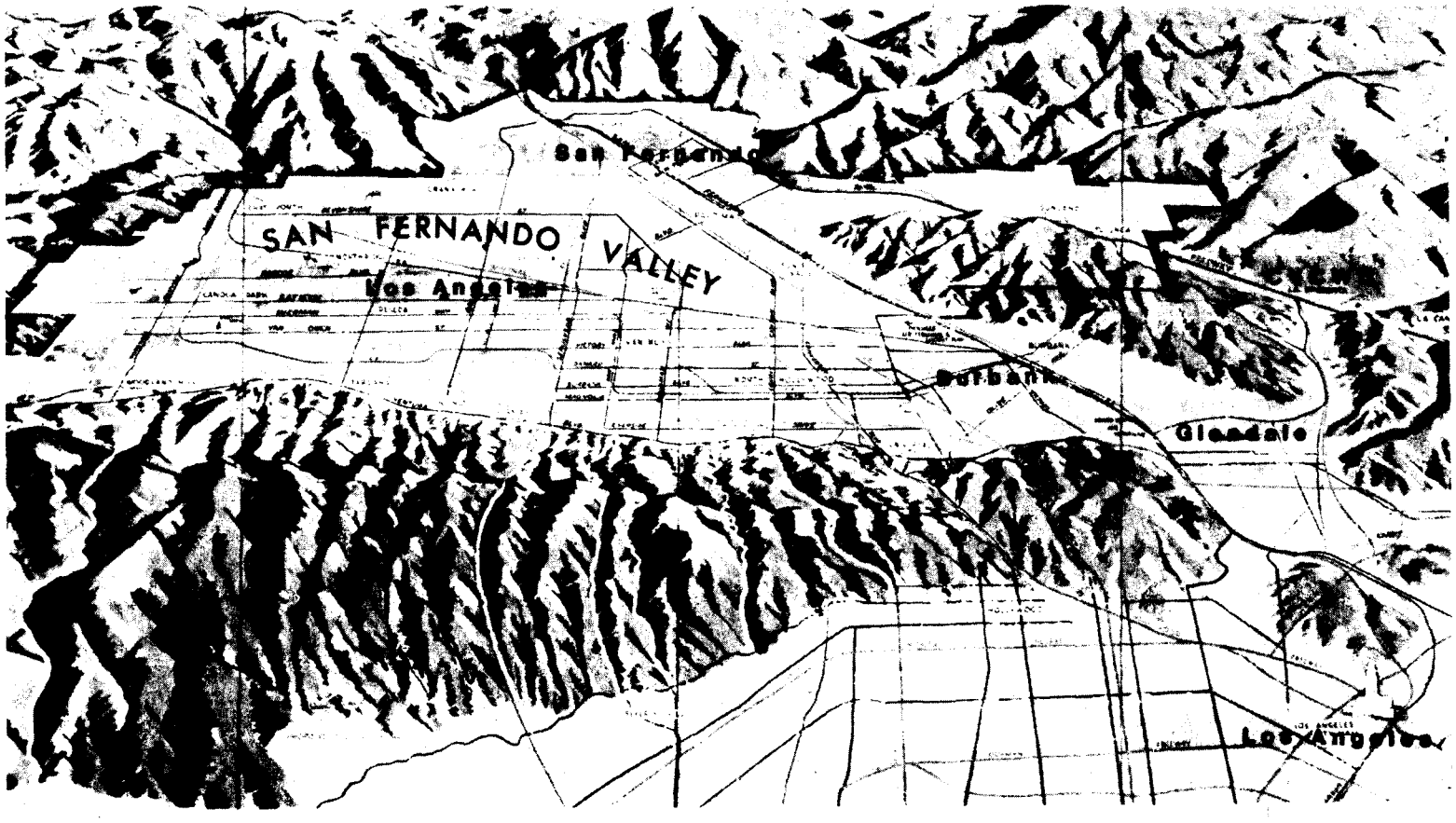
UPPER LOS ANGELES RIVER AREA WATERMASTER

CITY OF LOS ANGELES VS. CITY OF SAN FERNANDO, ET AL.
CASE NO. 650079 — COUNTY OF LOS ANGELES

WATERMASTER SERVICE IN THE UPPER LOS ANGELES RIVER AREA LOS ANGELES COUNTY

OCTOBER 1, 1982 - SEPTEMBER 30, 1983



MAY 1984

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CONVERSION FACTORS

English to Metric System of Measurement

Quantity	English unit	Multiply by	To get metric equivalent
Length	feet (ft)	.3048	metres (m)
	miles (mi)	1.6093	kilometres (km)
Area	square feet (ft^2)	.092903	square metres (m^2)
	acres	4046.9	square metres (m^2)
		.40469	hectares (ha)
		.40469	square hectometres (hm^2)
		.0040469	square kilometres (km^2)
	square miles (mi^2)	2.590	square kilometres (km^2)
Volume	gallons (gal)	3.7854	litres (l)
		.0037854	cubic metres (m^3)
	million gallons (10^6 gal)	3785.4	cubic metres (m^3)
	cubic feet (ft^3)	.028317	cubic metres (m^3)
	cubic yards (yd^3)	.76455	cubic metres (m^3)
	acre-feet (ac-ft)	1233.5	cubic metres (m^3)
		.0012335	cubic hectometres (hm^3)
		1.233×10^{-6}	cubic kilometres (km^3)
Volume/Time (Flow)	cubic feet per second (ft^3/s)	28.317	litres per second (l/s)
		.028317	cubic metres per second (m^3/s)
	gallons per minute (gal/min)	.06309	litres per second (l/s)
		6.309×10^{-5}	cubic metres per second (m^3/s)
	million gallons per day (mgd)	.043813	cubic metres per second (m^3/s)
	miners inch*	.70792 (.56634)	litres per second (l/s)
Temperature	Degrees Fahrenheit (°F)	$\frac{tF - 32}{1.8} = tC$	Degrees Celsius (°C)

* Section 24 of Water Code = 1/40 ft^3/s

( ) 1/50 ft^3/s commonly used in Southern California

UPPER LOS ANGELES RIVER AREA WATERMASTER

CITY OF LOS ANGELES VS. CITY OF SAN FERNANDO, ET AL
CASE NO. 650079 — COUNTY OF LOS ANGELES

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FOREWARD

As Watermaster for the Upper Los Angeles River Area (ULARA), I am pleased to submit this report of the water supply conditions in ULARA during the 1982-83 water year. It was prepared in accordance with the provisions of the Final Judgment, signed by the Honorable Harry L. Hupp of the Superior Court on January 26, 1979.

This report describes the water rights in each basin. lists the allowable pumping for the water year 1983-84, and indicates the water in storage to the credit of each party as of October 1, 1983. In addition, this report includes background information on the history of the San Fernando Case; information as to each basin and the ULARA in total on water supply, ground water extractions, ground water levels, quantities of imported water use, recharge operations including amounts thereof, water quality conditions; and other pertinent information occurring during the water year pursuant to the provisions of the Judgment.

I wish to acknowledge and express appreciation to all parties that have provided information and data which were essential to the completion of this report.

Sincerely,

M L Blevins

MELVIN L. BLEVINS
Senior Hydrologic Engineer
and ULARA Watermaster
(Reg. C.E. No. 12863)

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UPPER LOS ANGELES RIVER AREA WATERMASTER

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ULARA WATERMASTER REPORT FOR WATER YEAR 1982-83

Report Prepared By:

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I. INTRODUCTION

Upper Los Angeles River Area (ULARA) encompasses all the watershed of the Los Angeles River and its tributaries above a point in the river designated as Los Angeles County Flood Control District (LACFCD) Gaging Station F-57C-R, near the junction of the Los Angeles River and the Arroyo Seco (Plate 1). ULARA encompases 328,500 acres, composed of 122,800 acres of valley fill, referred to as the ground water basins, and 205,700 acres of hills and mountains. ULARA is bounded on the north and northwest by the Santa Susana Mountains; on the north and northeast by the San Gabriel Mountains; on the east by the San Rafael Hills, which separate it from the San Gabriel Basin; on the south by the Santa Monica Mountains, which separate it from the Los Angeles Coastal Plain; and on the west by the Simi Hills.

ULARA has four distinct ground water basins. The water supplies of these basins are separate and are replenished by deep percolation from rainfall and from a portion of the water that is delivered for use within these basins. The four ground water basins in ULARA are the San Fernando, Sylmar, Verdugo, and Eagle Rock Basins (Plate 1).

The San Fernando Basin, the largest of the four basins, consists of 112,000 acres and comprises 91.2 percent of the total valley fill. It is bounded on the east and northeast by the San Rafael Hills, Verdugo Mountains, and San Gabriel Mountains; on the north by the San Gabriel Mountains and the eroded south limb of the Little Tujunga Syncline which separates it from the Sylmar Basin; on the northwest and west by the Santa Susana Mountains and Simi Hills; and on the south by the Santa Monica Mountains.

The Sylmar Basin, in the northerly part of ULARA, consists of 5,600 acres and comprises 4.6 percent of the total valley fill. It is bounded on the north and east by the San Gabriel Mountains; on the west by a topographic divide in the valley fill between the Mission Hills and the San Gabriel Mountains; on the southwest by the Mission Hills; on the east by the Upper Lopez Canyon Saugus formation along the east bank of the Pacoima Wash; and on the south by the eroded south limb of the Little Tujunga syncline, which separates it from the San Fernando Basin.

The Verdugo Basin, north and east of the Verdugo Mountains in ULARA, consists of 4,400 acres and comprises 3.6 percent of the total valley fill. It is bounded on the north by the San Gabriel Mountains, on the east by a ground water divide separating it from the Monk Hill Subarea of the Raymond Basin, on the southeast by the San Rafael Hills, and on the south and southwest by the Verdugo Mountains.

The Eagle Rock Basin, the smallest of the four basins, is in the extreme southeast corner of ULARA. It comprises 800 acres and consists of 0.6 percent of the total valley fill.

History of Adjudication

The water rights in ULARA were established by the JUDGMENT AFTER TRIAL BY COURT in Superior Court Case No. 650079, entitled The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, it al., Defendants, signed March 14, 1968 by the Honorable Edmund M. Moor, Judge of the Superior Court. Prior to the judgment, numerous pretrials were held subsequent to the filing of the action by the City of Los Angeles in 1955 and before the trial commenced on March 1, 1966.

On March 19, 1958, an Interim Order of Reference was entered by the Court directing the State Water Rights Board, now known as the State Water Resources Control Board (SWRCB), to study the availability of all public and private records, documents, reports, and data relating to a proposed order of reference in the case. The Court subsequently entered on June 11, 1958 an "Order of Reference to State Water Rights Board to Investigate and Report upon the Physical Facts (Section 2001, Water Code)."

A final Report of Referee was approved on July 27, 1962 and filed with the Court. The Report of Referee made a complete study of the geology, insofar as it affects the occurence and movement of ground water and the surface and ground water hydrology of the area. In addition, investigations were made of the history of the horizontal and vertical locations of the beds, banks, and channels of the Los Angeles River and its tributaries; the areas, limits, and directions of flow of all groundwater within the area; the historic extractions of ground water in the basin and their quality; and all sources of water, whether they be diverted, extracted, or imported, etc. Said Report of Referee served as the principal basis for geological and hydrological facts for the original Trial Court Judgment in 1968 and Decision of the Supreme Court in 1975 (14 Cal 3d 199, 123 Cal Rept 1) and the Trial Court Judgment on remand on January 26, 1979.

The City of Los Angeles filed an appeal from the Judgment of the Trial Court with the Court of Appeals, which held a hearing on November 9, 1972, and issued its opinion on November 22, 1972. The opinion, prepared by Judge Compton and concurred in by Judges Roth and Fleming, reversed, with direction, the original judgment handed down by Judge Moor. In essence, the City of Los Angeles was given rights to all water in ULARA including the use of the underground basins. The defendants, however, were given the right to capture "return water," which is water purchased from the Metropolitan Water District of Southern California (MWD) that percolates into the basin.

A petition for rehearing was filed on December 7, 1972, but was denied by the Court of Appeals. On January 2, 1973, the defendants filed a petition for hearing with the State Supreme Court. The Court on March 2, 1973 advised the parties it would hear the case. The hearing was held on January 14, 1975.

On May 12, 1975, the California Supreme Court filed its opinion on the 20-year San Fernando Valley water litigation. This opinion, which became final on August 1, 1975, upheld the Pueblo Water Rights of the City of Los Angeles to all ground water in the San Fernando Basin derived from precipitation within ULARA. The City of Los Angeles' Pueblo Water Rights were not allowed to extend to the ground waters of the Sylmar and Verdugo Basins.

The City of Los Angeles was also given rights to all San Fernando Basin ground water derived from water imported by it from outside ULARA and either spread or delivered within ULARA. The Cities of Glendale and Burbank each were given rights to all San Fernando Basin ground water derived from water that each imports from outside ULARA and delivered within ULARA. San Fernando was not a member of MWD until the end of 1971, and had never prior thereto imported any water from outside ULARA.

The Supreme Court reversed the principal judgment of the Trial Court and remanded the case back to the Superior Court for further proceedings consistent with the Supreme Court's opinion. On remand the case was assigned to the Honorable Harry L. Hupp, Judge of the Superior Court of Los Angeles County.

The Final Judgment, signed by the Honorable Harry L. Hupp, was entered on January 26, 1979. Copies of the Final Judgment are available from th ULARA Watermaster, Post Office Box 111, Room 1466, Los Angeles, California 90051. The water rights set forth in the judgment are consistent with the opinion of the Supreme Court described above. In addition, the Final Judgment includes provisions and stipulations regarding water rights, the calculation of imported return water credit, storage of water, stored water credit, and arragements for a physical solution for certain parties as suggested by the Supreme Court. The extraction rights under the Judgment are as follows:

San Fernando Basin

Native Water. Los Angeles has an exclusive right to extract and utilize all the native water which, under the judgment, are evaluated to be 43,660 acre-feet per year.

Imported Return Water. Los Angeles, Glendale, Burbank, and San Fernando each have a right to extract from the San Fernando Basin the Following amounts:

Los Angeles: 20.8 percent of all delivered water (including reclaimed water) to valley fill lands of San Fernando Basin.

San Fernando: 26.3 percent of all imported and reclaimed water delivered to valley fill lands of San Fernando Basin.

Burbank: 20.0 percent of all delivered water (including reclaimed water) to San Fernando Basin and its tributary hill and mountain areas.

Glendale: 20.0 percent of all delivered water (including reclaimed water) to San Fernando Basin and its tributary hill and mountain areas (i.e., total delivered water [including reclaimed water] less 105 percent of total sales by Glendale in Verdugo Basin and its tributary hills).

Physical Solution Water. Several parties are granted limited rights to extract water chargeable to the rights of others upon payment of specified charges. The parties and their maximum physical solution quantities are as follows:

As to Los Angeles' Water:

Glendale	5,500 acre-feet per year
Burbank	4,200 acre-feet per year
Van de Kamp	120 acre-feet per year
Toluca Lake	100 acre-feet per year
Sportsmens Lodge	25 acre-feet per year

As to Glendale's Water:

Forest Lawn	400 acre-feet per year
Environmentals Inc.	75 acre-feet per year

As to Burbank's Water:

Valhalla	300 acre-feet per year
Lockheed	25 acre-feet per year

As to San Fernando's Water:

San Fernando may extract ground water from Sylmar Basin in a quantity sufficient to utilize its San Fernando Basin import return water credit, and Los Angeles shall reduce its Sylmar Basin extractions by an equivalent amount and receive an offsetting entitlement for additional San Fernando Basin extractions.

Stored Water. Los Angeles, Glendale, Burbank, and San Fernando each have rights to store water in the San Fernando Basin and the right to extract equivalent amounts.

Sylmar Basin

Native Water. San Fernando and Los Angeles have rights of 3,580 and 1,560 acre-feet per year, respectively, to extract native water of Sylmar Basin. Private parties Meurer Engineering and Kisag Moordigian have overlying rights to extract and use on their lands overlying the Sylmar Basin all native water reasonably necessary for the acreage owned by them to meet beneficial uses.

Imported Return Water. Los Angeles and San Fernando have a right to extract imported return water equal to 35.7 percent of the preceding water year's imported water delivered to lands overlying Sylmar Basin.

Stored Water. Los Angeles and San Fernando each have a right to store water in the Sylmar Basin.

Physical Solution Water - Refer to physical solution provisions under San Fernando Basin as the San Fernando's water.

Verdugo Basin

Glendale and Crescenta Valley own mutually prescriptive rights to extract 3,856 acre-feet and 3,294 acre-feet per year, respectively.

Eagle Rock Basin

Native Water. The Eagle Rock Basin has no significant native safe yield.

Imported Return Water. Los Angeles has the right to extract or cause to be extracted the recharge to the basin.

Physical Solution Water. Sparkletts and Deep Rock have rights to extract water chargeable to Los Angeles.

Watermaster Service

In preparing the 1982-83 annual report, Watermaster collected and reported all information affecting and relating to the water supply and disposal within ULARA. Such information includes the following items:

1. Water supply

    a. Precipitation and runoff
    b. Imports and exports

2. Water use and disposal

    a. Extractions
        (1) Used in valley fill area
        (2) Exported from each basin

b. Water outflow
   (1) Surface
   (2) Subsurface
   (3) Sewers

3. Water levels

4. Water quality

5. Ownership and location of new wells

Administrative Committee

Section 8, Paragraph 8.3 of the ULARA judgment established as Administrative Committee for the purpose of advising the Watermaster in the administration of his duties. The duly appointed members of the Committee, as of September 30, 1983, are:

City of Burbank

Martindale Kile, Jr.
Ronald O. Snyder (Alternate)

City of Glendale

Steven J. Meyerhofer
Norman C. Koontz (Alternate)

City of Los Angeles

Le Val Lund
Bruce W. Kuebler (Alternate)

City of San Fernando

Arthur Kidman
Rick Navarro (Alternate)

Crescenta Valley County Water District

Robert K. Argenio
Ray Marsden (Alternate)

Private Parties

Charles Meurer
Roger Meurer
Kisag Moordigian

Martindale (Dale) Kile, Jr., is President of the Committee and Steven Meyerhofer is Vice President.

The Administrative Committee may be convened by the Watermaster at any time in order to seek its advice. In addition, the Committee is responsible for reviewing with the Watermaster the proposed annual report.

During the 1982-83 water year the Administrative Committee met on April 12, 1983. The following items were discussed at this meeting:

1. Status of Watermaster activities within ULARA.
2. Health report of Administrative Committee Member Neville Lewis.
3. Update of ground water quality study for San Fernando Basin.
4. Overdraft in Sylmar Basin.
5. City of Glendale draft EIR on Modification to Verdugo Park Ground Water Pickup System.
6. Hansen Dam storage problem update.
7. Administrative Committee members update.
8. Discharging TCE-contaminated ground water to waste.
9. Rising water table possibly affecting East Bradley Landfill.
10. Annual report for 1981-82.

Summary of 1982-83 Operating Conditions

Table 1 compares statistics for this period of record and the prior water year.

Rainfall on the valley fill area was 241 percent of normal as compared to 104 percent of normal the year before. Surface runoff leaving the valley at Gage F-57C-R for 1982-83 was 405,690 acre-feet. The amount conserved by the LACFCD and DWP in their spreading basins was 70,688 acre-feet, an increase of 246 percent over last year. Total precipitation falling on the San Fernando Valley and its tributary hill and mountain areas was estimated to be 1,264,000 acre-feet for the water year 1982-83. Of this total, approximately 388,000 acre-feet flowed from the valley as storm runoff and rising water, leaving 876,000 acre-feet which was beneficially used within the area (69 percent of the total).

Ground water extractions decreased in all four basins during 1982-83. Total ULARA extractions amounted to 82,855 acre-feet as compared to an allowable pumping of 106,313 acre-feet. Of this total, 104,067 acre-feet represents the 1982-83 extraction rights of parties in the San Fernando Basin (see 1982-83 Table 15) plus the safe yield values of Sylmar and Verdugo Basins. The remaining 2,246 acre-feet is nonconsumptive use pumping (see Table 13). Extractions used within ULARA decreased by 16 percent (3908 acre-feet) from last year.

TABLE I

UPPER LOS ANGELES RIVER AREA
SUMMARY OF OPERATING CONDITIONS
1981-82 AND 1982-83

Item		Water Year 1981-82	Water Year 1982-83
1. Parties		22	22
2. Active pumpers		19	19
3. Active nonpumpers (within valley fill)		0	0
4. Valley rainfall, in inches		17.18	39.64
5. Spreading operations, in acre-feet[a/]			
a. LACFCD		20,400	60,098
b. Los Angeles, City of		3,853	42,827
6. Extractions, in acre-feet		100,237	82,855
a. Used in ULARA		24,783	20,875
7. Gross imports, in acre-feet			
a. MWD water		63,516	66,155
b. Owens River water[b/]		469,453	451,712
	Total	532,969	517,867
8. Exports in acre-feet			
a. Owens River water		238,069	231,095
b. Groundwater by Los Angeles		75,454	61,980
	Total	313,523	293,075
9. Imports used in ULARA, in acre-feet		294,900	286,772
10. Reclaimed water, in acre-feet		12,440	8,607
a. Used in ULARA		1,454	1,296
11. Total delivered water used in ULARA, in acre-feet		321,137	308,943
12. Sewage export, in acre-feet[c/]		115,179	115,887

a/ Breakdown of spreading operations as to sources of water is shown in Table 6. Values include native and imported water.

b/ This value represents the summation of the gross amount of water delivered to and exported from ULARA. It does not include operational released, reservoir evaporation, and water spread during the year.

c/ Total of sewage outflow from all four basins, including reclaimed water which is discharged into flood control channel and flows out of basin.

For ULARA, gross imports decreased by 15,102 acre-feet, or 3 percent, while imports used within ULARA decreased by 3 percent (8,128 acre-feet). Exports of Owens River water decreased by 6,974 acre-feet, or 3 percent. The total amount delivered to water users within ULARA was 4 percent less (12,194 acre-feet) than last year.

Sewage export was 115,887 acre-feet in 1982-83, an increase of less than 1 percent. Total reclaimed water used in ULARA (cooling towers, irrigation, etc.) decreased by 11 percent (158 acre-feet), while the total water reclaimed decreased from 12,440 acre-feet to 8,607 acre-feet, a decrease of 31 percent. Much of this decrease was caused by the shut-down of the Los Angeles-Glendale Reclamation Plant for approximately six months while some cracked filters were being replaced. Most of the reclaimed water is discharged to the Los Angeles River.

A total of 102,925 acre-feet of water, 70,688 native and 32,237 Owens River, was spread during the year, which was a 324 percent increase from last year in spreading of imported and native water.

Ground water levels increased by an average of 15 and 10 feet respectively in the central and northeastern part of the San Fernando Basin, increased by 5 feet in the central portion of the Verdugo Basin, and increased by an average of 10 feet in the City of San Fernando pumping area of the Sylmar Basin.

Ground water storage for the San Fernando, Sylmar, and Verdugo Basins increased by 121,090 acre-feet, 7,320 acre-feet, and 2,990 acre-feet, respectively, during 1982-83.

Summary of Allowable Pumping for 1983-84

Table 2 gives a summary of allowable pumping for the Cities of Los Angeles, Burbank, Glendale, San Fernando and Crescenta Valley County Water District. Stored water is also shown as a credit for these parties as of October 1, 1983.

TABLE 2

SUMMARY OF ALLOWABLE PUMPING FOR ENSUING YEAR 1983-84

(In Acre-Feet)

	Extractions			Stored Water Credit*
	Native	Import Credit	Total	
San Fernando Basin				
Los Angeles	43,660	39,147	82,807	185,667
Burbank	--	4,424	4,424	19,298
Glendale	--	4,508	4,508	16,343
San Fernando	--	21	21	94
Sylmar Basin				
Los Angeles	1,560	2,460	4,020	--
San Fernando	3,580	--	3,580	--
Verdugo Basin				
Crescenta	--	--	3,294	--
Glendale	--	--	3,856	--

* As of October 1, 1983

Note: Calculation of these values shown in more detail in Tables 14 and 15.

II. WATER SUPPLY CONDITIONS

The present water supply of ULARA consists of ground water recharge from imported water, hill and mountain runoff, and direct precipitation on the valley floor area. This includes runoff from precipitation falling on portion of the San Gabriel, Verdugo, Santa Monica, and Santa Susana Mountains; imports from the Mono Basin-Owens River system; imports from the Colorado River; imports from Northern California made available by the State Water Project; and reclaimed water.

Precipitation

ULARA has the climate of an interior valley and is hotter in summer and wetter in the winter than the coastal areas.

Precipitation varies considerably throughout ULARA, depending on topography and elevation. Mean seasonal precipitation ranges from about 14 inches at the western end of the San Fernando Valley to 35 inches in the San Gabriel Mountains. Approximately 80 percent of the annual rainfall occurs from December through March.

The 1982-83 water year experienced above average rainfall. The Valley floor received 39.64 inches of rain, whereas the mountains received approximately 50.06 inches. The weighted average of both valley and mountain areas was 46.07 inches, an increase of 25.91 inches from last year. The 100-year (1881-1981) average precipitation for the valley and mountains is 16.48 inches and 21.91 inches, respectively. Table 3 presents a record of rainfall at 17 key precipitation stations which were used to develop the 100-year average rainfall and are described in the Report of Referee.

In the safe yield evaluation, precipitation on the valley is determined separately from that on the hills and mountains. The valley is made up of the four ground water basins, whereas the hills and mountains comprise the remaining areas in ULARA. Precipitation in the hills and mountains is evaluated to relate the runoff from the water sheds of Big Tujunga, Pacoima Creek, and Sycamore Canyon to the runoff records which are included in this report and also to calculate the ground water recharge. (See Plate 5 for location of precipitation stations.)

Runoff and Outflow from ULARA

The drainage area of ULARA contains 328,500 acres, of which 205,700 acres are hills and mountains. The drainage system, in turn, is made up of the Los Angeles River and its tributaries. Surface flow originates as storn runoff from the hills and mountains; storm runoff from the impervious areas of the valley; operational spills of imported water; industrial and sanitary waste discharges; and rising water.

