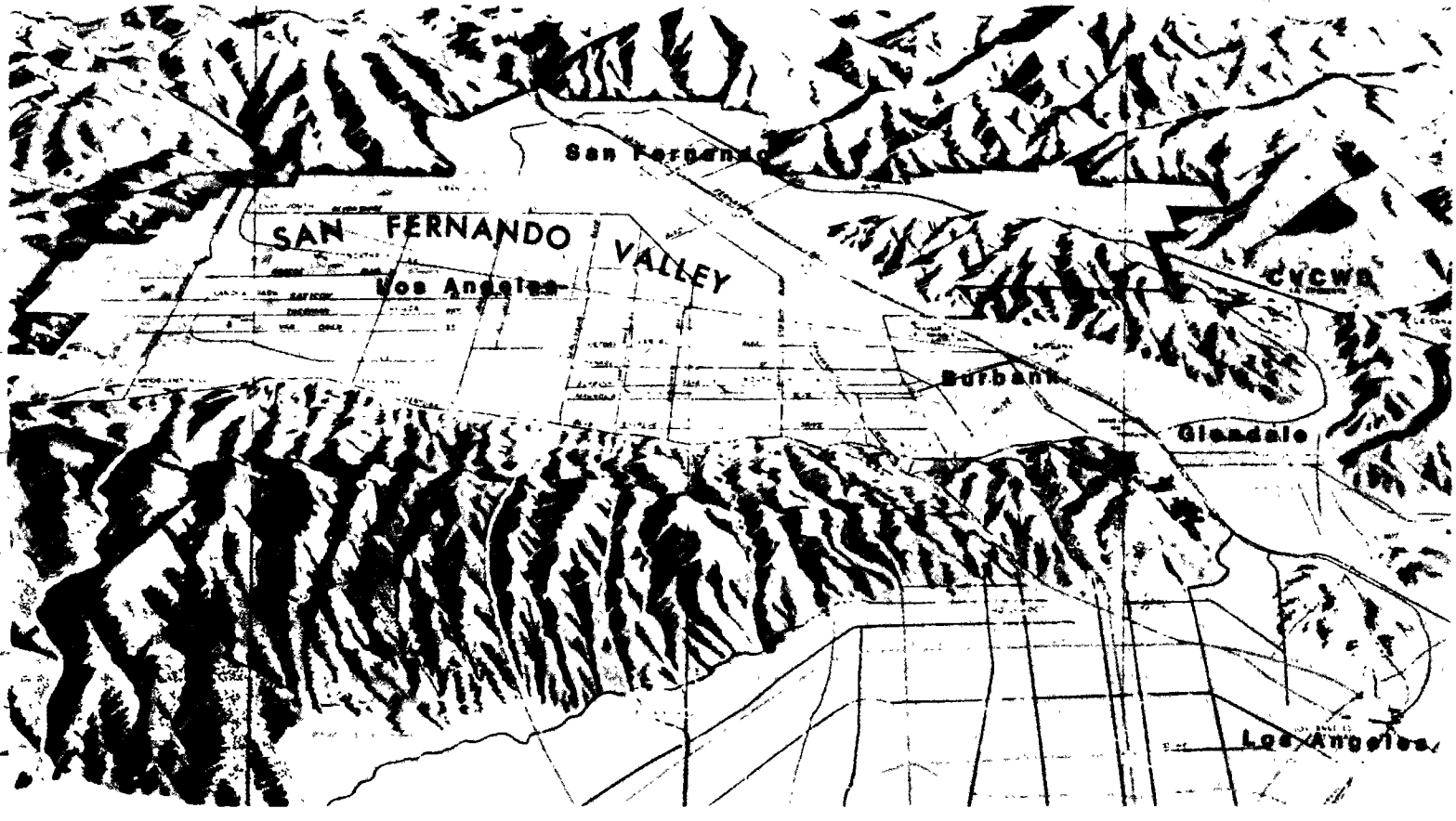
UPPER LOS ANGELES RIVER AREA WATERMASTER

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, 1980 - SEPTEMBER 30, 1981



MAY 1982

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CONVERSION FACTORS

English to Metric System of Measurement

Quantity	English unit	Multiply by	To get metric equivalent
Length	inches (in)	25.4	millimetres (mm)
		.0254	metres (m)
	feet (ft)	.3048	metres (m)
	miles (mi)	1.6093	kilometres (km)
Area	square inches (in^2)	6.4516×10^{-4}	square metres (m^2)
	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)
Mass	pounds (lb)	.45359	kilograms (kg)
	tons (short, 2,000 lb)	.90718	tonne (t)
		907.18	kilograms (kg)
Power	horsepower (hp)	0.7460	kilowatts (kW)
Pressure	pounds per square inch (psi)	6894.8	pascal (Pa)
Temperature	Degrees Fahrenheit (°F)	$\frac{tF - 32}{1.8} = tC$	Degrees Celsius (°C)

*Section 24 of Water Code = 1/49 of second foot.
() 1/50 of second foot commonly used in Southern California

FOREWORD

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 1980-81 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 1981-82, and indicates the water in storage to the credit of each party as of October 1, 1981. 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, groundwater extractions, groundwater 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,

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

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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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ULARA WATERMASTER REPORT FOR WATER YEAR 1980-81

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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 encompasses 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 Basin; 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

ULARA was 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, et 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 occurrence 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 ground water within the area; the quality of the ground water in the basin; 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 the ULARA Watermaster, Post Office Box 111, Room 1469, 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 arrangements 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 waters 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. (was Southern Service Co.)	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 the 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 to 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 1980-81 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 an 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, 1981, 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

Duane L. Georgeson
Bruce W. Kuebler (Alternate)

City of San Fernando

Neville R. Lewis
Rick Navarro (Alternate)

Crescenta Valley County Water District

Robert K. Argenio
Robert Sloan (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 1980-81 water year the Administrative Committee met on April 7 and April 28, 1981. The following items were discussed at these meetings:

1. Status of Watermaster activities within ULARA.
2. Update of groundwater quality study for San Fernando Basin.
3. Conjunctive use program/interruptible supply (MWD) for in-lieu replenishment.
4. Status of water reuse studies.
5. Hansen Dam operation and effect on future recharge.
6. Administrative Committee members update.
7. Sanitary landfill update.
8. Annual report for 1979-80.

Summary of 1980-81 Operating Conditions

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

Rainfall on the valley fill area was 67 percent of normal as compared to 184 percent of normal the year before. Surface runoff leaving the valley at Gage F-57C-R for 1980-81 was 76,230 acre-feet. The amount conserved by the LACFCD in its spreading basins was 18,219 acre-feet, a decrease of 62 percent over last year. Total precipitation falling on the San Fernando Valley and its tributary hill and mountain areas was estimated to be 354,000 acre-feet for the water year 1980-81. Of this total, approximately 52,000 acre-feet flowed from the valley as storm runoff, leaving 302,000 acre-feet which was beneficially used within the area (85 percent of the total).

Ground water extractions increased in all four basins during the year. Total ULARA extractions amounted to 109,730 acre-feet as compared to an allowable pumping of 108,996 acre-feet. Of this total, 104,825 acre-feet represents the 1980-81 extraction rights of parties in the San Fernando Basin (see 1980-81 Table 10) plus the safe yield values of Sylmar and Verdugo Basins. The remaining 4,171 acre-feet is nonconsumptive use pumping (see Table 9A). Extractions used within ULARA increased by 14 percent (3,093 acre-feet) from last year.

For ULARA, gross imports increased by 5,499 acre-feet, or 1 percent, while imports used within ULARA increased by 9 percent (24,498 acre-feet). Exports of Owens River water decreased by 18,999 acre-feet, or 7 percent. The total amount delivered to water users within ULARA was 9 percent greater (27,591 acre-feet) than last year.

TABLE 1

UPPER LOS ANGELES RIVER AREA
SUMMARY OF OPERATING CONDITIONS
1979-80 AND 1980-81

Item		Water Year 1979-80	Water Year 1980-81
1. Parties		24	24
2. Active pumpers		19	19
3. Active nonpumpers (within valley fill		0	0
4. Valley rainfall, in inches		30.25	11.04
5. Spreading operations, in acre-feet[a/]			
a. LACFCD		47,852	18,219
b. Los Angeles, City of		25,691	13,672
6. Extractions, in acre-feet		72,925	109,730
a. Used in ULARA		22,052	25,145
7. Gross imports, in acre-feet			
a. MWD water		62,477	70,533
b. Owens River water[b/]		477,754	475,197
	Total	540,231	545,730
8. Exports in acre-feet			
a. Owens River water		255,543	236,544
b. Groundwater by Los Angeles		50,873	84,585
	Total	306,416	321,129
9. Imports used in ULARA, in acre-feet		284,688	309,186
10. Total delivered water used in ULARA, in acre-feet		306,740	334,331
11. Reclaimed water, in acre-feet		15,215	14,377
12. Sewage export, in acre-feet[c/]		113,288	115,479

a/ Breakdown of spreading operations as to sources of water is shown in Table 5. 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 releases, reservoir evaporation, and water spread during the year.

c/ Total of sewage outflow from all four basins, including reclaimed water.

Sewage export was 115,479 acre-feet in 1980-81, an increase of 2 percent. Total reclaimed water used in ULARA (cooling towers, etc.) decreased by 32 percent (800 acre-feet), while the total reclaimed water use decreased from 15,265 acre-feet to 14,377 acre-feet, a decrease of 6 percent. Most of the reclaimed water is discharged to the Los Angeles River.

A total of 31,891 acre-feet of water, 22,871 native and 9,020 Owens River, was spread during the year, which was a 57 percent decrease from last year.

Ground water levels declined by an average of 15 feet in the central part of the San Fernando Basin, 5 feet in the southwestern section of the Sylmar Basin, and 5 to 10 feet in the southern portion of the Verdugo Basin; and increased by an average of 10 feet in the southeastern area of the San Fernando Basin.

Ground water storage for the San Fernando, Sylmar, and Verdugo Basins decreased by 32,560 acre-feet, 2,070 acre-feet, and 2,870 acre-feet, respectively, during 1980-81.

Summary of Allowable Pumping for 1981-82

Table 1A gives a summary of allowable pumping for the Cities of Los Angeles, Burbank, Glendale, and San Fernando and Crescenta Valley County Water District. Stored water is also shown as a credit for these parties as of October 1, 1981.

TABLE 1A

SUMMARY OF ALLOWABLE PUMPING FOR ENSUING YEAR 1981-82
(In Acre-Feet)

	Extractions			Stored Water Credit*
	Native	Import Credit	Total	
San Fernando Basin				
Los Angeles	43,660	41,418	85,078	133,773
Burbank	-	5,040	5,040	12,359
Glendale	-	4,769	4,769	9,083
San Fernando	-	6	6	88
Sylmar Basin				
Los Angeles	1,560	2,686	4,246	-
San Fernando	3,580	-	3,580	-
Verdugo Basin				
Crescenta	-	-	3,294	-
Glendale	-	-	3,856	-

* As of October 1, 1981

Note: Calculation of these values shown in more detail in Tables 10 and 11.

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 portions 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 the 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 1980-81 water year experienced below average rainfall. The valley floor received 11.04 inches of rain, whereas the mountains received approximately 14.06. The weighted average of both valley and mountain areas was 12.89 inches, a decrease of 20.77 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 2 presents a record of rainfall at 18 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 watersheds 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 4 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 storm runoff from the hills and mountains; storm runoff from the impervious areas of the valley;

TABLE 2

PRECIPITATION[a]
(Inches)

Station			1979-80 Precipitation	1980-81	
LACFCD Number	Name	100-Year Mean		Precipitation	Percent of 100-Year Mean
11D	Upper Franklin Canyon Reservoir	18.50	36.92	13.02	70
13C	Hollywood-Blix[b]	16.63	32.95	12.26	74
14C	Roscoe-Merrill[b]	14.98	27.95	10.37	69
15A	Van Nuys[b]	15.30	32.45	10.32	67
17	Sepulveda Canyon-Mulholland Highway	19.82	41.04	12.59	64
21B	Woodland Hills[b]	14.60	30.53	10.42	71
23B-E	Chatsworth Reservoir[b]	15.19	27.77	9.44	62
25C	Northridge-LADWP[b]	15.16	24.83	9.29	61
30B	Sylmar[b]	17.91	[c]		
33A-E	Pacoima Dam	19.64	29.55	11.84	60
47D	Clear Creek-City School	33.01	49.37	17.64	53
53D	Colby's Ranch	29.04	44.10	15.60	54
54C	Loomis Ranch-Alder Creek	18.62	28.87	10.15	55
210B	Brand Park	18.13	34.00	18.20	100
251C	LaCrescenta[b]	23.31	38.61	14.09	60
259D	Chatsworth-Twin Lakes	18.70	30.51	12.13	65
293B-E	Los Angeles Reservoir[b]	17.32	27.08	11.99	69
1074E	Little Gleason	24.34	[c]		
1190	Pacoima Canyon-North Park Ranger Station	23.06	38.00	15.06	65

Weighted average for valley stations - 11.04 inches (1980-81)
Weighted average for mountain stations - 14.06 inches (1980-81)

[a] Data furnished by Los Angeles County Flood Control District (LACFCD)
[b] Valley Station
[c] Discontinued. Station 30B replaced by 293B-E and Station 1074E replaced by 1190.

operational spills of imported water; industrial and sanitary waste discharges; and rising water.

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 3 summarizes the monthly runoff for these gaging stations and compares the 1979-80 water year with the 1980-81 year. The changes in runoff reflect the decrease 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 west 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 4. The mean daily discharge rates for these six gaging stations during 1980-81 are summarized in Appendix B. Data was not available for Station F-300-R because of sanding problems throughout the year caused by sluicing of Big Tujunga and Hansen Reservoirs.

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

TABLE 3

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	1979-80	6490	4760	5500	45480	176400	incl.	incl.	4160	1510	1950	2710	1910	incl.
Los Angeles River	1980-81	2720	1580	5740	16580	7430	24490	3780	4400	2810	2260	2480	1960	76,230
F-252-R	1979-80	677	528	579	2760	3860	1030	574	507	594	616	355	822	12,902
Verdugo Channel	1980-81	652	577	518	2020	606	1800	651	612	497	186	363	215	8,697
E285-R	1979-80	977	875	850	3420	9090	3380	990	665	754	422	439	624	22,486
Burbank Storm Drain	1980-81	806	1060	1050	1720	949	2380	896	602	484	566	635	819	11,967
F-300-R	1979-80	3350	3100	2680	29400	115700	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.
L.A. River Tujunga Ave.	1980-81	- Data Not Available -												
F-168-R	1979-80	555	784	194	2709	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.
Big Tujunga Dam	1980-81	688	759	806	1780	918	2780	1370	1682	421	325	256	298	12,083
118B-R	1979-80	6	+	+	893	13015	6120	1733	3405	722	3	+	+	25,897
Pacoima Dam	1980-81	209	64	+	188	708	641	1250	204	20	12	132	12	3,440

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 4.

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 waste and reclaimed water. Industrial wastes 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 includes wastewater.
>
> 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.

Continued urban development 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.

TABLE 4

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	Waste Discharge		
Station F57C-R				
1971-72	3,602[a]	8,219	35,049	46,870
1972-73	4,596[a]	8,776	100,587	113,959
1973-74	2,694[a]	6,366	79,818	88,878
1974-75	427[a]	7,318	56,396	64,141
1975-76	261[a]	6,741	32,723	39,725
1976-77	839[a]	7,128	58,046	66,013
1977-78	1,331[a]	7,449	357,883	366,663
1978-79	2,840[a]	16,450	119,810	139,100
1979-80	5,500[d]	16,500[d]	[b]	[b]
1980-81	4,710[a]	19,580	51,940	76,230
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

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.

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 1 shows the locations of these spreadings 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 5 summarizes the spreading operations for the 1980-81 water year.

Ground Water Table Elevations

During the 1980-81 water year, the Watermaster collected and processed data to determine prevailing ground water conditions in ULARA during the spring and fall of 1981. Plates 5 and 6 show these conditions. Change in ground water surface elevation from fall of 1980 to fall of 1981 as presented in Plate 7 reflects the effects of variations in spreading, ground water extractions, and replenishment from rainfall.

TABLE 5

SPREADING OPERATIONS
(In Acre-Feet)

Month	Native Water Spread by Los Angeles County Flood Control District				Water Spread by City of Los Angeles				
	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/]
1980									
Oct.	4	1,282	103	0	0	1,238	0	0	600
Nov.	1	1,323	38	0	0	589	0	0	440
Dec.	28	1,436	0	9	0	566	0	0	452
1981									
Jan.	108	1,361	113	383	0	1,010	0	0	311
Feb.	50	1,286	0	905	0	1,357	0	0	361
Mar.	54	3,585	0	922	0	944	0	0	200
Apr.	0	1,582	52	900	0	317	0	0	578
May	0	384	29	0	0	0	0	0	109
June	0	396	0	0	0	0	0	0	232
July	0	734	0	0	0	0	0	0	588
Aug.	0	430	0	0	0	0	0	0	365
Sept.	0	671	0	0	0	0	0	0	469
Totals	245	14,470	335	3,169	0	9,020	0	0	4,652

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

Due to below normal rainfall during the water year 1980-81, an average decline of approximately 15 feet in water levels occurred in the central part of the San Fernando Basin because of decreased spreading and increased pumping. In the southeastern part of the basin they increased by an average of approximately 10 feet due to decreased pumping by the Cities of Burbank and Glendale. Average water levels declined by approximately 5 feet in the southwestern section of the Sylmar Basin because extractions exceeded safe yield and have been greater than safe yield for ten of the past thirteen years (1969-81). An average decline of 5 to 10 feet occurred in the southern portion of the Verdugo Basin due to increased pumping by Glendale and Crescenta Valley County Water District.

