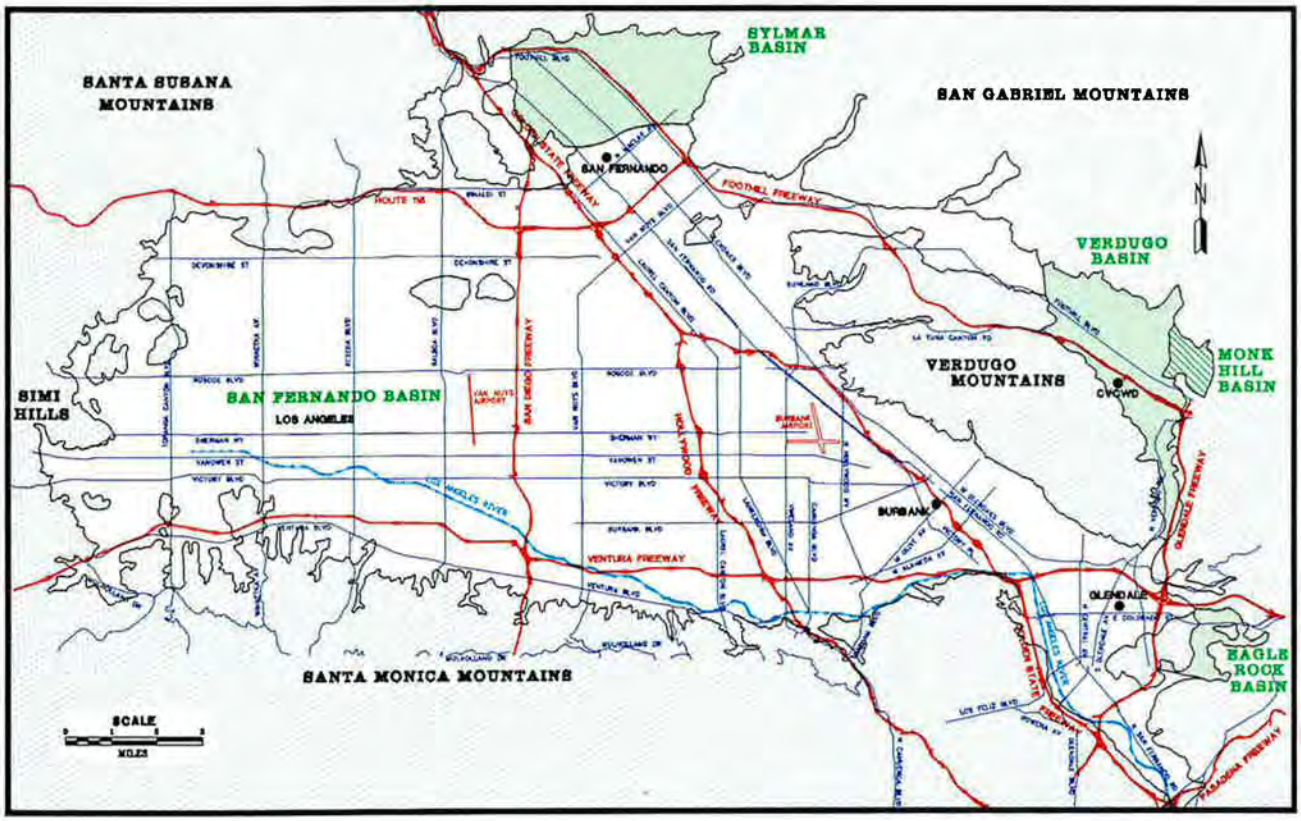
UPPER LOS ANGELES RIVER AREA WATERMASTER

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

1994-95 WATER YEAR
OCTOBER 1, 1994 - SEPTEMBER 30, 1995



MAY 1996

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

1994-95 WATER YEAR
OCTOBER 1, 1994 - SEPTEMBER 30, 1995

ULARA WATERMASTER
Melvin L. Blevins, P.E.

ASSISTANT WATERMASTER
Richard Nagel, P.E.

WATERMASTER CONSULTANT
John F. Mann, Jr., Ph.D.

WATERMASTER STAFF
Patricia Kiechler ULARA Administrator
Andy Agra Computer Specialist
Hadi Jonny Ground Water Modeling
Mario Acevedo Watermaster Report Advisor
Winnie Wang Senior Clerk
Bebe Barber-Turgeon Archivist
Jaqueline Covian Clerk
P.O. Box 111, Room 1455
Los Angeles, CA 90051-0100

MAY 1996

FOREWORD

As Watermaster for the Upper Los Angeles River Area (ULARA), I am pleased to submit this report of the water supply in accordance with the provisions of the Final Judgment signed by the Los Angeles Superior Court on January 26, 1979.

This report describes the water rights in each basin, lists the allowable pumping for the 1994-95 Water Year, and indicates the water in storage to the credit of each party as of October 1, 1995. 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, water quality conditions, and other pertinent information occurring during the 1994-95 Water Year pursuant to the provisions of the Judgment.

Updates on the development of significant issues that took place through the printing of this report are discussed in Section 1.5. These include the status of the Headworks Wellfield Remediation Project, the progress of the East Valley Water Recycling Project, the status of the Pollock Wellfield Reactivation, Burbank's Reclaimed System Expansion, the Burbank and Glendale OUs, and the Glendale Water Treatment Plant in the Verdugo Basin. The progress of the San Fernando Valley Remedial Investigation and related activities is discussed in Section 3.6.

In dealing with the amount of stored groundwater, change in groundwater storage and the groundwater contours for the ULARA, additional monitoring wells are needed. These wells were commented on in the May 1995 report. These monitoring wells would provide more control on the status of groundwater levels and underflow calculations required by the ULARA Judgment. However, some of these wells have been installed as part of other projects, and may provide the data required.