TABLE 3

PRECIPITATION[a/]
(Inches)

LACFCD Number	Name	100-Year Mean	1981-82 Precipitation	1982-83 Precipitation	1982-83 Percent of 100-Year Mean
11D	Upper Franklin Canyon Reservoir	18.50	18.80	46.6[c/]	252
13C	Hollywood-Blix[b/]	16.63	17.66	41.57	250
14C	Roscow-Merrill[b/]	14.98	17.71	40.14	268
15A	Van Nuys[b/]	15.30	15.45	37.82	247
17	Sepulveda Canyon-Mulholland Highway	19.82	19.10	44.8[c/]	226
21B	Woodland Hills[b/]	14.60	16.40	34.86	239
23B-E	Chatsworth Reservoir[b/]	15.19	14.24	34.29	226
25C	Northridge-LADWP[b/]	15.16	14.65	34.54	228
33A-E	Pacoima Dam	19.64	18.21	41.86	213
47D	Clear Creek-City School	33.01	33.87	70.58	214
53D	Colby's Ranch	29.04	29.60	56.7[c/]	195
54C	Loomis Ranch-Alder Creek	18.62	18.23	42.32	227
210B	Brand Park	18.13	19.20	52.5[c/]	290
251C	LaCrescenta[b/]	23.31	22.79	54.69	235
259D	Chatsworth-Twin Lakes	18.70	17.25	39.74	213
293E	Los Angeles Reservoir[b/]	17.32	18.98	38.26	221
1190	Pacoima Canyon-North Park Ranger Station	23.06	27.16	60.0[c/]	260

Weighted average for valley stations - 39.64 inches (1982-83)
Weighted average for mountain stations - 50.06 inches (1982-83)

a/ Data furnished by Los Angeles County Flood Control District (LACFCD)
b/ Valley Station
c/ Partially estimated

A number of stream-gaging stations are maintained throughout ULARA, either by LACFCD or United States Geological Survey (USGS). The Watermaster has selected six key gaging stations which, in effect, record runoff from hydrologic areas in ULARA.

Table 4 summarized the monthly runoff for these gaging stations and compares the 1981-82 water year with the 1982-83 year. The changes in runoff reflect the increase in rainfall in the valley and in the mountains.

Station F-57C-R registers all surface outflow from ULARA.

Station F-252-R registers flow from Verdugo Canyon plus flows from Dunsmore and Pickens Canyons.

Station E-285-R registers flow from the westerly slopes of the Verdugo Mountains and some flow east of Lankershim Boulevard. It also records any releases of reclaimed wastewater discharged by the City of Burbank.

Station F-300-R registers all flow east of Lankershim Boulevard plus outflow from Hansen Dam that is not spread. These records also include releases from Sepulveda Dam, which may include extractions from Reseda wells.

Station F-168-R registers all releases from Big Tujunga Dam, which collects runoff from Tujunga Canyon northeast of the dam. Runoff below this point flows to Hansen Dam.

Station 118B-R registers all releases from Pacoima Dam that originate in Pacoima Canyon. Runoff below this point flows to the Lopez and Pacoima spreading grounds and on down to the Los Angeles River through lined channels.

The locations of these key gaging stations are shown on Plate 5. The mean daily discharge rates for these six gaging stations during 1982-83 are summarized in Appendix B.

The Watermaster has computed the surface flow of the Los Angeles River at Gaging Station F-57C-R as to the sources, i.e. storm runoff from precipitation, Owens River water, rising water, and industrial and reclaimed wastewater discharges. The Watermaster utilized the procedures outlined in the Report of Referee for estimating the approximate flow rates and sources of water passing Gaging Station F-57C-R. A similar calculation was made for Station F-252-R. A summary of the procedures used follows, and a tabulation of the computed flows is shown in Table 5.

TABLE 4

MONTHLY RUNOFF AT SELECTED GAGING STATIONS*
(In Acre-Feet)

Station	Water Year	Month												Total
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	
F-57C-R	1981-82	2660	12550	3620	13460	4090	32310	16830	3450	2210	1980	1990	4310	99,460
Los Angeles River	1982-83	2600	28060	10030	46420	36890	201800	37340	18180	4140	2890	8050	9290	405,690
F-252-R	1981-82	267	1130	793	1340	394	2180	1400	262	364	255	121	571	9,077
Verdugo Channel	1982-83	444	2270	1060	2960	2060	10380	3320	960	507	729	884	1140	26,714
E285-R	1981-82	631	1450	320	1510	588	3430	1700	528	371	637	534	816	12,515
Burbank Storm Drain	1982-83	410	2160	928	3550	2940	9590	2620	951	690	504	924	1240	26,507
F-300-R	1981-82	1160	7000	1810	10180	1880	15070	10020	2190	956	728	708	747	52,449
L.A. River Tujunga Ave.	1982-83	619	18150	4920	27080	28,770	157410	29670	1700	3230	2260	6280	7230	287,319
F-168-R	1981-82	367	481	524	693	800	3910	6368	1611	856	368	314	265	16,557
Big Tujunga Dam	1982-83	234	927	1044	4470	8501	51372	12795	10067	3896	2389	1766	973	98,434
118B-R	1981-82	12	15	74	12	12	866	2438	12	1391	12	12	12	4,868
Pacoima Dam	1982-83	12	12	455	2547	5252	23195	5855	4330	1490	684	420	238	44,490

* See Plate 5 for gaging station location.

TABLE 5

SEPARATION OF SURFACE FLOW AT STATIONS F-57C-R AND F-252-R
(In Acre-Feet)

Period	Base Low Flow		Storm Runoff	Total Measured Outflow
	Rising Water[a/]	Waste Discharge		
Station F57C-R				
1971-72	3,602	8,219	35,049	46,870
1972-73	4,596	8,776	100,587	113,959
1973-74	2,694	6,366	79,818	88,878
1974-75	427	7,318	56,396	64,141
1975-76	261	6,741	32,723	39,725
1976-77	839	7,128	58,046	66,013
1977-78	1,331	7,449	357,883	366,663
1978-79	2,840	16,450[d/]	119,810	139,100
1979-80	5,500[d/]	16,500[d/]	[b/]	[b/]
1980-81	4,710	19,580	51,940	76,230
1981-82	1,280	18,180	80,000	99,460
1982-83	3,460	17,610	384,620	405,690
29-year average 1929-57	6,810	770	30,790	39,950
Station F252 R				
1971-72	2,050	0	2,513	4,563
1972-73	1,706	0	7,702	9,408
1973-74	1,772	0	5,613	7,385
1974-75	1,333	0	4,255	5,588
1975-76	2,170	0	2,380	4,550
1976-77	1,683	0	2,635	4,318
1977-78	1,168	0	23,571	24,739
1978-79	2,470	0	[b/]	[b/]
1979-80	5,150[c/]	0	7,752	12,902
1980-81	5,780	0	2,917	8,697
1981-82	3,710	0	5,367	9,077
1982-83	5,330	0	21,384	26,714

a/ Includes rising water past rubber dam at Headworks Spreading Grounds, Verdugo Channel, and Los Angeles River Narrows.

b/ Data Not available.

c/ Verdugo Basin. Large increase in 1979-80 due to more accurate measurements.

d/ Estimated.

The base low flows were separated from the surface runoff by the use of the hydrographs of Station F-57C-R. Base flows consist of rising water and industrial waste plus reclaimed water. Separation of base flow from surface runoff is based on the following assumptions:

> Rising water equals base low flow minus the sum of industrial discharge water and reclaimed water. Industrial discharge waters are estimated from City of Los Angeles waste permits, Los Angeles-Glendale reclamation plant discharges, and low flows in the Burbank-Western storm drain which include wastewater from the Burbank reclamation plant.
>
> When the City of Los Angeles diverts water at the Headworks spreading grounds, most of the rising water is diverted.
>
> When there is no diversion, a portion of the rising water may percolate upstream from Station F-57C-R.

Historically, the surface runoff obtained from the hydrographs of Station F-57C-R consisted primarily of storm runoff and Owens River water. The last releases of Owens River water into the Los Angeles River occurred in February 1971 due to the San Fernando earthquake. Releases in the future are expected to be minimal, but if they do occur, separation of surface runoff will be based on the following assumptions:

> Net storm runoff equals surface runoff minus Owens River water.
>
> If the Headworks diversion structure is used, all releases of Owens River waters are diverted to the Headworks spreading grounds. If the Headworks diversion structure does not divert water, all releases of Owens River waters are considered as passing Station F-57C-R.

Ground Water Recharge

Local precipitation can have a marked influence on the ground water supply and water in storage. However, there is a wide variation in the annual amount of runoff as a result of changes in both precipitation and retentive characteristics of the watershed.

Urban development during the past years in ULARA has resulted in much of the rainfall being collected and routed into paved channels, which discharge into the Los Angeles River, and subsequently being carried out of the basin.

To somewhat overcome the increased runoff due to urbanization, Pacoima and Hansen Dams, originally built for flood protection,

were utilized to regulate storm flows to recapture the flow in downstream spreading basins operated by LACFCD, as well as the City of Los Angeles. Operation of Hansen Dam for the purpose of spreading water for recharge has become increasingly more difficult due to the sand and gravel that has accumulated within the forebay of the dam.

LACFCD operates the Branford, Hansen, Lopez, and Pacoima spreading grounds. The City of Los Angeles, in turn, operates the Tujunga and Headworks spreading grounds. Plate 2 shows the locations of these spreading basins. The spreading grounds operated by LACFCD are utilized for spreading native water and imported water under contract. The spreading grounds operated by the City of Los Angeles are utilized to spread Owens River and native waters, ground water, and the discharge from the Reseda wells. Table 6 summarized the spreading operations for the 1982-83 water year.

Ground Water Table Elevations

During the 1982-83 water year, the Watermaster collected and processed data to determine prevailing ground water conditions in ULARA during the spring and fall of 1983. Plates 7 and 8 show these conditions. Change in ground water surface elevation from fall of 1982 to fall of 1983 as presented in Plate 9 reflects the effects of variations in spreading, ground water extractions, and replenishment from rainfall. Plate 10 provides a diagrammatic sketch of the direction travel time for ground water flow in the San Fernando and Verdugo Basins in 1980.

TABLE 6

SPREADING OPERATIONS
(In Acre-Feet)

Month	Native Water Spread by Los Angeles County Flood Control District				Water Spread by City of Los Angeles					Total San Fernando Basin Spreading
	Spreading Basins				Tujunga Spreading Grounds		Headworks Spreading Grounds			
	Branford	Hansen	Lopez	Pacoima	Native Water	Owens River Water	Owens River Water	Reseda Wells	Surface Runoff[a/]	
1982										
Oct.	4	508	0	0	0	0	0	0	10	522
Nov.	152	532	0	490	0	1,794	0	0	0	2,968
Dec.	45	1,568	0	540	0	5,192	0	0	0	7,345
1983										
Jan.	228	3,364	65	2,372	0	871	0	0	0	6,900
Feb.	103	5,374	433	4,490	0	6,581	0	0	0	16,981
Mar.	96	3,985	394	5,007	0	8,677	0	0	0	18,159
Apr.	88	7,813	159	5,088	0	4,003	0	0	0	17,151
May	4	4,299	0	3,565	0	2,637	0	0	0	10,505
June	0	2,702	0	1,141	4,368	2,354	0	0	0	10,565
July	0	2,491	0	185	2,634	0	0	0	0	5,310
Aug.	101	2,536	0	94	1,018	0	0	0	0	3,749
Sept.	62	20	0	0	2,560	128	0	0	0	2,770
Totals	883	35,192	1,051	22,972	10,580	32,237	0	0	10	102,925

a/ Includes industrial discharge, ground water effluent, and surface runoff diverted from Los Angeles River.

Due to increased spreading at Hansen, Pacoima and Tujunga spreading grounds during 1982-83, water levels rose approximately 30 feet in the vicinity of these spreading grounds. Water levels increased by approximately 20 feet in the North Hollywood area due to decreased pumping and increased by approximately 10 feet in the Crystal Springs Area increase area due to a decrease in pumping. An increase of 10 feet in the City of San Fernando well field area of the Sylmar Basin was caused by a decrease in pumping, and an average increase of 10 feet occurred in the central portion of the Verdugo Basin due to decreased pumping by Glendale and Crescenta Valley County Water District.

Figures 1 and 2 depict water levels at key wells with their approximate locations indicated by numbers shown on Figure 2 map.

Water Reclamation

Water reclamation presently provides a source of water for irrigation, industrial and recreational uses, and ground water recharge which occurs in the unlined section of the Los Angeles River. Five wastewater reclamation plants are in operation in ULARA. A tabulation of operating water reclamation plants is shown on Table 7.

Construction of the Donald C. Tillman (Sepulveda Basin) Water Reclamation Plant began in November 1980, with completion expected around July 1984. A portion of the effluent from the 40 million gallons per day (mgd) plant will be used to irrigate the Sepulveda Basin recreation area and the residual will be discharged to the Los Angeles River. In the future this residual discharge may be used for industrial cooling, freeway landscape irrigation, and ground water recharge. Direct groundwater recharge will be allowed only if the Department of Health Services permits it.

Water Quality

Water resources management must take into account water quality as well as water supply. The total dissolved solids (TDS) concentration in water is the quality indicator that is generally used. A comparison of the TDS content in the various water sources is shown in Figure 3. Representative mineral analyses of imported, surface, and ground waters for 1982-83 are contained in Table 8.

An Interagency Coordinating Committee has been formed to coordinate the implementation of the Groundwater Quality Management Plan - San Fernando Valley Basin inorder to deal with the organic contaminants TCE and PCE found in the groundwater. Table 9 shows the total number of wells for 1982-83 exceeding the California DOHS action levels for these contaminants.

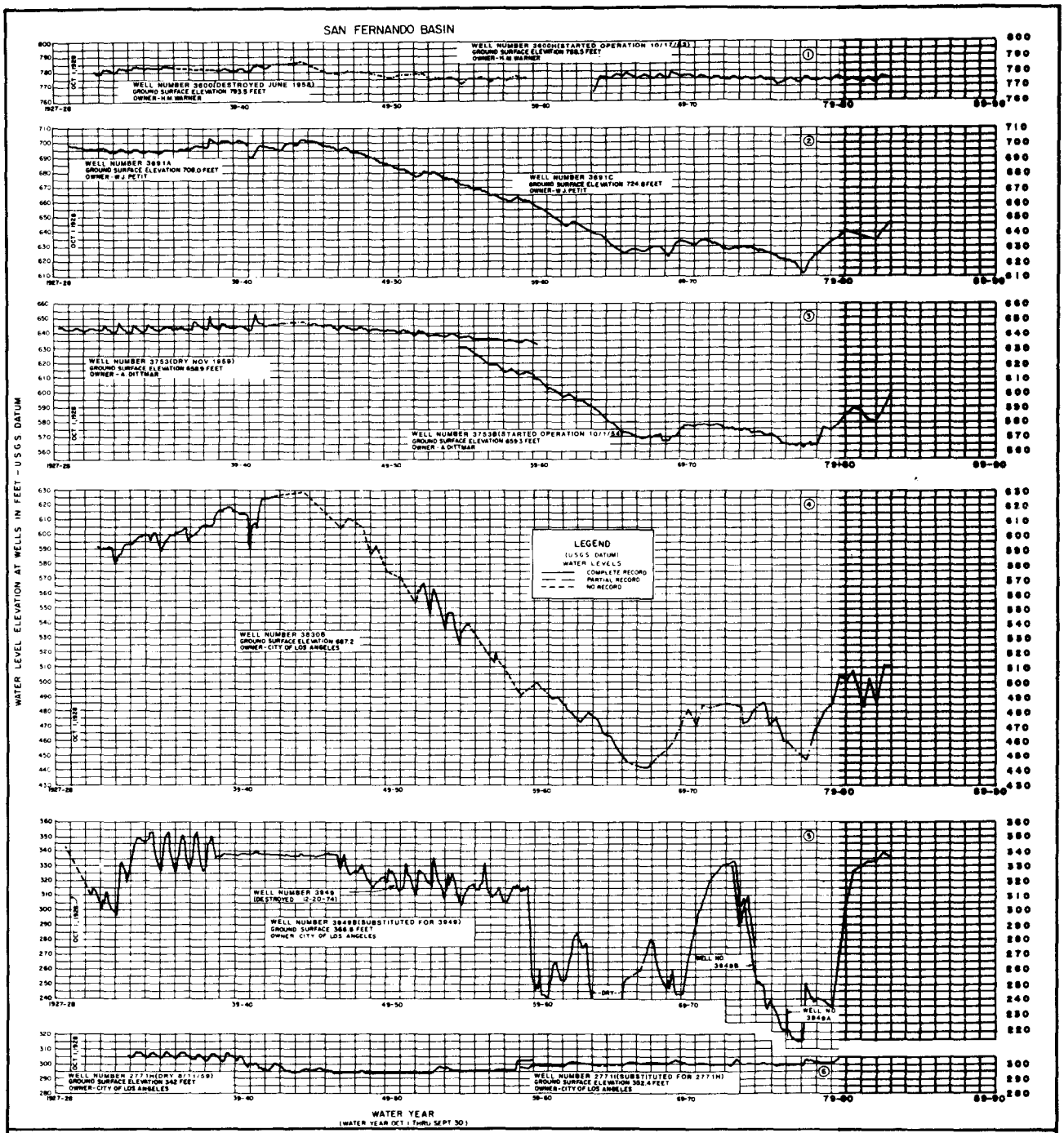

Figure 1—FLUCTUATION OF WATER LEVEL ELEVATION AT WELLS IN THE SAN FERNANDO BASIN

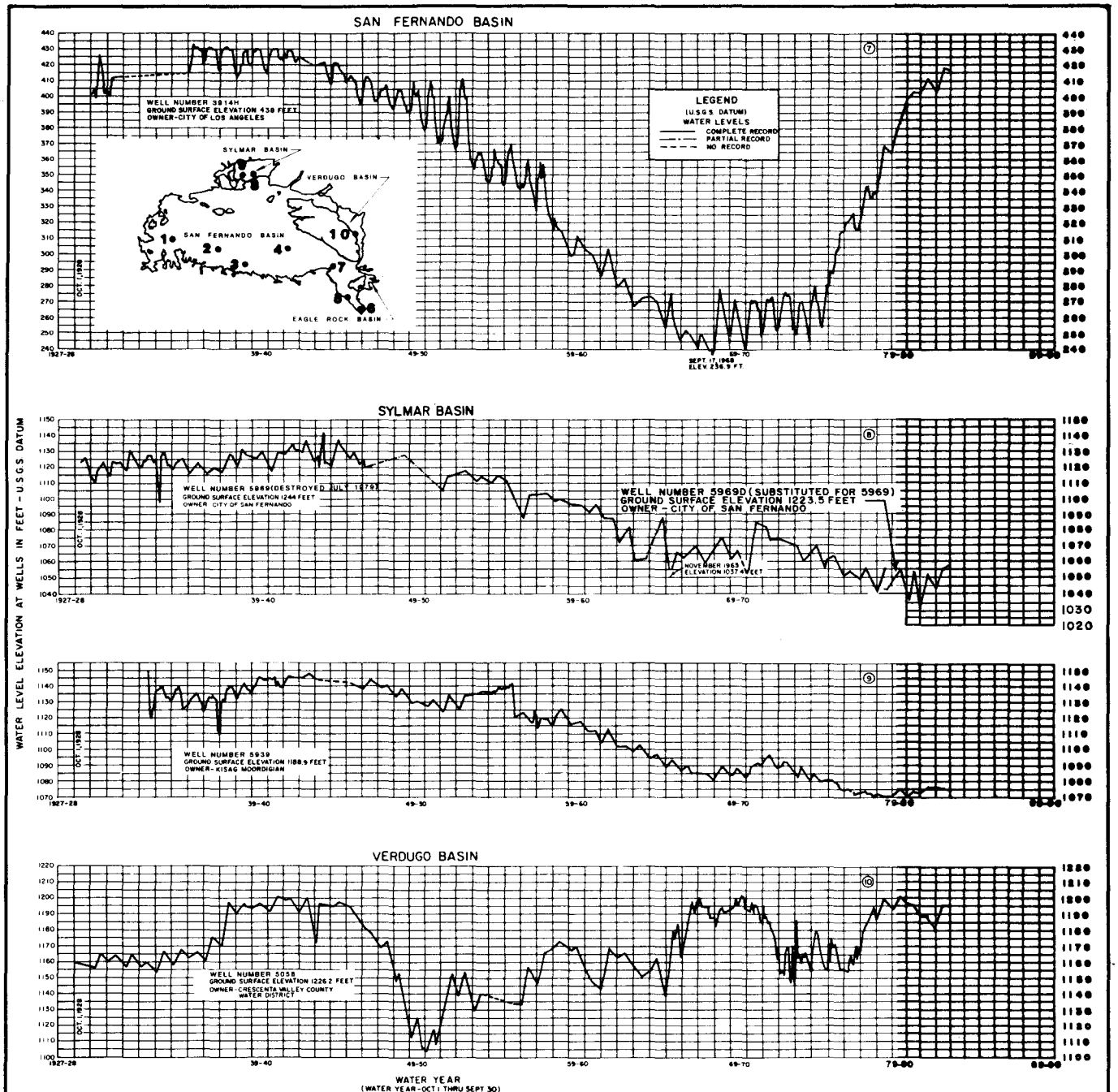

Figure 2 – FLUCTUATION OF WATER LEVEL ELEVATION AT WELLS IN THE SAN FERNANDO, SYLMAR AND VERDUGO BASINS

TABLE 7

WATER RECLAMATION PLANTS, 1982-83
(In Acre-Feet)

Plant	Treated	Used in ULARA	Discharged to Los Angeles River
San Fernando Basin			
City of Burbank	4,996	653[a/]	4,670
Los Angeles-Glendale	3,511	543[b/]	3,018
Indian Hills Mobile Homes[d/]	20	20[c/]	0
Rocketdyne (Santa Susana Field Laboratory)	60	60[c/]	0
The Independent Order of Foresters[e/]	20	20[c/]	0
Total	8,607	1,296	7,688

a/ Total water delivered to Burbank cooling towers includes 50 percent evaporation and the rest to Los Angeles River.

b/ Total water delivered (100 AF) to phosphate plant in Glendale includes 50 percent evaporation and the rest to Los Angeles River; 443 AF delivered to Griffith Park by City of Los Angeles for irrigation and to Los Angeles-Glendale plant for wash down, cooling, and irrigation.

c/ Land irrigation.

d/ Water supply from nearby well.

e/ Water supply from pipeline from LADWP.

