower Area Replenishment Water.

8. The amount and quality of Reclaimed Water reclaimed by or on behalf of Lower Area.
9. The total amount of Make-up Water delivered to Lower Area.
10. The surface outflow from Montebello Forebay in the channel of each of the Rio Hondo and San Gabriel rivers.
11. The amount of Usable Water received by the Lower Area.
12. The Accrued Debit of Upper Area, if any, or Accrued Credit of Upper Area, if any, as it exists at the end of each water year.
13. The amount, if any, of Make-up Water which Upper District is obligated to deliver during the following water year.

Administration

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

A tentative budget for the water year 1970-71 was transmitted to the parties on July 24, 1970. After fifteen days, there being no objections thereto, the tentative budget became the final budget and is set forth in Table 1.

TABLE 1

WATERMASTER BUDGET
FOR THE WATER YEAR 1970-71

1.	Administrative fees of Watermaster and general operating expenses	\$ 3,500
2.	Collection of data, field inspection, and maintenance of records	4,500
3.	Calculations and preparation of Watermaster Report for Water Year 1969-70	3,400
4.	Printing and reproduction costs	600
5.	Contingencies	<u>1,000</u>
	TOTAL	\$13,000
	Less estimated carry-over from 1969-70	<u>500</u>
	Balance to be financed for 1970-71	\$12,500

Proration for Payment Purposes

Upper San Gabriel Valley Municipal Water District, 50%	\$ 6,250.00
Central Basin Municipal Water District, 41.2%	5,150.00
City of Long Beach, 7.125%	890.63
City of Compton, 1.675%	<u>209.37</u>
TOTAL	\$12,500.00

An audit of expenditures of the Watermaster for the water year 1969-70 was obtained. This audit was performed by the firm of R. J. Galletly, CPA. His letter dated January 22, 1971, presenting his findings and showing the income and expense, is included in the appendix.

Data Collection

The Watermaster collects data on stream flow, rainfall, water quality, ground water levels, export of water, reclaimed water, replenishment water, and other information as required. The principal source of data is the Los Angeles County Flood Control District. Copies of 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 the determinations required by the Judgment. Other data were obtained from The Metropolitan Water District of Southern California, the County Sanitation Districts, the Central and West Basin Water Replenishment District, the Upper San Gabriel Valley Municipal Water District and the U. S. Geological Survey.

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 detail the channels and facilities in the Whittier Narrows area.

Field Inspections

On March 19, 1970, the San Gabriel River Watermaster, along with a representative of the Los Angeles County Flood Control District, inspected a number of gaging stations, channels, and replenishment facilities in the vicinity of Whittier Narrows. Of particular interest were the gaging stations on the San Gabriel River below Parkway Bridge (F263C-R), Whittier Narrows Flood Channel, San Gabriel River Spreading Ground headworks, and the construction work at the San Jose Water Renovation Plant.

During the year 1969-70, a number of field inspections were also made by representatives of the Watermaster of stream gaging facilities in the Whittier Narrows area.

Preparation of Annual Report

One of the required functions of the Watermaster is the preparation of the annual report containing certain determinations 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 furnished the Court, each of the parties, and others. The report for water year 1969-70 covers the seventh year of operation under the Judgment.

Delivery of Make-up Water

As of September 30, 1969 the Upper Area had an Accrued Credit. The Upper District was, therefore, under no obligation, nor did they deliver Make-up Water to the Lower Area during the 1969-70 water year.

Stream Gaging Stations

The Watermaster maintained contact during the water year 1969-70 with the Los Angeles County Flood Control District and the U. S. Geological Survey regarding the operation of stream gaging stations in the vicinity of Whittier Narrows.

Prior Watermaster reports have discussed problems experienced with the adequacy of gaging at the Whittier Narrows Flood Channel Station E337-R. This gage has been subject to unusual conditions. When water is stored in Whittier Narrows reservoir, the gage may be affected by backwater and become inoperative. Other factors affect the accuracy of this gage, including the existence of a dike in the vicinity of the gage, debris buildup on bridge piers, and clogging of the communication conduit. The station has been operated by the U. S. Geological Survey under a cost sharing agreement with the U. S. Army, Corps of Engineers. The Corps of Engineers is no longer

interested in maintaining the gage and the station was removed at the end of the 1969-70 water year. Unless measuring facilities are reestablished, it will be necessary to use an alternative method for determining the flow in the flood channel, and a method was discussed in detail in the Sixth Annual Report of the San Gabriel River Watermaster.