Adjustments for the return water credit for Glendale (Forest Lawn water), and Burbank (Valhalla water) have been made for the period 1978-79 through 1992-93. Adjustments had already been made for the Water Year 1993-94. Other matters that need to be investigated are the pumped groundwater by CalMat in the San Fernando Basin, and Meurer Engineering (Santiago Estates) in the Sylmar Basin. Additional investigation and review of the amounts to be pumped for the Burbank OU and the Glendale North and South OUs were made, and these cleanup programs appear to be moving towards a satisfactory conclusions. Other action items to be evaluated in the 1995-96 water year deal with water rights of parties, rising water outflow (Gage F57), and other basin activities (see Appendix L).

In an effort to provide a more extensive groundwater quality management for the San Fernando Valley basins, the ULARA Administrative Committee met on a monthly basis during 1994-95. As provided in Section 2.9 of the ULARA Policies and Procedures, the first "ULARA Groundwater Pumping and Spreading Plan" (dated September 1995) was completed. This report will continue to be published in September of each year.

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
ULARA Watermaster

TABLE OF CONTENTS

TABLE OF CONTENTS - cont'd

TABLES

TABLE OF CONTENTS - cont'd

FIGURES

PLATES

TABLE OF CONTENTS - cont'd

APPENDICES

1. INTRODUCTION

1. INTRODUCTION

1.1 Background

The 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 Department of Public Works (LACDPW) Gaging Station F-57C-R, near the junction of the Los Angeles River and the Arroyo Seco (Plates 1 and 5). ULARA encompasses 328,500 acres, composed of 122,800 acres of valley fill, referred to as the groundwater basins, and 205,700 acres of hills and mountains. ULARA is bounded on the north and northwest by the Santa Susana Mountains; on the north and northeast by the San Gabriel Mountains; on the east by the San Rafael Hills, which separate it from the San Gabriel Basin; on the south by the Santa Monica Mountains, which separate it from the Los Angeles Coastal Plain; and on the west by the Simi Hills.

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

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 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, 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 groundwater 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.

1.2 History of Adjudication

The water rights in ULARA were established by the JUDGMENT AFTER TRIAL BY COURT in Superior Court Case No. 650079, entitled The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et al., Defendants, signed March 14, 1968, by the Honorable Edmund M. Moor, Judge of the Superior Court. Numerous pretrial conferences 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 an "Order of Reference to State Water Rights Board to Investigate and Report upon the Physical Facts (Section 2001, Water Code)" on June 11, 1958.

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 groundwater and the surface and groundwater hydrology of the area. In addition, investigations were made of the history of channels of the Los Angeles River and its tributaries; the areas, limits, and directions of flow of all groundwater within the area; the historic extractions of groundwater in the basin and their quality; and all sources of water, whether they be diverted, extracted, imported, etc. The Report of Referee served as the principal basis for geological and hydrological facts for the original Trial Court Judgment in 1968, the Decision of the Supreme Court in 1975 (14 Cal 3d 199, 123 Cal Rept 1), and the Trial Court Final 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 Appeal, 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 Appeal. 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 groundwater 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 groundwaters of the Sylmar and Verdugo Basins.

The City of Los Angeles was also given rights to all San Fernando Basin groundwater derived from water imported by it from outside ULARA and either spread or delivered within ULARA. The Cities of Glendale and Burbank each were also given rights to all San Fernando Basin groundwater 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's office at Post Office Box 111, Room 1455, 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 physical solution water for certain parties as suggested by the Supreme Court.

On August 26, 1983, the Watermaster reported to the Court pursuant to Section 10.2 of the Judgment that the Sylmar Basin was in a condition of overdraft. In response to the Watermaster's letter and a Minute Order of this Court, the Cities of Los Angeles and San Fernando responded by letter to the Court, agreeing with the Watermaster's report on overdraft. On March 22, 1984, Judge Harry L. Hupp signed a stipulation ordering, effective October 1, 1984, that the Cities of Los Angeles and San Fernando would be limited in their pumping to bring the total pumping within the safe yield of the basin, including any rights exercised by private parties.

The following table lists the judges who have succeeded Judge Hupp as Judge of Record for the San Fernando Judgment.

TABLE 1-1: JUDGES OF RECORD

Judge	Date Appointed
Vernon G. Foster	April 30, 1985
Miriam Vogel	January 16, 1990
Sally Disco	May 25, 1990
Jerold A. Krieger	April 16, 1991
Gary Klausner	December 9, 1991
Ricardo A. Torres	January 1, 1993

1.3 Extraction Rights

The extraction rights under the Judgment and Sylmar Basin Stipulation are as follows:

San Fernando Basin

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

Import Return Water: Los Angeles, Glendale, and Burbank each has a right to extract the following amount:

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

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

Glendale: 20.0% of all delivered water (including reclaimed water) to the San Fernando Basin and its tributary hill and mountain areas (i.e., total delivered water [including reclaimed water] less 105% of total sales by Glendale in the 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 following table lists the parties and their maximum physical solution quantities.

TABLE 1-2: PHYSICAL SOLUTION PARTIES

Chargeable Party	Pumping Party	Allowable Pumping (acre-feet)
City of Los Angeles	City of Glendale	5,500
	City of Burbank	4,200
	Van de Kamp	120
	Toluca Lake	100
	Sportsmen's Lodge	25
City of Glendale	Forest Lawn	400
	Angelica Healthcare	75
City of Burbank	Valhalla	300
	Lockheed	25

Under the Judgment, Walt Disney Pictures and Television (Defendant No. 105) operates under a separate stipulation (filed on May 11, 1961 and merged into the ULARA Judgment) whereby groundwater extracted for cooling water is discharged into the channel of the Los Angeles River just upstream from the Headworks Spreading Grounds (HSG). The original stipulation between Los Angeles and Disney anticipated that the water so discharged would be diverted by the then-existing rubber dam into the HSG and returned to the San Fernando Basin as groundwater storage. The operation of the rubber dam was discontinued in the 1982-83 Water Year due to water quality concerns by the California Department of Health Services. Thus, the water discharged by Disney, since it was not being spread at HSG, was considered flowing to the ocean and being wasted. As a result of meetings between the Parties and the ULARA Watermaster, a solution to the problem has been obtained. As of January 1993, Disney no longer pumped from its wells. It has installed a system for air conditioning and heating that does not require the use of groundwater. Three extraction well pumps have been pulled at Disney as of March 1996.