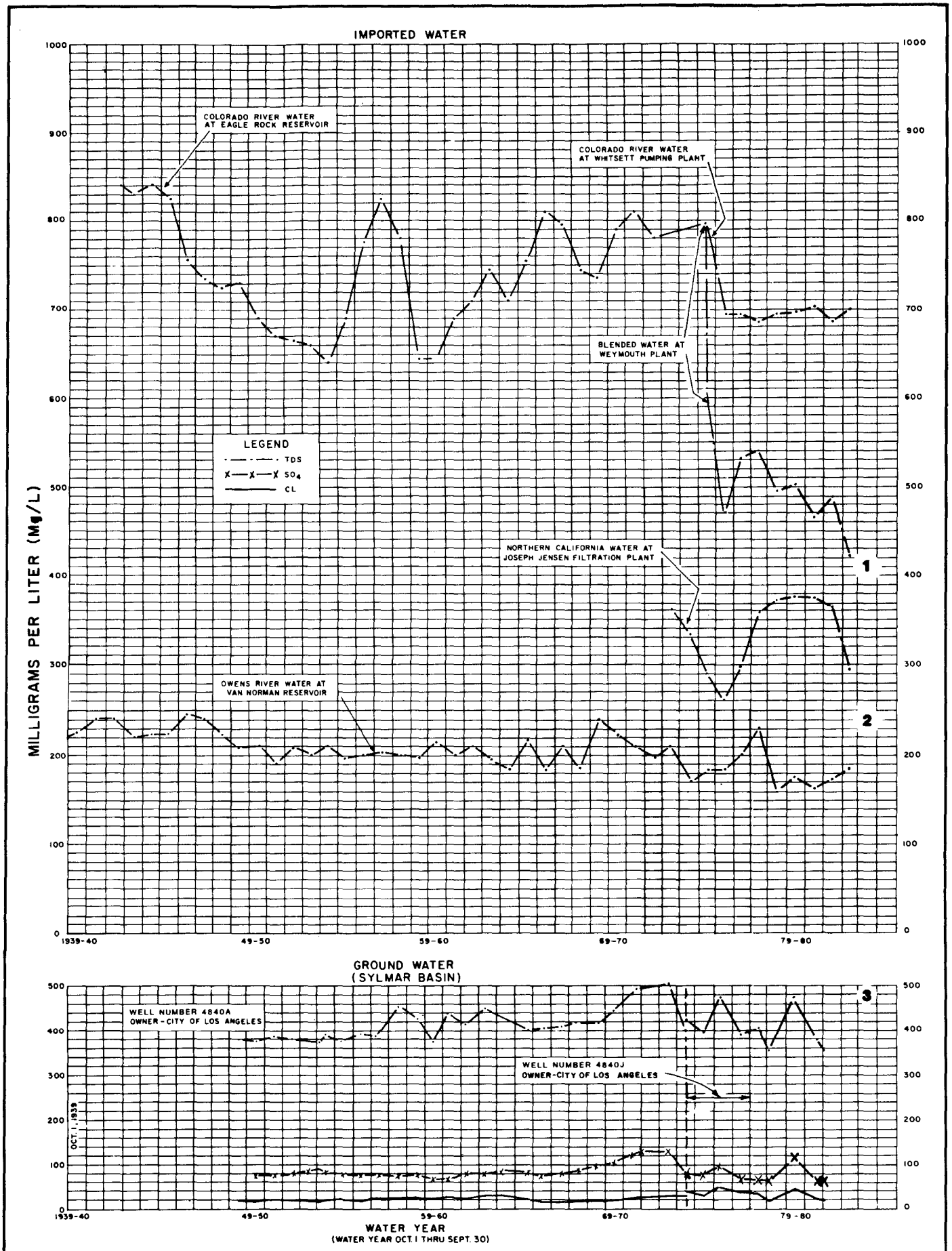

Figure 3— MINERAL CONSTITUENTS OF WATER SOURCES IN THE ULARA

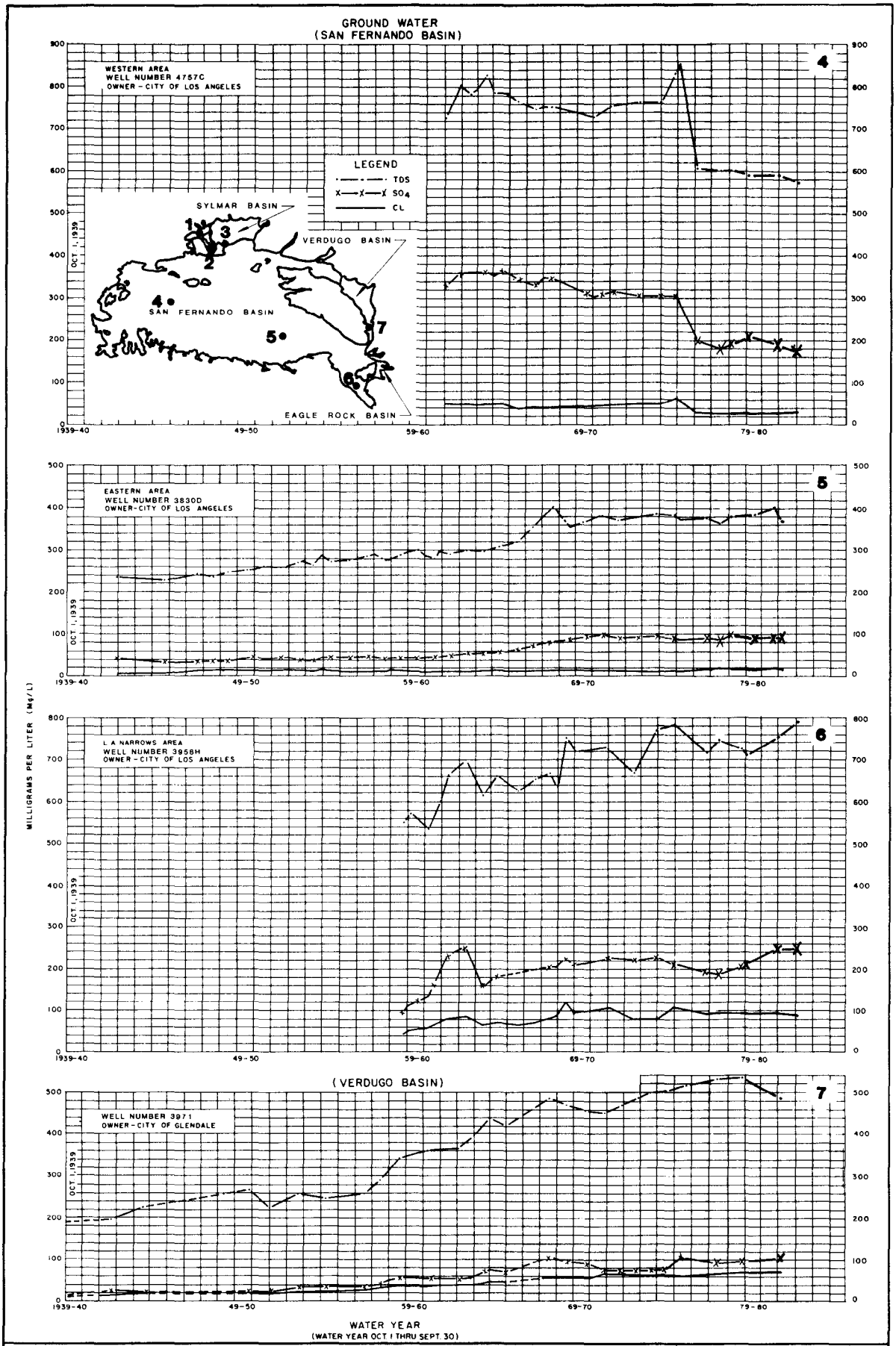

Figure 3(Cont.) — MINERAL CONSTITUENTS OF WATER SOURCES IN THE ULARA

TABLE 8

REPRESENTATIVE MINERAL ANALYSIS OF WATER

Well Number or Source	Date Sampled	EC x 10^6 at 25°C	PH	Mineral Constituents in Milligrams per liter (mg/l) / Milliequivalents per liter (me/l) Ca	Mg	Na	K	Co_3	HCO_3	SO_4	Cl	NO_3	F	B	TDS Total Dissolved Solids mg/l	Total Hardness as $CaCO_3$ mg/l[3]
Imported Water																
Blended State Project and Colorado River Water at Eagle Rock Reservoir	82-83	709	8.0	48 2.40	20 1.63	65 2.83	3.7 0.09	-- --	55 0.90	164 3.42	58 1.63	1.7 0.03	0.24 0.01	-- --	447	202
Owens River water at Upper Van Norman Reservoir Inlet	82-83	295	7.3	21 1.05	4.3 0.35	31 1.35	3.4 0.09	-- --	54 0.89	23 0.48	16 0.45	0.4 0.01	0.57 0.03	0.40 0.11	186	61
State Project Water at Joseph Jensen Filtration Plant (Influent)	82-83	509	8.13	33 1.65	13.5 1.12	48 2.09	2.6 0.07	0 0	116 1.90	73 1.52	51 1.44	1.8 0.03	0.30 0.02	0.32 0.09	295	136
Surface Water																
Los Angeles River at Sepulveda Blvd.	11/22/82	1320	8.21	136 6.80	49 4.08	86 3.74	5.3 0.14	-- --	228 3.73	370 7.71	88 2.48	3.7 0.06	-- --	-- --	1012	540
	7/6/83	1450	7.90	131 6.55	52 4.33	107 4.65	5.8 0.15	-- --	165 2.70	456 9.50	101 2.85	2.4 0.04	-- --	-- --	1246	540
Los Angeles River at Colorado Blvd.	11/22/82	895	8.19	77 3.85	34 2.83	59 2.57	5.4 0.14	-- --	195 3.20	170 3.54	58 1.63	2.7 0.04	-- --	-- --	700	332
	7/6/83	1140	8.71	82 4.10	52 4.33	79 3.43	5.2 0.13	20 0.66	160 2.62	280 5.83	81 2.28	2.6 0.04	-- --	-- --	948	416
Burbank Western Wash at Los Angeles River	11/22/82	860	7.74	29 1.45	17 1.42	87 3.78	10 0.26	-- --	108 1.77	91 1.90	89 2.51	1.8 0.03	-- --	-- --	480	140
	7/6/83	910	8.12	35 1.75	22 1.83	89 3.87	11 0.28	-- --	155 2.54	144 3.00	84 2.37	2.5 0.04	-- --	-- --	615	188
Burbank Reclamation Plant Discharge to Burbank-Western Wash	11/11/82	--	6.59	-- --	-- --	106 4.61	-- --	-- --	-- --	50 1.04	110 3.10	-- --	0.25 0.01	0.48 0.13	475	--
L.A.-Glendale Reclamation Plant Discharge to L.A. River	7/83	--	--	54 2.70	16 1.33	112 4.87	9.5 0.25	-- --	-- --	-- --	-- --	3.47 0.06	0.99 0.05	0.72 0.20	564	--
Groundwater																
(San Fernando Basin - Western Portion)																
4757C (Reseda No. 6)	10/27/82	956	7.38	115 5.75	34 2.83	40 1.74	1.9 0.05	0 0	-- --	176 3.67	31 0.87	8.1 0.13	0.30 0.02	0.28 0.08	574	428
(San Fernando Basin - Eastern Portion)																
3820B (No. Hollywood No. 18)	11/30/81	616	7.45	62 3.10	20 1.67	31 1.35	3.3 0.08	0 0	176 2.89	92 1.92	17 0.48	18 0.29	0.52 0.03	0.17 0.05	370	236
3841G (Burbank No. 18)	8/25/83	460	8.10	49 2.44	8.0 0.66	50 2.18	1.2 0.03	0 0	210 3.44	35 0.72	43 1.20	0.34 0.01	0.30 0.02	0.22 0.06	319	155
3913H Grandview No. 16	1/19/82	519	7.60	57 2.83	10 0.82	38 1.65	3.5 0.09	0 0	211 3.47	46 0.96	33 0.93	-- --	0.45 0.02	-- --	321	185
(San Fernando Basin - L.A. Narrows)																
3958H (Pollock No. 6)	10/27/82	1320	7.40	130 6.50	46 3.83	69 3.00	3.1 0.08	0 0	-- --	248 5.17	87 2.45	5.1 0.08	0.29 0.02	0.47 0.13	792	505
(Sylmar Basin)																
4840J (Mission No. 5)	10/6/81	594	7.55	68 3.40	16 1.33	28 1.22	3.4 0.09	0 0	195 3.20	62 1.29	18 0.51	18 0.29	0.34 0.02	0.27 0.08	356	236
5959 (San Fernando No. 3	1/14/82	599	7.50	71 3.56	19 1.59	31 1.35	2.8 0.07	0 0	232 3.81	82 1.71	32 0.89	-- --	0.37 0.02	-- --	392	267
(Verdugo Basin)																
3971 (Glorietta No. 3)	1/19/82	790	6.70	91 4.57	28 2.30	33 1.44	3.0 0.08	0 0	191 3.13	104 2.17	69 1.95	-- --	0.22 0.01	-- --	486	351
5069F (CVCWD No. 14)	11/24/82	640	7.26	76 3.80	23 1.9	29 1.26	2.9 0.07	0 0	189 3.1	55 1.1	48 1.35	-- --	0.3 0.02	-- --	393	285

Imported Water

A. Owens River-Mono Basin water is sodium bicarbonate in character and is the highest quality water available to ULARA. Its TDS concentration averaged about 210 milligrams per liter (mg/1) for 30 years before 1969, the highest record being 320 mg/1 on April 1, 1946, and the lowest, 150 mg/1 on September 17, 1941. Average TDS concentration for 1982-83 was 186 mg/1, which was slightly higher than the 173 mg/1 for 1981-82.

B. Colorado River water is predominantly sodium-calcium sulfate in character, changing to sodium sulfate after treatment to reduce total hardness. Samples taken at the Burbank turnout between 1941 and 1975 indicated a TDS concentration high of 875 mg/1 in August 1955 and a low of 625 mg/1 in April 1959. The average TDS over the 34-year period was approximately 740 mg/1. Tests conducted at the Whitsett Intake Pumping Plant showed an average TDS of 700 mg/1 for 1982-83, an increase of 2 percent from last year.

C. Northern California water (State Water Project water) is sodium bicarbonate-sulfate in character. It generally contains less TDS and is softer than local and Colorado River water. Since its arrival in Southern California in April 1972, the water had a high TDS concentration of 390 mg/1 and a low of 247 mg/1. Tests of Northern California water are taken at the Joseph Jensen Filtration Plant. Average TDS concentration during 1982-83 was 295 mg/1, a 19 percent decrease from last year.

D. Colorado River and Northern California water were first blended at the Weymouth Plant in May 1975. In the 1982-83 period, TDS had an average value of 422 mg/1 which was a 14 percent decrease from 1981-82. Blending ratios vary at the Weymouth Plant and test are taken from the effluent.

Surface Water

Surface runoff contains salts dissolved from rocks in the tributary areas. Surface water is sodium-calcium, sulfate-bicarbonate in character. In 1982-83, low flows in the Los Angeles River at Colorado Boulevard had an average TDS content of 824 mg/1 and a total hardness of 374 mg/1, an increase over last year of 16 and 97 percent, respectively. Much of this increase was caused by higher releases of native water from Hansen Dam throughout the year.

Ground Water

Ground water in ULARA is moderately hard to very hard. The character of ground water from the major water-bearing formations is of two general types, each reflecting the composition of the surface runoff in the area. In the western part of ULARA, it is calcium sulfate-bicarbonate in character, while in the eastern part, including Sylmar and Verdugo Basins, it is calcium bicarbonate. TDS decreased in the western part of the San Fernando Basin by 3 percent over 1980-81; decreased by 8 percent in the eastern part; decreased by 6 percent in the Sylmar Basin; and decreased by 9 percent from 1977-78 in the Verdugo Basin.

Ground water is generally within the recommended limits of the United States Public Health Service Drinking Water Standards, except perhaps for wells in the western end of the San Fernando Basin having excess concentrations of sulfate and those in the lower part of the Verdugo Basin having abnormally high concentrations of nitrate.

Groundwater Quality Management Plan

The Groundwater Quality Management Plan - San Fernando Valley Basin (GWQMP-SFVB) study was completed in July 1983. The purpose of the study was to investigate the contamination of wells within the San Fernando Basin by priority pollutants and to develop corrective strategies. The plan makes recommendations for long-term corrective action to eliminate and prevent groundwater contamination. A continuing groundwater quality investigation has been carried on by the Los Angeles Department of Water and Power in cooperation with the California State Department of Health Serviced (DOHS) since the discovery in early 1980 of low levels of the chemical contaminants TCE and PCE in water supply wells in the basin. A summary of the number of wells with TCE and PCE above the California DOHS action levels is presented in Table 9 for the water year 1982-83, with the well field locations shown on Plate 6. At the present time, the DOHS allowable action levels are 5 ppb for TCE and 4 ppb for PCE in the water supplied to the consumer. Blending or other means are employed to comply with DOHS water quality requirements in delivered supplies.

The recommendations of the Plan to prevent further contamination of the basin and to remedy the quality of the basin groundwater are as follows:

1. Increase the public's awareness of the need for groundwater quality protection through educational programs;

2. Eliminate private disposal systems (e.g. septic tanks, leach fields, etc.) in commercial/industrial zones in groundwater sensitive areas.

3. Augment industrial inspection efforts in areas overlying groundwater production areas.

4. Develop inspection and testing of all storage tanks, waste sumps, and piping containing hazardous materials to detect leaks;

5. Initiate a program for the collection of industrial wastes from small quantity generators.

6. Improve sanitary landfill regulation to protect groundwater quality.

7. Expand groundwater monitoring program to ascertain the quality trends of aquifer water in the basin; and

8. Reduce or remove contaminants in delivered water through blending or treatment.

An Interagency Coordinating Committee and eight subcommittees consisting of over 20 state and local agencies has been formed to coordinate the implementation of the above GWQMP-SFVB recommendations.

TABLE 9

1982-83
ULARA WELL FIELDS* -
WELLS EXCEEDING CALIFORNIA DOHS ACTION LEVELS
FOR TCE AND PCE

	Number of Wells											
	City of Los Angeles								Others			Total
	NH	CS	P	HW	E	W	V	Total	B	G	CVCWD	
TCE Levels (ppb)												
5-20	5**	3	1	2	1	2	1	15	4	3	0	22
20-100	8**	0	0	1	0	2**	0	11	1	1	0	13
100	3**	0	0	3	0	0	0	6	1	0	0	7
Total	16	3	1	6	1	4	1	32	6	4	0	42
PCE Levels (ppb)												
4-20	3	0	1	4	0	1	0	9	3	1	3	16
20-100	0	0	0	0	0	0	0	0	0	0	1	1
100	0	0	0	0	0	0	0	0	1	0	0	1
Total	3	0	1	4	0	1	0	9	4	1	4	18

Well Fields:
NH - North Hollywood
CS - Crystal Springs
P - Pollock
HW - Headworks
E - Erwin
W - Whitnall
V - Verdugo
B - City of Burbank
G - City of Glendale
CVCWD - Crescenta Valley County Water District

*Values in table represent an average for year.

**Since 8 NH and one W wells were not pumped during year, the previous year's TCE annual average values were used for those wells in compiling this table.

III. WATER USE AND DISPOSAL

Water delivered for use in ULARA is either imported water, local ground water, local surface diversions, reclaimed, or a mixture of local and imported water, depending on the area and water system operation. During the 1982-83 water year, the total amount delivered to water users in ULARA was 308,943 acre-feet. Of this total, 20,875 acre-feet was ground water, 286,772 acre-feet was imported, and 1,296 acre-feet was reclaimed water. Refer to Figure 5 for a monthly breakdown. The basin contains 521 wells, of which 124 are active and 397 are inactive, observation, test, capped, etc.

The original trial court adjudication of ground water rights in ULARA (no longer in effect) restricted all ground water extractions, effective October 1, 1968. On that date, extractions were restricted to approximately 104,000 acre-feet per water year. This amounted to a reduction of approximately 50,000 acre-feet below the previous six-year average. The State Supreme Court's opinion, as implemented on remand in the Final Judgment entered on January 26, 1979, provides a similar restriction in ground water pumping. Refer to the previous section entitled "History of Adjudication" for details of allowed pumping.

Sparkletts Drinking Water Corporation and Deep Rock Water Company are the only parties that extract water from the Eagle Rock Basin.

Figure 4 illustrates the annual ground water extractions and total water imported in ULARA, beginning with the 1944-45 water year. Note the change from 1968-69 through the present.

It can also be noted that for 10 years before pumping was restricted, imports exceeded extractions from 50,000 to 90,000 acre-feet per year and that, for the water years 1968-69 to 1982-83, the difference increased to between 110,000 and 210,000 acre-feet.

Figure 5 provides an analysis of the monthly relationship between rainfall, ground water extractions, and imported supply. Data relates to all ULARA and not to any one specified ground water basin. The precipitation values were obtained from stations on the valley floor (Table 3).

Ground Water Extractions

Appendix A is the record of groundwater extractions for the 1982-83 water year, and Plate 6 shows the approximate location of the well fields which pumped this water. A total of 71,312 acre-feet was pumped from the San Fernando Basin compared to an allowable pumping of 95,199 acre-feet. Of this total, 92,953

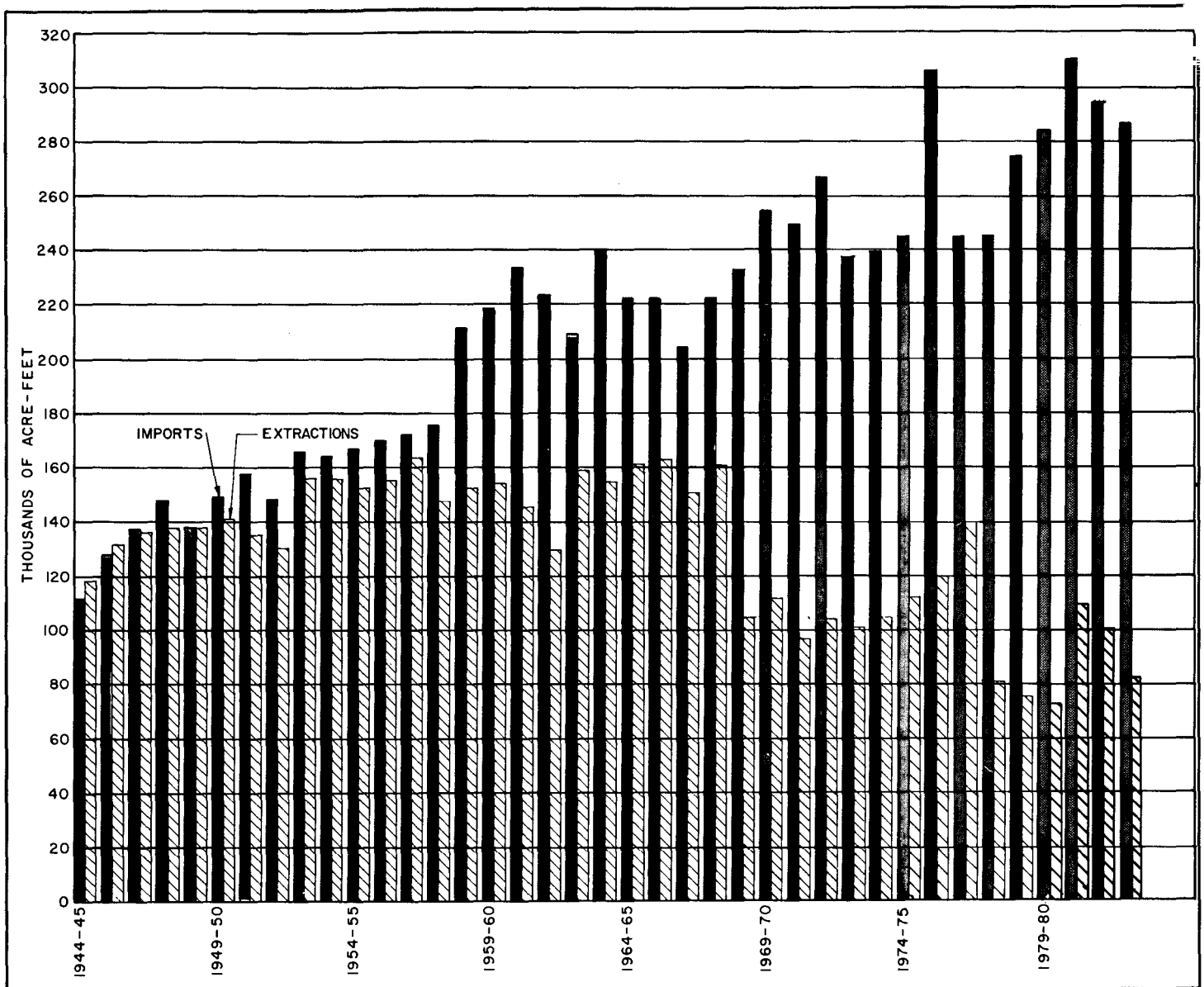

Figure 4- GROUND WATER EXTRACTIONS AND USE OF IMPORTED WATER IN UPPER LOS ANGELES RIVER AREA

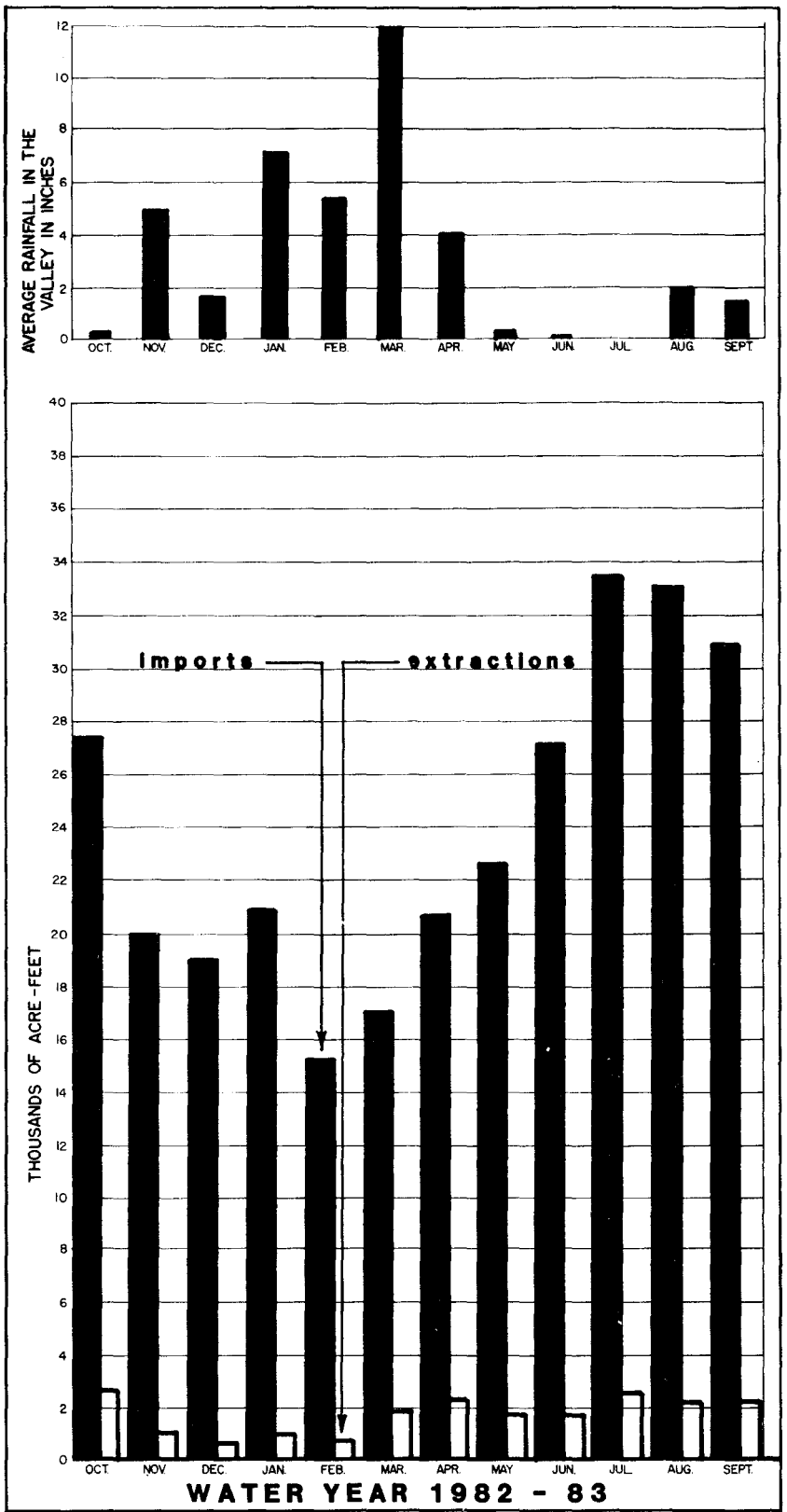

Figure 5 – MONTHLY WATER DEMAND AND AVERAGE RAINFALL IN UPPER LOS ANGELES RIVER AREA

(Used within ULARA)

acre-feet is extraction rights by parties in the San Fernando Basin (see 1982-83 Table 15), with its remaining 2,246 acre-feet being nonconsumptive use pumping (see Table 13). A total of 6,181 acre-feet was pumped from the Sylmar Basin and 5,187 acre-feet from the Verdugo Basin. The respective safe yield values for these three basins are 90,680, 6,210, and 7,150 acre-feet. Pumping in the Verdugo Basin is less than safe yield due to water quality problems. Construction of water blending facilities in the Verdugo Basin by the City of Glendale was completed in September 1981. This allows poorer quality Verdugo Basin ground water to be blended with MWD water and now enables Glendale to pump its prescriptive right in the Verdugo Basin.