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

Water Reclamation

Water reclamation could provide a source of water for irrigation, industrial and recreational uses, and ground water recharge. Six wastewater reclamation plants are in operation in ULARA. A tabulation of operating water reclamation plants is shown on Table 6.

Construction of the Sepulveda Basin Water Reclamation Plant began in November 1980, with completion expected in the spring of 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.

The City of Los Angeles, along with other local agencies, is participating in the development of a regional water reclamation study entitled "Orange and Los Angeles Counties Water Reuse Study." The objective of this report is to prepare a coordinated water reclamation plan for these two areas. This study is estimated to be completed in 1982. A mid-course report describing the status of studies to date was completed and circulated for comments in the summer of 1980.

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 1980-81 are contained in Table 7.

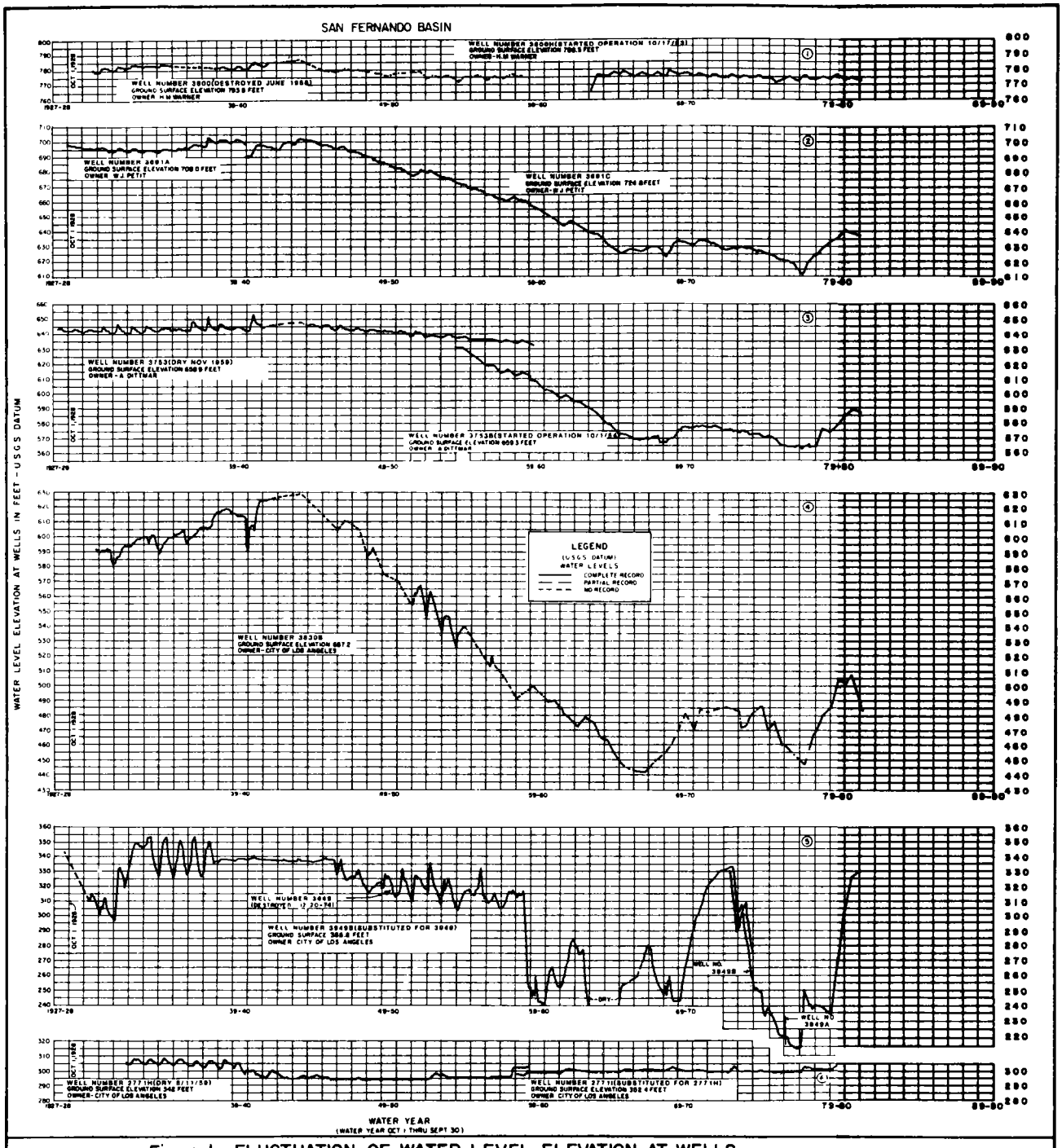

Figure 1 — FLUCTUATION OF WATER LEVEL ELEVATION AT WELLS IN THE SAN FERNANDO BASIN

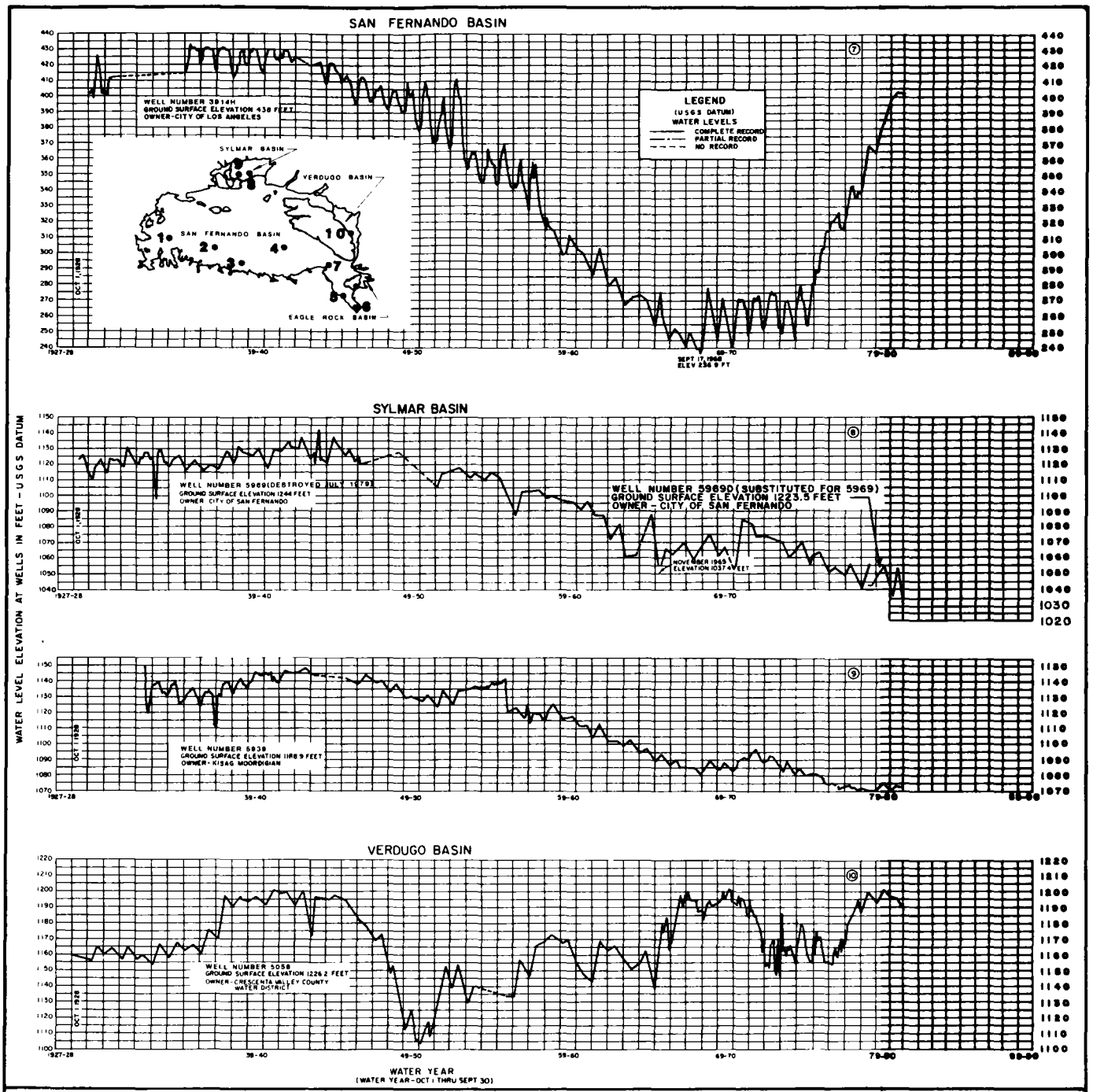

Figure 2 – FLUCTUATION OF WATER LEVEL ELEVATION AT WELLS IN THE SAN FERNANDO, SYLMAR AND VERDUGO BASINS

TABLE 6

WATER RECLAMATION PLANTS, 1980-81
(In Acre-Feet)

Plant	Treated	Used
San Fernando Basin		
City of Burbank	7,449	1,179[a]
Los Angeles-Glendale	6,728	285[b]
Indian Hills Mobile Homes[d]	21	21[c]
Rocketdyne (Santa Susana Field Laboratory)	56	56[c]
The Independent Order of Foresters[e]	12	12[c]
Total	14,266	1,553
Verdugo Basin		
Crescenta Valley County Water District	111	111[c]
ULARA Total	14,377	1,664

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

b/ Total water delivered (124 AF) to phosphate plant in Glendale includes 50 percent evaporation and the rest to Los Angeles River; 161 AF delivered to Griffith Park by City of Los Angeles for irrigation