Under the Judgment, CalMat (referred to as Conrock, defendant No. 18) was assigned rights to pump groundwater to be used for processing sands and gravel in their mining operations. The Judgment established that the pumped groundwater would be a non-consumptive or minimal consumptive (10%) use. The intent was to recharge or replenish the aquifer with the same processed groundwater. However, as the gravel mining operation has become more extensive, permanent replenishment ponds have been established on top of a perching zone which causes significant evaporative losses. The Watermaster received a mitigation plan from CalMat describing its intention to convey the processed groundwater to an acceptable recharge area. The Watermaster will follow-up on implementation of this plan, and if not implemented, then the evaporative losses would be a violation of the spirit of the Judgment and would be subject to payment to the City of Los Angeles.

Stored Water: Los Angeles, Glendale, and Burbank each has a right to store water and the right to extract equivalent amounts.

Sylmar Basin

Native and Import Return Water: As of October 1, 1984, Los Angeles and San Fernando were assigned equal rights to pump the safe yield of the basin (6,210 acre-feet). The only active potentially private overlying right as of 1996 is the site of the Santiago Estates. Santiago Estates Homeowners Group as of October 1995 is owned by Ellingberg Capital which is pumping for landscaping, as a possible successor to Meurer Engineering. This is being investigated.

Stored Water: Los Angeles and San Fernando each has a right to store water and the right to extract equivalent amounts.

Verdugo Basin

Native and Import Return Water: Glendale and the Crescenta Valley County Water District own 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 delivers imported water to lands overlying the basin, and return flow from this delivered water constitutes the entire safe yield of the basin. Los Angeles has the right to extract or cause to be extracted the safe yield of the basin.

Physical Solution Water: McKesson Water Products and Deep Rock each have physical solution rights to extract water pursuant to a stipulation with the City of Los Angeles, and as provided in Section 9.2.1 of the Final Judgment.

1.4 Watermaster Service and Administrative Committee

In preparing the annual Watermaster Report, the Watermaster collected and reported all information affecting and relating to the water supply, water use and disposal, groundwater levels,

water quality, and ownership and location of new wells within ULARA. Groundwater pumpers report their extractions monthly to the Watermaster. This makes it possible to update the Watermaster Water Production Accounts monthly and keep track of the amount pumped during the water year, and the amount that can be legally pumped out the remainder of the year.

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 May 1, 1996, are:

Burbank, City of	Glendale, City of
Fred Lantz (President)	Donald Froelich (Vice-President)
Ross Burke (Alternate)	Wil Wilson (Alternate)
San Fernando, City of	Los Angeles, City of
Michael Drake	Robert Y. Yoshimura
Harold Tighe (Alternate)	Gerald Gewe (Alternate)
Crescenta Valley County Water District	Private Parties(Santiago Estates)
Michael Sovich	Charles Meurer
Phil McCleaf (Alternate)	Roger Meurer

The Administrative Committee may be convened by the Watermaster at any time in order to seek its advice. During 1994-95, because of an accelerated workload, the frequency of meetings was increased to monthly. Each year the Committee is responsible for reviewing and approving with the Watermaster the proposed annual report. The 1994-95 Watermaster Report was approved by the Committee on April 16, 1996.

1.5 Significant Events Through April 1996

Headworks Well Field Remediation Project

Until the early 1980s, the Headworks wells were the most productive wells (6 wells) in the Los Angeles water system, each well pumping between 2500-4000 gpm. However, the wellfield had to be taken out of service when it was discovered that industrial solvents, primarily TCE and PCE, had severely degraded the water quality. The goal of this project is to reactivate the well

field. Studies are currently being conducted to determine the most appropriate and feasible treatment technology. A NPDES permit was issued by the RWQCB for an aquifer test which began in December 1995. An existing well, HW-29, located near the Equestrian Center was used for the aquifer tests and to evaluate the effectiveness of ultra-violet and hydrogen peroxide treatment technology. Final treatment involved passage through a portable granular activated carbon unit, the effluent of which showed "non-detect" for TCE and PCE.

East Valley Water Recycling Project

The LADWP continues to make progress in the implementation of this project. The East Valley Water Recycling Project (EVWRP) is the cornerstone of the City's water recycling efforts and will ultimately fulfill nearly half the goal of reusing about 40 percent of the city's wastewater by 2010. This project, originally entitled the East Valley Water Reclamation Project (EVWRP), will utilize up to 35,000 acre-feet per year of reclaimed water from the Tillman Water Reclamation Plant, primarily for groundwater recharge in the Sun Valley area of the San Fernando Valley. Other incidental uses will be for irrigation and industrial applications (Appendix D).

Pollock Wellfield Reactivation

The Pollock wellfield, which is located in the Los Angeles River Narrows area, was removed from service in the late 1980s because the water quality was significantly degraded with industrial solvents. The LADWP is proceeding with the Pollock Wells Treatment Plant to restore two of the existing Pollock production wells to operation by treating the groundwater to remove VOCs and then blending for nitrate reduction. Another significant purpose of the Pollock project is to reduce the rising groundwater discharges from the Los Angeles River Narrows area. The Pollock plant will also provide increased flexibility in utilizing the basin. Groundbreaking is anticipated for August 1996.

Pacoima Area Investigation

A significant groundwater contaminant plume has been identified in the Pacoima area near the intersection of the Simi Valley (118) Freeway and San Fernando Road (Plate 7). LADWP is working in cooperation with the RWQCB, Cal-EPA Department of Toxics Substance Control, USEPA, and the ULARA Watermaster Office to develop a plan to further investigate the extent and nature of the contaminant plumes.