The new station at Parkway Bridge (F263C-R) has some operational problems which have been under study. There has been some difficulty in determining a correct gage height and discharge relationship because of difficulty in correlating the recorded stage with the actual stream gage. The recorder equipment being utilized at this station makes use of a bubbler connected to a servo-manometer. It is apparent that the required accuracy at this station must be improved so that satisfactory records are available to the Watermaster.

Transfer of Water Rights

In event of a change in ownership of the water rights of any of the Defendants in the case, the Judgment requires that the Watermaster shall be notified of such transfer in writing.

The Watermaster has not been advised of any transfers during the 1969-70 water year. Two previous transfers of water rights were reported in prior reports. These are the transfer of the Glen-

dora Irrigating Company to the City of Glendora on April 28, 1965, and of the California Water and Telephone Company to the California-American Water Company in March 1966.

Change of Address

The Judgment provides that if any party or transferee of water rights shall desire to change its mailing address, it shall file a written notice of such change with the clerk of the Court and with the Watermaster. The Watermaster must then notify all parties of the change. The Upper San Gabriel Valley Municipal Water District reported a change of address with the Court and the Watermaster under date of January 23, 1970. This was reported in the preceding Watermaster Report. No subsequent notices of change of address of parties have been received by the Watermaster.

The water rights of producers in the Main San Gabriel Basin are currently being adjudicated and the Watermaster has kept informed regarding this action.

CHAPTER III. LOWER AREA ANNUAL ENTITLEMENT

The Lower Area Annual Entitlement for the water year 1969-70 is based on the average annual rainfall which occurred in the 10-year period ending with water year 1969-70 and the corresponding entitlement shown in Table A of the Judgment. Four precipitation stations in the San Gabriel Valley 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 1969-70 water year at the four locations was as follows:

<u>Station number</u>	<u>Location</u>	<u>Depth of precipitation, in inches</u>
95	114 East First Street, San Dimas	11.38
102C	11977 East Valley Blvd., Walnut	10.66
108D	119 South Hoyt Avenue, El Monte	10.77
610B	City Hall, Pasadena	<u>11.42</u>
	Average rainfall	11.06

Shown in Table 2 is the calculation of the 10-year average rainfall in the San Gabriel Valley for the water years 1960-61 through 1969-70.

TABLE 2
AVERAGE ANNUAL RAINFALL
IN SAN GABRIEL VALLEY
1960-61 through 1969-70

<u>Water year</u>	<u>Rainfall, in inches</u>
1960-61	5.9
1961-62	22.4
1962-63	12.3
1963-64	9.4
1964-65	15.2
1965-66	19.6
1966-67	25.0
1967-68	15.0
1968-69	30.5
1969-70	<u>11.1</u>
Total	166.4
10-year average	16.6

Based on the 10-year average rainfall of 16.6 inches, the Lower Area Annual Entitlement for the water year 1969-70 is 84,000 acre-feet, determined from Table A of the Judgment.

CHAPTER IV. USABLE WATER

Presented in this chapter is the determination of the quantity of Usable Water received by the Lower Area during the water year 1969-70.

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, 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 1969-70 was 48,100 acre-feet.

Mission Creek at San Gabriel Boulevard, Station F83-R

The measured flow at Station F83-R for the water year 1969-70 was 4,230 acre-feet.

Rio Hondo Bypass Channel, Station F313-R

No water was diverted through the Rio Hondo Bypass Channel during the water year 1969-70.

Whittier Narrows Flood Channel, Station E337-R

The U. S. Geological Survey, which operated Station E337-R, reported a flow of 14 acre-feet for the water year 1969-70.

Sycamore Canyon

The 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 westerly of the Whittier Narrows and enters the Rio Hondo below Station F64-R, Rio Hondo above Mission Bridge. During the water year 1969-70, the precipitation at that station was 9.69 inches. Referring to Table 6 of Exhibit B, the runoff from Sycamore Canyon was determined to be 35 acre-feet.

San Gabriel River near Parkway Bridge, F263C-R

The flow measured by the Flood Control District at the San Gabriel River at Parkway Bridge, the point of maximum rising water, for the 1969-70 water year was 79,110 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 17,254 acre-feet of Reclaimed Water during the 1969-70 water year, 13,749 acre-feet was delivered to Rio Hondo. This flow was delivered to the river below the F64-R gage and must therefore be added as Surface Flow.

The balance of the Reclaimed Water in the amount of 3,505 acre-feet was delivered to the San Gabriel River and measured at Parkway Bridge.

Adjustments to Surface Flow

As reported in the Watermaster Report of 1968-69, an adjustment was made to the values of surface flow computed for each gaging station for that year. This adjustment was due principally to the extremely high amounts of flow which persisted for a considerable period of time. The adjustment and the reasons therefor are fully discussed in the 1968-69 Report. Inspection of the records for the 1969-70 water year indicates that a similar adjustment is not warranted.