c/ Land irrigation

d/ Water supply from nearby well

e/ Water supply from pipeline from LADWP

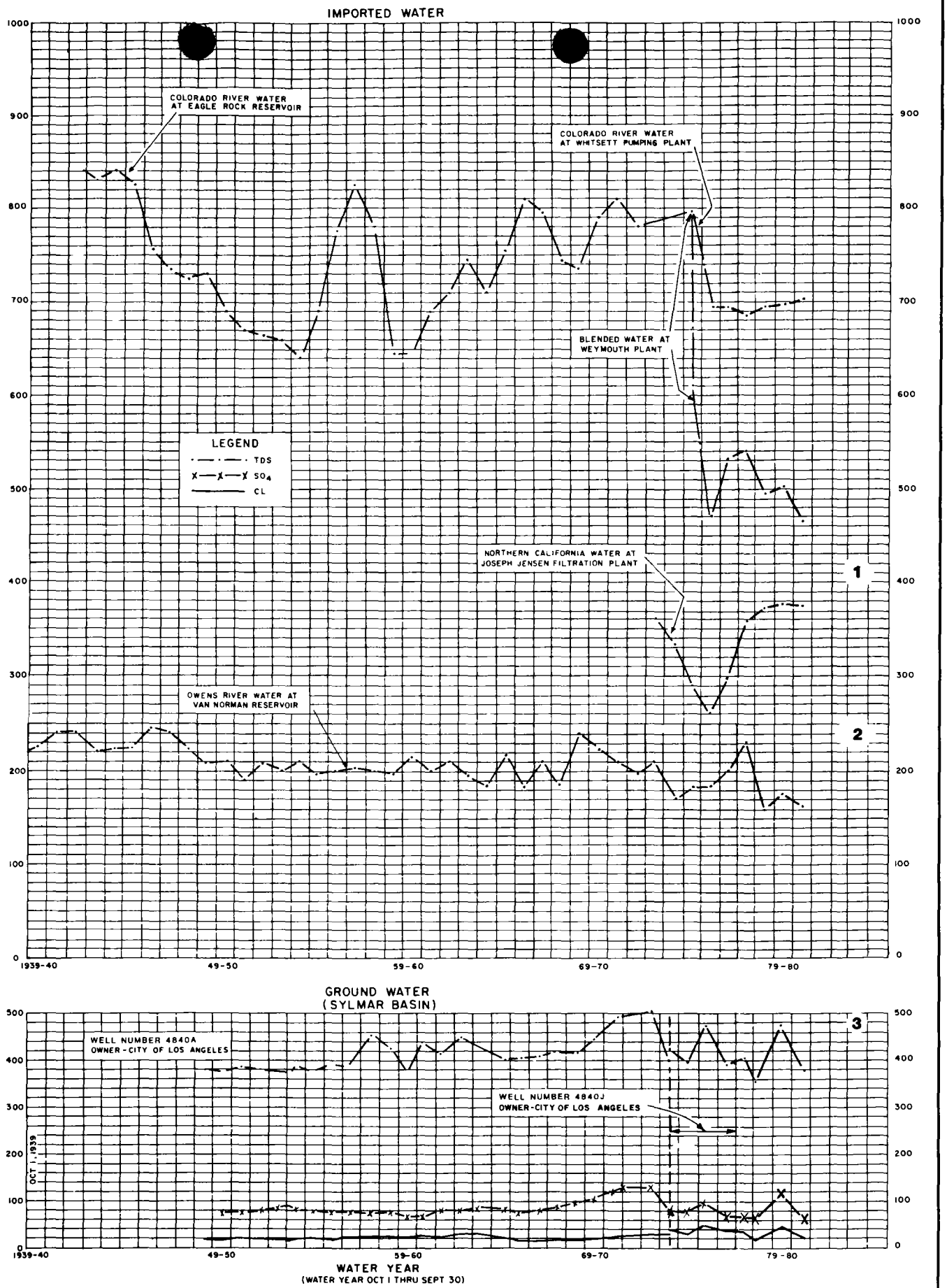

Figure 3— MINERAL CONSTITUENTS OF WATER SOURCES IN THE ULARA

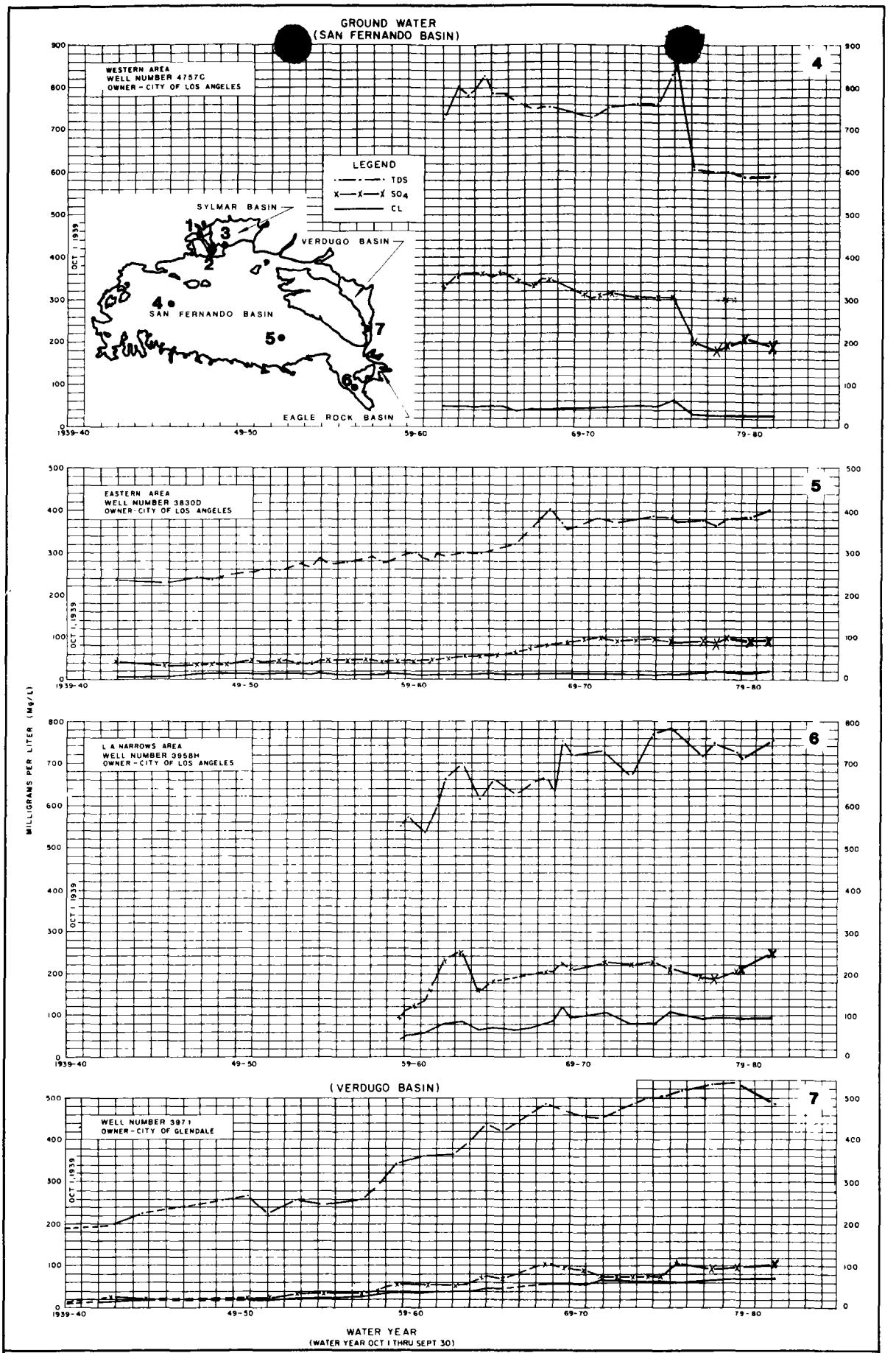

Figure 3(Cont.) — MINERAL CONSTITUENTS OF WATER SOURCES IN THE ULARA

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)											TDS Total Dissolved Solids mg/l	Total Hardness as $CaCO_3$ mg/l
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	NO_3	F	B		
Imported Waters																
Blended State Project and Colorado River Water at Eagle Rock Reservoir	80-81	742	7.95	48 2.40	20 1.64	72 3.13	3.5 0.09	0 0	97 1.59	160 3.33	68 1.92	1.9 0.03	0.25 0.01	0.23 0.07	444	202
Owens River water at Upper Van Norman Reservoir Inlet	80-81	272	7.75	21 1.05	4.2 0.34	29 1.26	3.0 0.08	0 0	94 1.54	20 0.42	13 0.37	0.44 0.01	0.56 0.03	0.42 0.13	164	68
State Project Water at Joseph Jensen Filtration Plant (Influent)	80-81	626	8.12	51 2.55	19 1.58	47 2.04	3.0 0.08	0 0	133 2.18	128 2.67	46 1.30	1.0 0.02	0.43 0.02	0.29 0.08	377	206
Surface Water																
Los Angeles River At Sepulveda Blvd.	11/5/80	1,200	8.42	120 6.00	44 3.61	109 4.74	6.4 0.16	0 0	192 3.15	326 6.79	97 2.73	3.0 0.05			934	480
	5/6/81	1,370	8.25	112 5.60	46 3.77	122 5.30	6.8 0.17	15 0.50	123 2.02	375 7.81	136 3.83	1.5 0.02			1012	470
Burbank Western Wash at Los Angeles River	11/5/80	990	8.23	58 2.90	20 1.64	118 5.13	12.1 0.31	0 0	118 1.93	182 3.79	102 2.87	8.3 0.13			670	228
	5/6/81	1,060	8.30	52 2.60	20 1.64	122 5.30	10 0.26	0 0	162 2.66	170 3.54	111 3.13	2.0 0.03			640	212
Los Angeles River at Colorado Blvd.	11/5/80	970	8.22	78 3.90	28 2.30	90 3.91	6.7 0.17	0 0	165 2.70	178 3.71	88 2.48	6.0 0.10			686	312
	5/6/81	1,200	8.35	104 5.20	37 3.03	102 4.43	6.9 0.18	10 0.33	210 3.44	240 5.00	116 3.27	3.0 0.05			836	412
Burbank Reclamation Plant Discharge to Burbank-Western Wash	8/5/81		6.92	- -	- -	108 4.7	- -	- -	- -	166 3.46	108 3.04	3.2 0.05	0.72 0.04	0.98 0.27	592	
L. A.-Glendale Reclamation Plant Discharge to L. A. River	7/7/81		6.90	44 2.20	19 1.58	100 4.35	17 0.44	- -	193 3.16	83 1.73	108 3.04	4.2 0.07	0.79 0.04	0.63 0.18	574	
Groundwaters																
(San Fernando Basin - Western Portion)																
4757C (Reseda No. 6)	10/8/81	940	7.50	116 5.80	29 2.38	44 1.91	2.0 0.05	0 0	240 3.93	194 4.04	28 0.79	3.2 0.05	0.26 0.01	0.36 0.11	592	410
(San Fernando Basin - Eastern Portion)																
3830D (No. Hollywood No. 19)	7/1/81	640	7.45	77 3.85	20 1.64	28 1.22	4.2 0.11	0 0	200 3.28	90 1.88	20 0.56	14 0.23	0.49 0.03	0.20 0.06	403	272
3841C (Burbank No. 6A)	11/29/79	-	8.00	52 2.61	8.8 0.72	33 1.44	3.5 0.09	0 0	207 3.39	45 0.94	18 0.50	- -	0.50 0.03	- -	292	173
3913H Grandview No. 16	4/16/81	490	7.6	62 3.08	10 0.82	49 2.13	3.6 0.09	22 0.73	187 3.06	51 1.06	40 1.13	-	0.5 0.03	- -	339	219
3955H				(San Fernando Basin - L. A. Narrows)												
(Pollock No. 6)	10/5/81	1,200	7.19	114 5.70	43 3.52	92 4.00	3.4 0.09	0 0	245 4.02	252 5.25	97 2.73	3.7 0.06	0.29 0.02	0.56 0.17	756	460
(Sylmar Basin)																
4840J (Mission No. 5)	6/17/81	599	7.40	72 3.60	15 1.23	27 1.17	3.5 0.09	0 0	190 3.11	64 1.33	20 0.56	14 0.23	0.34 0.02	0.20 0.06	377	240
5959 (San Fernando No. 3)	1/14/82	599	7.5	71 3.56	19.3 1.59	31 1.35	2.8 0.07	- -	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 0.08	- -	191 3.13	104 2.17	69 1.95	- -	0.22 0.01	- -	486	351

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/l) for 30 years before 1969, the highest record being 320 mg/l on April 1, 1946, and the lowest, 150 mg/l on September 17, 1941. Average TDS concentration for 1980-81 was 164 mg/l, which was lower than the 177 mg/l for 1979-80. This decrease in TDS was caused by a small decrease in export of stream flows (90 TDS average) and a greater decrease in export of pumped ground waters (195 TDS average) from the Owens Valley.

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/l in August 1955 and a low of 625 mg/l in April 1959. The average TDS over the 34-year period was approximately 740 mg/l. Tests conducted at the Whitsett Intake Pumping Plant showed an average TDS of 703 mg/l for 1980-81, an increase of less than 1 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/l and a low of 247 mg/l. Tests of Northern California water are taken at the Joseph Jensen Filtration Plant. Average TDS concentration during 1980-81 was 377 mg/l, a negligible decrease from last year.

D. Colorado River and Northern California water were first blended at the Weymouth Plant in May 1975. In the 1980-81 period, TDS had an average value of 466 mg/l which was a 7 percent decrease from 1979-80. Blending ratios vary at the Weymouth Plant and tests 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 1980-81, low flows in the Los Angeles River at Colorado Boulevard had an average TDS content of 760 mg/l and a total hardness of 360 mg/l, an increase over last year of 33 and 3 percent, respectively.

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 increased in the western part of the San Fernando Basin by less than 1 percent over 1979-80; increased by 5 percent in the eastern part; decreased by 21 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 State 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.

The Groundwater Quality Management Plan - San Fernando Valley Basin (GWQMP-SFVB) study was commenced in July 1981 to investigate the contamination of wells within the San Fernando Basin by priority pollutants. This two-year study will develop a recommended plan for long-term corrective action to eliminate and prevent groundwater contamination. A continuing investigation of the above groundwater quality problem in the basin has been carried on since early 1980 by the Los Angeles Department of Water and Power in cooperation with the California State Department of Health Services (DOHS). A summary of the number of wells with TCE and PCE above the California DOHS action levels is presented in Table 7A for the water year 1980-81. At the present time the DOHS allowable limits are 5 ppb for TCE and 4 ppb for PCE. The water utilities providing groundwater to public water supplies are required to maintain the level of TCE and PCE in that water to below the allowable DOHS actions levels. Blending or other means are employed to maintain DOHS water quality requirements in delivered supplies.

TABLE 7A

1980-81
ULARA WELL FIELDS-
Wells Exceeding California DOHS Action Levels
for TCE and PCE

	Number of Wells								
	City of Los Angeles						Others		
	NH	CS	P	HW	E	W	B	G	CVCWD
TCE Levels (ppb)									
5-20	5	3	2	3	1	2	5	3	0
20-100	6	0	0	0	0	1	1	0	0
100	4	0	0	0	0	0	1	0	0
PCE Levels (ppb)									
4-20	0	1	1	0	1	1	1	1	5
20-100	0	0	1	0	0	0	2	0	0
100	0	0	0	0	0	0	0	0	0

Well Fields:

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

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 1980-81 water year, the total amount delivered to water users in ULARA was 334,331 acre-feet. Of this total, 25,145 acre-feet was ground water and 309,186 acre-feet was imported. Refer to Figure 5 for a monthly breakdown. The basin contains 518 wells, of which 126 are active and 392 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 1980-81, 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 2).

Ground Water Extractions

Appendix A is the record of ground water extractions for the 1980-81 water year. A total of 97,789 acre-feet was pumped from the San Fernando Basin compared to an allowable pumping of 95,636 acre-feet. Of this total, 91,465 acre-feet is extraction

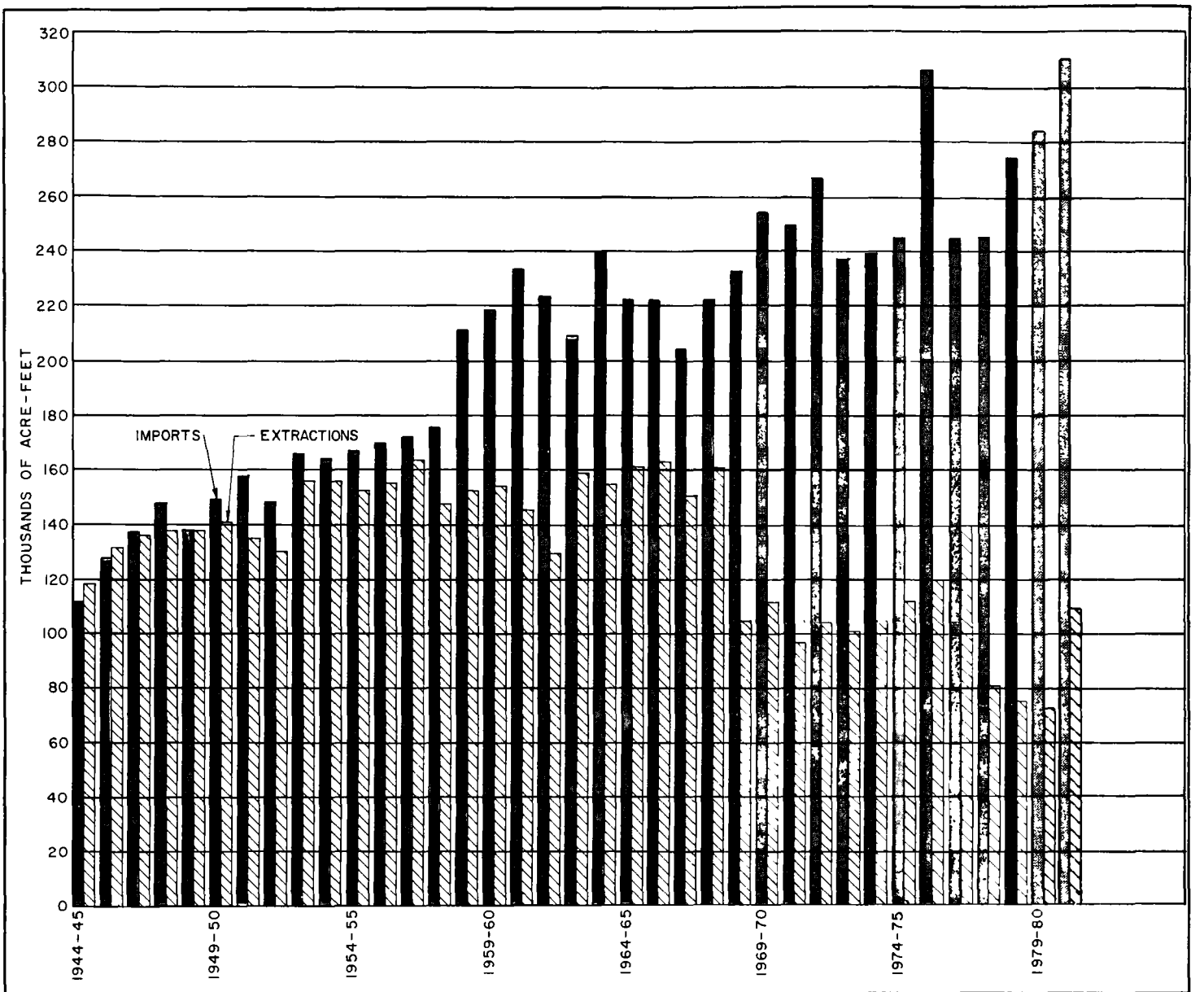

Figure 4- GROUND WATER EXTRACTIONS AND USE OF IMPORTED WATER IN UPPER LOS ANGELES RIVER AREA

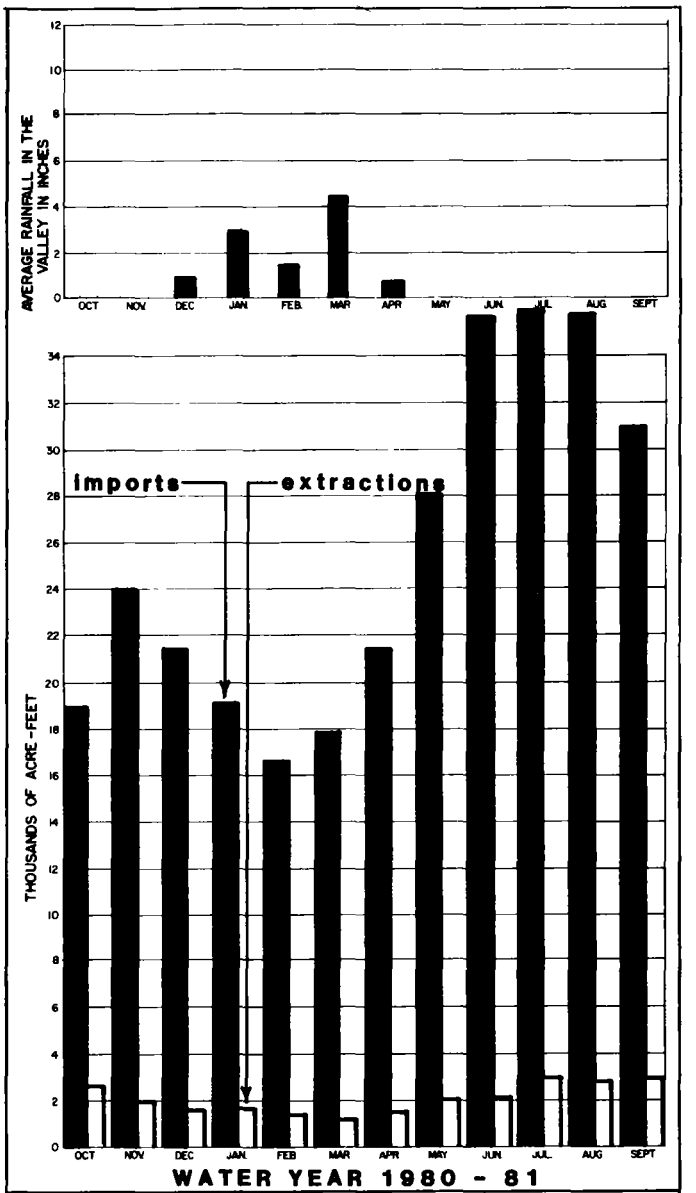

Figure 5 – MONTHLY WATER DEMAND AND AVERAGE RAINFALL IN UPPER LOS ANGELES RIVER AREA

(Used within ULARA)

rights by parties in the San Fernando Basin (see 1980-81 Table 10), with its remaining 4,171 acre-feet being nonconsumptive use pumping (see Table 9A). A total of 7,497 acre-feet was pumped from the Sylmar Basin and 4,262 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 system facilities, by the City of Glendale, in the Verdugo Basin are presently under way to allow pumping to be increased to safe yield.

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 8 summarizes the nontributary imports and exports from ULARA. Ground water imports and exports in and out of ULARA are listed in Table 9.

Physical Data by Basins

The Watermaster has collected and summarized data in Table 9 which show the water supply and disposal in each of the basins.

The information for Table 9 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 9A.

San Fernando Basin Allowable Extractions

Table 10 lists San Fernando Basin extraction rights for the Cities of Burbank, Glendale, Los Angeles, and San Fernando for the water year 1981-82. Table 11 shows San Fernando Basin stored water as of October 1, 1980 and October 1, 1981. 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 1980-81 was -32,560 acre-feet, and the cumulative change in storage from 1954-55 through 1980-81 was -204,490 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 1980-81 was 18.22 inches, compared to a long-term average of 16.48 inches of rainfall. During that time, the basin gained approximately 241,000 acre-feet of stored water. Of this total, 155,000 acre-feet was stored through spreading and in-lieu pumping activities. Thus, the natural change in storage due to an above normal rainfall period was 86,000 acre-feet. Refer to Table 8A for the annual precipitation and change in storage.

Sylmar Basin. The change in storage for 1980-81 was -2070 acre-feet, and the cumulative change in storage from 1954-55 through 1980-81 was -24,920 acre-feet.

Verdugo Basin. The change in storage for 1980-81 was -2,870 acre-feet, and the cumulative change in storage from 1954-55 through 1980-81 was +25,190 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 8

ULARA - NONTRIBUTARY WATERS,
IMPORTS AND EXPORTS

(In Acre-Feet)

Source and Agency	Quantity, in acre-feet			
	1979-80		1980-81	
Imports				
MWD water[a/]				
Burbank, City of	21,547		23,428	
Crescenta Valley County Water District	2,151		2,565	
Glendale, City of	23,678		25,669	
Los Angeles, City of	3,759		6,624	
La Canada Irrigation District	758		931	
Las Virgenes Municipal Water District (nonparty)	10,370		11,292	
San Fernando, City of	214		24	
	62,477		70,533	
Owens River water				
Los Angeles, City of	477,754[b/]		475,197[b/]	
Total	540,231	540,231	545,730	545,730
Exports				
Owens River water				
Los Angeles, City of	-255,543	-255,543	-236,544	-236,544
Net Import		284,688		309,186

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 8A

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
13-yr. average	18.22		

Note:
(1) 100-year mean precipitation = 16.48 inches.
(2) Stored water through spreading and in-lieu pumping = 155,300 AF.
(3) Natural change in storage = +241,430 AF - 155,300 AF = 86,130 AF.