Burbank Reclaimed System Expansion

Construction is under way to deliver reclaimed water to the DeBell Golf Course, Stough Landfill, McCambridge Park, Muir Middle School, Starlight Bowl, and Stough Park. This will require

installing 17,000 feet of pipe, two new pump stations, and two storage tanks, along with modifications to the existing facilities.

The reclaimed water will originate from Burbank's Water Reclamation Plant. This plant processes the City's wastewater to a high enough quality that it is allowed to be discharged to an open storm channel that feeds the Los Angeles River. While not suitable for potable applications, it is an ideal source for landscape irrigation. It is already being used by CalTrans and the Media City Center for landscape irrigation.

The total project cost is about $6 million, and construction is scheduled for completion in the 1995-96 water year.

Burbank EPA Consent Decree Project

Phase I of the EPA Consent Decree project (Burbank OU), is complete. On January 3, 1996 Lockheed-Martin began delivering treated water to the City of Burbank at a rate of approximately 500 acre-feet per month. Such water will be blended with MWD water for nitrate reduction and delivered for potable use.

Glendale EPA Project

The City of Glendale and the DreamWorks Studios SKG have entered into an agreement permitting the DreamWorks to develop a studio on the Crystal Springs site which had been previously selected as the site for the treatment plant of the operable unit. The treatment facility will be relocated from the Crystal Springs Yard to the Glendale's Recylcing Center site, approximately 500 feet away from the Crystal Springs site. This relocation will delay the project about three to four months.

Glendale-Verdugo Park Water Treatment Plant

The City has completed construction of the Verdugo Park Water Treatment Plant. This facility is expected to be operational in the summer of 1996 with a capacity of 1,150 gpm.

1.6 Summary of Water Supply, Operations, and Hydrologic Conditions

Highlights of operations for the 1993-94 and 1994-95 Water Years are summarized in Table 1-3. Details of the 1994-95 Water Year operations and hydrologic conditions are given in Section 2.

Locations of the ground water basins, water service areas of the parties and individual producers, and other pertinent hydrologic facilities are shown on Plates 2 through 9.

Average Rainfall

Precipitation on the valley fill floor area during 1994-95 was 32.69 inches, 198 percent of the calculated 100-year mean (16.48 inches); precipitation in the mountain areas was 33.35 inches, 154 percent of the calculated 100-year mean (21.62 inches).

Spreading Operations

A total of 69,108 acre-feet of water was spread -- a large increase from the 19,980 acre-feet spread during 1993-94. Average annual spreading for the 1968-1995 period was 34,563 acre-feet.

Extractions

Total ULARA extractions amounted to 71,560 acre-feet. Of this total, 347 acre-feet was for non-consumptive use. Total extractions decreased 4,975 acre-feet from the previous water year. This decrease was related to increased surface water available statewide. Appendix A contains a summary of ground water extractions for the 1994-95 Water Year.

Imports

Gross imports (which include pass-through water) totaled 503,768 acre-feet, a decrease of approximately nine percent from 1993-94; net imports used within ULARA amounted to 288,351 acre-feet, a 32,366 acre-feet decrease. The decrease in gross imports is partially related to the fact that this year, for the first time, the City of Los Angeles reported MWD imports from trunklines feeding directly into ULARA and did not include MWD water which in earlier years passed through ULARA to the Central City and other parts of its service area. At the time of the Judgment, all of the existing trunklines fed first into the San Fernando Basin, and then, passed through to other areas of the city. Now, with the addition of distribution pipelines, some MWD water flows directly to these other areas.

Exports

A total of 269,398 acre-feet of water was exported from ULARA, a decrease of 21,966 acre-feet from the previous year. Of the 269,398 acre-feet exported, 53,783 acre-feet was from ground water extractions, and 215,417 acre-feet was from imports (pass-through).

Treated Wastewater

A total of 99,815 acre-feet of wastewater was treated in ULARA. The majority of the treated water was discharged to the Los Angeles River, a small amount was delivered to the Hyperion Treatment Plant, and approximately seven percent was used as reclaimed water.

Reclaimed Water

Total reclaimed water used in ULARA was 7,424 acre-feet, a 1,540 acre-feet decrease from last year. The reclaimed water is used for in-plant use, power plant use (i.e. cooling), irrigation and landscaping.

Sewage Export

Sewage export was estimated at 116,540 acre-feet; this was the amount of sewage delivered by pipeline to the Hyperion Treatment Plant. It does not include treated wastewater discharged to the Los Angeles River which leaves ULARA as surface flow.

Groundwater Storage

Groundwater storage in the San Fernando Basin during 1994-95 increased by 79,132 acre-feet; the total cumulative increase in groundwater storage since October 1, 1968 has been 311,209 acre-feet. The 1994-95 increase is due to a combination of increased spreading activities by the LACDPW, above-average rainfall, and below average groundwater pumping. The change in groundwater storage for the Sylmar, Verdugo, and Eagle Rock Basins was +1,490, -2,444, and +108 acre-feet, respectively. The total change in groundwater storage in ULARA was 78,286 acre-feet.

Wells

During the 1994-95 Water Year, a total of two wells were drilled for use in groundwater investigations within ULARA. Five wells were destroyed (Appendix G).