Imports and Exports of Water

Residential, commercial, and industrial expansions in ULARA require the importation of additional water supplies to supplement that provided by the ground water basins.

The imported supplies to ULARA are from the City of Los Angeles' Owens-Mono Basin aqueduct and through the MWD distribution system, which consists of California and Colorado River Aqueduct waters.

Exports from ULARA, exclusive of sewage, are limited to the City of Los Angeles, which exports imported and ground water. Table 10 summarized the nontributary imports and exports from ULARA. Ground water imports and exports in and out of ULARA are listed in Table 12.

Physical Data by Basins

The Watermaster has collected and summarized data in Table 12 which show the water supply and disposal in each of the basins.

The information for Table 12 was submitted by the parties. In instances where estimates were made by the parties, such as water delivered to hill and mountain areas, sewage exported, etc., these were based upon methods consistent with previous estimates computed by SWRCB for the San Fernando Valley reference. The Watermaster also made computations of subsurface outflows based on similar computations made by SWRCB.

Pumping by private parties is summarized in Table 13.

San Fernando Basin Allowable Extractions

Table 14 lists San Fernando Basin extraction rights for the Cities of Burbank, Glendale, Los Angeles, and San Fernando for the water year 1983-84. Table 15 shows San Fernando Basin stored water as of October 1, 1982 and October 1, 1983. All rights are based on the City of Los Angeles vs. City of San Fernando, et al., judgment, dated January 26, 1979.

Facts Relevant to Ground Water Storage Capacity*

San Fernando Basin. The total ground water storage capacity of San Fernando Basin is approximately 3,200,000 acre-feet, with a regulatory storage capacity of 350,000 acre-feet required by the judgment. As of 1954-55, the temporary surplus in the basin had been exhausted by the overextraction of approximately 520,000 acre-feet.

Sylmar Basin. Sylmar Basin consists of confined aquifers with ground water storage space of approximately 310,000 acre-feet.

Verdugo Basin. The ground water storage capacity of Verdugo Basin is approximately 160,000 acre-feet.

Change in Ground Water Storage

San Fernando Basin. The change in storage for 1982-83 was +121,090 acre-feet, and the cumulative change in storage from 1954-55 through 1982-83 was -83,930 acre-feet. A comparison is made between the annual precipitation and the cumulative change in storage since the commencement of Watermaster activities for the San Fernando Basin. The average precipitation for the period 1968-69 through 1982-83 was 19.58 inches, compared to a long-term average of 16.48 inches of rainfall. During that time, the basin gained approximately 362,000 acre-feet of stored water. Of this total, 222,000 acre-feet was stored through spreading and in-lieu recharge activities. Thus, the natural change in storage due to an above normal rainfall period was 140,000 acre-feet. Refer to Table 11 for the annual precipitation and change in storage.

Sylmar Basin. The change in storage for 1982-83 was +7,320 acre-feet, and the cumulative change in storage from 1954-55 through 1982-83 was -20,560 acre-feet.

Verdugo Basin. The change in storage for 1982-83 was +2,990 acre-feet, and the cumulative change in storage from 1954-55 through 1982-83 was +25,520 acre-feet.

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* Information obtained from the City of Los Angeles vs. City of San Fernando, et al., Findings of Fact and Conclusions of Law dated January 26, 1979.

TABLE 10

ULARA - NONTRIBUTARY WATERS,
IMPORTS AND EXPORTS

(In Acre-Feet)

Source and Agency	1981-82	1982-83
Imports		
MWD water[a/]		
Burbank, City of	20,958	19,463
Crescenta Valley County Water District	2,405	2,316
Glendale, City of	21,787	21,913
Los Angeles, City of	2,282	10,727
La Canada Irrigation District	782	769
Las Virgenes Municipal Water District (nonparty)	15,302	10,887
San Fernando, City of	0	80
	63,516	66,155
Owens River water		
Los Angeles, City of	469,453[b/]	451,712[b/]
Total	532,969	517,867
Exports		
Owens River water		
Los Angeles, City of	-238,069	-231,095
New Import	294,900	286,772

a/ Colorado River and Northern California waters combined.

b/ This value represents the summation of the gross amount of water delivered to and exported from ULARA. It does not include operational releases, reservoir evaporation, and water spread during the year.

TABLE 11

SAN FERNANDO BASIN
PRECIPITATION COMPARED TO
CHANGE IN STORAGE

Water Year	Valley Floor Precipitation (Inches)	Change in Storage (AF)	Cumulative Change in Storage (AF)
1968-69	29.00	+79240	+79240
1969-70	10.50	-9740	+69500
1970-71	15.57	+15340	+84840
1971-72	8.10	-17090	+67750
1972-73	20.65	+17020	+84770
1973-74	15.75	-21820	+62950
1974-75	14.74	-22580	+40370
1975-76	9.90	-30090	+10280
1976-77	14.19	-50490	-40210
1977-78	35.43	+136150	+95940
1978-79	21.76	+78080	+174020
1979-80	30.25	+99970	+273990
1980-81	11.04	-32560	+241430
1981-82	17.18	-530	+240900
1982-83	39.64	+121090	+361990
15-yr. average	19.58		

Note:
(1) 100-year mean precipitation = 16.48 inches.
(2) Stored water through spreading and in-lieu pumping = 221,590 AF.
(3) Natural change in storage = +361,990 AF - 221,590 AF = 140,400 AF.

TABLE 12

1982-83
SUMMARY OF WATER SUPPLY AND DISPOSAL
SAN FERNANDO BASIN
(In Acre-Feet)

Water Source and Use	City of Burbank	City of Glendale	City of Los Angeles	City of San Fernando	All Others	Total
Extractions						
Total quantity extracted	2,187	1,028	65,189	0	2,906*	71,310
Used in valley fill	2,002	d/	3,209	d/	d/	d/
Imports						
MWD water	19,463	21,913	7,418	80	10,887	59,761
Owens River water	--	--	444,017	--	--	444,017
Ground water from Sylmar Basin	--	--	3,047	2,851	0	5,898
Ground water from Verdugo Basin	--	2,157	--	--	--	2,157
Reclaimed water	653e/	100e/	443c/	--	100e/	1,296
Exports						
Ground water:						
to Verdugo Basin	--	0	0	--	0	0
out of ULARA	185	--	61,980	--	0	62,165
Owens River water:						
to Eagle Rock Basin	--	--	428	--	--	428
out of ULARA	--	--	231,095	--	0	231,095
MWD:						
to Verdugo Basin	--	2,656	0	--	--	2,656
Total net delivered water	22,118	22,542a/	226,611	2,931	13,893	288,095
Water delivered to hill and mountain areas						
Ground water	d/	d/	0	0	0	d/
Owens River water	--	--	34,040	--	--	34,040
MWD water	d/	d/	4,363	0	10,887	d/
Verdugo Basin water	--	d/	--	--	--	d/
Water outflow						
Surface	--	--	--	--	--	405,700b/
Subsurface	--	--	--	--	--	430
Sewers	8,015	14,910	76,760	1,919	--	101,604
Reclaimed	4,670	1,509	1,509	--	--	7,688

* See Table 13 for parties included.

a/ Total delivered water to the City of Glendale was 26,468 AF. Verdugo Basin metered sales times 105 percent equaled 3,926 AF. Therefore, the San Fernando Basin delivered water was 22,542 AF (26,468 AF minus 3,926 AF). Refer to Section 5.2.1.3 of Judgment.

b/ At Station F-57C-R where 29-year mean (1929-57) base low flow is 7,580 acre-feet.

c/ Used for irrigation at the Harding and Wilson Golf Courses and Crystal Springs picnic area. Also used for wash down, cooling, and irrigation at the Los Angeles-Glendale plant.

d/ These values are no longer calculated as per Judgment.

e/ Delivered to cooling towers of steam plant in Burbank and phosplate plant in Glendale. Assumed 50 percent evaporation and 50 percent to Los Angeles River. Refer to Table 7 for all others.

Note: Colorado River and Northern California waters combined and listed as MWD water.

TABLE 12

1982-83
SUMMARY OF WATER SUPPLY AND DISPOSAL
SYLMAR BASIN
(In Acre-Feet)

Water Source and Use	City of Los Angeles	City of San Fernando	All Others	Total
Extractions				
Total quantity	3,047	3,133	0	6,180
Used in valley fill	0	282	0	282
Imports				
Owens River water	6,896	--	--	6,896
MWD water	--	80	--	80
Exports				
Groundwater: to San Fernando Basin	3,047	2,851	0	5,898
Water delivered to hill and mountain area				
Owens River	414	--	--	414
Water outflow				
Surface	--	--	--	5,000[g/]
Subsurface: to San Fernando Basin[f/]	--	--	--	--
Sewers	790	190	0	980

f/ Computation not possible, well destroyed.

g/ Surface outflow is not measured. Calculated average surface outflow by Mr. Laverty - SF Exhibit 57.

TABLE 12

1982-83
SUMMARY OF WATER SUPPLY AND DISPOSAL
VERDUGO BASIN
(In Acre-Feet)

Water Source and Use	Crescenta Valley County Water District	City of Glendale	La Canada Irrigation District	City of Los Angeles	Total
Extractions					
Total quantity	1,759	3,427	0	0	5,186
Used in valley fill	1,714	k/	0	0	k/
Imports					
MWD water	2,316	2,656	769	0	5,741
Owens River water	--	--	--	799	799
Groundwater from:					
San Fernando Basin	--	0	--	--	0
Reclaimed water	0	--	--	--	0
Exports					
Groundwater to:					
San Fernando Basin	--	2,157	--	--	2,157
Water delivered to hill and mountain areas					
MWD water	59	k/	0	0	k/
Owens River water	--	--	--	265	265
Groundwater from:					
Verdugo Basin	45	k/	--	0	k/
San Fernando Basin	--	0	--	0	0
Water outflow					
Surface	--	--	--	--	26,714 h/
Subsurface:					
to Monk Hill Basin	--	--	--	--	300 i/
to San Fernando Basin	--	--	--	--	60
Sewage	755	2,800	0	160	3,715

h/ Information obtained from Station F-252C-R
i/ Based on 29-year average (1919-57)
j/ Measured
k/ These values are no longer required

TABLE 12

1982-83
SUMMARY OF WATER SUPPLY AND DISPOSAL
EAGLE ROCK BASIN
(In Acre-Feet)

Water Source and Use	City of Los Angeles	Deep Rock[o/] Water Company	Sparkletts Drinking[o/] Water Corporation	Total
Extractions				
Total quantity	0	6	169	175
Used in valley fill	0	0	0	0
Imports				
Owens River water	428	--	--	428
MWD water	3,309	--	--	3,309
Groundwater	0	0	0	0
Exports				
Groundwater	0	6	169	175
Water delivered to hill and mountain areas				
MWD water	1,813	--	--	1,813
Owens River water	155	--	--	155
Water outflow				
Surface[m/]	--	--	--	--
Subsurface[n/]	--	--	--	--
Sewers	1,900	0	0	1,900

m/ Information not available

n/ Estimated in Supplement No. 2 to Report of Referee for dry years 1960-61. Currently, data not available for direct evaluation.

o/ Deep Rock Water Company and Sparkletts Drinking Water Corporation under a stipulated agreement with the City of Los Angeles; extract limited to 500 AF/year, and export given amount.

TABLE 13

1982-83
PUMPING BY NONCONSUMPTIVE USE, PHYSICAL SOLUTION,
AND PARTIES WITHOUT RIGHTS
SAN FERNANDO BASIN

(In Acre-Feet)

I.	Nonconsumptive Use Parties	
1.	Conrock Co.	1,333
2.	Livingston-Graham, Inc.	128
3.	Sears, Roebuck and Company	19
4.	Sportsmen's Lodge, Inc.	18
5.	Toluca Lake Property Owners Assn.	6
6.	Walt Disney Productions	742
7.	Total	2,246
II.	Physical Solution Parties	
1.	Environmentals Inc.	65
2.	Forest Lawn Cemetery Assn.	395
3.	Sportsmen's Lodge, Inc.	1
4.	Toluca Lake Property Owners Assn.	30
5.	Valhalla Memorial Park	167
6.	Total	658
III.	Parties Without Rights	
1.	Harper, Cecelia De Mille	1
2.	Mena, John and Barbara	1
3.	Total	2
IV.	Total Pumping by Private Parties	2,906

Note: Sportsmen's Lodge and Toluca Lake pumping is part nonconsumptive and part physical solution.

TABLE 14

1983-84
SAN FERNANDO BASIN EXTRACTION RIGHTS
(In Acre-Feet)

Item	Cities of			
	Burbank	Glendale	Los Angeles	San Fernando
	(1)	(2)	(3)	(4)
1. Delivered water 1982-83	22,118	22,541	226,611	--
2. Import delivered 1982-83	--	--	--	80
3. Delivered to hill & mountain 1982-83	--	--	38,403	--
4. Delivered to valley fill 1982-83	--	--	188,208	--
5. Percent recharge	20%	20%	20.8%	26.3%
6. Return water extraction right 1983-84	4,424	4,508	39,147	21
7. Native safe yield	0	0	43,660	0
8. Total extraction right 1983-84	4,424	4,508	82,807	21

Items 1, 2 & 3 = Table 12
Item 4 = Item 1 minus Item 3
Item 5 = Article 5.2.1.3, page 17 of Judgment
Item 6, cols. (1) & (2) = Item 1 x Item 5
col. (3) = Item 4 x Item 5
col. (4) = Item 2 x Item 5
Item 7 = Article 4.2.4, page 11 of Judgment
Item 8 = Item 6 + Item 7
-- = Data not required

TABLE 15

STORED WATER
SAN FERNANDO BASIN
(In Acre-Feet)

	Cities of			
	Burbank	Glendale	Los Angeles	San Fernando
	(1)	(2)	(3)	(4)
1981-82				
1. Stored water as of Oct. 1, 1981	12,359	9,083	133,773	88
2. Delivered water 1980-81	25,202	23,846	199,126	24
3. Return water extraction right 1981-82	5,040	4,769	41,418	6
4. Native safe yield	0	0	43,660	0
5. Total extraction right for 1981-82	5,040	4,769	85,078	6
6. Extractions for year	523	952	82,991	0
7. Physical solution extractions	(191)	(419)	31	-
8. Spread water	0	0	0	0
9. Stored water as of Oct. 1, 1982	16,876	12,900	135,219	94
1982-83				
10. Delivered water 1981-82	22,120	22,354	194,221	-
11. Return water extraction right 1982-83	4,424	4,471	40,398	0
12. Native safe yield	0	0	43,660	0
13. Total extraction right for 1982-83	4,424	4,471	84,058	0
14. Extractions for year	2,002*	1,028	65,189	0
15. Physical solution extractions	(167)	(460)	31	-
16. Spread water	0	0	32,237	0
17. Stored water as of Oct. 1, 1983**	19,298	16,343	185,667	94

Items 3 & 11 = Items 2 & 10 x percent recharge
Items 5 & 13 = Items 3 + 4 & 11 + 12, respectively
Item 9 = Items 1 + 5 - 6 - 7 + 8
Items 7 & 15 = All subtracted from Los Angeles
col. (1) = Valhalla pumping
col. (2) = Forest Lawn & Environmentals Inc. pumping
col. (3) = Toluca Lake & Sportsmens Lodge pumping. Only consumptive use portion charged to Los Angeles.
Item 17 = Items 9 + 13 - 14 - 15 - + 16
* = Excludes 185 AF of Burbank Well No. 10 pumping discharged to waste while testing for TCE.
** = Does not include return flow occurring during water year 1982-83.

Appendix A

GROUNDWATER EXTRACTIONS

(Acre-Feet)

LACFCD Well No.	Owners Designation	Extractions Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Total
							San Fernando Basin							
City of Burbank														
3841C	6A	45.99	0.00	11.48	4.73	8.08	234.15	333.61	44.47	0.00	0.00	16.58	0.00	699.09
3851C	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	176.00*	9.00*	0.00	0.00	0.00	185.00
3851E	12	10.63	0.00	8.74	7.82	5.24	176.76	53.24	0.00	0.00	0.00	6.74	0.00	269.17
3851K	13A	49.28	0.00	10.14	9.23	6.67	191.69	277.13	36.81	0.00	0.00	17.16	0.00	598.11
3841F	17	42.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.14
3841G	18	26.15	0.00	6.46	6.21	0.00	131.24	186.94	24.88	0.00	0.00	12.10	0.00	393.98
Party Total		174.19	0.00	36.82	27.99	19.99	733.84	850.92	282.16	9.00	0.00	52.58	0.00	2187.49
Conrock Co.														
4916A	2	36.58	36.62	42.51	33.13	36.29	35.59	57.99	81.60	97.94	67.83	13.55	37.74	577.37
4916 3		52.25	51.84	60.78	46.22	52.97	76.98	56.50	54.56	67.81	72.53	55.64	107.38	755.46
Party Total		88.83	88.46	103.29	79.35	89.26	112.57	114.49	136.16	165.75	140.36	69.19	145.12	1332.83
Environmentals Inc.														
3934A	M050A	10.15	10.60	11.28	10.26	10.41	3.92	2.45	2.20	0.97	1.25	1.88	0.00	65.37
Forest Lawn Cemetary Assn.														
3947A	2	12.57	4.98	2.75	6.10	1.08	1.16	4.15	11.59	12.77	24.73	16.00	15.21	113.09
3947B	3	20.76	8.25	4.43	10.09	1.74	1.91	7.08	20.83	32.87	32.19	28.23	26.46	194.84
3958K	7	9.87	3.82	2.06	3.91	0.80	0.04	0.41	9.59	15.90	15.32	17.98	6.89	86.59
Party Total		43.20	17.05	9.24	20.10	3.62	3.11	11.64	42.01	61.54	72.24	62.21	48.56	394.52
City of Glendale														
3924N	STPT 1	0.99	11.49	3.02	18.31	17.13	0.85	3.08	15.13	25.42	45.20	51.06	46.69	238.37
3924R	STPT 2	0.92	0.98	0.54	0.26	0.71	0.37	0.12	0.39	0.54	3.95	11.80	5.28	25.86
GVENT	GVENT	83.48	31.61	36.83	39.90	64.76	70.28	66.60	39.90	42.66	58.33	112.00	117.54	763.89
Party Total		85.39	44.08	40.39	58.47	82.60	71.50	69.80	55.42	68.62	107.48	174.86	169.51	1028.12
Harper, Cecelia DeMille														
4940A	North	0.10[E]	0.10[E]	0.10[E]	0.10[E]	0.10[E]	0.10	0.10[E]	0.10[E]	0.10[E]	0.10[E]	0.10[E]	0.10[E]	1.20
Livingston-Graham, Inc.														
4916B	SnVal	24.66	18.19	15.73	14.41	9.58	13.16	17.81	14.55	0.00	0.00	0.00	0.00	128.09
City of Los Angeles														
3914L	CS-45	194.81	113.68	0.00	94.24	0.00	0.00	0.00	103.49	211.98	195.41	209.05	0.00	1122.66
3914M	CS-46	315.59	190.47	0.00	144.08	0.00	0.00	0.00	149.34	316.94	232.28	21.21	169.38	1539.29
CS Total		510.40	304.15	0.00	238.32	0.00	0.00	0.00	252.83	528.92	427.69	230.26	169.38	2661.95
3831H	E-1	236.07	0.14	106.52	121.86	0.00	0.00	1.08	130.90	277.87	278.15	157.09	0.00	1309.68
3821I	E-2A	110.49	0.18	92.01	99.59	0.00	0.00	0.94	108.29	225.05	223.81	216.60	210.52	1287.48
3831G	E-3	187.93	0.14	87.79	174.38	157.81	8.26	0.87	109.99	228.84	221.51	209.41	198.72	1585.65
3921F	E-4	118.48	0.11	51.38	150.57	214.23	8.54	0.99	112.81	198.78	193.57	227.71	210.91	1488.08
3831F	E-5	212.49	0.14	49.08	119.38	0.00	0.00	0.00	0.00	0.23	72.11	0.00	0.00	453.43
3811F	E-10	93.27	0.11	72.22	150.99	169.15	6.91	0.00	86.32	181.36	189.07	185.15	52.85	1187.40
E Total		958.73	0.82	459.00	816.77	541.19	23.71	3.88	548.31	1112.13	1178.22	995.96	673.00	7311.72

* - Pumped to waste while testing for TCE.

E - Estimated

1982-83 WATER YEAR

LACFCD Well No.	Owners Designation	Extractions Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Total
						San Fernando Basin (Cont'd)								
3894BB	H-25	296.74	265.34	0.00	185.61	0.00	0.00	0.00	177.99	588.32	368.83	389.63	275.97	2348.43
3893L	H-26	233.38	176.40	0.00	119.93	0.00	0.00	0.00	125.14	137.79	149.27	0.00	0.00	941.91
3893K	H-27	367.43	331.57	352.39	0.00	0.00	0.00	0.00	11.11	36.73	0.00	0.00	0.00	1099.23
3893M	H-28	497.94	335.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	833.69
3893N	H-29	0.00	64.05	0.00	15.77	0.00	0.00	0.00	14.92	49.06	0.00	0.00	0.00	143.80
3893P	H-30	561.09	353.72	31.27	312.61	0.00	0.00	0.00	15.98	155.56	453.63	540.78	387.47	2812.11
H Total		1956.58	1526.83	383.66	633.92	0.00	0.00	0.00	345.14	767.46	971.73	930.41	663.44	8179.17
3800	NH-2	298.79	102.62	12.99	198.39	8.63	23.44	272.45	276.45	0.00	183.95	182.71	82.97	1643.39
3780A	NH-4	120.11	4.13	8.65	93.85	0.00	10.86	158.01	166.60	34.34	103.56	153.58	195.62	1049.31
3810S	NH-5	130.26	0.39	0.00	0.00	0.00	0.00	6.82	0.00	0.00	0.00	0.00	0.00	137.47
3770	NH-7	139.81	0.00	0.00	82.76	0.00	11.57	195.75	176.68	101.03	129.71	162.54	142.38	1142.23
3810	NH-11	0.14	0.00	0.00	0.00	0.00	0.00	8.68	0.00	0.00	0.00	0.00	0.00	8.82
3810A	NH-13	0.11	0.00	0.00	0.00	0.00	0.00	7.90	0.00	0.00	0.00	0.00	0.00	8.01
3810B	NH-14A	0.00	0.92	0.00	0.00	0.00	0.00	9.85	0.00	0.00	0.00	0.00	0.00	10.77
3790B	NH-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.32	0.00	7.64	0.00	0.00	52.96
3820D	NH-16	0.00	0.00	0.00	2.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.82
3820C	NH-17	180.10	132.92	0.00	77.32	0.00	0.00	0.00	131.31	0.00	73.46	190.08	326.91	1111.80
3820B	NH-18	197.75	13.61	0.00	163.50	0.00	0.00	0.00	138.41	0.00	76.75	292.56	352.64	1235.22
3820D	NH-19	73.44	113.36	0.00	0.00	0.00	0.00	86.48	0.00	0.00	0.00	0.00	0.00	273.28
3830C	NH-20	50.87	0.16	0.00	133.06	0.00	0.00	0.00	111.04	0.00	17.81	155.97	0.00	468.91
3830B	NH-21	0.00	0.16	0.00	0.00	0.00	9.99	0.00	0.00	0.00	0.00	0.00	0.00	10.51
3790C	NH-22	143.05	0.53	0.00	215.64	0.00	0.00	165.73	273.92	0.00	200.14	171.33	84.11	1254.45
3790D	NH-23	238.55	131.47	16.76	287.31	0.00	0.00	9.85	20.09	0.00	0.00	0.00	0.00	704.03
3800C	NH-24	258.98	61.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	320.87
3790F	NH-25	323.14	100.46	15.59	166.39	0.00	22.08	167.20	0.00	198.85	247.02	387.08	151.47	1779.28
3790E	NH-26	231.61	60.01	154.98	207.62	0.00	0.00	0.00	96.14	175.71	237.38	213.80	137.93	1515.18
3820F	NH-27	42.77	68.43	8.20	148.55	0.00	0.00	7.92	60.10	112.90	23.14	132.35	0.00	604.36
3810K	NH-28	0.25	0.00	0.00	0.00	0.00	0.00	14.07	0.00	0.00	0.00	0.00	0.00	14.32
3810L	NH-29	8.77	0.00	0.00	81.18	0.00	0.00	4.06	0.00	0.00	0.00	0.00	0.00	94.01
3800D	NH-30	261.94	0.57	0.00	130.17	0.00	0.00	0.00	76.97	0.00	244.45	167.91	78.97	960.98
3810T	NH-31	7.58	0.00	0.00	0.00	0.00	11.96	0.00	70.62	0.00	0.00	0.00	62.93	153.09
3770C	NH-32	133.95	0.00	74.38	108.56	0.00	11.41	195.32	173.21	0.00	119.22	168.64	133.31	1118.32
3780C	NH-33	195.18	7.30	9.73	146.42	0.00	15.86	269.06	241.67	0.00	175.25	228.42	284.99	1573.88
3790G	NH-34	222.22	0.00	0.00	177.48	0.00	0.00	0.00	87.65	0.00	254.39	179.25	0.00	920.99
3830N	NH-35	136.87	0.46	0.00	123.51	0.00	0.00	0.00	0.00	0.00	20.80	119.61	0.00	401.25
3790H	NH-36	381.48	76.24	121.08	328.84	419.29	0.00	0.00	0.00	0.00	378.61	395.20	316.78	2417.52
3790J	NH-37	420.50	47.22	101.63	319.10	406.96	0.00	0.00	0.00	76.61	364.88	381.11	305.70	2423.71
3810M	NH-38	159.67	0.00	0.00	128.51	0.00	0.00	0.00	0.00	0.00	23.19	0.00	0.00	326.02
3810P	NH-40	0.21	0.00	0.00	0.00	0.00	0.00	10.42	0.00	0.00	0.32	0.00	0.00	10.95
3810Q	NH-41	151.61	0.00	0.00	72.54	0.00	0.00	0.25	0.00	0.00	29.80	0.00	0.00	254.20
3810R	NH-42	417.38	406.96	16.02	184.69	0.00	0.00	0.00	152.99	0.00	269.19	0.00	0.00	1680.38
3790K	NH-43A	-	-	-	-	-	-	-	-	-	-	-	0.53	0.53
NH Total		4927.09	1329.51	540.01	3578.21	834.88	117.17	1604.79	2299.17	699.44	3180.66	3915.29	2657.24	25683.46
3904J	CS-52(#1)	0.47	0.27	0.31	0.40	0.06	0.56	0.81	0.39	0.52	0.54	0.63	0.67	5.63
3904J	CS-52(#2)	0.42	0.25	0.28	0.36	0.06	0.51	0.73	0.35	0.47	0.74	0.32	0.60	5.09
CS Total		0.89	0.52	0.59	0.76	0.12	1.07	1.54	0.74	0.99	1.28	0.95	1.27	10.72