TABLE 9

1980-81
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	595	1129	91,125	0	4,939*	97,788
Used in valley fill	d/	d/	6,538	d/	d/	d/
Imports						
MWD water	23,428	25,669	3,801	24	11,292	64,214
Owens River water	--	--	466,292	--	--	466,292
Ground water from Sylmar Basin	--	--	4,117	3,076	0	7,193
Ground water from Verdugo Basin	--	128	--	--	--	128
Reclaimed water	1,179e/	124e/	161c/	--	--	1,464
Exports						
Ground water:						
to Verdugo Basin	--	0	0	--	0	0
out of ULARA	--	--	84,587	--	--	84,587
Owens River water:						
to Eagle Rock Basin	--	--	1,272	--	--	1,272
out of ULARA	--	--	236,544	--	0	236,544
MWD:						
to Verdugo Basin	--	3,204	0	--	0	3,204
Total net delivered water	25,202	23,846a/	243,093	3,100	16,231	311,472
Water delivered to hill and mountain areas						
Ground water	d/	d/	0	0	0	d/
Owens River water	--	--	41,241	--	--	41,241
MWD water	d/	d/	2,726	0	11,292	14,018
Verdugo Basin water	--	d/	--	--	--	d/
Water outflow						
Surface	--	--	--	--	--	76,230b/
Subsurface	--	--	--	--	--	370
Sewers	8,084	13,309	74,076	1,774	--	97,243
Reclaimed	6,859	3,364	3,364	--	--	13,587

* See Table 9A for parties included.
a/ Total delivered water to the City of Glendale was 29,044 AF. Verdugo Basin metered sales times 105 percent equaled 5,198 AF. Therefore, the San Fernando Basin delivered water was 23,846 AF (29,044 AF minus 5,198 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/ Delivered to Harding and Wilson Golf Courses and Crystal Springs picnic area. Used for irrigation.
d/ These values are no longer calculated as per Judgment.
e/ Delivered to cooling towers of steam plant in Burbank and phosphate plant in Glendale. Assumed 50 percent evaporation and 50 percent to Los Angeles River.

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

TABLE 9

1980-81
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	4,117	3,380	0	7,497
Used in valley fill	0	304	0	304
Imports				
Owens River water	7,964	--	--	7,964
Exports				
Groundwater: to San Fernando Basin	4,117	3,076	0	7,193
Water delivered to hill and mountain area				
Owens River	440	--	--	440
Water outflow				
Surface	--	--	--	5,000[g/]
Subsurface: to San Fernando Basin[f/]	--	--	--	--
Sewers	780	176	0	956

f/ Computation not possible, well destroyed.

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

TABLE 9

1980-81
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	2,140	2,122	0	0	4,262
Used in valley fill	2,074	k/	0	0	k/
Imports					
MWD water	2,565	3,204	931	0	6,700
Owens River water	--	--	--	941	941
Groundwater from:					
San Fernando Basin	--	0	--	--	0
Exports					
Groundwater to:					
San Fernando Basin	--	128	--	--	128
Water delivered to hill and mountain areas					
MWD water	80	k/	0	0	k/
Owens River water	--	--	--	313	313
Groundwater from:					
Verdugo Basin	66	k/	--	0	k/
San Fernando Basin	--	0	0	0	0
Water outflow					
Surface	--	--	--	--	8,697 h/
Subsurface:					
to Monk Hill Basin	--	--	--	--	300 i/
to San Fernando Basin	--	--	--	--	70
Sewage	0	1,593 j/	0	200	1,793

h/ Information obtained from Station F-252C-R
i/ Based on 29-year average (1929-57)
j/ Measured
k/ These values are no longer required

TABLE 9

1980-81
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	9	173	182
Used in valley fill	0	0	0	0
Imports				
Owens River	1,272	--	--	1,272
MWD water	2,823	--	--	2,823
Groundwater	0	0	0	0
Exports				
Groundwater	0	9	173	182
Water delivered to hill and mountain areas				
MWD water	1,568	--	--	1,568
Owens River water	645	--	--	645
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 Reference 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 9A

1980-81
PUMPING BY NONCONSUMPTIVE USE, PHYSICAL SOLUTION,
AND WITHOUT RIGHTS PARTIES
SAN FERNANDO BASIN

(In Acre-Feet)

I.	Nonconsumptive Use Parties	
1.	Conrock Co.	1,681
2.	Livingston-Graham, Inc.	338
3.	Sears, Roebuck and Company	27
4.	Sportsmen's Lodge, Inc.	17
5.	Toluca Lake Property Owners Assn.	46
6.	Walt Disney Productions	2,062
7.	Total	4,171
II.	Physical Solution Parties	
1.	Environmentals Inc.*	85
2.	Forest Lawn Cemetery Assn.	345
3.	Sportsmen's Lodge, Inc.	1
4.	Toluca Lake Property Owners Assn.	30
5.	Valhalla Memorial Park	305
6.	Total	766
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	4,939

* Formerly Southern Service Company

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

TABLE 10

1981-82
SAN FERNANDO BASIN EXTRACTION RIGHTS
(In Acre-Feet)

Item	Cities of			
	Burbank	Glendale	Los Angeles	San Fernando
	(1)	(2)	(3)	(4)
1. Delivered water 1980-81	25,202	23,846	243,093	--
2. Import delivered 1980-81	--	--	--	24
3. Delivered to hill & mountain 1980-81	--	--	43,967	--
4. Delivered to valley fill 1980-81	--	--	199,126	--
5. Percent recharge	20%	20%	20.8%	26.3%
6. Return water extraction right 1981-82	5,040	4,769	41,418	6
7. Native safe yield	0	0	43,660	0
8. Total extraction right 1981-82	5,040	4,769	85,078	6

Items 1, 2 & 3 = Table 9
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 11

STORED WATER
SAN FERNANDO BASIN
(In Acre-Feet)

		Cities of			
		Burbank	Glendale	Los Angeles	San Fernando
		(1)	(2)	(3)	(4)
	1979-80				
1.	Stored water as of Oct. 1, 1979	3,947	2,612	90,092	32
2.	Delivered water 1978-79	24,234	20,830	183,404	-
3.	Return water extraction right 1979-80	4,847	4,166	38,148	0
4.	Native safe yield	0	0	43,660	0
5.	Total extraction right for 1979-80	4,847	4,166	81,808	0
6.	Extractions for year	677	934	57,122	0
7.	Physical solution extractions	(300)	(307)	31	-
8.	Spread water	0	0	20,243	0
9.	Stored water as of Oct. 1, 1980	8,117	5,844	134,383	32
	1980-81				
10.	Delivered water 1979-80	24,184	21,840	185,577	214
11.	Return water extraction right 1980-81	4,837	4,368	38,600	56
12.	Native safe yield	0	0	43,660	0
13.	Total extraction right for 1980-81	4,837	4,368	82,260	56
14.	Extractions for year	595	1,129	91,124*	0
15.	Physical solution extractions	(305)	(430)	31	-
16.	Spread water	0	0	9,020	0
17.	Stored water as of Oct. 1, 1981**	12,359	9,083	133,773	88

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 1 AF of Crystal Springs pumping discharged to Los Angeles River while testing for TCE
** = Does not include return flow occurring during water year 1980-81

Appendix A

GROUND WATER EXTRACTIONS

1980-81 WATER YEAR
GROUND WATER EXTRACTIONS

(ACRE-FEET)

LACFCD Well No.	Owners Designation	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
						San Fernando Basin								
City of Burbank														
3841C	6A	2.11	5.37	0.00	2.36	0.00	0.00	3.38	118.38	92.97	0.00	0.00	13.55	238.12
3851J	11A	0.00	0.00	0.00	1.37	0.00	0.00	0.00	13.57	8.20	0.00	0.00	0.00	23.14
3851H	12	1.56	3.31	0.00	0.00	0.00	0.00	1.21	0.00	10.25	0.00	0.00	0.00	16.33
3851K	13A	1.78	4.41	1.01	1.82	0.00	5.08	2.78	105.96	57.96	0.00	1.53	11.13	193.46
3841F	17	1.29	2.56	0.00	0.00	0.00	0.00	1.80	48.30	57.14	0.00	0.00	8.28	119.37
3841G	18	1.72	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26
	Party Total	8.46	18.19	1.01	5.55	0.00	5.08	9.17	286.21	226.52	0.00	1.53	32.96	594.68
Conrock Co.														
4916A	2	88.61	52.95	62.84	59.57	66.06	32.38	40.68	38.77	41.11	71.19	[illegible]	56.23	670.37
4916	3	109.47	66.96	78.99	77.98	86.95	81.59	92.80	75.36	82.42	92.69	[illegible]	79.23	1010.96
	Party Total	198.08	119.91	141.83	137.55	153.01	113.97	133.48	114.13	123.53	163.88	[illegible]	135.46	1681.33
Environmentals Inc.														
3934A	MO50A	--	--	8.99	9.84	10.00	10.11	10.36	10.01	8.87	5.06	1.03	0.00	74.27
3934A	Meter 1	2.74	2.81	--	--	--	--	--	--	--	--	--	--	5.55
3934A	Meter 2	0.57	0.00	--	--	--	--	--	--	--	--	--	--	0.57
3934A	Meter 3	2.46	2.40	--	--	--	--	--	--	--	--	--	--	4.86
	Party Total	5.77	5.21	8.99	9.84	10.00	10.11	10.36	10.01	8.87	5.06	1.03	0.00	85.25
Forest Lawn Cemetery Assn.														
3947A	2	18.89	18.06	9.07	9.49	7.44	5.49	18.62	21.84	21.12	13.68	12.10	16.31	172.11
3947B	3	23.69	21.11	9.92	10.13	7.91	5.76	19.93	22.33	20.69	16.18	12.02	1.88	171.55
3958K	7	1.16	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	1.23
	Party Total	43.74	39.18	19.00	19.63	15.36	11.26	38.56	44.18	41.81	29.86	24.12	18.19	344.89
City of Glendale														
3924N	STPT1	7.70	30.63	1.56	5.50	26.94	33.52	27.74	48.75	46.77	47.44	53.31	13.52	343.38
3924R	STPT2	0.48	0.94	0.16	0.53	1.91	1.64	3.90	0.84	9.07	1.88	6.46	0.00	27.81
GVENT	GVENT	87.47	89.92	41.12	44.19	39.59	30.38	60.15	42.35	62.91	48.49	163.27	48.19	758.02
	Party Total	95.65	121.49	42.84	50.22	68.44	65.54	91.79	91.94	118.75	97.81	223.04	61.70	1129.21
Harper, Cecelia DeMille														
4940A	North	0.10E	0.10E	0.10E	0.10E	0.10E	0.10E	0.10E	0.10E	0.10E	0.10E	0.10E	0.10E	1.20
Livingston-Graham, Inc.														
4916B	SnVal	46.28	34.50	35.22	8.54	47.23	17.07	29.62	27.50	27.99	27.99	20.01	15.91	337.86
City of Los Angeles														
3914L	CS-45	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	111.94	206.48	195.25	513.72
3914M	CS-46	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	169.15	330.10	318.05	817.46
3914S	CS-50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.15*	22.15
	CS Total	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	281.09	536.58	535.45	1353.33
3831H	E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	235.38	285.63	266.35	286.73	267.06	1341.15
--	E-2A	--	--	--	--	--	--	--	--	--	--	137.05	159.80	296.85
3831G	E-3	42.79	49.29	24.63	246.03	74.68	193.30	154.23	217.15	195.09	182.69	150.90	159.21	1609.99
3821F	E-4	189.35	34.27	0.00	264.53	235.68	242.08	230.90	222.94	220.48	228.70	177.73	208.79	2255.45
3831F	E-5	214.72	126.08	0.00	303.58	267.68	277 99	268.80	263.80	248.37	253.45	198.56	232.05	2655.08
3821H	E-6	47.34	0.00	0.00	250.05	75.37	149 03	241.90	248.67	237.38	240.18	232.30	217.24	1988.46
3811F	E-10	81.93	0.00	0.00	217.08	0.00	140 10	143.00	145.80	198.65	118.57	161.27	179.02	1425.42
	E Total	576.13	209.84	24.63	1281.27	653.41	1041 00	1038.83	1333.74	1385.60	1289.94	1344.54	1423.17	11652.40
3894BB	H-25	362.05	336.76	63.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	762.70
3893L	H-26	306.38	337.31	103.03	336.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1083.06
3893K	H-27	172.13	237.10	100.09	337.17	305.33	156.77	43.16	229.16	133.75	58.20	256.54	10.03	2039.43
3893M	H-28	375.19	450.12	466.37	0.00	75.37	385.98	56.77	314.35	383.08	470.92	340.82	324.20	[illegible]
3893N	H-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.91	0.00	0.00	[illegible]
3893F	H-30	0.00	3.67	0.80	0.00	0.00	24.38	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]
	H Total	1215.75	1364.96	734.18	673.51	380.70	567.13	99.93	543.51	516.83	572.03	597 36	334.23	[illegible]
3800	NH-2	263.57	21.90	0.00	0.00	76.72	228.74	165.93	258.54	301.06	302.94	296.77	282.07	2198.24
3810B	NH-5	54.96	0.00	8.54	0.00	18.64	0.00	0.00	0.00	0.00	68.30	180.12	172.96	503.52
3770	NH-7	150.07	0.00	0.00	0.00	22.38	123.42	57.62	158.06	157.05	213.87	201.93	59.80	1144.20
3810	NH-11	94.54	0.00	0.53	0.00	0.00	0.00	0.00	2.87	0.00	0.00	39.81	77.50	215.25