Summary of Surface Flow

A total of 145,238 acre-feet of surface water flowed through Whittier Narrows during the water year 1969-70. Table 3 shows the components and the total Surface Flow.

TABLE 3

SUMMARY OF SURFACE FLOW THROUGH WHITTIER NARROWS FOR WATER YEAR 1969-70

	<u>Amount in acre-feet</u>
Rio Hondo above Mission Bridge, Station F64-R	48,100
Mission Creek at San Gabriel River, Station F83-R	4,230
Rio Hondo By-pass Channel, Station F313-R	0
Whittier Narrows Flood Channel, Station E337-R	14
Sycamore Canyon	35
San Gabriel River at Parkway Bridge, Station 263C-R	79,110
Reclaimed Water delivered to Rio Hondo Channel below Station F64-R	<u>13,749</u>
Total Surface Flow	145,238

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 1969-70, which amounted to 23,900 acre-feet.

<u>Time</u>	<u>Subsurface Flow in acre-feet</u>
Spring 1968	25,000
Fall 1968	23,800
Spring 1969	25,600
Fall 1969	25,900
Spring 1970	20,700
Fall 1970	<u>22,500</u>
Subsurface Flow 1969-70	23,900

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 1969-70, there were four entities which transported water by pipeline through the Whittier Narrows. All of the water exported through the Narrows was ground water produced in the San Gabriel Valley. The San Gabriel Valley Water Company exported water for the first time during the 1969-70 water year. The total export for each of the four exporters in water year 1969-70 as shown by reports filed with the Upper San Gabriel Valley Municipal Water District is shown below.

<u>Exporter</u>	<u>Export to Lower Area in acre-feet</u>
California Domestic Water Company	13,040
San Gabriel Valley Water Company	420
Suburban Water Systems	13,471
City of Whittier	<u>8,875</u>
Total	35,806

The Judgment provides that, commencing in the water year 1966-67, the maximum allowance for export in the determination of Usable Water shall not exceed 23,395 acre-feet. The quantity credited herein as Export to Lower Area for 1969-70 is therefore 23,395 acre-feet.

Lower Area Replenishment Water

The Lower Area purchased replenishment water from the Metropolitan Water District of Southern California. Delivery of

imported water may be made at four connections: (1) San Gabriel River north of the San Bernardino Freeway (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 1969-70, the amount of imported water purchased for replenishment by or on behalf of the Lower Area Parties was 25,792 acre-feet at Alhambra Wash, and 43,073 acre-feet at San Dimas Wash, for a total of 68,865 acre-feet. The San Gabriel River connection and the Live Oak Wash connections were not used during the water year.

Provision is made in the Judgment for the deduction of evaporation losses upstream from Whittier Narrows from the metered releases of replenishment water. The calculated amounts of evaporation were 12 acre-feet for Alhambra Wash releases and 413 acre-feet for the San Dimas Wash releases, for a total of 425 acre-feet.

The net amount of Lower Area Replenishment Water after deducting evaporation amounted to 68,440 acre-feet.

Reclaimed Water

The total amount of reclaimed water produced at the Whittier Narrows Water Reclamation Plant during 1969-70 was 17,254 acre-feet. During storm periods, 97 acre-feet of the reclaimed water

delivered to the Rio Hondo was included in the outflow from the Montebello Forebay. The total amount of reclaimed water purchased in the water year 1969-70 from the Whittier Narrows Water Reclamation Plant by or on behalf of the Lower Area Parties was therefore 17,157 acre-feet. A chemical analysis of the reclaimed water is included in the appendix to this report.

County Sanitation District No. 21 owns and operates a sewage treatment and water renovation plant near the City of Pomona. The majority of the effluent from this plant is delivered to San Jose Wash near Spadra or into the San Jose Creek at the treatment plant. Minor quantities are sold for agricultural use. During the 1969-70 water year, a substantial quantity of reclaimed water from this plant reached the Whittier Narrows. The discharge of effluent from this plant, changes in plant facilities, and method of determining the amount of discharge generated within the San Gabriel River System and reaching the Whittier Narrows were described in the fifth annual report.

The total production at the Pomona Water Renovation Plant during the 1969-70 water year was 10,140 acre-feet. The total sales were 433 acre-feet resulting in 9,707 acre-feet of reclaimed water delivered to San Jose Wash. It is estimated that of this latter amount, 444 acre-feet wasted to the ocean, leaving 9,263 acre-feet as the net amount. The portion of this reclaimed water which was generated

inside the watershed of the San Gabriel River system was calculated to be 5,095 acre-feet.