1982-83 WATER YEAR

LACFCD Well No.	Owners Designation	Extractions Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Total
						San Fernando Basin (Cont'd)								
3959E	P-4	104.00	109.05	117.65	104.80	104.34	116.64	108.33	106.18	100.44	91.94	89.42	85.51	1238.30
3958H	P-6	8.82	0.00	0.00	0.00	0.00	0.00	82.65	250.23	240.82	242.43	137.42	0.00	962.37
P Total		112.82	109.05	117.65	104.80	104.34	116.64	190.98	356.41	341.26	334.37	226.84	85.51	2200.67
3853F	V-2	82.90	4.55	25.32	47.22	0.00	45.68	32.71	51.91	104.13	106.77	107.05	103.90	712.14
3863J	V-4	138.96	4.57	42.10	43.64	0.02	0.00	0.78	97.59	193.18	184.62	171.05	113.38	989.89
3863L	V-11	333.27	97.18	195.73	275.46	289.67	143.96	99.13	156.66	310.81	318.48	313.13	300.87	2834.35
3853G	V-13	34.64	1.91	7.02	31.59	0.00	0.00	0.00	11.94	12.28	61.23	75.32	50.21	286.14
3843M	V-16	0.00	0.00	0.00	0.00	40.70	0.00	0.00	34.00	199.82	196.40	193.07	186.00	849.99
3854F	V-22	0.00	0.07	0.00	0.00	0.00	0.00	1.74	7.97	8.10	39.69	48.44	14.05	120.06
3844R	V-24	162.24	240.50	208.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	610.94
V Total		752.01	348.78	478.37	397.91	330.39	189.64	134.36	360.07	828.32	907.19	908.06	768.41	6403.51
3820E	W-1	0.00	0.23	0.00	0.00	0.00	0.00	11.59	0.00	0.00	0.00	0.00	0.00	11.82
3821B	W-2	135.65	100.83	221.40	228.31	0.00	163.68	293.73	300.55	110.06	289.69	0.00	0.00	1843.90
3821C	W-3	110.10	82.62	180.53	186.23	0.00	134.18	240.96	293.51	280.28	239.12	0.00	0.00	1747.53
3821D	W-4	271.58	127.94	223.12	297.06	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	919.86
3821E	W-5	147.57	75.62	159.67	166.87	249.57	9.92	1.22	50.90	297.87	298.07	281.11	256.13	1994.52
3831J	W-6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70.23	286.46	347.04	333.27	1037.00
3832K	W-7	103.63	0.14	27.85	114.78	0.00	0.00	0.71	28.17	230.17	247.13	241.23	231.13	1224.94
3832L	W-8	0.00	327.39	233.89	242.63	0.00	171.81	305.12	374.96	358.52	364.53	221.93	0.00	2600.78
3832M	W-9	16.87	0.02	0.00	66.92	0.00	4.50	0.00	26.13	28.35	149.17	193.14	189.12	674.22
3842E	W-10	21.90	0.05	13.15	53.83	0.00	56.36	94.54	117.82	106.38	100.14	92.82	26.29	683.28
W Total		807.30	714.84	1059.61	1356.63	249.57	540.61	947.87	1192.04	1481.86	1974.31	1377.27	1035.94	12737.85
City of Los Angeles Total		10025.82	4334.50	3038.89	7127.32	2060.49	988.84	2883.42	5354.71	5760.38	8975.45	8585.04	6054.19	65189.05
Mena, John & Barbara														
4973J	4973J	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.08[E]	0.96
Sears Roebuck & Co.														
3945	3945	0.65	0.65	0.08	0.00	0.21	0.08	0.09	3.60	2.25	2.25	5.44	4.06	19.36
Sportmen's Lodge, Inc.														
3785A	1	0.27	0.83	0.92	1.06	0.72	0.57	0.00	3.77	3.94	1.91	0.58	4.92	19.49
Toluca Lake Property Owners Assn.														
3845F	3845F	6.99	0.67	0.00	0.00	0.00	0.00	0.00	1.58	6.65	5.99	6.49	7.91	36.28
Valhalla Memorial Park														
3840K	4	20.49	1.91	0.80	1.97	0.00	0.00	0.00	16.10	17.00	61.39	25.62	21.62	166.90
Walt Disney Productions														
3874E	East	78.41	56.70	62.87	35.05	1.74	0.00	5.37	55.95	84.31	74.30	125.98	91.78	672.46
3874F	West	0.00	0.00	0.00	11.19	24.19	22.73	10.23	1.36	0.00	0.00	0.00	0.00	69.70
Party Total		78.41	56.70	62.87	46.24	25.93	22.73	15.60	57.31	84.31	74.30	125.98	91.78	742.16
Basin Total		10559.23	4573.82	3320.49	7387.35	2302.99	1950.50	3966.40	5969.75	6180.59	9442.80	9110.05	6547.85	71311.82

LACFCD Well No.	Owners Designation	Extractions Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Total
Sylmar Basin														
City of Los Angeles														
Plant	Mission	263.00	3.42	0.00	0.00	0.00	227.55	446.15	457.00	429.43	425.26	393.37	402.76	3047.94
Meurer Engineering Co.														
5998	3	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.01[E]	0.12
City of San Fernando														
5969D	2A	153.87	131.23	0.00	77.16	62.99	89.54	46.11	163.69	178.40	195.31	201.97	187.70	1487.97
5959	3	95.35	81.40	72.14	89.22	82.77	95.69	131.94	29.33	27.37	118.76	101.90	96.33	1022.20
5969	4	24.76	19.43	31.02	23.00	15.72	12.83	7.26	13.07	19.78	30.09	24.59	21.13	242.68
5968	7A	31.27	9.01	25.10	27.18	35.17	34.17	47.11	33.89	31.89	41.39	31.86	31.89	379.93
Party Total		305.25	241.07	128.26	216.56	196.65	232.23	232.42	239.98	257.44	385.55	360.32	337.05	3132.78
Basin Total		568.26	244.50	128.27	213.57	196.66	459.79	678.58	696.99	686.88	810.82	753.70	739.82	6180.84
Verdugo Basin														
Crescenta Valley County														
5058B	1	1.80	0.45	0.00	0.01	0.00	0.00	0.00	0.30	2.68	19.07	7.75	9.70	41.76
5058H	5	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.58	5.29	0.00	0.08	5.96
5047B	7	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.05	0.04	0.77	0.00	1.56	2.44
5069J	8	23.13	7.45	4.74	7.75	0.75	0.22	3.37	19.43	31.30	32.00	29.91	31.51	191.56
5047D	9	0.15	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.41	0.06	0.83
5058D	10	78.55	56.65	55.64	58.21	44.60	48.50	53.84	74.55	84.94	96.44	83.51	83.96	819.39
5058J	12	8.48	1.97	1.28	2.13	1.17	0.25	0.35	4.78	4.26	15.76	7.17	9.02	56.62
5069F	14	48.24	47.00	49.08	48.52	43.33	50.64	51.85	50.36	45.33	46.60	44.03	41.64	566.62
	Pick	5.25	5.04	5.19	5.13	4.66	6.27	6.96	7.10	6.93	7.23	7.40	6.89	74.05
Party Total		165.60	118.72	115.95	121.76	94.51	105.88	116.37	156.57	176.06	223.21	180.18	184.42	1759.23
City of Glendale														
3961,71,70	GL3,4&6	129.45	196.20	84.61	70.96	66.47	83.72	93.97	94.95	92.96	97.93	157.34	170.29	1338.85
-	MM-1	117.23	119.51	156.30	217.75	202.25	216.70	203.14	214.06	211.02	209.74	89.61	131.18	2088.49
Party Total		246.68	315.71	240.91	288.71	268.72	300.42	297.11	309.01	303.98	307.67	246.95	301.47	3427.34
Basin Total		412.28	434.43	356.86	410.47	363.23	406.30	413.48	465.58	480.04	530.88	427.13	485.89	5186.57
Eagle Rock Basin														
Deep Rock Water Co.														
--	3	0.42	0.41	0.42	0.52	0.75	0.68	0.54	0.47	0.37	0.36	0.49	0.46	5.89
Sparkletts Drinking Water														
3987A	1	6.51	5.68	6.47	6.76	6.07	7.58	6.58	8.09	6.15	6.51	7.86	6.24	80.50
3987B	2	6.48	5.81	6.40	6.58	5.77	8.11	6.85	8.47	7.06	6.91	8.53	6.88	83.85
3987F	3	0.59	0.25	0.67	0.41	0.06	0.09	0.00	0.00	0.11	0.62	1.10	1.14	5.04
Party Total		13.58	11.74	13.54	13.75	11.90	15.78	13.43	16.56	13.32	14.04	17.49	14.26	169.39
Basin Total		14.00	12.15	13.96	14.27	12.65	16.46	13.97	17.03	13.69	14.40	17.98	14.72	175.28
ULARA Total		11553.77	5264.90	3819.58	8028.66	2875.53	2833.05	5072.43	7149.35	7361.20	10798.90	10308.86	7788.28	82854.51

Appendix B

KEY GAGING STATIONS SURFACE RUNOFF

GAGING STATION SUMMARY

Station Location and Description LOS ANGELES RIVER ABOVE ARROYO SECO for Water-Year 1982 1983

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station No. F57C-R

Drainage Area 511 Square Miles (H. ELDEEB Observer)

Gage Read 15 MIN. PUNCH TAPE

Rating Table No. 69-I

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY			FEBRUARY			MARCH			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	
1	0.60		36.5	[illegible]		35.3	[illegible]		20.5	0.68		47.3	1.14		164.	8.52		25100.	1
2	0.58		34.2	0.58		34.3	0.75		57.5	0.65		43.2	2.72		2940.	8.11		23300	2
3	0.58		34.2	0.54		29.6	[illegible]		50.0	0.65		473	1.55		614.	5.95		14150	3
4	0.59		35.3	0.58		27.3	0.62		39.2	0.65		432	1.26		256.	3.61		5520.	4
5	0.57		33.0	[illegible]		36.5	[illegible]		4 9	0.59		35.3	1.48		512.	3.16		4120.	5
6	0.54		29.6	0.58		32.2	[illegible]		50.0	0.55		30.7	1.18		185.	2.66		3280.	6
7	0.55		30.7	0.62		39.2	[illegible]		55.8	0.56		31.9	1.58		659	2.73		2960.	7
8	0.54		29.6	0.67		45.9	[illegible]		48.6	0.56		31.9	2.34		2030.	4.22		1790.	8
9	0.60		34.	3.08		3870	[illegible]		53.7	0.55		30.7	1.41		421.	1.83		1050.	9
10	0.62		39.2	2.29		1930	[illegible]		56.1	0.54		29.6	1.35		351.	1.72		867.	10
11	0.61		37.8	b		150	[illegible]		5.5	0.58		34.2	1.33		280	1.69		819	11
12	0.58		34.2	|		105	0.75		545	0.66		44.6	1.00		108.	1.64		743.	12
13	0.55		30.7	|		95.	0.71		5.5	0.65		43.2	1.13		155	1.75		908.	13
14	0.47		22.2			73.7	0.72		53.0	0.63		40.5	1.03		118.	1.75		920.	14
15	0.53		26.4	b		65.0	0.66		47.3	0.59		35.3	1.28		270.	1.57		641	15
16	0.53		26.4	0.67		459	0.60		36.5	0.54		29.6	0.79		63.5	1.63		723.	16
17	0.57		33.0	0.64		419	0.61		38.8	0.54		29.6	0.76		59.0	1.93		1220.	17
18	0.62		39.2	0.73		550	0.70		53.0	0.63		28.4	0.87		76.9	1.72		870.	18
19	0.59		35.3	1.69		1150.	0.72		53.3	2.20		1740	0.77		60.5	1.67		788	19
20	0.59		35.3	0.99		80.7	0.74		56.1	0.82		68.5	0.74		56.	1.68		773.	20
21	0.57		33.0	0.81		667	0.71		56.0	0.75		57.5	0.73		54.5	2.60		2640	21
22	0.57		33.0	0.77		60.5	0.73		57.0	2.74		2980	0.83		70.2	1.74		894	22
23	0.55		30.7	0.68		47.3	0.65		(77.	2.52		2450	0.79		63.5	1.44		457.	23
24	0.55		30.7	0.70		50.9	0.85		737	2.21		1770	1.40		403	2.58		2580	24
25	0.61		37.8	0.71		51.5	0.75		57.5	1.12		148	0.91		83.8	1.75		916.	25
26	1.06		127.0	0.69		46.6	[illegible]		54.5	0.96		103	2.45		2160.	1.59		668	26
27	0.69		49.1	0.70		50.0	0.75		57.5	4.01		6840	3.17		4150.	1.54		597.	27
28	0.55		34.2	0.71		51.5	0.72		53.0	1.99		1340	2.43		2240.	1.55		611.	28
29	0.51		26.1	1.16		174	0.84		71.4	3.21		4270				1.52		568.	29
30	1.12		142.0	3.64		5610	0.75		57.5	1.51		554				1.52		568	30
31	0.92		85.7				0.67		45.9	1.42		428				1.65		755	31
1	130.7			14144.6			505.8			2340.5			1859.9			10174.6			1
2	42.3			471.			16.3			75.5.			66.4.			328.6			2
3	2600.			28060.			1003.			4642.			3689.			20180.			3
4	129.			5610.			2760.			6840.			4150.			25100.			4
5	22.2			27.3			36.5			28.2			54.5			457.			5

DAY	APRIL			MAY			JUNE			JULY			AUGUST			SEPTEMBER			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj	Discharge	Gage Height	Adj.	Discharge	
1	1.56		625	1.71		846	1.13		156.	0.74		56.0	E		48.6	E		47.3	1
2	1.49		527.	1.50		535	0.92		86.3	0.70		50.0			48.6			47.3	2
3	1.49		527.	1.32		321	0.85		73.7	0.67		45.9			48.6			47.3	3
4	1.49		527.	1.20		200	0.88		78.9	0.64		41.9			48.1			48.6	4
5	1.58		649.	1.27		265.	0.87		77.2	0.69		48.6			48.6			47.3	5
6	1.51		554.	1.27		265.	0.91		82.4	0.68		47.3			48.6			47.3	6
7	1.44		461.	1.24		236	0.90		80.4	0.69		48.6			48.6			48.6	7
8	1.37		373	1.28		279.	0.86		75.4	0.71		51.5			48.6			48.6	8
9	1.31		304.	1.22		219.	0.86		75.4	0.70		50.0			48.6			48.6	9
10	1.25		246.	1.26		256	0.84		72.6	0.68		47.3			48.6			48.6	10
11	1.23		228.	1.26		259	0.87		77.2	0.70		50.0			48.6			48.6	11
12	1.29		280	1.23		202	0.81		66.7	0.72		53.0			48.6			48.6	12
13	1.24		237	1.21		209	0.78		62.0	0.70		50.0			48.6			48.6	13
14	1.30		295	1.32		293	0.79		63.5	0.72		53.0			48.6			48.6	14
15	1.29		281	1.32		293	0.78		62.0	0.68		47.3			197.			48.6	15
16	1.19		194.	1.33		327	0.78		62.0	0.67		45.9			976.			48.6	16
17	1.23		219.	1.34		339	0.76		59.0	0.65		43.2			478.			47.3	17
18	1.25		240.	1.34		339	0.75		57.5	0.65		43.2			439.			47.3	18
19	1.28		277.	1.34		337.	0.73		54.5	0.66		43.2			712.			47.3	19
20	1.36		3020	1.35		327	0.74		56.0	0.65		43.2			53.			112.	20
21	1.90		1170	1.31		304	0.76		59.0	0.67		459			48.6			58.5	21
22	1.59		665	1.31		304	0.78		62.0	0.64		41.9			47.3			47.3	22
23	1.38		385	1.30		293	0.80		65.0	0.63		40.5			47.3			47.3	23
24	1.38		385	1.29		284	0.82		68.5	0.61		37.8			47.3			47.3	24
25	1.33		327	1.28		274	0.73		54.5	E		41.9			47.3			47.3	25
26	1.62		253.	1.28		256	0.74		56.0			48.6			47.3			47.3	26
27	1.15		169	1.22		219	0.77		60.5			48.6			47.3			47.3	27
28	1.25		249	1.22		219	0.77		60.5			48.6			47.3			47.3	28
29	2.18		1730	1.21		209	0.77		60.5			48.6			47.3			1190.	29
30	1.90		180	1.23		228	0.76		59.0			42.6			47.3	E		2080.	30
31				1.23		228				e		48.6	E		47.3				31
1	188.5			9167.			2085.6			1458.7			4056.5			4684.6			1
2	62.8			296.			69.5			47.1			131.			156.			2
3	3734			18486			4140			2890.			8050.			9290.			3
4	3020			846.			156.			56.			976.			2080.			4
5	169			200.			54.5			37.8			47.3			47.3			5

Maximum stage	12.83	feet at	9:17	on	1-22-83
Minimum stage	1.15	feet at		on	

Discharge 44,500 Second-feet
Discharge Second-feet

REMARKS:

1. Total CFS
2. Average Daily Flow in CFS
3. Total Monthly Flow in A.F.
4. Maximum Average Daily Flow in CFS
5. Minimum Average Daily Flow in CFS

YEARLY TOTALS	
1	204,537.9
2	560.4
3	405,700.
4	25,100.
5	22.2

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description VERDUGO WASH AT ESTELLE AVE for Water-Year 1982 1983

Station No. F252-R

Drainage Area 26.8 Square Miles (H. ELDEEB Observer)

Gage Read EVERY 15 MIN.

Rating Table No. 47 I

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY			FEBRUARY			MARCH			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	
1	0.20		2.8	0.21		3.9	0.22		5.0	0.20		2.8	0.26		9.5	H		1262	1
2	0.20		2.8	0.22		5.0	0.23		6.2	0.20		2.8	0.57		125	E		1214	2
3	0.21		3.9	0.27		2.8	0.22		5.0	0.20		2.8	0.31		16.4			730	3
4	0.22		5.0	1.19		25	0.18		2.3	0.20		2.8	0.25		8.4			294	4
5	0.22		5.0	0.23		6.2	0.18		2.3	0.20		2.8	0.32		17.6			218	5
6	0.22		5.0	0.23		6.2	0.21		3.9	0.21		3.9	0.27		10.6			170	6
7	0.23		6.2	0.24		7.3	0.23		6.2	0.20		2.8	0.51		83.4			150	7
8	0.22		5.0	0.25		8.4	0.23		6.2	0.19		2.5	0.38		129			93	8
9	0.22		5.0	0.81		333	0.24		7.3	0.19		2.5	0.23		6.2			55	9
10	0.2		5.0	0.51		86.2	0.24		7.3	0.25		2.8	0.23		6.2			45.	10
11	0.22		5.0	0.21		3.9	0.24		7.3	0.23		6.2	0.22		5.0			42.	11
12	0.22		5.0	0.21		3.9	0.24		7.3	0.21		3.9	0.22		5.0			39.	12
13	0.24		7.3	0.21		3.9	0.24		7.3	0.21		3.9	0.22		5.0			47.	13
14	0.24		7.3	0.21		3.9	0.25		8.4	0.21		3.9	0.21		3.9			48.	14
15	0.24		7.3	0.21		3.9	0.24		7.3	0.23		6.2	0.20		2.8			23	15
16	0.23		6.2	0.22		5.0	0.25		8.4	0.21		3.9	0.20		2.8			38	16
17	0.24		7.3	0.22		5.0	0.25		8.4	0.20		2.8	0.21		2.8			63.	17
18	0.28		11.8	0.33		21.9	0.28		9.5	0.19		2.5	0.18		2.3			45	18
19	0.25		8.4	0.52		87.8	0.2		9.5	0.57		12.1	0.21		3.9			41.	19
20	0.23		6.2	0.23		6.2	0.2		9.5	0.23		6.2	0.23		6.2			40	20
21	0.24		7.3	0.23		6.2	0.2		9.5	0.21		3.9	0.18		2.3			137	21
22	0.24		7.3	0.22		6.2	0.93		351	0.70		23.2	0.18		2.3			46	22
23	0.25		8.4	0.2		5.0	0.27		10.2	0.53		9.1	0.17		2.1			24.	23
24	0.25		8.4	0.22		6.2	0.21		3.9	0.63		17.	0.41		41.8			134.	24
25	0.25		8.4	0.23		6.2	0.21		3.9	0.26		9.5	0.21		3.9			42.	25
26	0.39		35.8	0.23		6.2	0.2		3.9	0.93		6.2	0.57		78.7			35.	26
27	0.2		5.0	0.24		7.3	0.2		3.9	0.94		4.36	0.81		337			31.	27
28	0.22		5.0	0.24		7.3	0.21		2.8	0.57		124.	0.57		120			32.	28
29	0.22		5.0	0.32		17.9	0.21		3.9	0.66		14.						30	29
30	0.28		12.1	0.92		471	0.19		25	0.25		11.9						30.	30
31	0.21		3.9				0.2		2.8	0.27		10.4				E		39	31
1	244.1			1146.4			532.9			149.2			1040.			5235.			1
2	7.2			38.2			17.2			4.8			37.1			168.9			2
3	444.			2276.			1060.			295.			2280.			1038.			3
4	358			471.			355.			49.2			337.			122.			4
5	2.8			2.5			2.3			2.5			2.			24.			5

DAY	APRIL			MAY			JUNE			JULY			AUGUST			SEPTEMBER			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj	Discharge	Gage Height	Adj.	Discharge	
1	E		33.2	0.55		113.	0.20		2.8	0.25		8.4	0.28		11.8	0.22		5.0	1
2			31.8	1.36		284	0.19		2.5	0.25		8.4	0.26		9.5	0.22		5.0	2
3			22.0	0.33		21.2	0.17		2.0	0.25		8.4	0.25		8.4	0.22		5.0	3
4			18.8	0.31		21.2	0.18		2.3	0.29		12.9	0.24		7.3	0.23		6.2	4
5			12.9	0.35		21.2	0.21		2.8	0.27		10.6	0.24		7.3	0.24		7.3	5
6			11.0	0.30		18.8	0.22		5.0	0.25		8.4	0.23		6.2				6
7			21.2	0.32		18.8	0.24		7.3	0.26		9.5	0.25		8.4	0.23		6.2	7
8			18.8	0.31		16.4	0.25		8.4	0.26		9.5	0.24		7.3	0.24		7.3	8
9			16.4	0.30		14.0	0.24		9.5	0.25		8.4	0.22		5.0	0.24		7.3	9
10			14.2	0.30		14.0	0.28		11.8	0.26		9.5	0.22		2.8	0.23		6.2	10
11	E		9.5	0.31		16.4	0.24		10.9	0.26		9.5	0.22		2.8	0.24		7.3	11
12	0.23		6.2	0.29		12.9	0.27		11.4	0.24		9.5	0.19		2.5	0.24		7.3	12
13	0.25		8.4	0.29		12.9	0.27		10.6	0.28		11.8	0.20		2.8	0.23		6.2	13
14	0.24		7.3	0.29		12.9	0.27		10.6	0.29		12.9	0.22		2.8	0.24		7.3	14
15	0.24		7.3	0.29		12.9	0.28		11.8	0.28		11.8	0.47		65.3	0.23		6.2	15
16	0.23		6.2	0.25		9.5	0.26		9.5	0.27		10.6	0.21		2.8	0.21		3.9	16
17	0.29		13.2	0.28		11.8	0.22		5.0	0.28		11.8	0.44		62.2	0.22		5.0	17
18	0.72		245	0.29		12.9	0.24		7.3	0.30		14.0	0.43		48.5	0.23		6.2	18
19	0.27		10.6	0.29		12.9	0.22		5.0	0.29		12.9	0.51		81.3	0.20		5.0	19
20	0.92		45.0	0.20		9.5	0.28		11.8	0.29		12.9	0.26		9.5	0.32		19.2	20
21	0.45		520	0.25		8.4	0.28		11.8	0.29		12.9	0.25		8.4	0.19		2.3	21
22	0.33		21.2	0.27		10.6	0.27		10.6	0.29		12.9	0.25		8.4	0.19		2.5	22
23	0.31		16.4	0.27		10.6	0.26		9.5	0.29		12.9	0.25		8.4	0.24		7.3	23
24	0.30		14.4	0.24		9.5	0.26		9.5	0.30		14.0	0.24		7.3	0.24		7.3	24
25	0.30		14.4	0.25		8.4	0.26		9.5	0.30		14.0	0.24		7.3	0.24		7.3	25
26	0.31		15.4	0.21		2.8	0.27		10.6	0.31		16.4	0.25		8.4	0.21		3.9	26
27	0.29		12.9	0.20		2.5	0.27		10.6	0.32		18.8	0.25		8.4	0.18		2.3	27
28	0.48		68.8	0.20		2.5	0.26		9.5	0.31		14.0	0.27		10.6	0.19		2.5	28
29	0.82		346	0.24		7.3	0.27		10.6	0.30		14.0	0.25		8.4	0.58		126.0	29
30	0.56		114.	0.21		3.9	0.26		9.5	0.29		12.9	0.24		7.3	0.75		277.0	30
31				0.21		3.9				0.28		11.8	0.23		6.2				31
1	1671.6			483.8			255.7			367.4			445.8			573.7			1
2	55.7			15.6			8.5			11.9			14.4			19.1			2
3	3320.			961.			507.			729.			884			1140.			3
4	46.1			113			12.9			18.8			81.3			27.7			4
5	6.2			2.			2.			8.4			2.5			2.3			5

REMARKS

1 = Total CFS
2 = Average Daily Flow in CFS
3 = Total Monthly Flow in A.F.
4 = Maximum Average Daily Flow in CFS
5 = Minimum Average Daily Flow in CFS

YEARLY TOTALS

1	13,486.4
2	37.
3	26710.
4	1,262.
5	2.