*Testing for TCE. 1.19AF discharged to L.A. River

1980-81

LACFCD Well Number	Owners Designation	Extractions Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
						San Fernando Basin Cont'd.								
3810A	NH-13	0.11	0.00	0.00	0.00	0.00	0.00	0.00	8.49	0.00	0.00	0.00	0.00	8.60
3810B	NH-14A	257.74	0.00	0.00	0.00	60.74	276.88	2.27	0.00	46.74	165.59	282.35	269.08	1361.39
3790B	NH-15	61.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.69
3820D	NH-16	72.61	0.00	12.53	0.00	50.30	336.71	169.97	243.44	198.56	200.90	347.57	330.88	1963.47
3820C	NH-17	65.59	0.00	0.00	0.00	34.67	278.28	245.92	346.63	194.65	196.21	225.69	323.40	1911.04
3820B	NH-18	71.92	0.00	26.91	0.00	48.19	237.54	0.00	0.00	0.00	132.58	234.41	336.16	1159.36
3820D	NH-19	55.42	0.00	0.16	0.00	0.00	0.00	0.00	0.00	171.49	314.21	199.63	353.24	1094.15
3830C	NH-20	7.21	246.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	174.89	260.86	232.07	921.93
3830B	NH-21	30.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.22	279.20	263.25	617.59
3790C	NH-22	64.85	0.76	0.00	0.00	0.00	232.97	190.50	175.37	0.00	0.00	50.51	290.02	1004.98
3790D	NH-23	9.50	0.00	0.00	105.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	114.96
3800C	NH-24	0.00	0.00	0.00	0.00	0.00	36.25	0.00	0.00	0.00	0.00	0.00	0.00	36.25
3790F	NH-25	53.88	0.00	14.12	65.08	213.06	293.83	81.70	140.43	384.21	393.30	260.24	368.64	2268.49
3790E	NH-26	49.66	0.00	0.00	169.68	51.35	271.97	160.77	167.17	0.00	0.00	225.37	353.06	1449.03
3820F	NH-27	37.49	0.00	48.00	82.19	24.40	150.48	27.14	0.00	29.61	83.01	129.02	63.64	674.98
3810K	NH-28	63.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.73	0.00	0.00	89.71
3810L	NH-29	0.00	0.00	0.00	0.00	0.00	0.00	37.21	119.88	0.00	0.00	0.00	0.00	157.09
3800D	NH-30	64.30	0.00	0.00	156.08	0.00	239.83	99.38	226.40	313.66	305.12	285.19	256.04	1946.00
3810T	NH-31	11.16	0.00	12.90	0.00	24.31	25.41	0.00	0.00	0.00	22.68	0.00	0.00	96.46
3770C	NH-32	34.64	0.00	29.80	0.00	27.89	194.15	103.58	102.73	190.27	187.19	161.62	80.97	1112.84
3780C	NH-33	16.87	62.08	30.10	0.00	0.00	160.31	46.79	269.58	208.29	281.13	181.75	263.89	1520.79
3790G	NH-34	288.23	23.14	0.00	295.00	0.00	250.39	204.27	260.54	310.91	308.70	300.39	275.60	2517.17
3830N	NH-35	142.91	14.16	0.00	0.00	0.00	0.00	0.00	0.00	90.04	199.75	132.03	57.37	636.26
3790H	NH-36	83.45	28.77	0.00	0.00	237.86	366.53	273.49	429.82	405.56	479.72	474.02	449.08	3227.30
3790J	NH-37	164.79	0.00	0.00	259.37	63.20	327.25	150.57	422.09	384.19	454.85	451.13	429.69	3107.13
3810M	NH-38	97.52	93.60	36.66	0.00	116.76	325.28	57.85	96.69	364.53	487.19	320.71	465.59	2452.38
3810N	NH-39	66.35	91.99	0.00	424.77	49.75	368.57	60.93	0.00	282.95	469.56	440.89	0.00	2255.76
3810P	NH-40	116.09	0.00	0.00	345.59	0.00	323.88	225.41	418.48	377.46	442.82	437.77	423.90	3111.40
3810Q	NH-41	205.92	0.00	47.43	0.00	110.88	29.45	0.00	0.00	197.64	462.81	[illegible]	440.94	1950.72
3810R	NH-42	29.87	20.20	0.00	0.00	245.85	237.67	194.47	420.50	380.44	445.50	[illegible]	425.35	2839.80
	NH Total	2787.81	675.15	267.65	1903.22	1476.95	5315.79	2555.77	4257.71	4989.31	6861.77	[illegible]	7344.19	45729.93
3904J	CS-52(#1)	2.68	2.75	3.67	2.78	2.13	1.38	2.00	4.14	2.36	2.63	[illegible]	1.87	30.54
3904J	CS-52(#2)	2.40	2.47	3.30	2.49	1.77	1.24	1.79	3.95	1.89	2.35	1.93	1.68	27.26
	CS Total	5.08	5.22	6.97	5.27	3.90	2.62	3.79	8.09	4.25	4.98	4.08	3.55	57.80
3959E	P-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	135.68	142.02
3958H	P-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	235.31	274.59
	P Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	370.99	416.61
4992A	TGPLT	70.73	59.64	53.44	58.47	63.41	72.93	60.95	35.61	0.00	0.00	0.00	3.19	478.35
3863H	V-1	191.74	180.01	179.25	11.34	170.43	185.17	33.31	0.00	0.00	0.00	0.00	0.00	951.25
3853F	V-2	205.53	171.01	166.25	0.00	0.00	143.80	117.36	70.94	132.42	186.18	193.91	170.43	1547.83
3863J	V-4	104.00	203.56	125.23	115.98	69.90	184.87	120.50	153.97	228.79	233.52	229.71	210.93	1979.81
3863L	V-11	314.19	131.52	289.35	19.96	286.95	313.04	198.59	213.25	300.32	316.37	315.82	297.73	2996.88
3853G	V-13	12.83	0.07	0.00	0.00	0.00	45.55	14.35	0.00	0.11	25.07	31.38	1.40	130.76
3854F	V-22	31.73	10.61	3.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.92
3844R	V-24	96.17	47.04	24.72	241.35	0.00	205.83	[illegible]	[illegible]	242.63	252.09	244.74	239.42	1839.75
	V Total	956.19	743.82	788.38	388.53	526.58	1079.26	[illegible]	[illegible]	904.27	1013.23	1005.56	919.96	9491.23
3820E	W-1	0.16	12.12	0.00	0.00	189.85	0.00	0.00	0.00	0.00	55.12	344.36	328.31	929.92
3821B	W-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	216.37	216.85
3821C	W-3	56.31	57.92	215.02	0.00	0.00	237.63	222.48	256.61	108.20	110.19	282.37	263.91	1910.64
3821D	W-4	1.47	292.50	307.83	21.95	332.72	329.04	266.99	357.14	342.04	349.54	344.79	328.58	3274.59
3821E	W-5	340.43	351.82	288.39	0.00	223.81	356.32	269.54	355.65	335.24	332.69	311.30	272.84	3438.03
3831J	W-6A	0.00	0.00	0.00	0.00	39.03	428.61	318.62	420.62	398.44	404.92	396.56	374.66	2781.46
3832L	W-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	231.87	420.83	390.57	364.24	1387.51
3842E	W-10	8.61	0.00	0.00	133.22	107.09	88.29	25.14	0.00	43.32	43.76	54.20	2.57	506.20
	W Total	406.98	714.36	811.24	155.17	892.50	1439.89	1102.77	1390.02	1459.11	1697.05	2124.63	2151.48	14345.20
City of Los Angeles Total		6018.67	3773.00	2686.52	4465.44	3996.95	9568.12	5421.21	8176.54	9259.37	11720.09	12952.95	13086.11	91124.97
Mena, John & Barbara 4973J	4973J	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.08E	0.96
Sear Roebuck & Co. 3945	3945	2.60	1.35	1.20	1.19	1.19	0.39	1.17	1.02	5.68	3.64	4.85	3.01	27.29
Sportsmen's Lodge, Inc. 3785A	1	5.82	2.08	1.67	1.10	0.44	0.51	0.64	1.38	2.23	0.70	0.93	0.83	18.33
Toluca Lake Property Owners Assn. 3845F	3845F	7.77	7.36	8.71	5.10	3.59	0.00	6.12	5.53	6.51	7.96	7.78	9.72	76.15
Valhalla Memorial Park 3840K	4	35.68	20.46	24.27	11.77	3.88	4.52	17.43	23.95	34.35	68.20	39.76	20.78	305.05
Walt Disney Productions 3874E	East	0.00	0.00	131.78	96.66	0.00	0.00	118.01	148.40	191.67	176.20	32.70	0.00	895.42
3874F	West	172.98	167.45	0.23	78.81	139.47	140.65	73.47	0.00	0.72	3.99	194.65	193.77	1166.19
	Party Total	172.98	167.45	132.01	175.47	139.47	140.65	191.48	148.40	192.39	180.19	227.35	193.77	2061.61
	Basin Total	6641.68	4310.36	3103.45	4891.58	4439.74	9937.40	5951.21	8930.97	10048.18	12305.56	13650.03	13578.62	97788.78

1990-91

LACFCD Well Number	Owners Designation	Extractions												
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Sylmar Basin														
City of Los Angeles														
Plant	Mission	310.91	282.69	262.08	296.10	268.57	302.44	272.75	279.46	435.08	476.66	477.05	453.33	4117.12
Meurer Engineering Co.														
5998	3	0.01E	0.01E	0.01E	0.01E	0.01E	0.01E	0.01E	0.01E	0.01E	0.01E	0.01E	0.01E	0.12
City of San Fernando														
5969D	2A	231.68	67.43	32.53	44.55	114.25	131.62	145.75	107.74	160.13	179.40	216.89	188.46	1619.48
5959	3	56.35	164.27	174.03	125.01	0.00	0.00	48.22	120.99	147.93	139.36	56.58	4.62	1037.26
5969	4	--	--	--	--	--	--	--	22.07	22.45	21.36	20.30	19.43	106.10
5968	7A	33.76	48.39	58.14	56.51	51.40	59.87	55.67	50.49	54.71	56.26	54.37	37.66	617.23
	Party Total	321.79	280.09	264.70	226.07	165.65	191.49	249.64	301.29	385.17	396.37	349.64	250.17	3330.07
	Basin Total	632.71	562.79	526.79	522.18	434.23	493.94	522.40	580.76	820.26	872.04	825.70	703.51	7497.31
Verdugo Basin														
Crescenta Valley County														
5058B	1	3.04	4.96	0.01	0.01	0.00	0.02	0.01	0.63	29.10	37.69	35.52	14.35	125.34
5036A	2	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
5058H	5	0.71	2.01	0.01	0.01	0.01	0.53	2.91	9.52	5.03	0.63	0.21	0.00	21.49
5058	6	0.01	0.03	0.07	0.16	0.00	0.02	0.01	0.35	0.05	0.77	0.10	0.06	1.63
5047B	7	0.01	0.46	0.00	0.02	0.00	0.02	0.07	0.02	4.07	2.07	1.37	0.05	8.16
5069J	8	46.85	36.32	46.46	45.67	22.57	31.83	43.97	46.70	6.34	30.18	41.36	36.11	434.36
5047D	9	9.49	1.92	0.00	0.01	0.00	0.00	0.00	0.00	5.55	0.00	2.67	1.25	20.79
5058D	10	77.84	65.95	49.82	43.55	46.43	24.53	53.70	78.27	96.02	97.94	67.09	24.37	726.51
5058J	12	1.22	5.72	0.70	1.50	0.53	0.45	0.42	0.89	37.34	10.98	26.56	69.40	155.61
5069F	14	50.79	49.89	50.08	48.51	46.42	44.04	45.78	46.86	43.92	49.72	46.61	43.47	566.09
	Pick	7.27	6.98	7.07	6.94	6.12	6.68	6.29	6.42	6.46	6.58	6.43	6.24	79.48
	Party Total	197.24	174.15	154.22	146.39	122.38	109.12	153.06	189.66	233.88	236.46	229.92	195.80	2139.97
City of Glendale														
3961,71	GL3-4	135.46	96.70	11.34	3.99	0.00	17.34	66.59	84.05	127.65	122.24	77.57	39.46	782.39
3970	GL-6	112.73	90.71	116.56	119.57	106.89	62.40	57.30	67.54	107.00	149.60	83.75	137.28	1211.33
--	MM-1	--	--	--	--	--	--	--	--	--	--	--	128.07	128.07
	Party Total	248.19	187.41	127.90	123.56	106.89	79.74	123.89	151.59	234.65	271.84	161.32	304.81	2121.79
	Basin Total	445.43	361.56	282.12	269.94	228.97	187.96	276.95	341.25	463.53	508.30	390.24	500.61	4261.76
Eagle Rock Basin														
Deep Rock Water Co.														
--	3	0.33	0.33E	0.33E	0.89E	0.89E	0.89	1.03	1.06	1.26	0.70	0.53	0.49	8.73
Sparkletts Drinking Water														
3987A	1	8.18	6.12	7.35	7.28	6.41	7.43	6.92	6.90	8.07	8.53	8.13	8.06	89.38
3987B	2	7.77	5.95	7.16	6.93	6.14	7.26	6.80	6.96	8.11	1.93	3.87	4.29	77.07
3987F	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	4.49	0.26	1.15	6.54
	Party Total	15.95	12.07	14.51	14.21	12.55	14.69	13.72	13.76	16.82	14.95	12.26	13.50	172.99
	Basin Total	16.28	12.40	14.84	15.10	13.44	15.58	14.75	14.82	18.08	15.65	12.79	13.99	181.72
	ULARA Total	7736.10	5247.11	3927.20	5693.80	5116.38	10634.78	6765.31	9367.90	11355.05	13701.55	14978.76	14300.73	109729.57

Appendix B

KEY GAGING STATIONS
SURFACE RUNOFF

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description LOS ANGELES RIVER
ABOVE ARROYO SECO for Water-Year 1980 1981 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	0.75		57.5	0.52		27.	0.72		53.	0.70		50.0	e		50.0	2.44		2260	1
2	0.76		59.	0.43		18.4	0.75		57.5	0.77		59.9			41.9	2.60		2640	2
3	0.79		63.5	0.46		21.2	0.76		59.	0.72		53.3			35.3	e		138	3
4	0.72		53.	0.35		11.9	2.08		1500	0.70		50.2	e		57.4	e		237	4
5	0.64		41.9	0.44		18.9	0.82		68.7	0.69		49.3	0.74		56.0	2.76		3020	5
6	0.61		378	0.40		15.8	0.67		45.9	0.68		47.8	0.67		456	1.27		268	6
7	0.54		29.6	0.35		12.2	0.72		52.8	0.58		339	0.60		36.8	0.85		737	7
8	0.55		30.7	0.38		14.2	0.83		71.	0.66		446	1.51		552	0.80		65	8
9	0.55		30.7	0.38		14.2	0.61		38	0.67		459	1.81		1010	0.75		575	9
10	0.54		296	0.40		15.6	0.63		405	0.64		41.9	e		66.7	3.71		52	10
11	0.53		28.4	0.41		16.5	0.58		34.2	0.86		75.	e		555	0.77		501	11
12	0.50		25.	0.44		19.8	0.57		33.0	0.73		54.5	0.68		479	0.72		53	12
13	0.55		30.7	0.49		24.3	0.59		35.6	0.68		473	0.62		386	0.65		428	13
14	0.66		45.1	0.45		20.3	0.56		31.9	0.60		36.3	0.59		34.9	0.59		348	14
15	0.65		43.2	0.40		15.6	0.57		33	0.55		31.3	0.55		31.1	0.61		38	15
16	0.64		41.9	0.39		14.9	0.61		38.2	0.56		31.7	0.54		29.6	0.67		45.9	16
17	0.60		36.5	0.45		20.3	0.66		44.6	0.65		43.2	0.52		27.3	0.66		44.3	17
18	0.63		40.5	0.54		29.4	0.69		48.6	0.63		40.5	0.60		36.4	0.65		43.3	18
19	0.63		40.5	0.51		26.5	0.66		45.2	0.65		43.2	0.58		34.7	2.46		230	19
20	0.68		47.3	e		24.8	0.66		44.6	0.64		41.9	0.55		30.7	e		319	20
21	0.69		48.6			27.3	0.62		39.2	0.66		44.6	0.52		27.3	e		824	21
22	0.75		57.5			36.5	0.67		45.5	0.69		48.6	0.52		27.8	e		62	22
23	0.75		57.5			37.8	0.69		49.2	1.55		60.9	0.54		29.4	e		545	23
24	0.75		57.5			37.8	0.68		46.7	0.86		74.9	0.60		36.4	0.68		46.8	24
25	0.71		51.5			37.8	0.64		42.1	0.74		56.	1.56		63.1	0.64		42.1	25
26	0.68		47.3	e		41.9	0.67		45.5	0.70		50.0	1.18		188	0.93		90.3	26
27	0.71		51.5	0.67		45.9	0.68		46.9	0.66		45.2	0.61		37.8	0.70		49.7	27
28	0.70		50.	0.70		49.5	0.69		48.7	2.65		276.0	1.43		451	0.55		31.3	28
29	0.66		44.6	0.69		48.6	0.72		52.5	2.88		334.0				0.55		30.5	29
30	0.65		43.2	0.70		50.	0.71		51.5	1.34		340				0.55		31.3	30
31	0.68		473				0.71		51.3	e		692				0.56		31.8	31
1	1368.9			794.9			2894.4			8359.2			3747.1			12345.1			1
2	44.2			26.5			93.4			270			134			398			2
3	2720			1580			5740			16580			7430			24490			3
4	63.5			50			1500			3340			1010			3020			4
5	25			11.9			31.9			31.3			27.3			30.5			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	0.56		317	0.78		62	0.73		62	0.64		418	0.56		312	0.59		353	1
2	0.31		306	0.64		41.9	0.78		62	0.73		55	0.57		33	0.49		241	2
3	0.32		678	0.56		31.9	0.77		60.5	0.70		50	0.61		37.8	0.55		305	3
4	0.61		381	0.88		78.2	0.76		59	0.66		44.6	0.61		37.8	0.55		432	4
5	0.50		255	0.97		101	0.77		605	0.68		47.3	0.60		36.5	0.50		253	5
6	0.54		295	0.64		41.9	0.74		56.	0.73		54.5	0.64		41.2	0.47		222	6
7	a		351	0.87		77	0.72		53.	0.54		29.6	0.59		35.5	0.57		33.3	7
8			392	0.88		78.1	0.72		53	0.47		22.2	0.53		29.5	0.65		432	8
9			428	0.89		80.7	0.75		575	0.44		19.4	0.54		30.3	0.63		405	9
10			563	0.83		78.9	0.75		575	0.54		29.7	0.62		34.4				10
11			388	0.88		78.9	0.76		59.	0.54		29.6	0.60		33.5	0.61		373	11
12			34	87		77.2	0.76		59	0.54		29.6	0.55		30.7	0.61		378	12
13			368	0.84		72.	0.73		545	0.58		34.2	0.53		28.4	0.57		335	13
14			368	0.85		73.7	0.69		486	0.52		27.3	0.54		29.6	0.58		342	14
15			38	0.84		72.	0.72		53.	0.52		53.	0.53		28.4	0.64		419	15
16			43	0.84		72.	0.72		53.	0.52		53.	0.51		26.1	0.52		332	16
17			431	0.85		73.7	0.66		446	0.60		36.5	0.53		28.4	0.54		296	17
18	a		265	0.88		79.7	0.64		419	0.57		33.	0.58		34.2	0.56		319	18
19	1.18		189	0.85		73.7	0.61		378	0.56		31.9	0.73		54.2	0.58		342	19
20	0.91		855	0.87		772	0.60		365	0.59		353	0.71		515	1.57		530	20
21	0.71		509	0.87		772	0.56		319	0.57		33.	0.74		56.	0.52		273	21
22	0.63		407	0.85		737	0.59		353	0.43		18.4	0.75		575	0.47		244	22
23	1.61		382	0.86		754	0.58		342	0.47		22.2	0.72		53.	0.44		234	23
24	0.59		348	0.84		72.	0.53		284	0.51		26.1	0.72		53.	0.45		205	24
25	0.54		30	0.83		72.	0.54		276	0.60		36.5	0.71		515	0.48		231	25
26	0.56		322	0.85		737	0.61		384	0.57		33.	0.72		53.	0.56		317	26
27	0.61		373	0.86		754	0.60		365	0.64		414	0.71		515	0.57		330	27
28	0.73		551	0.86		754	0.59		353	0.63		405	0.70		50.	0.55		307	28
29	0.68		475	0.86		754	1.63		403	0.66		446	0.66		446	0.53		284	29
30	0.75		569	0.82		685	0.62		396	0.66		446	0.63		405	0.58		616	30
31				0.78		72.				0.62		372	0.63		405				31
1	1905.6			2220.6			1418.4			1137			1256.5			939.7			1
2	63.5			71.6			47.3			36.7			40.3			33.			2
3	3780			4410			2810			2260			2480			1960			3
4	306			101			62			55			57.5			61.6			4
5	25.5			31.9			28.4			18.4			26.1			19.4			5

Maximum stage	9.22	feet at	1206	on	01-29-81	Discharge 28,200 cubic feet per second
Minimum stage	0.46	feet at	1434	on	10-12-80	Discharge 4.6 cubic feet per second