The total amount of Reclaimed Water which should be deducted from the inflow is 22,252 acre-feet for the 1969-70 water year. This is comprised of the 17,157 acre-feet from the Whittier Narrows Water Reclamation Plant and the 5,095 acre-feet of reclaimed water generated inside the watershed originating from the Pomona Plant.

Make-up Water by Surface Flow Delivery

During the water year 1969-70, the Upper Area purchased no Metropolitan Water District water for surface flow delivery to the Lower Area as Make-up Water. As of September 30, 1969, there was an accrued credit and the Upper Area was under no obligation to furnish make-up water.

Recirculation of Measured Water

During the water year 1969-70 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 on the Rio Hondo at Stewart and Gray Road, Station F45B-R, and on 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 channel southwesterly of Whittier Narrows.

During water year 1969-70, measured surface outflow from the Montebello Forebay in the Rio Hondo at Station F45B-R was 7,220 acre-feet. This included water from San Gabriel Valley and local inflow originating below Whittier Narrows. The daily inflow from tributary channels below Whittier Narrows 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. The total amount of local storm inflow was calculated to be 3,532 acre-feet. By an analysis of daily flows, 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 2,860 acre-feet and the unusable surface flow in the Rio Hondo was 4,360 acre-feet.

The total flow of the San Gabriel River at Florence Avenue Station F262B-R was measured to be 11,950 acre-feet. This flow consisted of local storm inflow through storm drains located in the Montebello Forebay and of discharge from the San Gabriel Valley. The gaging station at Florence Avenue has been relocated

from the location used in the Judgment upstream, a distance of 1,400 feet. 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 existing location of the station and the original location. Analysis of daily flows, in accordance with provisions in the Judgment (along with an adjustment to allow for the moving of the gaging station) indicate a total outflow from the Montebello Forebay of San Gabriel Valley water of 10,720 acre-feet in the San Gabriel River.

The total Unusable Surface Flow passing through the Montebello Forebay in the Rio Hondo and San Gabriel River in water year 1969-70 was 15,080 acre-feet.

Determination of Usable Water

Usable Water under terms of the Judgment is defined as the sum of Surface Flow, Subsurface Flow and Export to Lower Area less Lower Area Replenishment Water, Reclaimed Water, Make-up Water by Surface Flow Delivery, Recirculation of Measured Water and Unusable Surface Flow. Shown in Table 4 is the determination of Usable Water for water year 1969-70.

TABLE 4

USABLE WATER FOR WATER YEAR 1969-70

<u>Item</u>	<u>Amount, in acre-feet</u>
Surface Flow	145,238
Subsurface Flow	23,900
Export to Lower Area	<u>23,395</u>
Subtotal	192,533
Less:	
Lower Area Replenishment Water	68,440
Reclaimed Water	22,252
Make-up Water by Surface Flow Delivery	0
Recirculation of Measured Water	0
Unusable Surface Flow	<u>15,080</u>
Subtotal	<u>105,772</u>
Usable Water	86,761

CHAPTER V. 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 obligation, if any, of the Upper District to deliver Make-up Water during the ensuing water year. A long-term accounting is required each 15 to 25 years. There is presented herein a summary of operations under the Judgment which include Usable Water received, Annual Entitlement, Accrued Debit or Credit and Make-up Water deliveries.

Adjustment of Prior Year Determinations

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

The Los Angeles County Flood Control District published its "Biennial Report on Hydrologic Data, Seasons of 1967-68 and 1968-69" in September 1970. A review of this document was made. It was found that the published data for 1967-68 required no change

in the Watermaster report for that year. For the water year 1968-69, changes occurred at three stations, which are as follow:

- (1) Mission Creek at San Gabriel Boulevard (Station F83-R). The preliminary data indicated that the measured flow at Station F83-R for the water year 1968-69 was 5,530 acre-feet. Upon publication, this value was changed to 5,540 acre-feet, an increase of 10 acre-feet.
- (2) Rio Hondo above Mission Bridge (Station F64-R). For the water year 1968-69, the Watermaster found it necessary to utilize the Alternate Method for determination of Usable Water utilizing preliminary daily discharge figures. The published data made changes of daily discharges during 36 days. Applying these changes in daily discharge to the Alternate Method results in a net decrease in the amount of inflow of 212 acre-feet.
- (3) San Gabriel River below Parkway Bridge (Station F263C-R). The Flood Control District preliminary value for the flow on the San Gabriel River for the 1968-69 water year was 274,660 acre-feet. Subsequently, in its biennial report, the Flood Control District published a value of 274,300 acre-feet, a decrease of 360 acre-feet.