TABLE 1-3: SUMMARY OF OPERATIONS IN ULARA

Item	Water Year 1993-94	Water Year 1994-95
Active Pumpers (party and nonparties)	29	29
Inactive Pumpers (parties within valley fill)(a)	2	2
Valley Rainfall, in inches		
Valley Floor	10.19	32.69
Mountain Area	11.86	33.36
Spreading Operations, in acre-feet	19,980	69,108
Extractions, in acre-feet		
Used in ULARA	15,402	17,232
Exported from ULARA	60,422	53,981
Nonconsumptive Use	717	347
Testing (b)	50	0
Total	76,591	71,560
Gross Imports, in acre-feet		
Los Angeles Aqueduct Water	184,675	353,168
MWD Water	367,542	150,600
Total	552,217	503,768
Exports, in acre-feet		
Los Angeles Aqueduct Water	87,762	168,898
MWD Water	143,180	46,519
Ground Water	60,422	53,981
Total	291,364	269,398
Net Imports Used in ULARA, in acre-feet	321,275	288,351
Reclaimed Water Use, in acre-feet	8,964	7,424
Total Water Use in ULARA, in acre-feet (c)	345,641	313,007
Treated Wastewater, in acre-feet (d)	102,410	99,815
Sewage Export to Hyperion, in acre-feet (e)	99,605	116,540

(a) The two inactive pumpers are Deep Rock Bottled Water Company and Van de Kamp.

(b) Parties are allowed to extract a limited amount for facility testing purposes.

(c) Extractions plus Net Imports used plus Reclaimed.

(d) Most treated wastewater flows to LAR, a portion to Hyperion (see T2-7), and for reclaimed water.

(e) Sewage outflow includes estimates of outflow from each of the four basins, and discharges to Hyperion from the Tillman and Los Angeles-Glendale Reclamation Plants.

1.7 Allowable Pumping for the 1995-96 Water Year

Table 1-4 shows a summary of extraction rights for the 1995-96 Water Year and stored water credit as of October 1, 1995, for the Cities of Los Angeles, Burbank, Glendale, San Fernando, and the Crescenta Valley County Water District. The calculation of these values is shown in more detail in Section 2.

TABLE 1-4: ALLOWABLE PUMPING 1995-96 WATER YEAR
(acre-feet)

	Extraction Right			Stored Water Credit (as of Oct. 1, 1995)	Allowable Pumping 1995-96 Water Year
	Native Safe Yield Credit (a)	Import Return Credit (b)	Total Sum of Native + Import		
San Fernando Basin					
City of Los Angeles	43,660	39,801	83,461	294,093	377,554
City of Burbank	—	4,508	4,508	63,215	67,723
City of Glendale	—	4,942	4,942	50,191	55,133
Total	43,660	49,251	92,911	407,499	500,410
Sylmar Basin					
City of Los Angeles	—	—	3,105	3,498	6,603
City of San Fernando	—	—	3,105	2,043	5,148
Total	—	—	6,210	5,541	11,751
Verdugo Basin (c)					
CVCWD	—	—	3,294	—	3,294
City of Glendale	—	—	3,856	—	3,856
Total	—	—	7,150	—	7,150

(a) Native Safe Yield, Per Judgment, p.11
(b) Import Return, Per Judgment p.17
(c) There is no Stored Credit assigned in the Verdugo Basin.

2. WATER SUPPLY, OPERATIONS, AND HYDROLOGIC CONDITIONS

2. WATER SUPPLY, OPERATIONS, AND HYDROLOGIC CONDITIONS

2.1 Precipitation

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 1994-95 Water Year experienced above average rainfall. The valley floor received 32.69 inches of rain (198% of the 100-year mean), while the mountain area received 33.35 inches (154% of the 100-year mean). Figure 2.1 shows monthly valley floor and mountain area rainfall in ULARA. The weighted average of both valley and mountain area was 33.08 inches (168% of the 100-year mean). Table 2-1 shows a record of rainfall at the valley and mountain precipitation stations, and Plate 5 shows their locations.

FIGURE 2.1 - MONTHLY RAINFALL

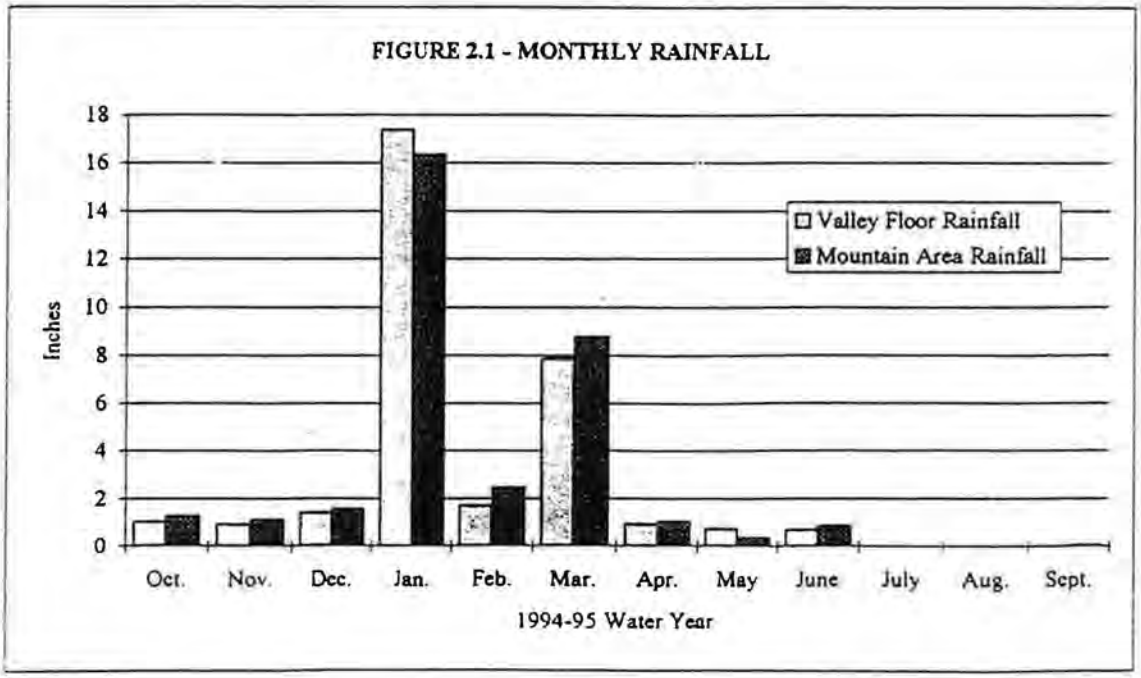


TABLE 2-1: 1994-95 PRECIPITATION
(inches)