Maximum stage 3.68 feet at 1815 on 3-1-83 Discharge 6714 Second-feet.

Minimum stage 0.13 feet at 1715 on 2-12-83 Discharge 1.2 Second-feet.

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description BURBANK WESTERN STORM DR. AT RIVERSIDE DR. for Water-Year 1982 1983

Station No. E285-R

Drainage Area 25.0 Square Miles H. ELDEEB Observer(s)

Gage Read 15 MIN. PUNCH TAPE

Rating Table No. 59 I

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY			FEBRUARY			MARCH		
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge
1	b		5.6	0.12		10.6	b		18.5	0.12		10.6	0.13		11.9	1.94		1710.
2			5.6	0.11		9.1			15.7	0.11		9.1	0.66		221.	1.47		1040.
3			5.6	0.11		9.1			13.1	0.11		9.1	0.17		17.1	b		242
4			4.9	0.11		9.1			11.9	0.11		9.1	0.13		11.9	b		51
5			4.5	0.11		9.1			10.6	0.12		10.6	0.30		43.8	b		303
6			5.6	0.12		10.6	b		11.9	0.11		9.1	0.21		23.5	b		25.5
7	b		6.7	0.12		10.6	0.13		11.9	0.11		9.1	0.30		44.5	0.19		19.7
8	0.09		6.7	0.11		9.1	0.12		10.6	0.12		10.6	0.48		115	0.17		17.1
9	0.09		6.7	0.62		195	0.12		10.6	0.11		9.1	0.20		21.2	0.16		15.7
10	0.08		5.6	b		86.2	0.13		11.9	0.12		10.6	0.18		18.5	0.16		15.7
11	0.08		5.6	0.12		10.6	0.12		10.6	0.13		11.9	0.17		17.1	0.16		15.7
12	0.08		5.6	0.12		10.6	0.13		11.9	0.13		11.9	0.17		17.1	0.15		14.6
13	0.08		5.6	0.12		10.6	0.12		10.6	0.12		10.6	0.18		18.5	0.28		383
14	0.08		5.6	0.11		9.1	0.13		11.9	0.12		10.6	0.16		15.7	0.16		15.7
15	0.08		5.6	0.11		9.1	0.12		10.6	0.11		9.1	0.17		17.1	0.15		14.6
16	0.08		5.6	0.11		9.1	0.13		11.9	0.12		10.6	0.18		18.5	0.25		33.6
17	0.08		5.6	0.11		9.1	0.13		11.9	0.12		10.6	0.17		17.1	0.61		135.
18	0.08		5.6	0.12		10.6	0.13		11.9	0.16		15.7	0.19		19.7	0.55		104.
19	0.13		11.9	0.39		76.2	0.13		11.9	0.57		164.	0.15		14.6	0.43		92.2
20	0.09		6.7	0.12		10.6	0.12		10.6	0.13		11.9	0.15		14.6	0.28		39.4
21	0.09		6.7	0.12		10.6	0.12		10.6	0.12		10.6	0.16		15.7	0.72		268.
22	0.09		6.7	0.12		10.6	0.52		136.	0.62		195.	0.16		15.7	0.52		134.
23	0.09		6.7	0.12		10.6	b		7.9	0.53		141.	0.17		17.1	0.50		124.
24	0.15		7.9	0.11		9.1			5.6	0.49		119.	0.31		47.4	0.64		206.
25	0.10		7.9	0.11		9.1			6.7	b		36.	0.21		23.5	0.45		101.
26	0.11		9.1	0.11		9.1			7.9	0.13		11.9	0.51		126.	0.37		68.5
27	0.09		6.7	0.11		9.1			7.9	1.06		574.	0.78		310.	0.33		54.5
28	0.09		6.7	0.12		10.6	b		10.6	0.58		169.	0.67		227.	0.29		41.7
29	0.08		5.6	0.19		26.2	0.13		11.9	b		149.				0.24		30.3
30	0.15		15.0	b		467.	0.13		11.9	b		11.9				0.20		21.2
31	0.11		9.1				0.12		10.6	b		9.1				0.18		18.5
1	206.8			1090.1			468.1			1790.5			1480.8			4835.8		
2	6.7			36.3			15.1			57.8			52.9			156.		
3	410			2160			928			3550			2940.			9590.		
4	15			467			136			574.			310.			1710.		
5	4.5			9.1			5.6			9.1			11.9			14.6		

DAY	APRIL			MAY			JUNE			JULY			AUGUST			SEPTEMBER			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	
1	0.16		15.7	0.23		28.	0.14		13.1	0.12		10.6	0.10		7.9	0.10		7.9	1
2	0.14		13.1	0.21		23.5	0.14		13.1	0.11		9.1	0.10		7.9	0.10		7.9	2
3	0.13		11.9	0.17		17.1	0.12		13.1	0.11		9.1	0.10		7.9	0.10		7.9	3
4	0.12		10.6	0.15		14.6	0.14		13.1	0.11		9.1	0.10		7.9	0.10		7.9	4
5	0.33		52.8	0.15		14.6	0.15		14.6	0.10		7.9	0.10		7.9	0.10		7.9	5
6	0.19		19.7	0.16		15.7	0.15		14.6	0.11		9.1	0.10		7.9	0.10		7.9	6
7	0.16		15.7	0.15		14.6	0.14		13.1	0.11		9.1	0.10		7.9	0.10		7.9	7
8	0.15		14.6	0.14		13.1	0.13		11.9	0.11		9.1	0.10		7.9	0.10		7.9	8
9	0.14		13.7	0.15		14.6	0.12		10.6	0.10		7.9	0.10		7.9	0.10		7.9	9
10	0.13		11.9	0.15		14.6	0.10		7.9	0.10		7.9	0.10		7.9	0.10		7.9	10
11	0.13		11.9	0.16		15.7	0.12		10.6	0.11		9.1	0.10		7.9	0.10		7.9	11
12	0.15		14.6	0.16		15.7	0.12		10.6	0.10		7.9	0.10		7.9	0.11		9.1	12
13	0.14		13.1	0.16		15.7	0.12		10.6	0.10		7.9	0.09		6.7	0.10		7.9	13
14	0.14		13.1	0.16		15.7	0.11		9.1	0.11		9.1	0.09		6.7	0.10		7.9	14
15	0.13		11.9	0.16		15.7	0.11		9.1	0.12		10.6	0.10		7.9	0.12		10.6	15
16	0.13		11.9	0.15		14.6	0.11		9.1	0.12		10.6	0.35		60.0	0.10		7.9	16
17	0.13		273	0.14		13.1	0.11		9.1	0.10		7.9	0.27		36.6	0.10		7.9	17
18	0.13		182	0.15		14.6	0.12		10.6	0.09		6.7	0.39		76.3	0.10		7.9	18
19	0.24		306	0.15		14.6	0.13		11.9	0.10		7.9	0.38		72.5	0.10		7.9	19
20	0.24		363	0.15		14.6	0.14		13.1	0.10		7.9	0.12		10.6	0.22		26.4	20
21	0.25		63.1	0.15		14.6	0.14		13.1	0.09		6.7	0.12		10.6	0.11		9.1	21
22	0.14		13.1	0.15		14.6	0.14		13.	0.09		6.7	0.12		10.6	0.11		9.1	22
23	0.13		11.9	0.15		14.6	0.13		11.9	0.09		6.7	0.11		9.1	0.10		7.9	23
24	0.14		13.1	0.16		15.7	0.12		10.6	0.09		6.7	0.11		9.1	0.11		9.1	24
25	0.17		17.1	0.15		14.6	0.12		10.6	0.09		6.7	0.11		9.1	0.11		9.1	25
26	0.19		19.7	0.15		14.6	0.12		10.6	0.09		6.7	0.12		10.4	0.12		10.4	26
27	0.17		17.1	0.15		14.6	0.12		10.6	0.09		6.7	0.12		7.9	0.11		9.1	27
28	0.20		42.1	0.15		14.6	0.12		10.6	0.10		7.9	0.10		7.9	0.11		9.1	28
29	0.23		134.	0.15		14.6	0.14		13.	0.11		9.1	0.10		7.9	0.48		116.	29
30	0.32		68.1	0.15		14.6	0.13		11.9	0.10		7.9	0.10		7.9	0.71		254.	30
31				0.14		13.1				0.10		7.9	0.10		7.9				31
1	134.			479.5			347.7			254.2			465.6			623.3			1
2	44			15.5			11.6			8.2			15			20.8			2
3	2620			951			690			504.			924.			1240.			3
4	363			28.			43			16.6			76.3			25.			4
5	10.6			13.1			9.1			6.7			6.7			7.9			5

Maximum stage 4.17 feet at 6:00 pm on 3-1-83 Discharge 6320 cfs

Minimum stage 0.11 feet at 10:00 am on 10-2-82 Discharge 3.4 cfs

REMARKS

1 - Total CFS
2 - Average Daily Flow in CFS
3 - Total Monthly Flow in A.F.
4 - Maximum Average Daily Flow in CFS
5 - Minimum Average Daily Flow in CFS

YEARLY TOTALS	
1	133624
2	366
3	265[illegible]
4	1710
5	4.5

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description LOS ANGELES RIVER AT TUJUNGA AVE for Water-Year 1982 19 83

Station No. F300-R

Drainage Area 401 Square Miles (H. ELDEEB Observer)

Gage Read 15 MIN. PUNCH TAPE

Rating Table No. 621

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH		DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		DAY
	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge		Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	Gage Height	Adj. Discharge	
1	0.47	6.3	0.57	8.7	b	65.3	0.64	[illegible]	e	123.	e	[illegible]	1	e	550.	e	690.	e	14.	e	44.	e	33	e	37.	1
2	0.49	7.2	0.46	6.6	|	11.6	0.62	9.2	|	2220.	|	[illegible]	2	|	470.	|	460.	|	[illegible]	|	39.	|	38.	|	37.	2
3	0.50	7.4	0.43	6.1	|	6.6	0.67	11.1	|	430.	|	[illegible]	3	|	430.	|	270.	|	57.	|	36.	|	38.	|	37.	3
4	0.53	8.0	0.45	6.4	|	7.8	0.83	16.3	|	210.	|	[illegible]	4	|	485.	|	155.	|	60.	|	33.	|	33.	|	37.	4
5	0.58	9.1	0.47	6.8	|	9.5	0.69	11.6	|	400.	|	[illegible]	5	|	570.	|	220.	|	60.	|	38.	|	38.	|	37.	5
6	0.53	8.0	0.54	8.2	b	11.3	0.65	10.6	|	144.	|	256.	6	|	500.	|	225.	|	54.	|	37.	|	38.	|	37.	6
7	0.58	9.1	0.56	8.7	0.66	10.9	0.65	10.6	|	514.	|	2310.	7	|	410.	|	195.	|	64.	|	38.	|	38.	|	37.	7
8	0.59	9.3	0.53	8.0	0.58	9.1	0.68	11.3	|	1530.	|	[illegible]	8	|	325.	|	245.	|	59.	|	40.	|	38.	|	37.	8
9	0.56	8.7	5.00	2930	0.78	13.6	0.65	10.6	|	528.	|	8.1	9	|	265.	|	185.	|	57.	|	37.	|	38.	|	37.	9
10	0.51	7.6	b	1460	0.60	9.5	0.52	7.3	|	273.	|	[illegible]	10	|	540.	|	220.	|	56.	|	37.	|	38.	|	37.	10
11	0.51	7.6	|	75.1	0.61	9.8	0.56	8.7	|	225.	|	[illegible]	11	|	195.	|	220.	|	62.	|	37.	|	38.	|	37.	11
12	0.55	8.4	|	39.1	0.57	8.9	0.70	11.9	|	54.	|	[illegible]	12	|	250.	|	165.	|	52.	|	41.	|	38.	|	37.	12
13	0.59	9.3	|	29.8	0.58	9.1	0.65	10.6	|	121.	|	[illegible]	13	|	205.	|	170.	|	43.	|	39.	|	38.	|	37.	13
14	0.56	8.7	|	28.0	0.48	7.0	0.61	9.7	|	92.	|	[illegible]	14	|	265.	|	255.	|	52.	|	41.	|	38.	|	37.	14
15	0.53	8.0	b	22.2	0.50	7.4	0.62	10.0	|	215.	|	[illegible]	15	|	295.	|	255.	|	43.	|	37.	|	154.	|	37.	15
16	0.52	7.8	0.67	11.1	0.53	8.0	0.70	11.3	|	49.	|	[illegible]	16	|	165.	|	290.	|	43.	|	36.	|	760.	|	37.	16
17	0.61	9.7	0.63	10.2	0.53	8.0	0.62	10.0	|	62.	|	[illegible]	17	|	180.	|	330.	|	46.	|	34.	|	373.	|	37.	17
18	0.58	9.0	2.74	121.0	0.55	8.4	0.60	9.5	|	62.	|	671.	18	|	1960.	|	330.	|	47.	|	34.	|	342.	|	37.	18
19	0.55	8.4	3.73	777	0.58	9.1	e	1030.	|	47.	|	[illegible]	19	|	220.	|	390.	|	42.	|	34.	|	555	|	37.	19
20	0.54	8.2	1.69	45.8	0.57	8.9	e	339.	|	44.	|	[illegible]	20	|	2000.	|	[illegible]	|	44.	|	34.	|	41.	|	87.	20
21	0.53	8.0	1.43	34.5	0.59	9.3	b	6.1	|	42.	|	[illegible]	21	|	950.	|	270.	|	46.	|	36.	|	37.	|	46.	21
22	0.56	8.7	1.16	24.6	4.29	1640	4.32	1680	|	55.	|	[illegible]	22	|	580.	|	265.	|	48.	|	33.	|	37.	|	37.	22
23	0.54	8.2	0.79	14.0	b	461.	3.75	807.	|	51.	|	356.	23	|	345.	|	260.	|	51.	|	32.	|	37.	|	37.	23
24	0.56	8.7	0.76	13.2	|	32.5	3.88	989.	|	314.	|	[illegible]	24	|	345.	|	250.	|	53.	|	29.	|	37.	|	37.	24
25	0.56	8.7	0.73	12.4	|	18.3	2.21	763.	|	55.	|	[illegible]	25	|	285.	|	245.	|	42.	|	33.	|	37.	|	37.	25
26	1.32	30.2	0.73	12.5	|	14.2	1.31	27.6	|	168.	|	[illegible]	26	|	210.	|	235.	|	44.	|	38.	|	37.	|	37.	26
27	0.60	9.5	0.69	11.6	|	13.5	e	4330.	|	3240.	|	[illegible]	27	|	135.	|	245.	|	47.	|	38.	|	37.	|	37.	27
28	0.51	7.6	0.71	12.0	|	15.2	e	1230.	e	1758.	|	[illegible]	28	|	130.	|	295.	|	47.	|	33.	|	37.	|	37.	28
29	0.49	7.2	1.92	57.9	|	13.5	e	2600.	|	|	|	[illegible]	29	|	900.	|	130.	|	47.	|	38.	|	37.	|	928.	29
30	1.19	25.2	5.20	3350	b	12.3	e	420.	|	|	|	[illegible]	30	e	850.	|	210.	e	[illegible]	|	33.	|	37.	e	1620.	30
31	1.14	23.7	|	|	0.65	10.6	e	237.	|	|	e	524.	31	|	|	e	220.	|	|	e	33.	e	37.	|	|	31
1	312.	9151.7	2480.2		13655.2		12596.		79361.				1	14960.		8115.		1628.		1141.		3164.		3,643.		1	152,112.3
2	10.1	305.	80		440.		418.1		2561.				2	499.		261.8		54.3		36.8		102.1		121.4		2	416.8
3	617.	13150.	4920.		27080.		28770.		157410.				3	29670.		1700.		3230.		2260.		6280.		7,225.		3	287,310.
4	30.2	3350.	1640.		4306.		4289.		19580.				4	2000.		690.		122.		44.		760.		1,620.		4	19,580.
5	6.8	5.7	6.6		7.8		42.		443.				5	130.		155.		42.		29.		37.		37.		5	5.7

REMARKS

1 Total CFS
2 Average Daily Flow in CFS
3 Total Monthly Flow in A.F.
4 Maximum Average Daily Flow in CFS
5 Minimum Average Daily Flow in CFS

YEARLY TOTALS

Maximum stage 11.77 feet at CR15 on 3-1-83 Discharge 27,625 Second-feet.

Minimum stage INC. feet at on Discharge Second-feet.

F 118 R

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description: PACOIMA DAM FLUME
BELOW PACOIMA DAM
for Water-Year 19 82 19 83
Station No.: F 118 R
Drainage Area: 28.2 Square Miles (R.J. SARASUA Observer)
Gage Read: CONTINUOUSLY
Rating Table No.: 44 I

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY			FEBRUARY			MARCH			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	
1			0.2			0.2			0.2			0.2	1.98	+.07	190		*	1488	1
2												0.2			131		*	1626	2
3												68.3			665		*	2044	3
4										1.32	-.06	106	.57	-.05	37.7		*	1153	4
5										1.30	-.06	104	.57	-.05	37.7		*	949	5
6									0.2	1.27	-.06	101	.55	-.05	36			428	6
7									63.8	1.27	-.06	101	.55	-.05	36			195	7
8							1.45	+.03	98.			53.1	.58	-.05	36			251	8
9									61.6			0.2			79.1			181	9
10									0.2			0.2	1.20	-.05	100			150	10
11									0.2			0.2			120			162	11
12									0.2			0.2			135			175	12
13									0.2			0.2	1.43	+.07	130			175	13
14									0.2			0.2	1.41	+.07	128			136	14
15									0.5			0.2			133			237	15
16									0.2			0.2	1.53	+.07	141			395	16
17									0.2			0.2	1.54	+.07	142			209	17
18									0.2			0.2	1.50	+.07	138			117	18
19									0.2			0.2			76.3			114	19
20									0.2			0.2			0.2			117	20
21									0.2			0.2			15.0			119	21
22									0.2			0.2			52.0			114	22
23									0.2			0.2	.91	-.05	67.4			114	23
24									0.2			0.2	.91	-.05	67.4			120	24
25									0.2			0.2	.91	-.05	67.4			125	25
26									0.2			0.2	.91	-.05	67.4			125	26
27									0.2			68.6			138			125	27
28									0.2			110	2.67	-.05	280			125	28
29									0.2			153						141	29
30						0.2			0.2	2.10	+.07	206						155	30
31			0.2						0.2	2.12	+.07	209						b 140	31
1	6.2			6.0			229.3			1284			2648.1			11694			1
2	0.2			0.2			7.4			41.4			94.6			377			2
3	12.3			11.9			455			2547			5252			23,195			3
4	0.2			0.2			98			209			280			2094			4
5	0.2			0.2			0.2			0.2			0.2			114			5

DAY	APRIL			MAY			JUNE			JULY			AUGUST			SEPTEMBER			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	
1		b	114		b	93		b	37		b	18		b	8		b	4	1
2			114			93			34			17			7			4	2
3			114			93	M		34			16			7			4	3
4			114			93			33			15			7			4	4
5			112			93			32	M		15			6			4	5
6			112			93	M		32			14			5			4	6
7			77.5			93			31			13			5			4	7
8			5			93			30			12	M		5			4	8
9			92.3			93			29			11			5			4	9
10			100	M		93	M		27			10			5			4	10
11			158	M		84			26	M		10			5			4	11
12			107	M		83			25			10			5			4	12
13			150	M		87	M		24			10			5			4	13
14			250	M		76			23			10			5			4	14
15			207	M		72			23			10	M		5			4	15
16			115			68	M		22			10			6			4	16
17			65			63			22			10			7			4	17
18			65			59			22	M		10			7			4	18
19			65	M		54			22			10			7			4	19
20			65			55			22			10			8			4	20
21			65			55	M		22			10			9	M		4	21
22			65			55			21			10	M		9			4	22
23			65			56			21			10			9			4	23
24			65			56	M		20			10			9			4	24
25			65	M		56			20			10			9			4	25
26			65			53			20			10			9			4	26
27			65			50	M		20			9			9			4	27
28			65			47			20			9			8			4	28
29			65			44			19			9			7			4	29
30		b	65			41		b	18			9			7		b	4	30
31					b	39					b	9		b	7				31
1	2951.8			2183			751			345			212			120			1
2	98.4			70.4			25			11.1			6.8			4			2
3	5855			4330			1490			684			420			238			3
4	250			93			37			18			9			4			4
5	5			39			18			9			5			4			5

REMARKS:

1. Total CFS
2. Average Daily Flow in CFS
3. Total Monthly Flow in A.F.
4. Maximum Average Daily Flow in CFS
5. Minimum Average Daily Flow in CFS

YEARLY TOTALS

1	22430
2	61.5
3	44,490
4	2094
5	0.2

Maximum stage 14.± feet at 2020 on 3-1-83 Discharge 3941 Second-feet.
Minimum stage DRY feet at TIMES on Discharge Second-feet.

* SPILLWAY ◊ ALSO

F 168 R

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description: BIG TUJUNGA CREEK DAM OUTFLOW

for Water-Year 19 82 19 83

Station No.: F 168 R

Drainage Area: 82.7 Square Miles (R.J. SARASUA Observer)

Gage Read: EACH 15 MINUTES

Rating Table No.: 78 II

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY			FEBRUARY			MARCH			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	
1	b		3.8	b		3.8	b		0	b		58	⊢	b	129	⊢	b	3995	1
2												58			147	⊢		3171	2
3												58			147	⊢		2706	3
4												58			147	⊢		1629	4
5										⊢		37.1			147	⊢		1408	5
6										b		24			147	⊢		624	6
7												24			147	⊢		600	7
8				b		3.8						24	⊢		264	⊢		516	8
9				⊢		34.						24	⊢		372	⊢		418	9
10				⊢		117						24	⊢		208	⊢		350	10
11				b		10				⊢		19.3			160	⊢		349	11
12										b		15.1			160			300	12
13												15.1			160			300	13
14												15.1	⊢		136			300	14
15												16.1			95.1	⊢		433	15
16												15.1			95.1	⊢		707	16
17												14.9			95.1			0	17
18												14.9			95.1	⊢		128	18
19												14.9			95.1	⊢		280	19
20												14.9			95.1			250	20
21							b		0			14.9	⊢		109			250	21
22							⊢		4.2			14.9	⊢		93.9			250	22
23							b		58	⊢		24.5			76.1			250	23
24										⊢		55.5			76.1	⊢		605	24
25										b		82.2			76.1	⊢		351	25
26												87.2			76.1			300	26
27										⊢		317	⊢		267			300	27
28										b		470	b		470			300	28
29				b		10				⊢		250			0			300	29
30				⊢		96						240				⊢		280	30
31	b		3.8				b		58	⊢		149					b	250	31
1	117.8			467.4			526.2			2253.7			4285.9			25,900			1
2	3.8			15.6			17			72.7			153.1			835			2
3	234			927			1044			4470			8501			51,372			3
4	3.8			117			58			470			470			7171			4
5	3.8			3.8			0			14.9			76.1			0			5

DAY	APRIL			MAY			JUNE			JULY			AUGUST			SEPTEMBER			DAY
	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	Gage Height	Adj.	Discharge	
1		b	245		b	170		b	0	⊢	b	56.9		b	28.2		b	17.5	1
2			245	⊢		174			0			45			28.2			17.3	2
3			240	⊢		118	⊢		12.6			45	⊢		22.1			17.2	3
4			237	⊢		188			30			45			18.2			17.0	4
5			232			200			30	⊢		45.7			18.2			16.9	5
6			231			201	⊢		37.9	⊢		53.3			18.2			16.7	6
7	⊢		231			201	⊢		61.5			58.9			18.2			16.6	7
8	⊢		221			200			85.6			58.9			18.2			16.4	8
9			230			200			84.3			58.9			18.2			16.3	9
10	⊢		185			199			83.1			58.9			18.2			16.1	10
11			230			198			81.8			58.9			18.2			16.0	11
12			220			197			80.6	⊢		50.7			18.2			15.8	12
13			215			196			79.3	⊢		41.9			18.2			15.7	13
14			215			194			78.1			38.1			18.2			15.5	14
15			215			192			76.8			38.1			18.2			15.4	15
16			215			190			77.3			38.1	⊢		32.4			15.4	16
17			215			187			77.8			38.1			53.2			15.4	17
18	⊢		148			180			78.3			38.1			53.2			15.5	18
19			215			180			78.8	⊢		25.2			53.2			15.6	19
20			215			179			79.3			18.0			53.2			15.7	20
21	⊢		263			173			79.8			18.0			53.2			15.7	21
22			300			170			80.3	⊢		24.7			53.2			15.7	22
23			300			169			80.8			28.2			53.2			15.7	23
24			300			165			78.8			28.2			53.2			15.7	24
25	⊢		259	⊢		134			76.9			28.2	⊢		30.0			15.7	25
26	⊢		169	⊢		99.4			74.9			28.2			17.6			15.7	26
27			150			90			73.0			28.2			17.6			15.7	27
28			150			90			71.0			28.2			17.6			15.7	28
29			150			90			69.1			28.2			17.6			15.7	29
30		b	160			90		b	67.1			28.2			17.6	⊢	b	25.2	30
31				⊢	b	61					b	28.2		b	17.6				31
1	6451			5075.1			1969.4			1204.4			870.5			490.5			1
2	218			164			65.5			38.9			28.7			16.4			2
3	12,795			10,067			3896			2389			1766			973			3
4	300			201			85.6			58.9			53.2			25.2			4
5	125			61			0			18.0			17.6			15.7			5

REMARKS:

1. Total CFS
2. Average Daily Flow in CFS
3. Total Monthly Flow in A.F.
4. Maximum Average Daily Flow in CFS
5. Minimum Average Daily Flow in CFS

YEARLY TOTALS	
1	49627
2	136
3	98,434
4	7171
5	0

Maximum stage 10.7 feet at 2200 on 3-1-83 Discharge 9900 Second-feet.