The changes in the surface flow indicated by the published data represent a net decrease in the computed surface flow of 562 acre-feet. This changes the surface flow through the Whittier Narrows as reported in the 1968-69 Watermaster Report from 637,906 acre-feet to 637,344 acre-feet. A summary of the revised findings of the Watermaster for water year 1968-69 is shown in Table 5. The net effect of the change is to correct the Accrued Credit of the Upper Area as of September 30, 1969 from 78,790 acre-feet to 78,228 acre-feet.

In addition to the changes noted above, the amount of export by the California Domestic Water Company should have been reported as 12,838 acre-feet rather than 11,889 acre-feet. This change does not affect the determinations of the Accrued Credit, however, since the total exports exceed the amount for which credit may be applied.

Delivery of Make-up Water

By letter dated October 2, 1969, 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 per acre-foot thereof for the 1968-69 water year. By letter dated October 15, 1969, Central

TABLE 5

SUMMARY OF REVISED FINDINGS FOR WATER YEAR 1968-69

<u>Item</u>	<u>Quantities in acre-feet*</u>	
1. Rainfall 1968-69	30.50 inches	
2. 10-year average rainfall	16.6 inches	
3. Lower Area Annual Entitlement		84,000
4. Surface Flow through Whittier Narrows	(637,906)	637,344
5. Subsurface Flow through Whittier Narrows		24,400
6. Water exported through Whittier Narrows		23,395
7. Total flow through Whittier Narrows	(685,701)	685,139
8. Lower Area Replenishment Water		17,748
9. Reclaimed Water		17,130
10. Make-up Water (Surface Flow delivery)		0
11. Recirculation of Measured Water		0
12. Unusable Surface Flow		488,033
13. Usable Water received by Lower Area	(162,790)	162,228
14. Credit for water year 1968-69	(78,790)	78,228
15. Accrued Debit of Upper Area as of September 30, 1968		5,597
16. Amount of Make-up Water delivered during water year 1968-69		
Payment for Reclaimed Water	5,597	
Surface Flow Delivery	<u>0</u>	
Total		5,597
17. Adjusted Accrued Debit of Upper Area as of September 30, 1968		0
18. Accrued Credit of Upper Area as of September 30, 1969	(78,790)	78,228

* Values shown in parentheses are the previously published preliminary figures which have been corrected, as shown in the right-hand column.

Basin Municipal Water District advised Upper District that it had purchased 13,877.0 acre-feet. The cost of this water was \$18.00 per acre-foot.

In light of the Accrued Credit, the Upper District was under no obligation to provide Make-up Water for the year and, accordingly, made no delivery nor made any payments to Central Municipal.

Accrued Credit for 1969-70

The Lower Area Annual Entitlement as heretofore determined for 1969-70 is 84,000 acre-feet. The Usable Water received was 86,761 acre-feet, which results in a credit for the water year 1969-70 of 2,761 acre-feet. The Accrued Credit as of September 30, 1970 is equal to the September 30, 1969 accrued credit of 78,228 acre-feet plus the Accrued Credit of 1969-70 of 2,761 acre-feet, and is equal to 80,989 acre-feet. Since there is an Accrued Credit as of September 30, 1970, the Upper Area is under no obligation to furnish Make-up Water to the Lower Area during 1970-71.

Summary of Operations under Judgment

Table 6 is a summary of operations under the Judgment showing Lower Area Annual Entitlement, Usable Water and Make-up

Water received by Lower Area and the Accrued Debit or Credit of Upper Area for each year of operation since the effective date of the Judgment.

TABLE 6
SUMMARY OF OPERATION UNDER JUDGMENT
(Values in acre-feet)

Water Year	Entitlement	Water received by Lower Area*			Accrued Credit(+) or Debit(-)
		Usable	Make-up	Total	
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	<u>84,000</u>	86,761	0	<u>86,761</u>	<u>+80,989</u>
Seven-year total	519,400			600,389	+80,989

*Includes only Upper Area obligation under the Judgment

Long-term Accounting Data

The Watermaster is required from time to time, but not sooner than 15 years nor later 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 7.

TABLE 7
DATA FOR LONG-TERM ACCOUNTING

<u>Water year</u>	<u>Rainfall, in inches</u>		<u>Water received by Lower Area, in acre-feet</u>			
	<u>Annual Amount</u>	<u>Accumulated average annual amount</u>	<u>Amount</u>	<u>Make-up</u>	<u>Total</u>	<u>Accumulated total</u>
1963-64	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

Thus far, under the Watermaster operation, the rainfall has averaged 17.99 inches for the seven-year period. The Lower Area has received under the Judgment 600,389 acre-feet, which is an average for the seven-year period of 85,770 acre-feet.