No.	LACDPW Rain Gage Stations Name	1994-95 Precipitation	100-Year Mean (1881-1981)	Percent of 100-Year Mean
	Valley Stations			
13C	North Hollywood-Lakeside	41.31	16.63	248%
14C	Roscoe-Merrill	27.50	14.98	184%
15A	Van Nuys	33.48	15.30	219%
21B	Woodland Hills	28.44	14.60	195%
23B	Chatsworth Reservoir	26.61	15.19	175%
25C	Northridge-LADWP	26.04	15.16	172%
251C	La Crescenta	42.91	23.31	184%
293B	Los Angeles Reservoir	32.42	17.32	187%
	Weighted Average*	32.69	16.48	198%
	Mountain Stations			
11D	Upper Franklin Canyon Reservoir	31.25	18.50	169%
17	Sepulved Canyon at Mulholland	44.45	16.84	264%
33A	Pacoima Dam	33.82	19.64	172%
47D	Clear Creek - City School	51.90	33.01	157%
53D	Colby's	44.71	29.04	154%
54C	Loomis Ranch-Alder Creek	28.61	18.62	154%
210C	Brand Parks	33.83	19.97	169%
797(a)	DeSoto Reservoir	32.38	17.52	185%
	Weighted Average (b)	33.35	21.62	154%
	Weighted Average of both Valley and Mountain Areas (b)	33.08	19.64	168%

(a) Station 797 replaced Station 259 which has been discontinued.

*Weighted Average calculations performed according to Report of Referee-7/62

2.2 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 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, industrial and sanitary waste discharges, and rising water.

A number of stream-gaging stations are maintained throughout ULARA, either by the LACDPW or the United States Geological Survey (USGS). The Watermaster has selected six key gaging stations which record runoff from the main hydrologic areas in ULARA (Plate 5 shows the location of the stations). The six gage stations are as follows:

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

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

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

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

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

6. Station F-118B-R registers all releases from Pacoima Dam. Runoff below this point flows to the Los Angeles River through lined channels, or can be diverted to the Lopez and Pacoima spreading grounds. This station was severely damaged in January 1994 during the Northridge Earthquake.

Table 2-2 summarizes the 1993-94 and 1994-95 monthly runoff for these stations. The higher runoff in 1994-95 is related to higher rainfall in 1994-95 than in 1993-94. The mean daily discharge rates for these six stations during 1994-95 are summarized in Appendix B.

TABLE 2-2: MONTHLY RUNOFF AT SELECTED GAGING STATIONS
(acre-feet)

Station	Water Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total
F-57C-R	1993-94*	10,890	8,363	11,050	16,692	9,948	22,603	7,836	8,398	7,008	6,997	14,350	12,560	136,695
L.A. River	1994-95	12,670	12,060	13,840	242,900	18,220	81,610	5,387	10,610	10,730	9,402	12,240	8,898	438,567
Arroyo Seco														
F-252-R	1993-94	148	619	667	479	1,891	1,708	543	607	753	67	31	30	7,543
Verdugo Wash	1994-95	141	140	1,648	18,690	2,373	8,589	470	178	1,107	138	114	108	33,696
E-285-R	1993-94	654	1,018	1,038	865	3,007	1,875	709	596	662	674	545	512	12,155
Burbank	1994-95	2,209	1,444	3,336	6,692	1,551	7,544	954	989	1,374	839	920	835	28,687
Storm Drain														
F-300-R	1993-94	5,377	5,860	7,196	4,320	27,260	12,880	6,834	6,007	5,492	5,117	5,025	3,898	95,266
L.A. River	1994-95	6,884	5,603	7,812	77,510	838	38,040	7,308	5,185	5,074	4,317	5,197	4,001	167,769
Tujunga Ave.														
F-168-R	1993-94	827	756	1,074	939	2,167	1,452	1,620	488*	0*	26*	31*	35	9,415
Big Tujunga	1994-95	117	116	100	8,665	4,428	12,410	4,074	2,127	1,649	444	215	184	34,529
Dam														
118B-R	1993-94	450	0	323	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	773
Pacoima Dam	1994-95	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Incomplete Record - Numbers Estimated

2.3 Components of Surface Flow

The surface flow of the Los Angeles River at Gaging Station F-57C-R consists of:

1. Storm flows
2. Reclaimed wastewater from the Tillman, Burbank, and Los Angeles-Glendale Water Reclamation Plants
3. Industrial discharges
4. Rising groundwater

In the Report of Referee (Volume II, Appendix O), procedures were developed for the calculation of rising groundwater for the period 1928-1958. Some of the important factors of that study are no longer significant -- releases of Owens River water, operation of the Chatsworth Reservoir, and (temporarily, at least) operation of the Headworks Spreading Grounds. As shown on Figure O-2 of the Report of Referee, rising water was considered to have fallen to zero by the late 1950s. Groundwater levels along the course of the Los Angeles River were studied recently in the January 1993 report by Brown and Caldwell, "Potential Infiltration of Chlorides from the Los Angeles River into the Groundwater Aquifer". Figure 2-4 of that report is especially informative. As of the end of the drought period in 1977, groundwater levels in the Los Angeles Narrows were very low, with very little potential for rising groundwater. Heavy runoff occurred during the 1978-83 period, which, combined with reduced pumping in the Crystal Springs and Pollock Well Fields, permitted large recoveries of groundwater levels in the Los Angeles Narrows.