76,230

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description VERDUGO WASH AT ESTELLE AVE

for Water-Year 1980 1981

Station No. F252-R

Drainage Area 26.8 Square Miles (H. ELDEEB (Observer) Gage Read 15 MIN. PUNCH TAPE 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	0.29		12.9	e		16.4	0.20		2.8	0.26		95	e		88	0.65		183	1
2	0.29		12.9			16.4	0.22		5.	0.27		106	e		106	0.61		148	2
3	0.28		11.8			16.4	0.22		5.	0.25		84	e		39	0.24		7.3	3
4	0.28		11.8			16.4	0.56		114	0.25		84	0.22		62	0.29		126	4
5	0.27		10.6			16.4	0.20		28	0.28		118	0.20		28	0.61		149	5
6	0.26		9.5			16.4	0.19		25	0.28		11.8	0.20		28	0.32		18.8	6
7	0.25		8.4			16.4	0.21		3.9	0.29		12.9	0.18		23	0.27		10.6	7
8	0.23		6.2			16.4	0.20		2.8	0.28		11.8	0.41		435	0.27		10.6	8
9	0.23		6.2			16.4	0.18		2.3	0.28		11.8	0.43		514	0.30		14.	9
10	0.22		5.0			16.4	0.18		2.3	0.29		12.9	0.23		6.2	0.29		12.9	10
11	0.21		3.9			16.4	0.19		2.5	0.34		23.6	0.21		3.9	0.31		16.4	11
12	0.21		3.9	e		18.8	0.19		2.5	0.31		16.4	0.20		5.0	0.31		16.4	12
13	0.21		3.9	0.30		14.	0.18		2.3	0.30		14.0	0.21		3.9	0.30		14.	13
14	0.21		3.9	0.29		12.9	0.20		2.8	0.30		14.0	0.21		3.9	0.28		11.8	14
15	0.22		5.0	0.28		11.8	0.20		2.8	0.31		16.1	0.20		2.8	0.22		5.0	15
16	0.28		11.8	0.24		7.3	0.21		3.9	0.32		18.8	0.21		3.9	0.23		6.2	16
17	0.28		11.8	0.24		7.3	0.22		5.	0.32		18.8	0.22		5.0	0.22		5.0	17
18	e		12.9	0.24		7.3	0.22		5.	0.33		21.2	0.21		3.9	0.23		6.2	18
19			12.9	0.20		2.8	0.21		3.9	e		21.2	0.21		3.9	0.59		13.3	19
20			12.9	0.18		2.3	0.21		3.9			23.6	0.22		5.0	0.27		10.6	20
21			12.9	0.17		2.0	0.21		3.9			21.2	0.25		8.4	0.25		8.4	21
22			12.9	0.18		2.3	0.22		5			21.2	0.26		9.5	0.26		9.5	22
23			12.9	0.18		2.3	0.23		6.2			12.9	0.2.		9.5	0.26		9.5	23
24			14	0.21		3.9	0.23		6.2			16.4	0.20		2.8	0.28		11.8	24
25			14	0.19		2.5	0.24		7.3			14	0.41		401	0.27		10.6	25
26			14.	0.19		2.5	0.26		9.5			12.9	0.32		18.9	0.31		15.6	26
27			14	0.19		2.5	0.25		8.4	e		11.8	0.21		3.9	0.29		12.9	27
28			14.	0.19		2.5	0.25		8.4	e		20.0	0.34		2.4	0.28		11.8	28
29			14	0.20		2.8	0.26		9.5	0.74		26.6				0.27		10.6	29
30			14	0.20		2.8	0.26		9.5	e		14				0.24		7.3	30
31	e		14				0.26		9.5	e		18.8				0.24		7.3	31
1	328.9			291.			261.4			1020.8			305.3			906.7			1
2	10.6			9.7			8.4			32.9			10.9			29.2			2
3	652			577			518			2020			606			1800			3
4	14			18.8			114			266			514			183			4
5	3.9			2.			2.3			8.4			2.3			5			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	0.23		6.2	0.23		6.2	0.24		7.3	0.23		6.2	0.17		2.0	0.24		7.3	1
2	0.26		9.5	0.24		7.3	0.26		9.5	0.23		6.2	0.17		2.0	0.23		6.2	2
3	0.27		10.6	0.23		6.2	0.25		8.4	0.22		5.	0.17		2.0	0.24		7.3	3
4	0.29		12.9	0.23		6.2	0.24		7.3	0.21		3.9	0.17		2.0	0.23		6.2	4
5	0.29		12.9	0.25		8.4	0.24		7.3	0.22		5.0	0.16		1.8	0.23		6.2	5
6	0.29		12.9	0.27		10.6	0.24		7.3	0.22		5.0	0.17		2.0	0.22		5.0	6
7	0.29		12.9	0.28		11.8	0.27		10.6	0.21		3.9	0.21		3.9	0.22		5.0	7
8	0.33		21.2	0.25		8.4	0.27		10.6	0.20		2.8	0.23		6.2	0.23		6.2	8
9	0.26		9.5	0.29		12.9	0.25		8.4	0.18		2.3	0.25		8.4	0.21		3.9	9
10	0.23		6.2	0.25		8.4	0.27		10.6	0.19		2.5	0.23		6.2	0.22		5.0	10
11	0.24		7.3	0.27		10.6	0.25		8.4	0.19		2.5	0.24		7.3	0.21		3.9	11
12	0.25		8.4	0.30		14.	0.25		8.4	0.18		2.3	0.24		7.3	0.21		3.9	12
13	0.27		10.6	0.29		12.9	0.25		8.4	0.18		2.3	0.25		8.4	0.21		3.9	13
14	0.27		10.6	0.29		12.9	0.26		9.5	0.19		2.5	0.24		7.3	e		3.9	14
15	0.27		10.6	0.30		14.	0.26		9.5	0.20		2.8	0.23		6.2	0.17		2.0	15
16	0.27		10.6	0.30		14.	0.26		9.5	0.20		2.8	0.24		7.3	e		1.5	16
17	0.30		14.	0.29		12.9	0.27		9.6	0.20		2.8	0.24		7.3	0.16		1.8	17
18	0.41		40.4	0.30		14.	0.27		9.6	0.19		2.5	0.23		6.2	0.17		2.0	18
19	0.26		9.5	0.29		12.9	0.26		9.5	0.19		2.5	0.23		6.2	0.15		1.3	19
20	0.22		5.	0.28		11.8	0.25		8.4	0.19		2.5	0.23		6.2	0.17		2.0	20
21	0.22		5.	0.26		9.5	0.25		8.4	0.18		2.3	0.27		10.6	0.16		1.8	21
22	0.24		7.3	0.25		8.4	0.25		8.4	0.20		2.8	0.25		8.4	0.16		1.8	22
23	0.28		11.8	0.25		8.4	0.24		7.3	0.20		2.8	0.21		3.9	0.17		2.0	23
24	0.28		11.8	0.24		7.3	0.24		7.3	0.20		2.8	0.21		3.9	0.18		2.3	24
25	0.27		10.6	0.24		7.3	0.24		7.3	0.18		2.3	0.23		6.2	0.18		2.3	25
26	0.28		11.8	0.25		8.4	0.25		8.4	0.17		2.0	0.24		7.3	0.18		2.3	26
27	0.26		9.5	0.27		10.6	0.24		7.3	0.17		2.0	0.24		7.3	0.18		2.3	27
28	0.23		6.2	0.27		10.6	0.21		3.9	0.17		2.0	0.25		8.4	0.18		2.3	28
29	0.23		6.2	0.26		9.5	0.21		3.9	0.17		2.0	0.24		7.3	0.19		2.5	29
30	0.23		6.2	0.25		8.4	0.23		6.2			2.0	0.25		8.4	0.21		3.9	30
31										0.17		2.0	0.24		7.3				31
1	328.2			368.7			259.6			93.7			183.			108.2			1
2	10.9			12.3			8.65			3.02			5.90			3.60			2
3	651			612			497			186			363			215			3
4	404			14			118			5.2			10.6			7.3			4
5	5			62			39			2.0			1.8			1.5			5

1	4386.7					1
2	12.					2
3	8690					3
4	266					4
5	1.5					5

Maximum stage 2.22 Time 1300 Date 01-29-81 Discharge 287

Minimum stage 0.00 Time 1100 Date 09-15-81 Discharge 1.2

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GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description BURBANK WESTERN STORM DRAIN AT RIVERSIDE DR. for Water-Year 1980 1981

Station No E285-R

Drainage Area 25.0. Square Miles (H. ELDEEB (Observer) Gage Read 15 MIN. PUNCH TAPE Rating Table No 59-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	0.12		10.6	0.17		17.1	0.19		19.7	0.16		15.7	e		19.7	e		182	1
2	0.15		14.6	0.18		18.5	0.19		19.7	0.17		16.9	e		7.1			192	2
3	0.15		14.6	0.12		10.6	0.20		21.2	0.14		13.1	0.12		10.6			28	3
4	0.13		11.9	0.12		10.6	0.38		71.3	0.14		13.1	0.11		9.1			326	4
5	0.13		11.9	0.18		18.5	0.15		14.6	0.13		11.9	0.11		9.1			190	5
6	0.13		11.9	0.15		14.6	0.15		14.6	0.12		10.6	0.13		11.9	e		15.7	6
7	0.14		13.1	0.17		17.1	0.15		14.6	0.13		11.9	0.11		9.1	0.10		7.9	7
8	0.13		11.9	0.18		18.5	0.15		14.6	0.13		11.9	0.32		49.8	0.09		6.7	8
9	0.13		11.9	0.18		18.5	0.15		14.6	0.12		10.6	e		7.58	0.09		6.7	9
10	0.14		13.1	0.16		15.7	0.16		15.7	0.12		10.6	e		14.6	0.08		5.6	10
11	0.13		11.9	0.17		17.1	0.15		14.6	0.15		14.6	0.12		10.6	0.08		5.6	11
12	0.12		10.6	0.18		18.5	0.16		15.7	0.14		13.1	0.12		10.6	0.08		5.6	12
13	0.12		10.6	0.18		18.5	0.16		15.7	0.14		13.1	0.12		10.6	0.08		5.6	13
14	0.13		11.9	0.17		17.1	0.15		14.6	0.14		13.1	0.12		10.6	0.08		5.6	14
15	0.12		10.6	0.17		17.1	0.15		14.6	0.14		13.1	0.11		9.1	0.08		5.6	15
16	0.12		10.6	0.17		17.1	0.15		14.6	0.14		13.1	0.12		10.6	0.08		5.6	16
17	0.12		10.6	0.20		21.2	0.15		14.6	0.13		11.9	0.15		14.6	0.08		5.6	17
18	0.12		10.6	0.20		21.2	0.15		14.6	0.12		10.6	0.14		13.1	0.08		5.6	18
19	0.12		10.6	0.20		21.2	0.15		14.6	0.11		9.1	0.12		10.6	e		183	19
20	0.13		11.9	0.13		11.9	0.14		13.1	0.11		9.1	0.09		6.7			58	20
21	0.13		11.9	0.22		25.8	0.14		13.1	0.12		10.6	0.09		6.7			30.3	21
22	0.15		14.6	0.21		23.5	0.16		15.7	0.13		11.9	0.09		6.7			235	22
23	0.18		18.5	0.20		21.2	0.16		15.7	0.31		47.9	0.09		6.7	e		85	23
24	0.17		17.1	0.20		21.2	0.16		15.7	0.14		13.1	0.09		6.7	0.14		13.1	24
25	0.16		15.7	0.19		19.7	0.15		14.6	0.14		13.1	0.36		65.2	0.15		14.6	25
26	0.16		15.7	0.17		17.1	0.15		14.6	0.15		14.6	0.11		9.1	0.24		30.3	26
27	0.16		15.7	0.15		14.6	0.16		15.7	0.17		17.1	0.11		9.1	0.25		32.6	27
28	0.15		14.6	0.15		14.6	0.15		14.6	e		190	e		34.6	0.21		23.5	28
29	0.15		14.6	0.17		17.1	0.14		13.1			25.7				0.20		21.2	29
30	0.16		15.7	0.18		18.5	0.15		14.6			21.2				0.19		19.7	30
31	0.17		17.1				0.17		17.1	e		21.2				0.19		19.7	31

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	0.19		19.7	0.13		11.9	0.13		11.9	0.10		7.9	0.12		10.6	0.13		11.9	1
2	0.24		30.3	0.12		10.6	0.11		9.1	0.09		6.7	e		9.1	0.13		11.9	2
3	0.20		21.2	0.10		7.9	0.12		7.9	0.09		6.7			9.1	0.14		31	3
4	0.17		17.1	0.12		10.6	0.11		9.1	0.09		6.7			9.1	0.14		31	4
5	0.15		14.6	0.12		10.6	0.11		9.1	0.09		6.7	e		9.1	0.13		7	5
6	0.15		14.6	0.12		10.6	0.10		7.9	0.09		6.7	0.10		7.9	0.11		9.1	6
7	0.15		14.6	0.12		10.6	0.11		9.1	0.10		7.9	0.11		9.1	0.16		57	7
8	0.15		14.6	0.11		9.1	0.11		9.1	0.09		6.7	0.11		9.1	0.16		57	8
9	0.16		15.7	0.11		9.1	0.11		9.1	0.09		6.7	0.11		9.1	0.23		7	9
10	0.15		14.6	0.11		9.1	0.11		9.1	0.10		7.9	0.12		10.6	0.14		31	10
11	0.15		14.6	0.11		9.1	0.11		9.1	0.10		7.9	0.12		10.6	0.14		31	11
12	0.15		14.6	0.11		9.1	0.11		9.1	0.10		7.9	0.12		10.6	0.16		57	12
13	0.14		13.1	0.08		5.6	0.12		10.6	0.10		7.9	0.12		10.6	0.17		7	13
14	0.14		13.1	0.06		4.5	0.11		9.1	0.09		6.7	0.12		10.6	0.17		7	14
15	0.14		13.1	0.09		6.7	0.11		9.1	0.09		6.7	0.11		9.1	0.15		4.6	15
16	0.14		13.1	0.12		10.6	0.09		6.7	0.09		6.7	0.11		9.1	0.17		7	16
17	0.14		13.1	0.11		9.1	0.09		6.7	0.09		6.7	0.12		10.6	0.17		7	17
18	0.16		15.7	0.12		10.6	0.09		6.7	0.09		6.7	0.11		9.1	0.15		4.6	18
19	0.16		15.7	0.14		13.1	0.08		5.6	0.12		10.6	0.11		9.1	0.13		7	19
20	0.14		13.1	0.13		11.9	0.08		5.6	0.13		11.9	0.12		10.6	0.13		11.9	20
21	0.22		26.1	0.12		10.6	0.08		5.6	0.13		11.9	0.13		11.9	0.14		13.1	21
22	0.14		13.1	0.12		10.6	0.08		5.6	0.12		10.6	0.13		11.9	0.14		13.1	22
23	0.15		14.6	0.11		9.1	0.09		6.7	0.13		11.9	0.14		13.1				23
24	0.14		13.1	0.11		9.1	0.10		7.9	0.12		10.6	0.13		11.9	0.14		13.1	24
25	0.13		11.9	0.12		10.6	0.10		7.9	0.12		10.6	0.12		10.6	0.15		14.6	25
26	0.13		11.9	0.14		13.1	0.10		7.9	0.11		9.1	0.12		10.6	0.15		14.6	26
27	0.12		10.6	0.14		13.1	0.09		6.7	0.12		10.6	0.12		10.6	0.14		13.1	27
28	0.12		10.6	0.12		10.6	0.10		7.9	0.12		10.6	0.12		10.6	0.14		13.1	28
29	0.13		11.9	0.12		10.6	0.10		7.9	0.12		10.6	0.12		10.6	0.15		14.6	29
30	0.13		11.9	0.10		7.9	0.10		7.9	0.13		11.9	0.13		11.9	0.17		17.1	30
31				0.10		7.9				0.13		11.9	0.13		11.9				31

1	406.6		533.9		531.8		364.8		478.7		1198		451.9		303.6		244.1		225.6		320.2		413.1		6032.3	1
2	13.1		17.8		17.2		27.9		17.1		38.6		15.1		9.8		8.1		9.2		10.3		13.3		16.5	2
3	806		1060		1050		1720		949		2380		896		602		454		546		635		819		11970.	3
4	18.5		25.8		71.3		257		75.8		190		30.3		13.1		11.9		11.1		17.2		17.1		257	4
5	10.6		10.6		13.1		9.1		6.7		5.6		10.6		4.5		5.6		6.7		7.1		9.1		4.5	5

Maximum stage 3.33 Feet at 1135 on 01-29-81 Discharge 431 C.F.S.

Minimum stage 0.16 Feet at 0303 on 06-02-81 Discharge 2.2 C.F.S.

YEARLY TOTALS

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description: PACOIMA DAM FLUME
IN PACOIMA CANYON

for Water-Year 19 80 19 81

Station No. F118R

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				3.1	.02	22.4													1
2						9.8													2
3													1.4		66.0				3
4													2.1	.0	111				4
5															124				5
6													1.1		55.1				6
7			2.4																7
8												5.4							8
9												17.0							9
10										.2	.5	21.6							10
11										.29	.5	21.6							11
12										.29	.5	21.6							12
13												7.4							13
14																			14
15																			15
16																			16
17																			17
18																			18
19																			19
20																			20
21																			21
22																			22
23																			23
24																68.6			24
25																1.19	.36	105	25
26																1.18	.36	104	26
27			11.8													1.1		45.6	27
28	.32	.02	23.2																28
29	.32	.02	23.2																29
30	.31	.02	22.4																30
31	.31	.02	22.4																31

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					.2	2.4			2.2			0.2			0.2			0.2	1
2					.1	2.4			2.2										2
3					.1	2.4			0.2										3
4					.1	2.4													4
5					.1	2.4													5
6			51		.5	3.0													6
7	.95	.3	78.6		.5	3.0													7
8	.94	.3	77.6		.5	3.0													8
9			59.3		.5	3.0													9
10	.66	.1	50.4		.3	3.0													10
11			47.7		.6	3.6													11
12	.59	.1	44.5		.6	3.6													12
13			59.6		.6	3.6									0.2				13
14			27.1		.5	3.6									1.2				14
15					.5	3.6									2.1				15
16					.5	3.6									2.1				16
17					.5	3.6									7.1				17
18					.5	3.6									7.1				18
19					.6	3.6									3.4				19
20					.5	3.6									3.4				20
21					.5	3.6													21
22			42		.6	3.6													22
23			39.1		.6	3.6													23
24	.07	.04	6.7		.6	3.6													24
25	.07	.04	6.7		.5	3.6													25
26	.09	.04	7.4		.5	3.6													26
27	.09	.04	8.1		.5	3.6													27
28	.09	.04	8.1		.5	3.6													28
29	.09	.04	8.1		.5	3.6													29
30	.09	.04	8.1		.5	3.6			0.2										30
31					.5	3.6						0.2			3.4				31

1	105.4	32.2		94.6	356.9	323.2	630.1	102.6	10.0	6.2	66.4	6.0	1734	1
2	3.4	1.1		3.1	12.3	10.4	21.0	3.3	0.3	0.2	2.1	0.2	4.7	2
3	20.9	63.9		188	708	641	1250	204	19.8	12.3	132	12.3	3440	3
4	23.2	22.4		21.6	124	105	78.6	3.6	2.2	0.2	7.1	0.2	124	4
5	+	+		+	+	+	+	2.4	0.2	0.2	0.2	0.2	+	5

Maximum stage 1.52 feet at 1242 on 2-5-81 Discharge 134 Second-feet.