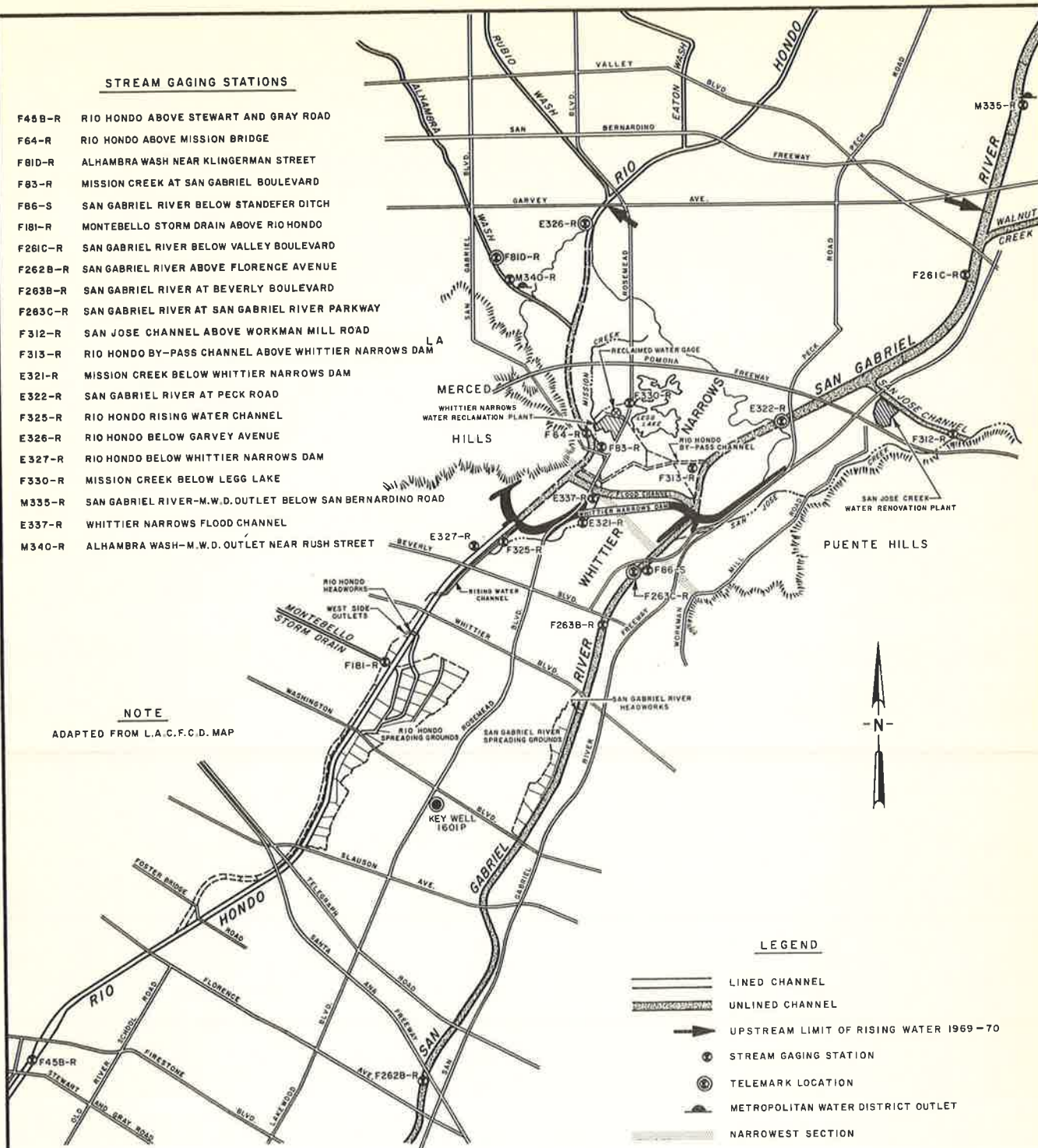
CHAPTER VI. SUMMARY OF FINDINGS
FOR WATER YEAR 1969-70