An even greater factor affecting hydrologic conditions in the Los Angeles Narrows has been the increasing releases of reclaimed waters. Releases from the Los Angeles-Glendale Plant were started in 1976-77 and from the Tillman Plant in 1985-86. These large year-round releases tend to keep the alluvium of the Los Angeles River Narrows full, even in dry years. There is opportunity for continuing percolation in the unlined reach, both upstream and downstream of the paved section near the confluence of the Verdugo Wash and the Los Angeles River. Water percolating in the unlined reach is believed to circulate through shallow zones and re-appear as rising groundwater downstream from Los Feliz Boulevard. Also, there is up to 3,000 acre-feet of recharge from delivered water within the Los Angeles Narrows-Pollock Well Field area that adds to the rising groundwater conditions.

Rising groundwater also occurs above the Verdugo Narrows, and in the reach upgradient from Gage F-57C-R. During dry periods conditions in the unlined reach are stabilized with regard to percolation and rising water by releases of treated water. In wet periods rising water above gage F-57C-R has been considered to be related to the increase of rising water above the Verdugo Narrows. Thus from 1991-92 (Table 2-3) to the very wet year of 1992-93 there was an increase of rising water at Gage F-252-R of about 1,900 acre-feet. From 1993-94 to 1994-95, another above average rainfall season, flows of rising water at gage F-252-R increased by about 3,422. For 1994-95 the rising water flow at gage F-57C-R was estimated to have increased by 1,948 acre-feet to 4,900 acre-feet, similar to the estimate for the wet year of 1992-1993.

TABLE 2-3
ESTIMATED SEPARATION OF SURFACE FLOW AT STATIONS F-57C-R & F-252-R
(acre-feet)

Water Year	Base Flow		Storm Runoff	Total Measured Outflow
	Rising Ground Water	Waste Discharge		
		Station F-57C-R		
1972-73	4,596	8,776	100,587	113,959
1973-74	2,694	6,366	79,587	88,878
1974-75	427	7,318	56,396	64,141
1975-76	261	6,741	32,723	39,725
1976-77	839	7,128	58,046	66,013
1977-78	1,331	7,449	357,883	366,663
1978-79	2,840	16,450	119,810	139,100
1979-80	5,500	16,500	n/a	n/a
1980-81	4,710	19,580	51,940	76,230
1981-82	1,280	18,180	80,000	99,460
1982-83	3,460	17,610	384,620	405,690
1983-84	3,000	17,780	49,090	69,870
1984-85	3,260	21,600	46,300	71,160
1985-86	3,880	48,370	102,840	155,090
1986-87	3,000	64,125	19,060	83,295
1987-88	3,000	81,920	74,074	156,204
1988-89	3,000	80,020	56,535	136,843
1989-90	3,000	76,789	55,811	167,639
1990-91	3,203	75,647	117,779	196,629
1991-92	3,000	120,789	197,040	320,829
1992-93	4,900	77,000	478,123	560,023
1993-94	2,952	60,594	73,149	136,695
1994-95	4,900	66,209	367,458	438,567
		Station F-252-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	n/a	n/a
1979-80	5,150	0	7,752	12,902
1980-81	5,780	0	2,917	8,697
1981-82	3,710	0	5,367	9,077
1982-83	5,330	0	21,384	26,714
1983-84	4,000	0	n/a	n/a
1984-85	2,710	0	3,970	6,680
1985-86	2,470	0	6,270	8,740
1986-87	2,100	0	1,690	3,790
1987-88	3,548	0	10,493	14,041
1988-89	1,995	0	4,453	6,448
1989-90	1,182	0	2,938	4,120
1990-91	1,157	0	6,865	8,022
1991-92	1,412	0	13,209	14,621
1992-93	3,335	0	20,185	23,520
1993-94	1,387	0	6,156	7,543
1994-95	4,809	0	28,881	33,696

2.4 Groundwater Recharge

Precipitation has a marked influence on groundwater recharge and, with some delay, groundwater storage. Urban development during the past years in ULARA has resulted in approximately 20 percent of the rainfall being collected and routed into paved channels which discharge into the Los Angeles River. To partially offset the increased runoff due to urbanization, Pacoima and Hansen Dams, originally built for flood control, are utilized to regulate storm flows and allow recapture of the flow in downstream spreading basins operated by the LACDPW and the City of Los Angeles.

The LACDPW operates the Branford, Hansen, Lopez, and Pacoima spreading grounds; the City of Los Angeles operates the Headworks spreading grounds. The LACDPW, in cooperation with the City of Los Angeles, operates the Tujunga spreading grounds. The spreading grounds operated by the LACDPW are utilized for spreading native water, and imported water under agreements. Table 2-4 summarizes the spreading operations for the 1994-95 Water Year, and Plate 6 shows the locations of the spreading basins.

TABLE 2-4: 1994-95 SPREADING OPERATIONS IN THE SAN FERNANDO BASIN
(acre-feet)

Agency	Spreading Facility	1994			1995								Total
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
LACDPW														
	Branford	34	56	70	105	60	60	81	21	47	22	17	12	585
	Hansen	425	387	466	5,950	4,560	9,930	6,950	1,640	2,100	1,480	868	381	35,137
	Lopez	0	0	0	3	217	100	472	199	90	1	3	0	1,086
	Pacoima	0	34	109	3,280	2,190	3,740	3,080	876	480	101	46	128	14,064
	Tujunga	0	6	70	4,558	2,675	3,120	2,914	4,030	787	0	0	76	18,236
	Total	459	483	715	13,896	9,702	16,950	13,497	6,766	3,504	1,604	934	597	69,108
City of Los Angeles														
	Tujunga	0	0	0	0	0	0	0	0	0	0	0	0	0
	Headworks	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0
City of Burbank														
	Pacoima	0	0	0	0	0	0	0	0	0	0	0	0	0
Basin Total		459	483	715	13,896	9,702	16,950	13,497	6,766	3,504	1,604	934	597	69,108

2.5 Groundwater Extractions

The original trial court adjudication of groundwater rights in ULARA restricted all groundwater 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 from 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 groundwater pumping.