Minimum stage feet at TIMES on Discharge DRY Second-feet.

REMARKS

C.F.S. - Daily Flow in C.F.S.
- Monthly Flow in A.F.
- Maximum Average Daily Flow in C.F.S.
- Minimum Average Daily Flow in C.F.S.

YEARLY TOTALS

GAGING STATION SUMMARY

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION

Station Location and Description: BIG TUJUNGA CREEK DAM OUTFLOW

for Water-Year 19 80 19 81

Station No. F168R

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		
	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	d		156			0.9			12.1			11.4			70.2			10
2			15.6			0.6			12.1			11.4			49.2			81.
3			39.5			0.6			12.1			11.4			26.2			168.
4			57.6			0.5			16.			11.4			21.2			197.
5			27.1			0.5			20.			11.3			21.6			418
6			0			0.5			20.			11.8			19.6			491
7						0.5			20.			11.8			17.2			481
8						0.5			19.8			11.8			17.6			407
9						0.5			15.			11.8			19.2			382
10						0.5			15.3			11.8			22.6			471
11						0.5			22.			12.1			22.6			442
12						0.5			14.4			13.7			22.6			268
13			0			0.5			11.1			15.2			15.2			252
14						0.5			11.1			15.2			11.1			364
15						0.5			11.1			15.2			11.1			382
16			0.1			0.5			11.1			12.7			11.1			288
17			0.2			6.10			11.1			10.5			11.4			220
18			0.3			19.2			11.1			10.5			11.1			220
19			0.5			19.2			11.1			10.5			11.1			238
20			0.9			37.8			11.1			10.5			10.8			339
21			1.4			41.2			11.1			10.5			10.2			479
22			2.0			43.6			11.1			10.5			10.2			484
23			36.5			43.1			11.1			10.5			10.2			484
24			56.7			42.4			11.1			10.5			5.8			475
25			44.8			41.8			11.1			10.5			1.4			385
26			358			25.7			11.1			10.5			0.8			238
27			11.3			18.8			11.1			10.6			0.5			239
28			0.3			12.4			11.1			83.2			0.8			244
29			0.1			10.5			11.1			186.						241
30			0.2	d		11.4			11.1			190.						250
31	d		0.5				d		11.1	d		113.						256

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			24.8			56.9			8.4			11.7			3.0			5.0	1
2			15.0			42.2													2
3			16.8			17.8													3
4			18.4		X	335	M		8.4										4
5			15.7	M		201			11.1			11.7							5
6			16.0			17						4.6	M		3.0				6
7			15.2			15													7
8			14.4	M		12.2	M		11.1										8
9			14.8							M		4.6							9
10			16.4																10
11			16.8																11
12			17.6						11.1										12
13			18.0			12.2			4.2						3.0				13
14			18.4			15.3									5.0				14
15			19.6																15
16			20.4				M		4.2										16
17			23.4																17
18			20.8																18
19			20.8						4.2										19
20			20.8	M		15.3			5.1				M		5.0				20
21			39.8																21
22			22.6									4.6							22
23			22.6			15.3	M		5.1			3.0							23
24			22.6			17.7										M		5.0	24
25			22.6						5.1										25
26			22.6				M		6.0										26
27			22.6			17.7													27
28			22.0	M		11.7													28
29			65.2																29
30			66.1						6.0									5.0	30
31						11.8						3.0			5.0				31

REMARKS

1 Total CFS
2 Average Daily Flow in CFS
3 Total Acre Feet in AF
4 Maximum Average Daily Flow in CFS
5 Minimum Average Daily Flow in CFS

	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	YEARLY TOTALS
1	347.1	382.6	406.2	895.8	462.6	1399.4	689.8	847.8	212.4	163.7	129	150	6086
2	11.2	12.8	13.1	28.9	16.5	45.1	23	27.3	7.1	5.3	4.2	5	16.7
3	688	759	806	1780	918	2780	1370	1682	421	325	256	298	12083
4	57.6	44.2	22	190	70.2	197	66.1	335	11.1	11.7	5	5	335
5	0	.5	11.1	10.5	0.5	1	14.4	0	4.2	3	3	5	0

Maximum stage 5.60 feet at 0803 on 5-4-81 Discharge 500 Second-feet

Minimum stage feet at TIMES on Discharge DRY Second-feet

X DAM EMPTIED

Appendix C

WELLS DRILLED AND DESTROYED

WELLS DESTROYED 1980-81

Party	LACFCD Well No.	Owner No.
Conrock	4915	
LADWP	3894U	HW-19
LADWP	3894V	HW-20
LADWP	3894W	HW-21
LADWP	3894X	HW-22
LADWP	3894Y	HW-23
LADWP	2772D	T.W.#9

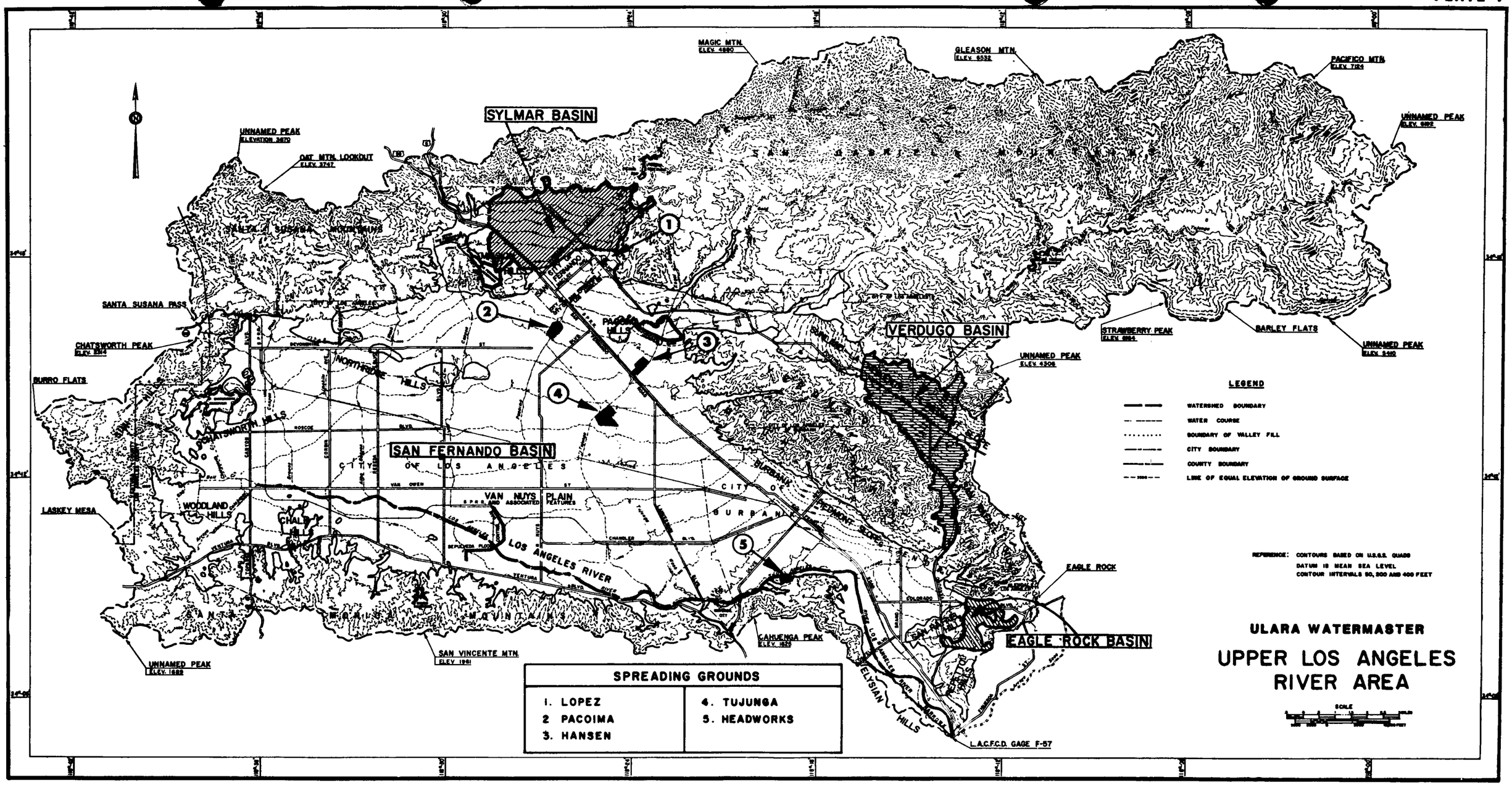
WELLS DRILLED 1980-81

LADWP	3821J	E-2A

Appendix D

PLATES

PLATE 1



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

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

ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

SCALE

PLATE 2

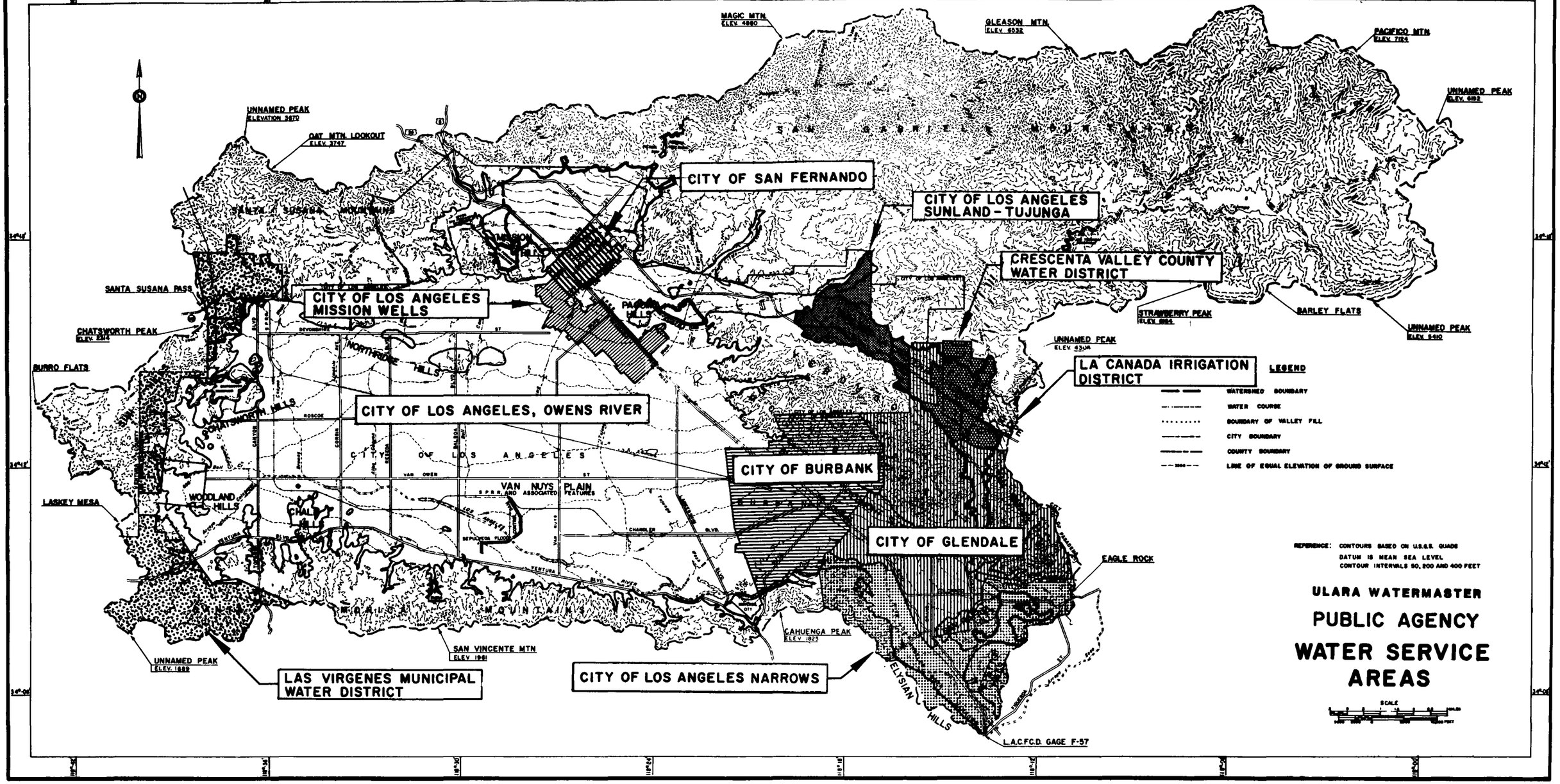
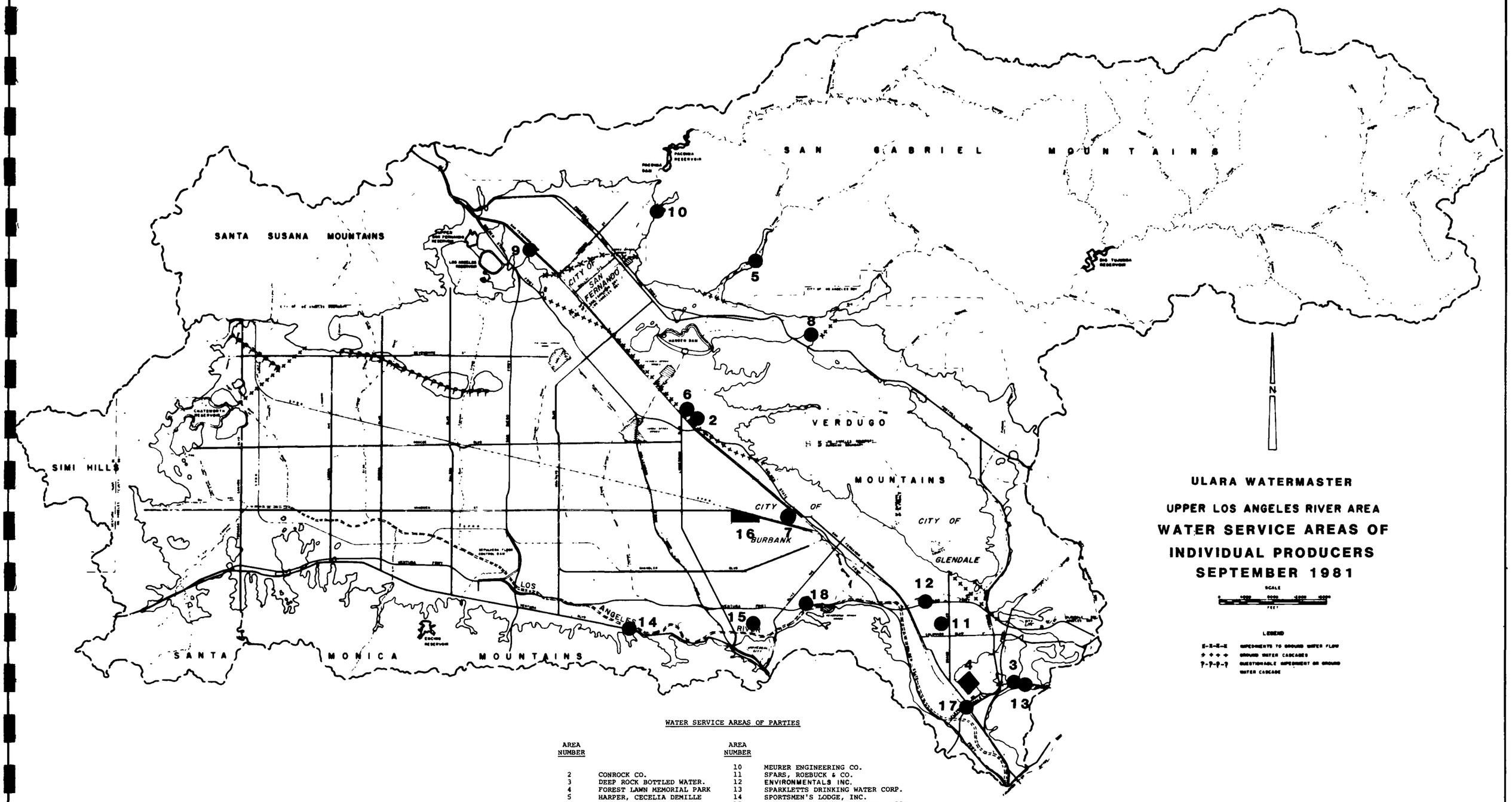