	<u>Quantities in acre-feet</u>
1. Rainfall 1969-70, 11.06 inches	
2. 10-year average rainfall, 16.6 inches	
3. Lower Area Annual Entitlement	84,000
4. Surface Flow through Whittier Narrows	145,238
5. Subsurface Flow through Whittier Narrows	23,900
6. Water exported through Whittier Narrows	23,395
7. Total flow through Whittier Narrows	192,533
8. Lower Area Replenishment Water	68,440
9. Reclaimed Water	22,252
10. Make-up Water (Surface Flow delivery)	0
11. Recirculation of Measured Water	0
12. Unusable Surface Flow	15,080
13. Usable Water received by Lower Area	86,761
14. Credit for water year 1969-70	2,761
15. Accrued Credit of Upper Area as of September 30, 1969 (corrected)	78,228
16. Amount of Make-up Water Delivered during water year 1969-70	
Payment for Reclaimed Water	0
Surface Flow Delivery	<u>0</u>
Total	0
17. Adjusted Accrued Credit of Upper Area as of September 30, 1969 (corrected)	78,228
18. Accrued Credit of Upper Area as of September 30, 1970	80,989

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 AT SAN GABRIEL RIVER PARKWAY
- 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
- ▶ UPSTREAM LIMIT OF RISING WATER 1969-70
- ⊙ STREAM GAGING STATION
- ⊙ TELEMARK LOCATION
- ⬇ METROPOLITAN WATER DISTRICT OUTLET
- NARROWEST SECTION

SAN GABRIEL RIVER WATERMASTER

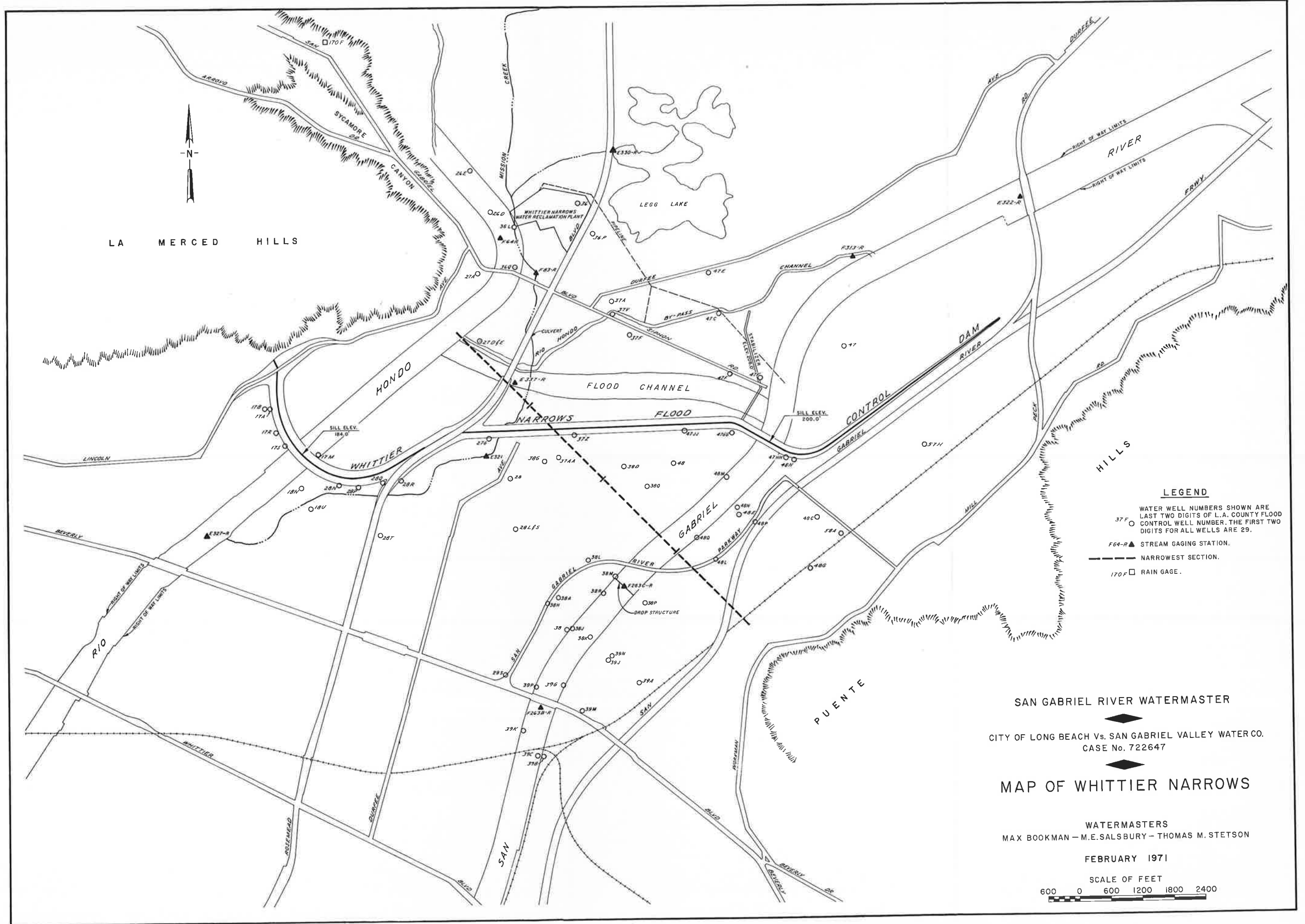
CITY OF LONG BEACH Vs. SAN GABRIEL VALLEY WATER CO.
CASE No. 722647