Minimum stage Dry feet at Times on Discharge Second-feet.

Appendix C

WELLS DRILLED AND DESTROYED

WELLS DESTROYED 1982-83

Party	LACFCD Well No.	Owner No.
T. F. Dixon	3582	394
L. A. County	3631	526
Conrock	4926	-

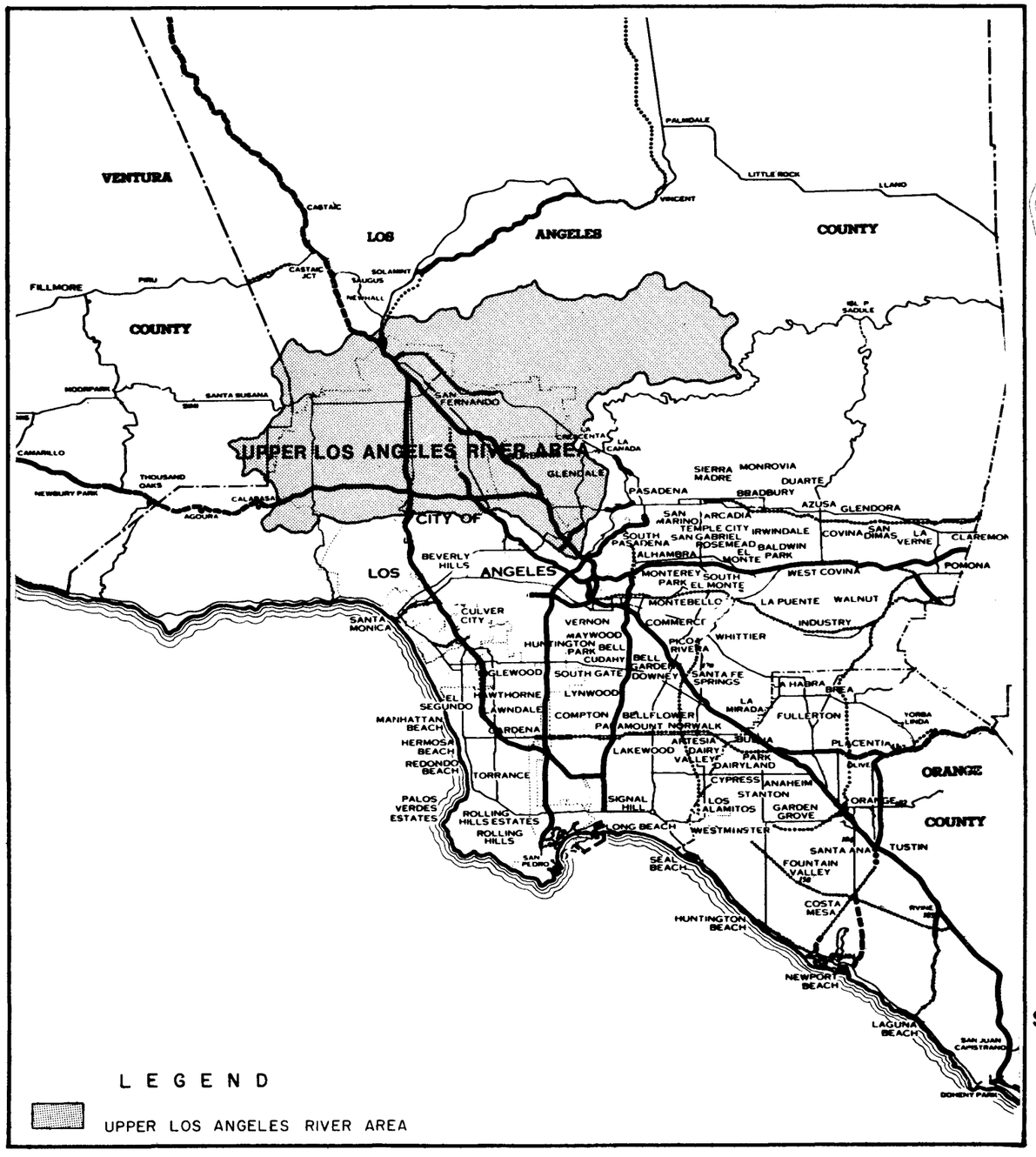
WELLS DRILLED 1982-83

LADWP	3790K	NH-43A
--	4914G	-
Conrock	4916D	-

Appendix D

PLATES

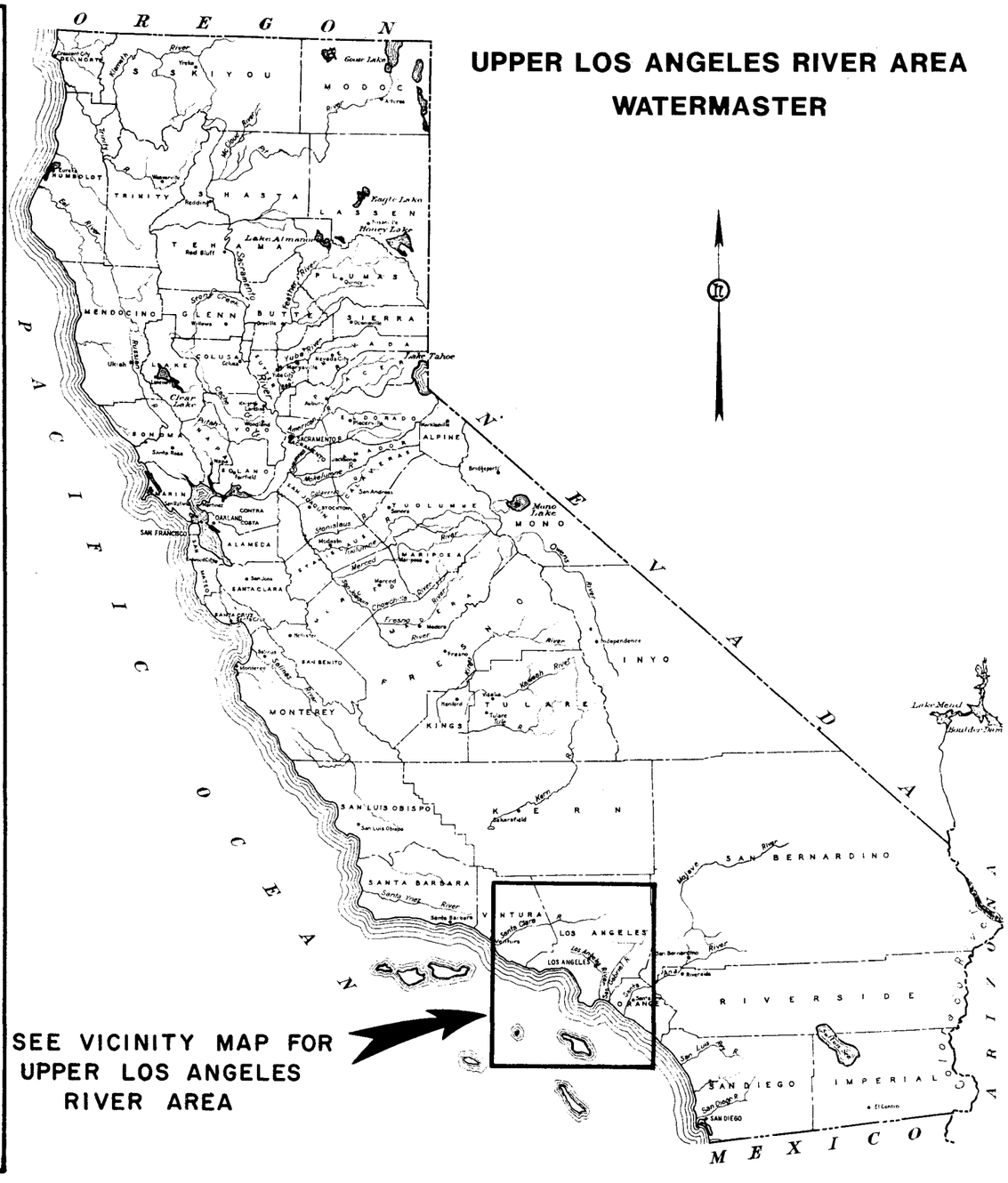
UPPER LOS ANGELES RIVER AREA WATERMASTER



VICINITY MAP

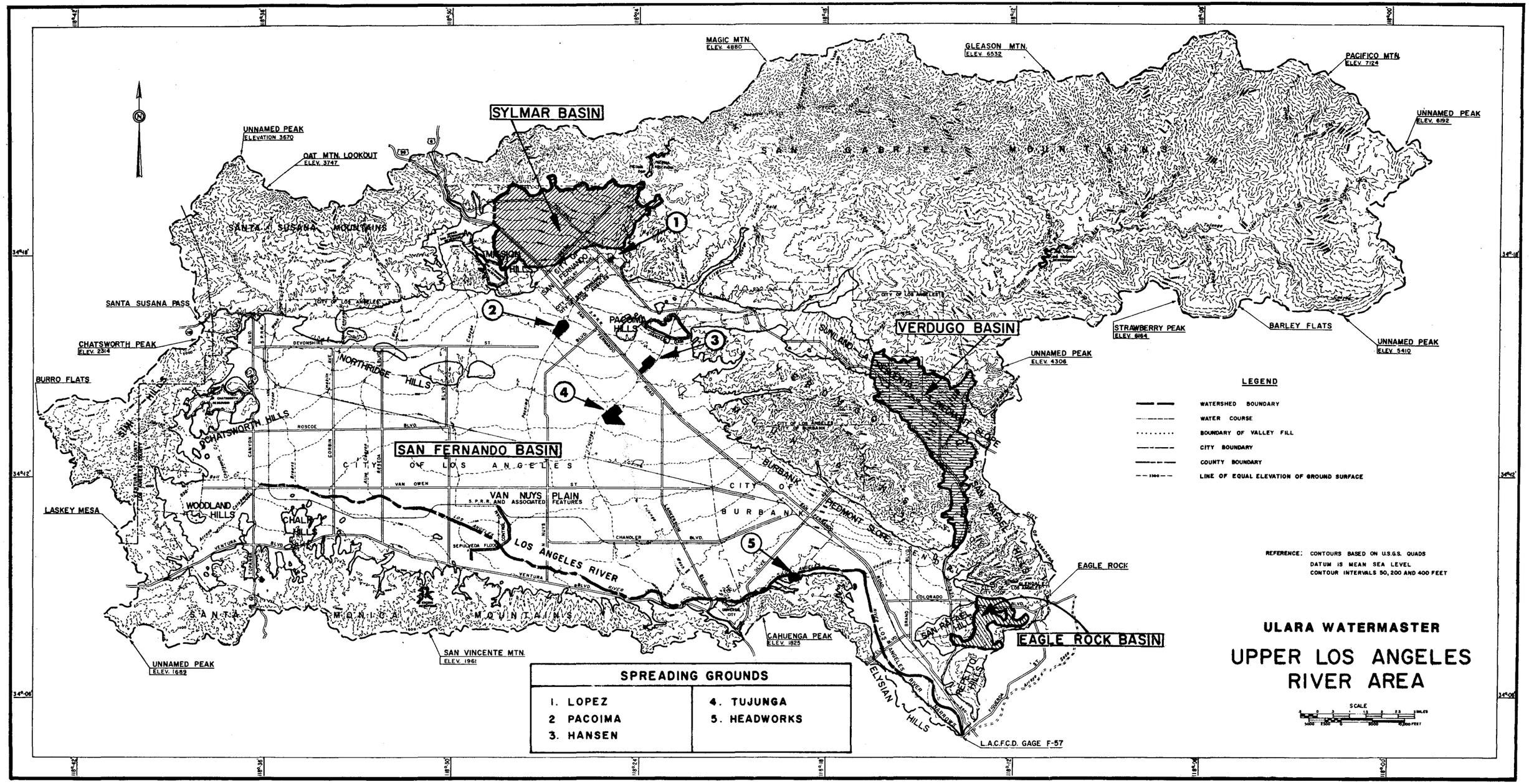
SCALE

0 5 10 15 Miles



LOCATION MAP

Scale of Miles



SPREADING GROUNDS	
1. LOPEZ	4. TUJUNGA
2 PACOIMA	5. HEADWORKS
3. HANSEN	

LEGEND

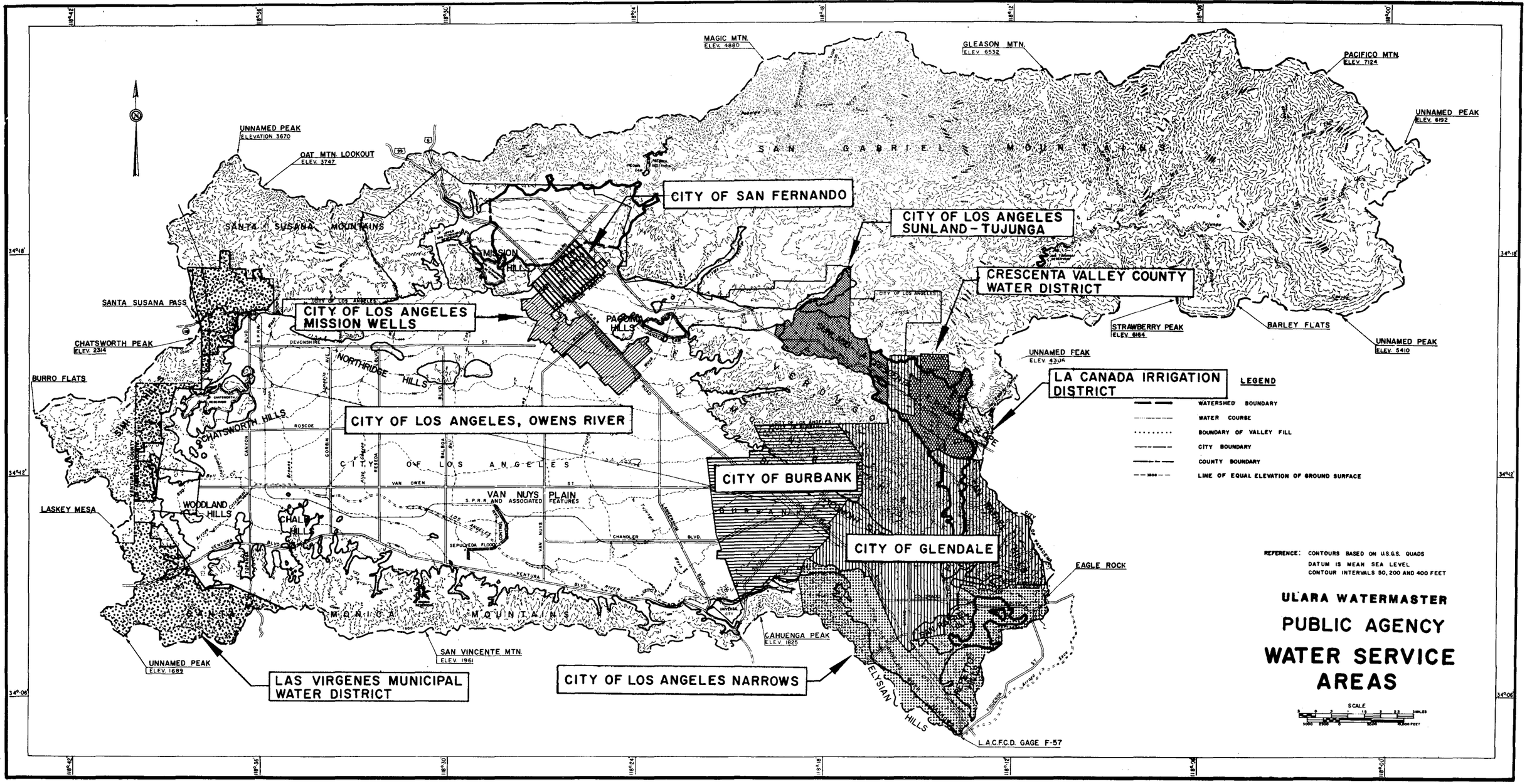
- WATERSHED BOUNDARY
- WATER COURSE
- BOUNDARY OF VALLEY FILL
- CITY BOUNDARY
- COUNTY BOUNDARY
- LINE OF EQUAL ELEVATION OF GROUND SURFACE

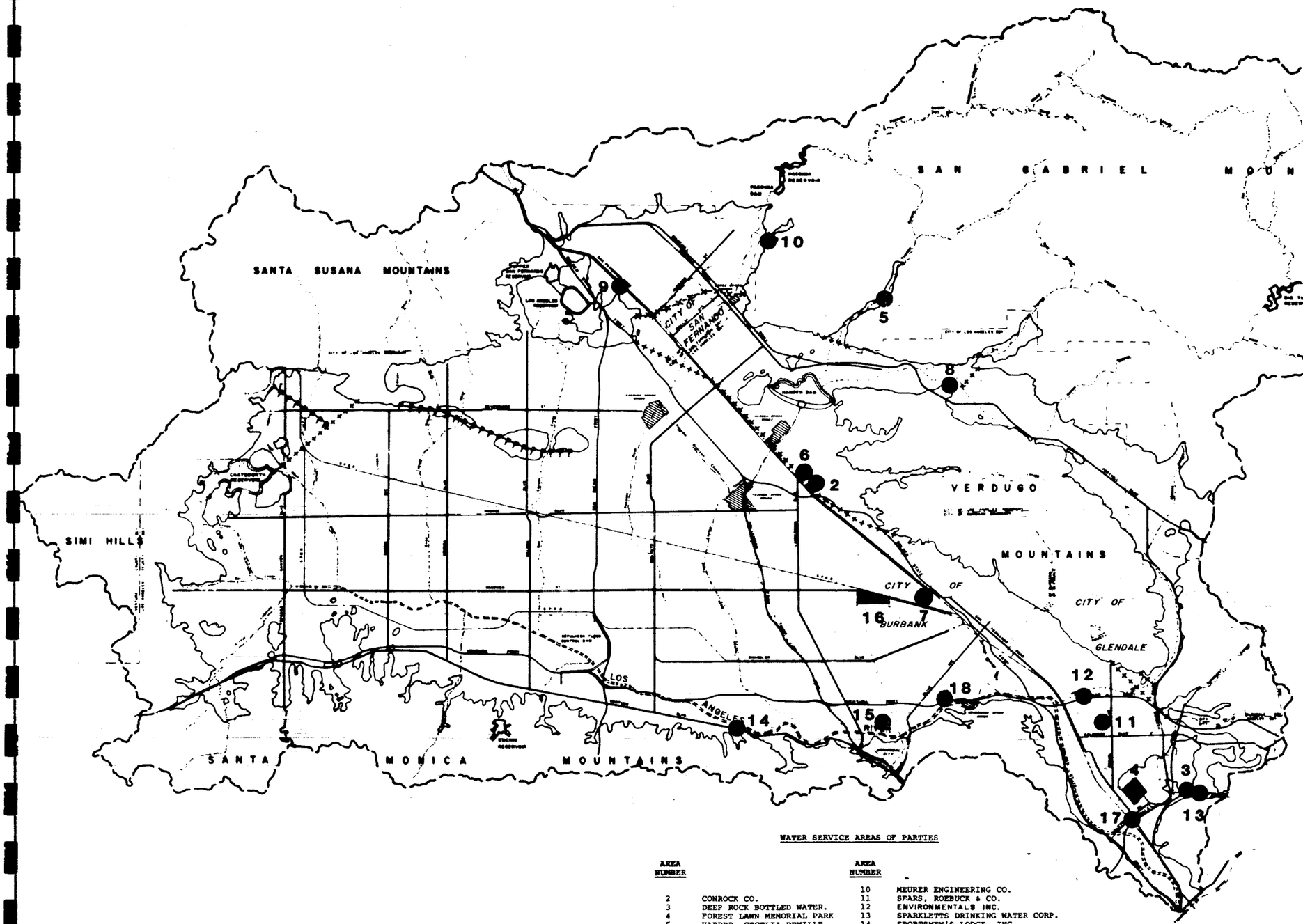
REFERENCE: CONTOURS BASED ON U.S.G.S. QUADS
DATUM IS MEAN SEA LEVEL
CONTOUR INTERVALS 50, 200 AND 400 FEET

ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

SCALE


MAGIC MTN.
ELEV. 4880
GLEASON MTN.
ELEV. 6532
PACIFICO MTN.
ELEV. 7124
UNNAMED PEAK
ELEV. 6192
UNNAMED PEAK
ELEVATION 3670
OAT MTN. LOOKOUT
ELEV. 3747
SAN GABRIEL MOUNTAINS
SANTA SUSANA MOUNTAINS
CITY OF SAN FERNANDO
CITY OF LOS ANGELES
SUNLAND - TUJUNGA
CRESCENTA VALLEY COUNTY
WATER DISTRICT
MISSION HILLS
PACOIMA HILLS
SANTA SUSANA PASS
CITY OF LOS ANGELES
MISSION WELLS
CHATSWORTH PEAK
ELEV. 2314
STRAWBERRY PEAK
ELEV. 6164
BARLEY FLATS
UNNAMED PEAK
ELEV. 5410
UNNAMED PEAK
ELEV. 4306
LA CANADA IRRIGATION
DISTRICT
BURRO FLATS
NORTHRIDGE HILLS
CHATSWORTH HILLS
CITY OF LOS ANGELES, OWENS RIVER
CITY OF LOS ANGELES
VAN NUYS PLAIN
ASSOCIATED FEATURES
CITY OF BURBANK
LASKEY MESA
WOODLAND HILLS
CHALK HILL
CITY OF GLENDALE
EAGLE ROCK
SANTA MONICA MOUNTAINS
SAN VINCENTE MTN.
ELEV. 1961
CAHUENGA PEAK
ELEV. 1825
UNNAMED PEAK
ELEV. 1689
LAS VIRGENES MUNICIPAL
WATER DISTRICT
CITY OF LOS ANGELES NARROWS
ELYSIAN HILLS
L.A.C.F.C.D. GAGE F-57
LEGEND
WATERSHED BOUNDARY
WATER COURSE
BOUNDARY OF VALLEY FILL
CITY BOUNDARY
COUNTY BOUNDARY
LINE OF EQUAL ELEVATION OF GROUND SURFACE
REFERENCE: CONTOURS BASED ON U.S.G.S. QUADS
DATUM IS MEAN SEA LEVEL
CONTOUR INTERVALS 50, 200 AND 400 FEET
ULARA WATERMASTER
PUBLIC AGENCY
WATER SERVICE
AREAS
SCALE
118°42'
118°36'
118°30'
118°24'
118°18'
118°12'
118°06'
118°00'
34°18'
34°12'
34°06'