MAGIC MTN.
ELEV. 4880
GLEASON MTN.
ELEV. 6932
PACIFICO MTN.
ELEV. 7124
UNNAMED PEAK
ELEV. 6893
UNNAMED PEAK
ELEVATION 3870
OAT MTN. LOOKOUT
ELEV. 3747
SANTA SUSANA MOUNTAINS
SAN GABRIEL MOUNTAINS
CITY OF SAN FERNANDO
CITY OF LOS ANGELES
SUNLAND - TUJUNGA
CRESCENTA VALLEY COUNTY
WATER DISTRICT
SANTA SUSANA PASS
CITY OF LOS ANGELES
MISSION WELLS
CHATSWORTH PEAK
ELEV. 2344
STRAWBERRY PEAK
ELEV. 6164
BARLEY FLATS
UNNAMED PEAK
ELEV. 6410
UNNAMED PEAK
ELEV. 6306
BURRO FLATS
LA CANADA IRRIGATION
DISTRICT
CITY OF LOS ANGELES, OWENS RIVER
CITY OF LOS ANGELES
VAN NUYS PLAIN
WOODLAND HILLS
LASKEY MESA
CITY OF BURBANK
CITY OF GLENDALE
EAGLE ROCK
CAHUENGA PEAK
ELEV. 1823
SAN VINCENTE MTN
ELEV. 1961
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

PLATE 3



ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

WATER SERVICE AREAS OF INDIVIDUAL PRODUCERS SEPTEMBER 1981

SCALE

LEGEND

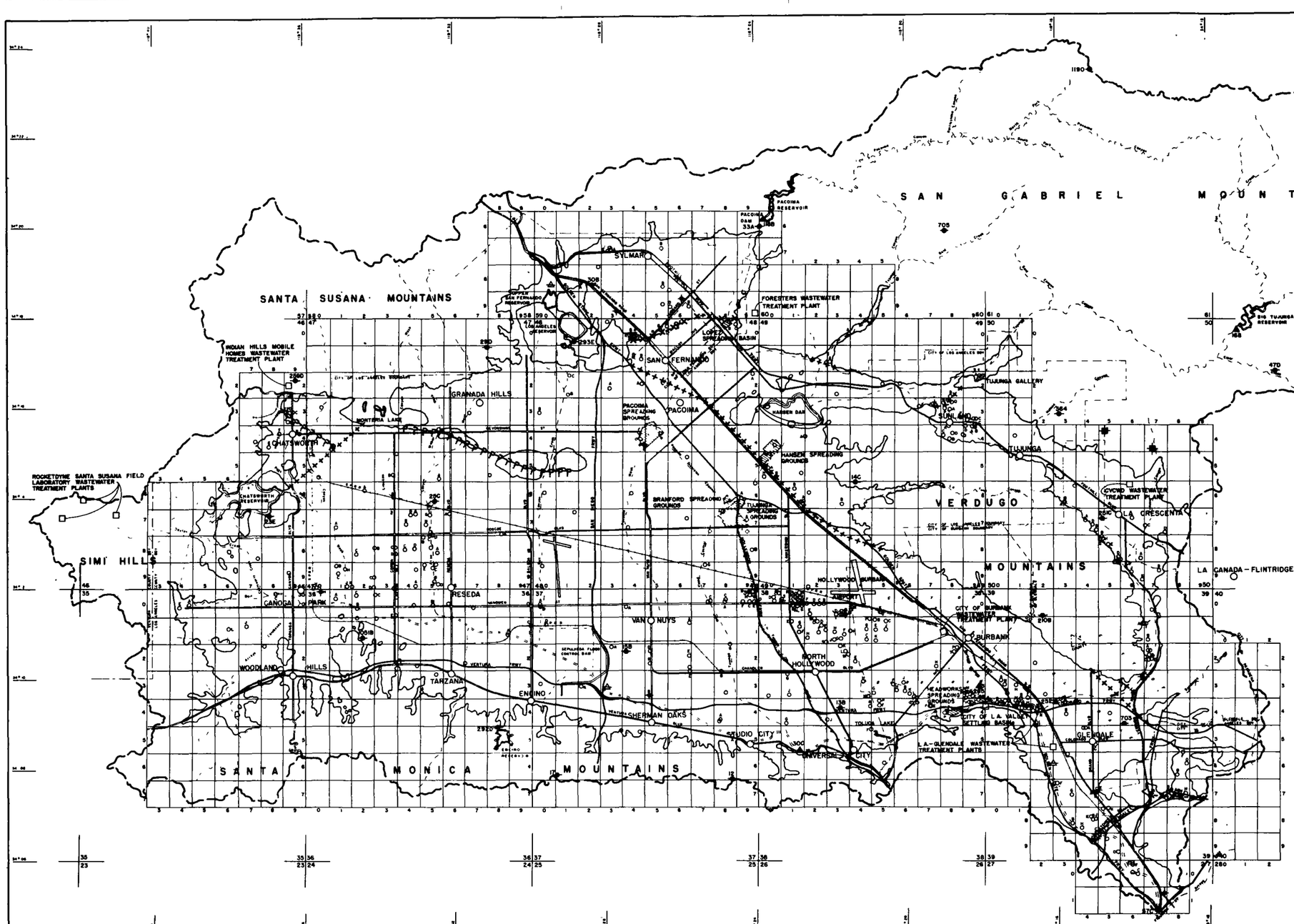
E-E-E-E IMPEDIMENTS TO GROUND WATER FLOW

+ + + + GROUND WATER CASCADES

?-?-?-? QUESTIONABLE IMPEDIMENT 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	ENVIRONMENTALB 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

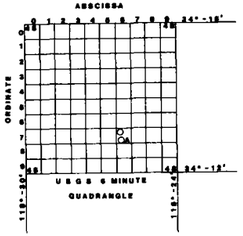
SCALE

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 HYDROGRAP
- KEY WELL USED FOR SAMPLING
- ACTIVE, OBSERVATION, OR TEST WEL
- SURFACE AND GRAVITY DIVERSION

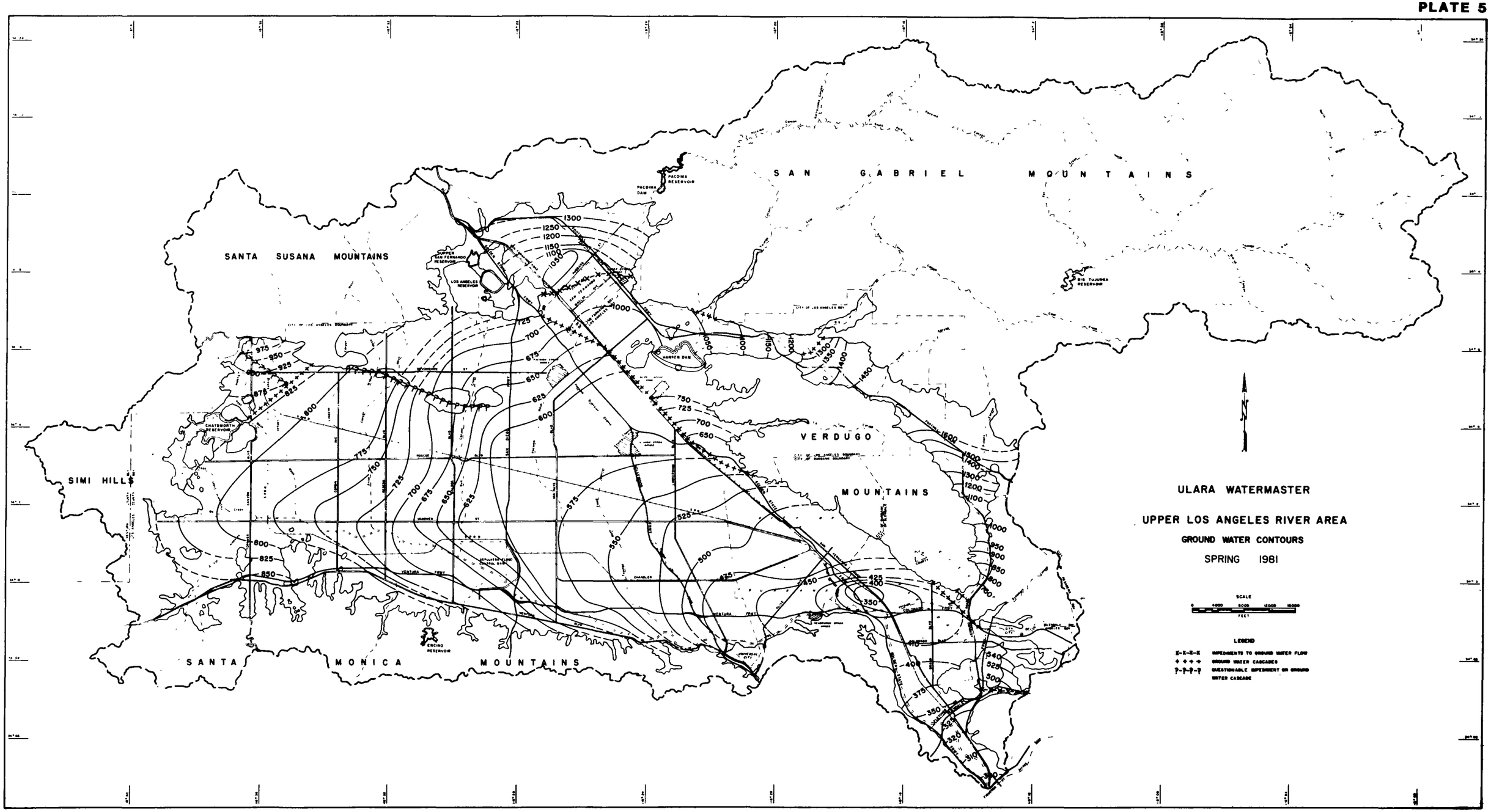
GUIDE TO WELL NUMBERING SYSTEM



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

PLATE 5



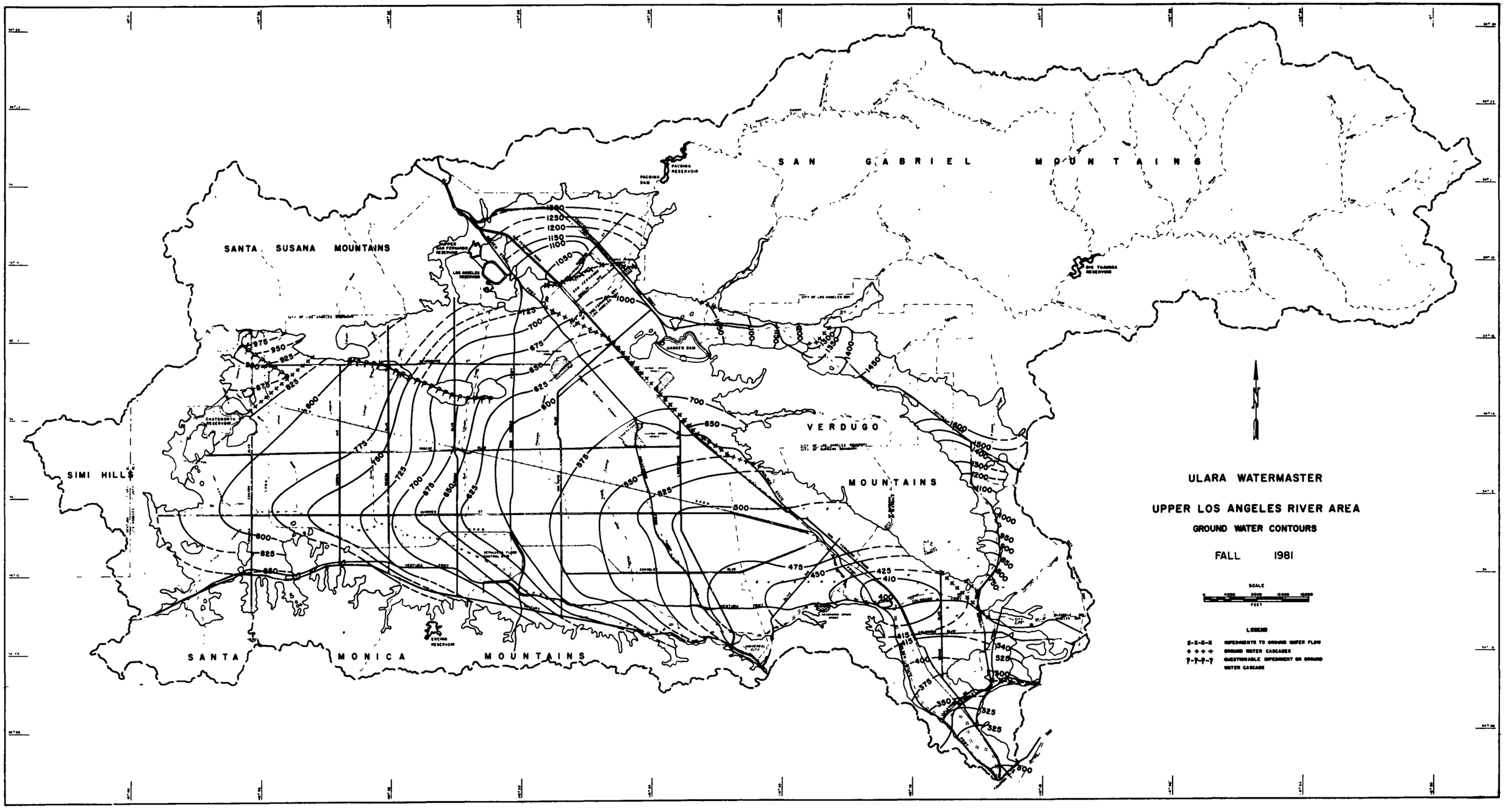
ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

GROUND WATER CONTOURS

SPRING 1981

PLATE 6



ULARA WATERMASTER

UPPER LOS ANGELES RIVER AREA

GROUND WATER CONTOURS

FALL 1981

SCALE

0 4000 8000 12000 16000

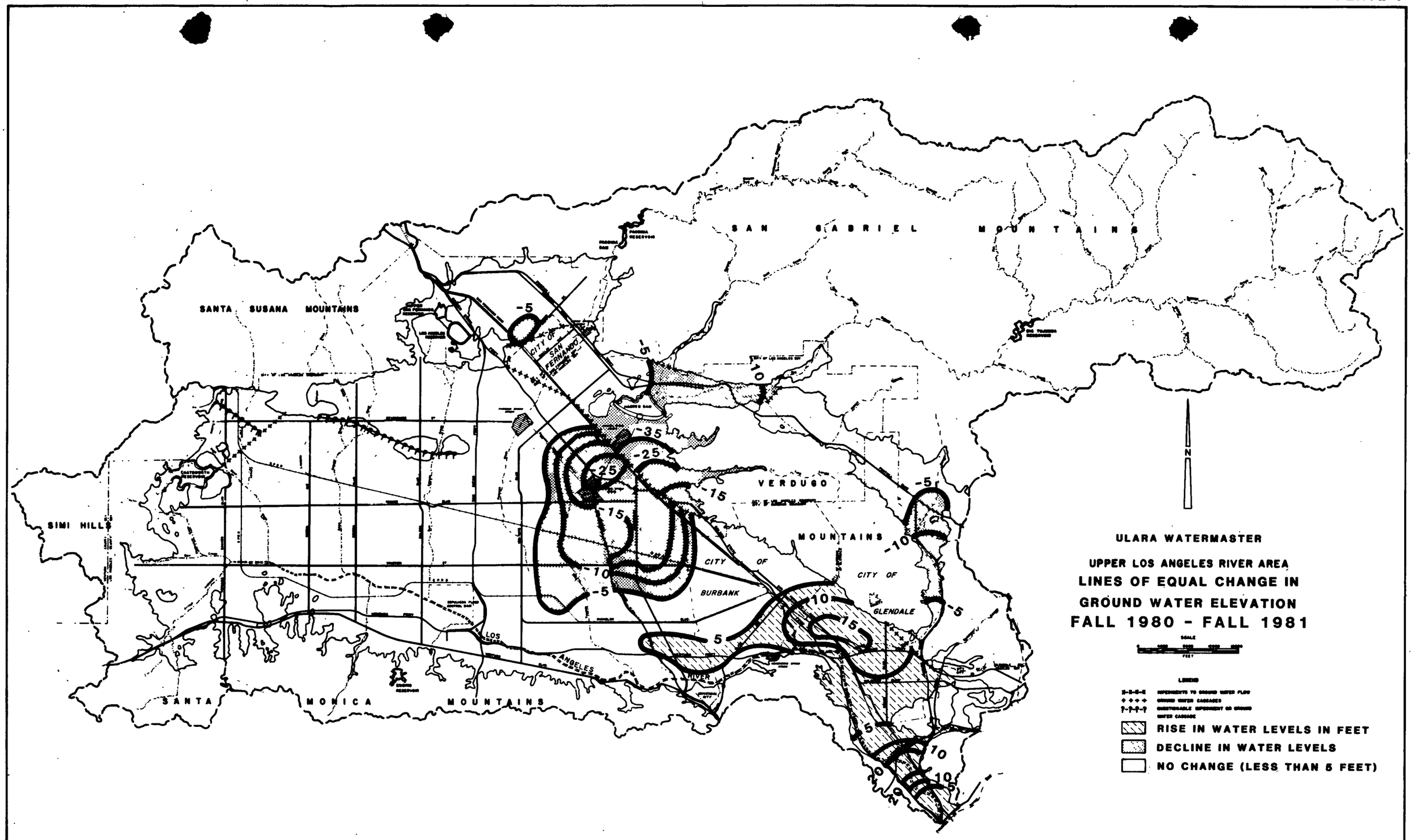
FEET

LEGEND

E-E-E-E 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
CITY OF SAN FERNANDO
CITY OF BURBANK
CITY OF GLENDALE
LOS ANGELES RIVER
-5
-35
-25
-25
-15
-15
-10
-5
5
10
15
10
-5
-10
10
5
10
20
20
10
N
ULARA WATERMASTER
UPPER LOS ANGELES RIVER AREA
LINES OF EQUAL CHANGE IN
GROUND WATER ELEVATION
FALL 1980 - FALL 1981
SCALE
FEET
LEGEND
RISE IN WATER LEVELS IN FEET
DECLINE IN WATER LEVELS
NO CHANGE (LESS THAN 5 FEET)