STREAM GAGING STATIONS
RIO HONDO - SAN GABRIEL RIVER SYSTEM

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

FEBRUARY 1971

SCALE OF FEET
0 4000 8000



APPENDIX

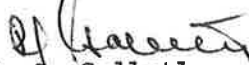
R. J. GALLETTY
CERTIFIED PUBLIC ACCOUNTANT
GLENDALE FEDERAL SAVINGS & LOAN BUILDING
401 NORTH BRAND BOULEVARD
GLENDALE 3, CALIFORNIA
CHAPMAN 5-2402

January 22, 1971

San Gabriel River Watermaster
Security Building, Room 604
102 North Brand Boulevard
Glendale, California

In our opinion the accompanying statement of Income and Expenditures for the San Gabriel River Watermaster for the water year 1969 - 1970 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.

Very truly yours,


R. J. Galletly

Certified Public Accountant

SAN GABRIEL RIVER WATERMASTER
Statement of Income and Expenditures
For the Water Year 1969 - 1970

Carried forward from year 1968 - 1969		\$ 5,509.12
Income		<u>8,500.00</u> 14,009.12
Expenditures		
Administrative fees and general operating expenses	\$ 3,198.74	
Collection of data, field inspections and maintenance of records	5,261.12	
Calculations and preparation of Watermaster Reports for water years 1969 - 1970	4,357.48	
Printing and reproduction costs	<u>605.89</u>	
Total expenditures		<u>13,423.23</u>
Balance		\$ <u><u>585.89</u></u>

WATER QUALITY ANALYSIS OF RECLAIMED WATER
FROM THE WHITTIER NARROWS WATER RECLAMATION PLANT

<u>Constituent</u>	<u>Raw Sewage</u>	<u>Final Effluent</u>	<u>Maximum Limits</u>
pH	7.6	7.5	
Solids, Suspended, mg/l	434	10	
Solids, Dissolved, mg/l	682	626	1,000
Solids, Total, mg/l	1,116	636	
Conductivity, EC x 10 ⁶	1,122	1,078	
Hardness, Total, mg/l as Ca CO ₃	204	187	
Alkalinity, Total, mg/l as Ca CO ₃	307	213	
Chloride, mg/l Cl	118	98	250
Sulfate, mg/l SO ₄	119	123	
Sulfate + Chloride mg/l	237	221	500
Phosphate, Total, mg/l P	15.7	9.1	
Fluoride, mg/l F	0.94	1.15	1.5
Nitrate, mg/l N	-	3.7	
Nitrite, mg/l N	-	.77	
Ammonia, mg/l N	18.2	9.8	
Organic Nitrogen, mg/l N	24.3	3.1	
Carbon, Total, mg/l C	-	-	
COD, Total, mg/l O	901	34	
COD, Soluble, mg/l O	-	26	
BOD, mg/l O, 5 days, 20° C	221	3	
Phenols, mg/l as C ₆ H ₅ OH	.04	0.002	
MBAS, mg/l as ABS	7.7	.2	2.0
Hexane Extractables, mg/l	-	7.1	
Arsenic, mg/l As	0.00	0.00	0.05
Boron, mg/l B	.90	.80	2.0
Cadmium, mg/l Cd	-	0.01	
Chromium, Hexavalent, mg/l Cr	0.02	0.03	0.05
Copper, mg/l Cu	.37	0.04	3.0
Iron, mg/l Fe	1.01	0.00	
Lead, mg/l Pb	.09	0.02	0.1
Manganese, mg/l Mn	0.00	0.00	
Iron + Manganese, mg/l	1.01	0.00	0.3
Potassium, mg/l K	23.	22	
Sodium, mg/l Na	156	140	
Sodium, Equivalent Ratio, % Na	59.3	58.6	60.0
Zinc, mg/l Zn	0.85	0.16	15
Calcium, mg/l CaCO ₃	121	112	
Magnesium, mg/l CaCO ₃	76	76	
Lithium, mg/l Li	0.03	0.06	
Sodium Adsorption Ratio	4.75	4.46	
Non-Ionic Detergent mg/l		4.0	