N

ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

WATER SERVICE AREAS OF INDIVIDUAL PRODUCERS SEPTEMBER 1983

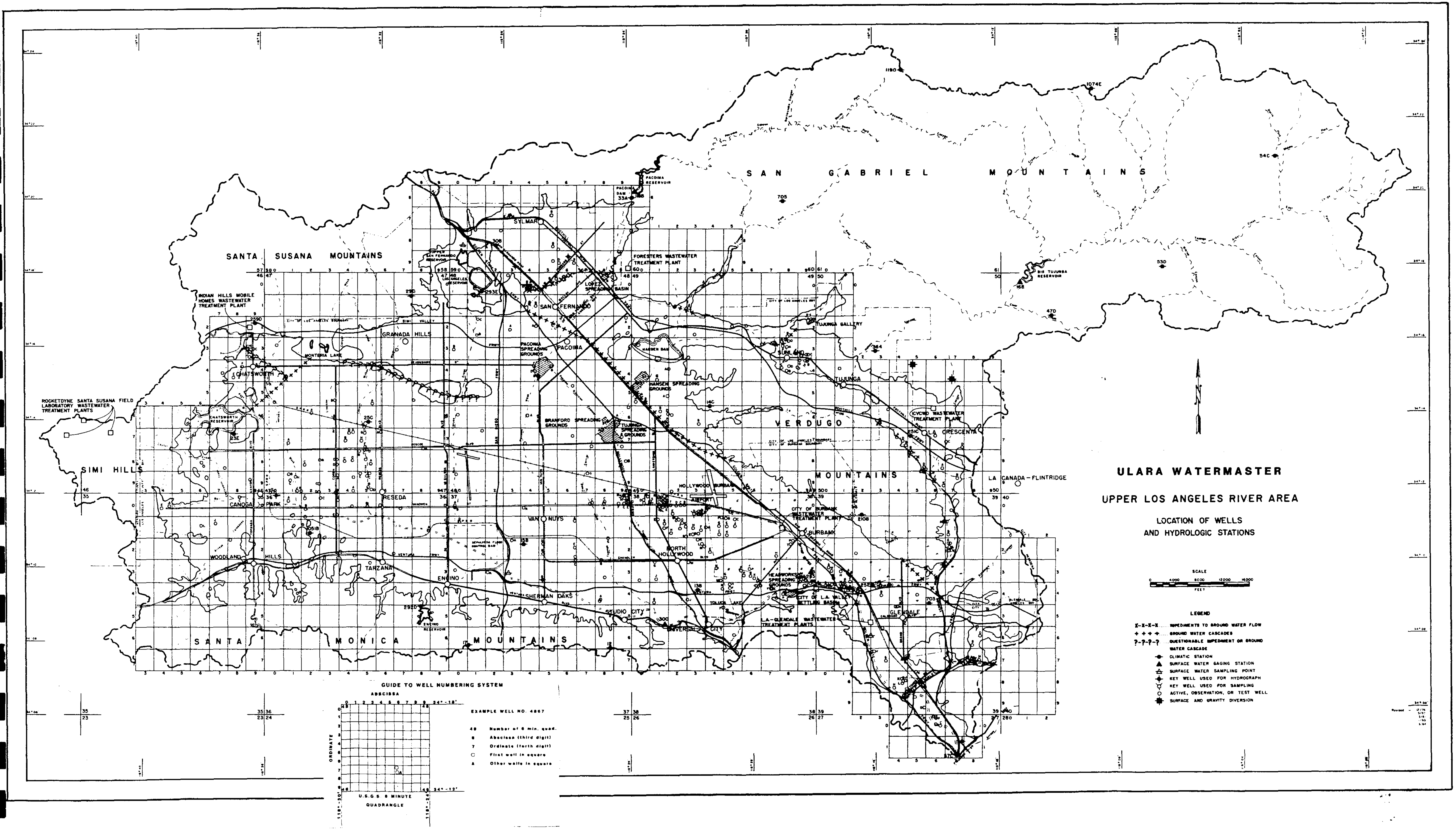
SCALE

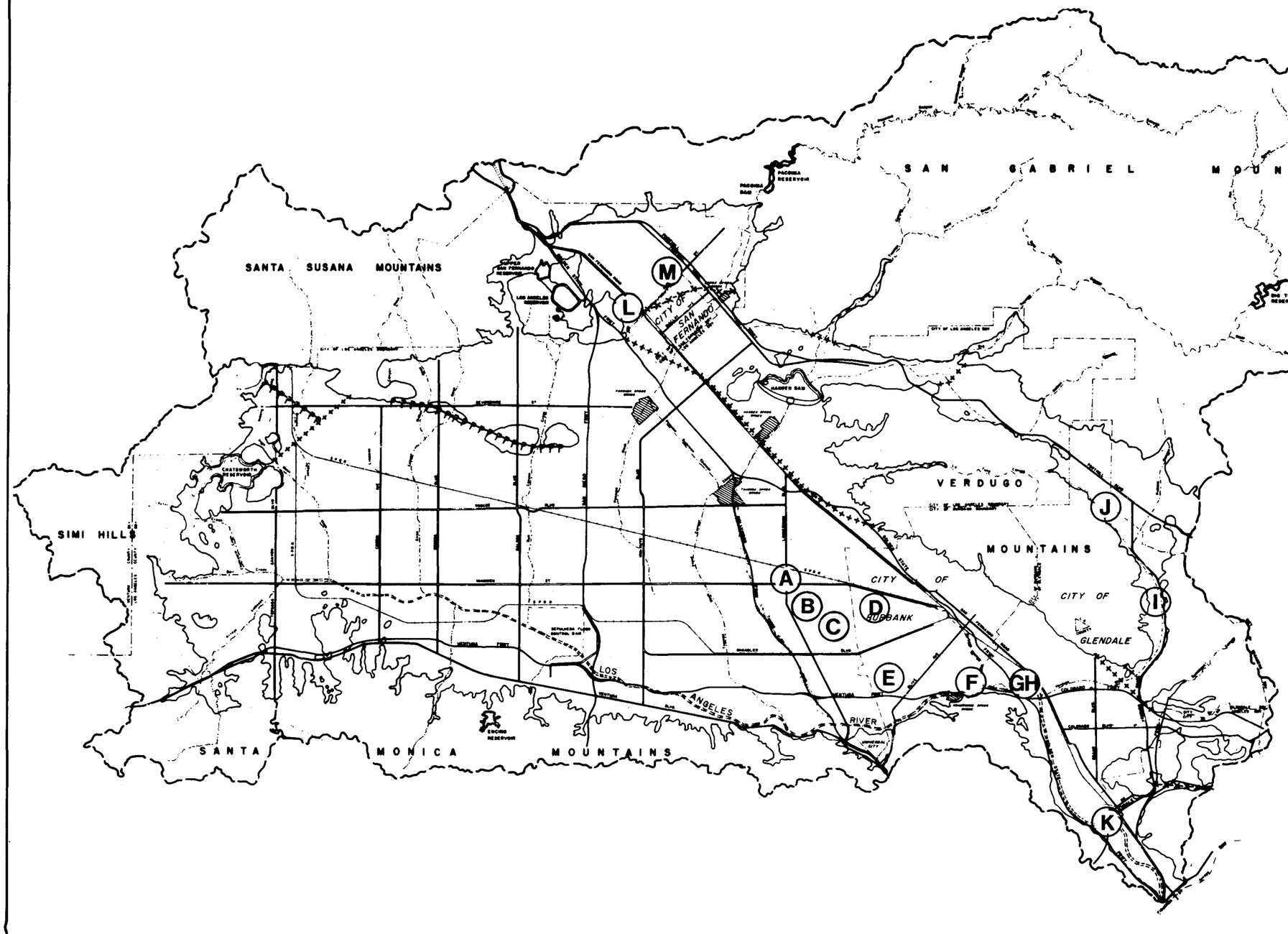
LEGEND

- 2-2-2-2 INCREMENTS TO GROUND WATER FLOW
- + + + + GROUND WATER CASCADES
- ?-?-?-? QUESTIONABLE INCREMENT OR GROUND WATER CASCADE

WATER SERVICE AREAS OF PARTIES

AREA NUMBER		AREA NUMBER	
2	CONROCK CO.	10	MEURER ENGINEERING CO.
3	DEEP ROCK BOTTLED WATER.	11	SPARS, ROEBUCK & CO.
4	FOREST LAWN MEMORIAL PARK	12	ENVIRONMENTALS INC.
5	HARPER, CECELIA DEMILLE	13	SPARKLETTS DRINKING WATER CORP.
6	LIVINGSTON-GRAHAM, INC.	14	SPORTSMEN'S LODGE, INC.
7	LOCKHEED AIRCRAFT CORP.	15	TOLUCA LAKE PROPERTY OWNERS ASSN.
8	MENA, JOHN & BARBARA	16	VALHALLA MEMORIAL PARK
9	MOORDIGIAN, KISAG	17	VAN DE KAMP'S DUTCH BAKERS, INC.
		18	WALT DISNEY PRODUCTIONS


ULARA WATERMASTER
UPPER LOS ANGELES RIVER AREA
LOCATION OF WELLS
AND HYDROLOGIC STATIONS
SCALE
0 4000 8000 12000 16000
FEET
LEGEND
X-X-X-X ..... IMPEDIMENTS TO GROUND WATER FLOW
+ + + + ... GROUND WATER CASCADES
?-?-?-? ..... QUESTIONABLE IMPEDIMENT OR GROUND WATER CASCADE
CLIMATIC STATION
SURFACE WATER GAGING STATION
SURFACE WATER SAMPLING POINT
KEY WELL USED FOR HYDROGRAPH
KEY WELL USED FOR SAMPLING
ACTIVE, OBSERVATION, OR TEST WELL
SURFACE AND GRAVITY DIVERSION
SAN GABRIEL MOUNTAINS
SANTA SUSANA MOUNTAINS
SIMI HILLS
VERDUGO MOUNTAINS
SANTA MONICA MOUNTAINS
SYLMAR
SAN FERNANDO
PACOIMA
GRANADA HILLS
CHATSWORTH
CANOGA PARK
RESEDA
VAN NUYS
WOODLAND HILLS
TARZANA
ENCINO
SHERMAN OAKS
STUDIO CITY
UNIVERSAL CITY
NORTH HOLLYWOOD
BURBANK
GLENDALE
TUJUNGA
LA CRESCENTA
LA CANADA-FLINTRIDGE
HOLLYWOOD BURBANK AIRPORT
PACOIMA RESERVOIR
PACOIMA DAM
BIG TUJUNGA RESERVOIR
TUJUNGA GALLERY
HANSEN DAM
HANSEN SPREADING GROUNDS
PACOIMA SPREADING GROUNDS
LOPEZ SPREADING BASIN
BRANFORD SPREADING GROUNDS
TUJUNGA SPREADING GROUNDS
HEADWORKS SPREADING GROUNDS
CITY OF L.A. VALLEY SETTLING BASIN
UPPER SAN FERNANDO RESERVOIR
LOS ANGELES RESERVOIR
CHATSWORTH RESERVOIR
ENCINO RESERVOIR
MONTERIA LAKE
TOLUCA LAKE
SEPULVEDA FLOOD CONTROL DAM
FORESTERS WASTEWATER TREATMENT PLANT
INDIAN HILLS MOBILE HOMES WASTEWATER TREATMENT PLANT
ROCKETDYNE SANTA SUSANA FIELD LABORATORY WASTEWATER TREATMENT PLANTS
CVCWD WASTEWATER TREATMENT PLANT
CITY OF BURBANK WASTEWATER TREATMENT PLANT
LA-GLENDALE WASTEWATER TREATMENT PLANTS
GUIDE TO WELL NUMBERING SYSTEM
ABSCISSA
ORDINATE
34°-18'
34°-12'
118°-30'
118°-24'
U.S.G.S. 6 MINUTE QUADRANGLE
EXAMPLE WELL NO. 4867
48 Number of 6 min. quad.
6 Abscissa (third digit)
7 Ordinate (forth digit)
First well in square
A Other wells in square



N

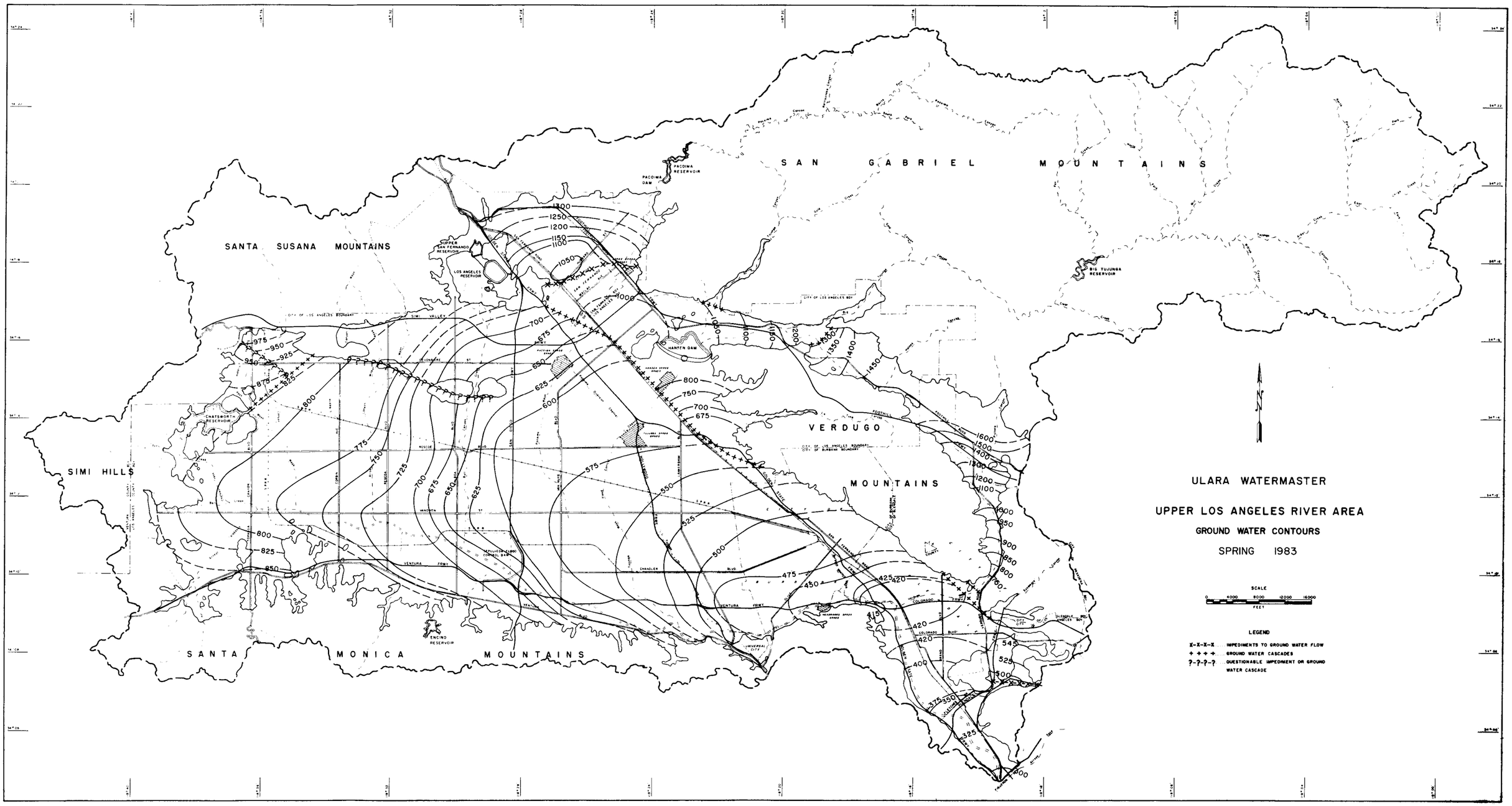
ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

WELL FIELD LOCATIONS

SCALE

A - NORTH HOLLYWOOD
B - ERWIN
C - WHITNALL
D - CITY OF BURBANK
E - VERDUGO
F - HEADWORKS
G - CRYSTAL SPRINGS
H - CITY OF GLENDALE (GRANDVIEW)
I - CITY OF GLENDALE (GLORIETTA)
J - C.V.C.W.D.
K - POLLOCK
L - MISSION
M - CITY OF SAN FERNANDO



ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

GROUND WATER CONTOURS

SPRING 1983

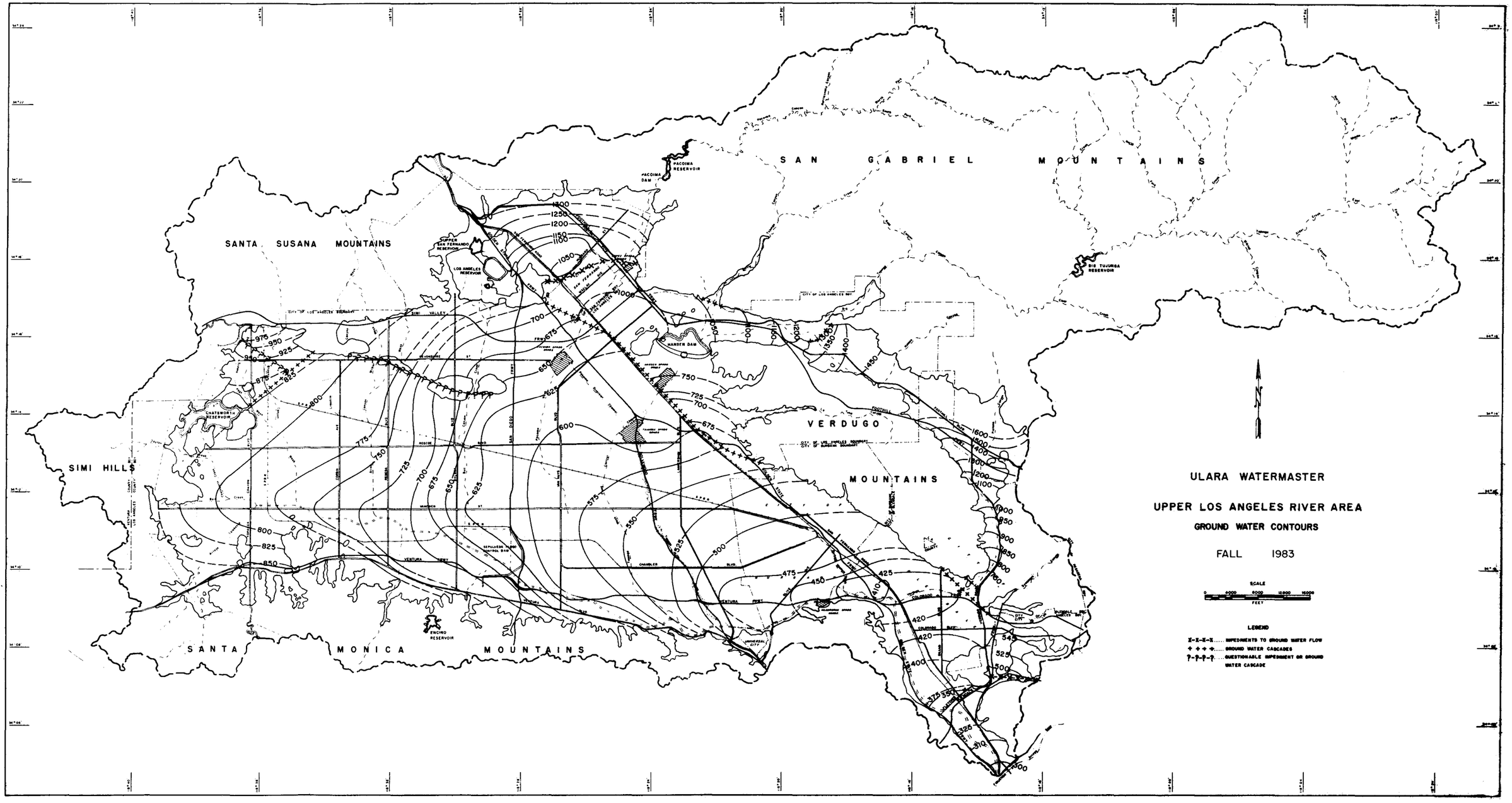
SCALE

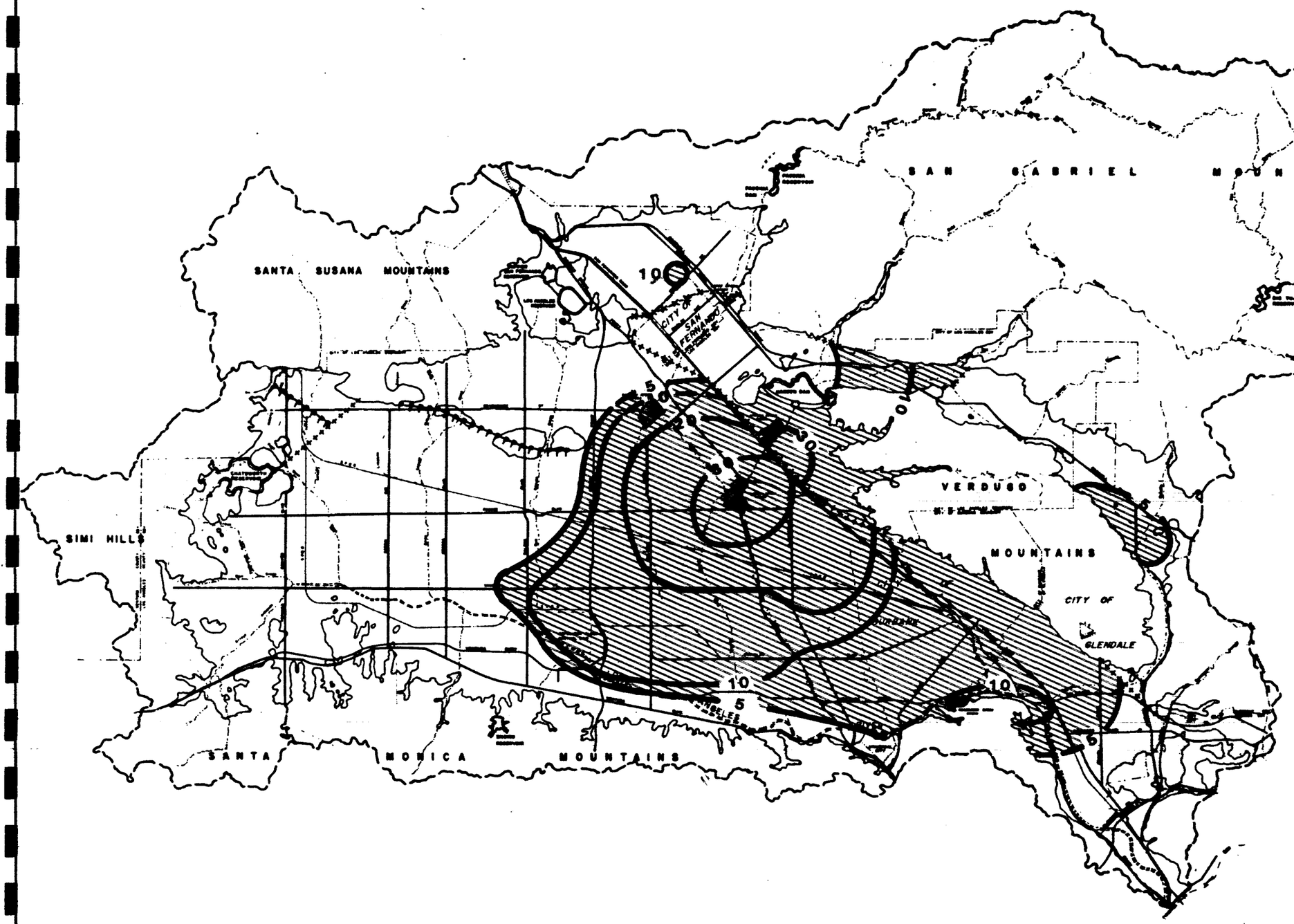
0 4000 8000 12000 16000

FEET

LEGEND

X-X-X-X	IMPEDIMENTS TO GROUND WATER FLOW
+ + + +	GROUND WATER CASCADES
?-?-?-?	QUESTIONABLE IMPEDIMENT OR GROUND WATER CASCADE


SAN GABRIEL MOUNTAINS
SANTA SUSANA MOUNTAINS
SIMI HILLS
SANTA MONICA MOUNTAINS
VERDUGO MOUNTAINS
PACOIMA DAM
PACOIMA RESERVOIR
SUPER SAN FERNANDO RESERVOIR
LOS ANGELES RESERVOIR
BIG TUJUNGA RESERVOIR
HANSEN DAM
CHATSWORTH RESERVOIR
ENCINO RESERVOIR
SIMI VALLEY
SAN FERNANDO VALLEY
GLENDALE NARROWS
CENTRAL BASIN
VENTURA FWY
HOLLYWOOD FWY
FOOTHILL FWY
SAN DIEGO FWY
COLORADO BLVD
CHANDLER BLVD
ULARA WATERMASTER
UPPER LOS ANGELES RIVER AREA
GROUND WATER CONTOURS
FALL 1983
SCALE
0 4000 8000 12000 16000
FEET
LEGEND
X-X-X-X..... IMPEDIMENTS TO GROUND WATER FLOW
+ + + +..... GROUND WATER CASCADES
?-?-?-?..... QUESTIONABLE IMPEDIMENT OR GROUND WATER CASCADE



ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

LINES OF EQUAL CHANGE IN GROUND WATER ELEVATION

FALL 1982 - FALL 1983

SCALE

LEGEND

RISE IN WATER LEVELS IN FEET

DECLINE IN WATER LEVELS

NO CHANGE (LESS THAN 5 FEET)

SAN FERNANDO & VERDUGO BASINS

GROUNDWATER FLOW 1980

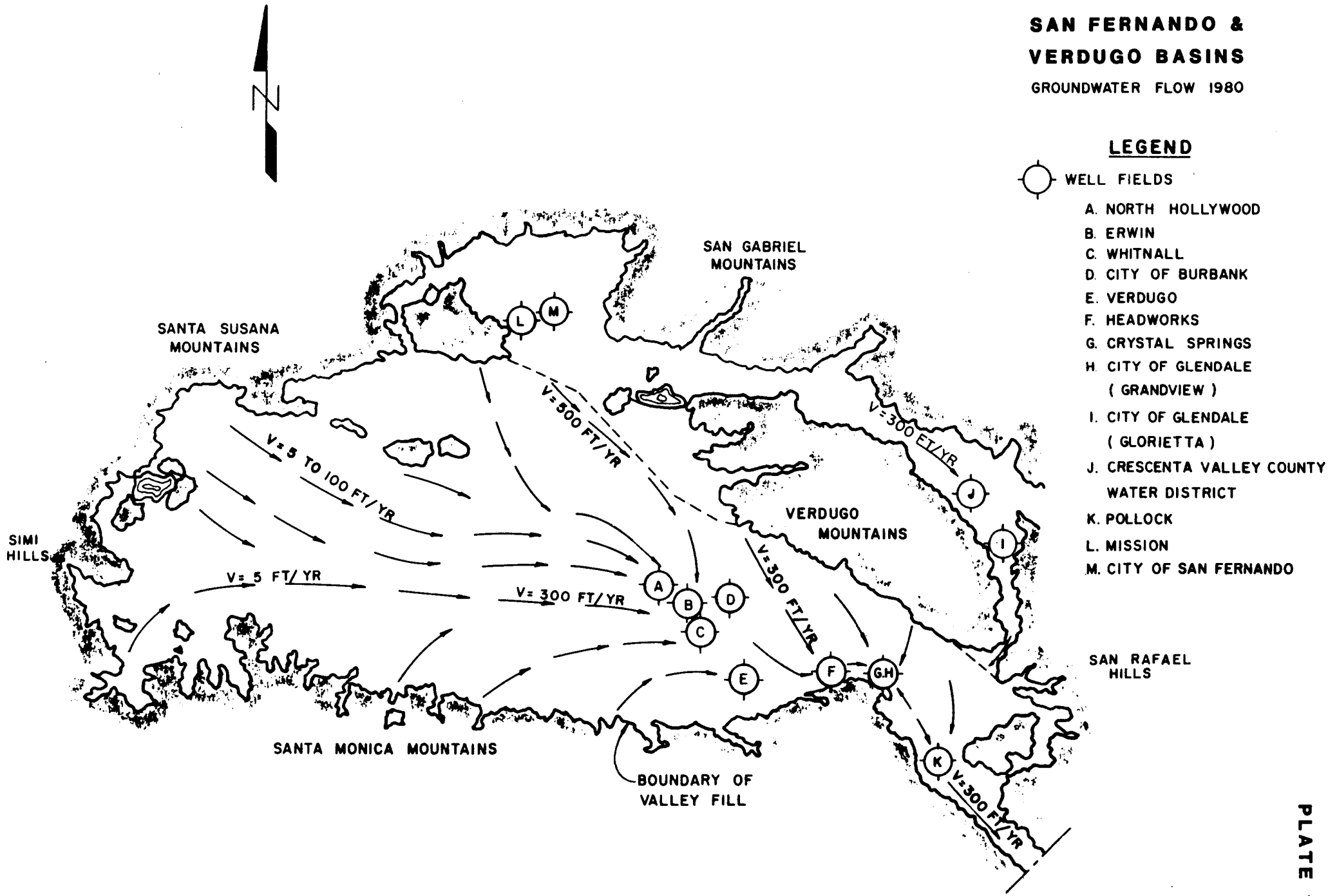


PLATE 10