McKesson Water Products (formerly Sparkletts Drinking Water Corporation) and Deep Rock Water Company are the only parties which have rights to extract water from the Eagle Rock Basin. These parties pay the City of Los Angeles for pumped ground water pursuant to the Judgment.

Figure 2.2 illustrates the annual groundwater extractions and imported water used in ULARA, beginning with the 1954-55 Water Year. It can be noted that for the 14 years prior to pumping restrictions (1954-55 to 1967-68), imports exceeded extractions by 50,000 to 90,000 acre-feet per year, in contrast to the past 27 years (1968-69 to 1994-95) where imports have exceeded extractions by 110,000 to 250,000 acre-feet per year (Refer to Figure 2.3 - Monthly Extractions and Imports).

A total of 71,560 acre-feet was pumped from ULARA during the 1994-95 Water Year- 60,288 acre-feet from the San Fernando Basin, 5,733 acre-feet from the Sylmar Basin, 5,341 acre-feet from the Verdugo Basin, and 198 acre-feet from the Eagle Rock Basin. The respective safe yield values for the 1994-95 Water Year are 98,369 acre-feet (Native Safe Yield of 43,660 and an import return of 54,709 acre-feet) for the San Fernando Basin, 6,210 acre-feet for the Sylmar Basin, and 7,150 acre-feet for the Verdugo Basin. Appendix A contains a summary of groundwater extractions for the 1994-95 Water Year, Plate 9 shows the locations of the well fields, and Plate 10 describes the pattern of groundwater extractions.

Of the total amount pumped in the San Fernando Basin (60,288 acre-feet), 58,122 acre-feet constitutes extraction rights by Parties to the Judgment, 347 acre-feet constitutes nonconsumptive use, and 1,819 acre-feet was by physical solution parties, groundwater cleanup and dewatering parties (Appendix G). Table 2-5 summarizes 1994-95 private party pumping in the San Fernando Basin, and Plate 3 shows the locations of the individual producers.

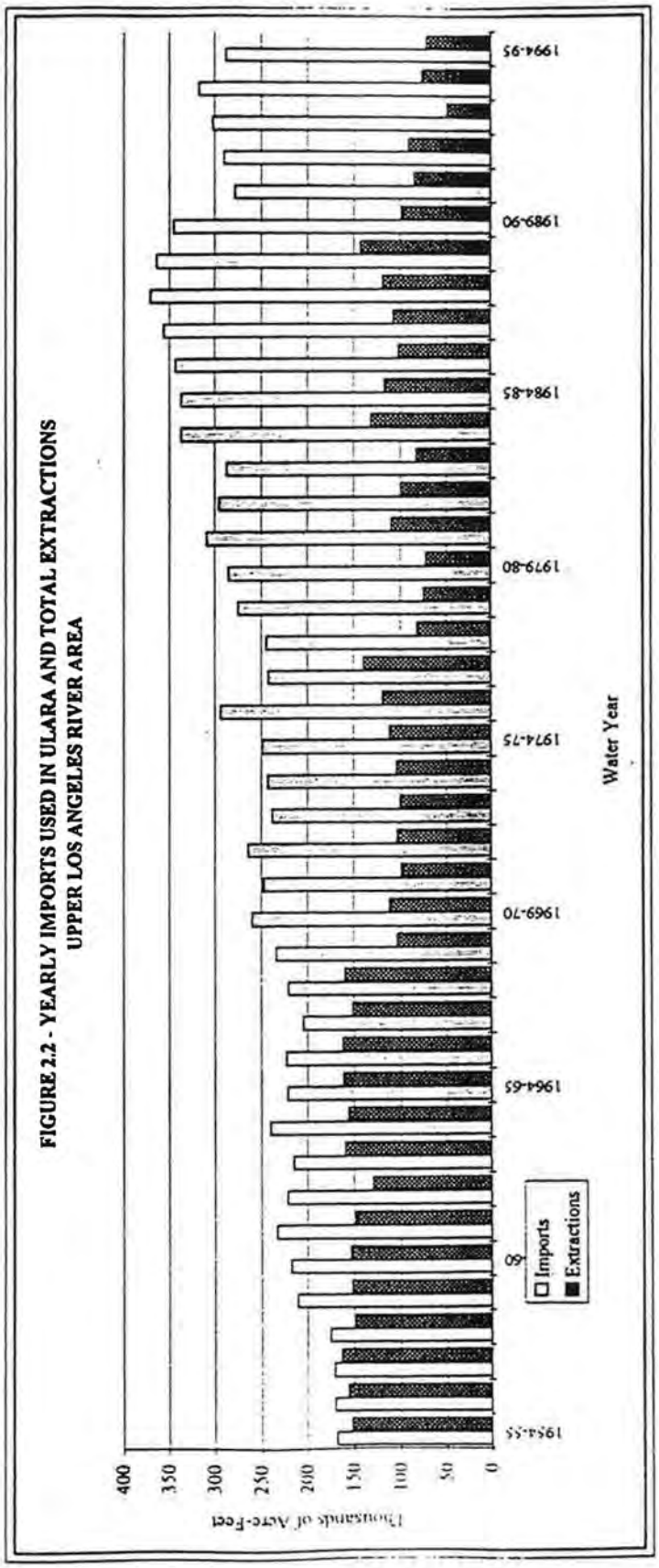


FIGURE 2.2 - YEARLY IMPORTS USED IN ULARA AND TOTAL EXTRACTIONS UPPER LOS ANGELES RIVER AREA

TABLE 2-5: 1994-95 PRIVATE PARTY PUMPING
SAN FERNANDO BASIN
(acre-feet)

Nonconsumptive Use	
CalMat (Gravel washing)	139
Livingston-Graham Co. (Gravel washing)	0
Sears, Roebuck and Company (Air Conditioning)	206
Sportsmen's Lodge	1
Toluca Lake Property Owners Ass'n (Lake overflows to LA River)	1
Walt Disney Productions	0
Total	347
Groundwater Cleanup	
Lockheed-Burbank Operable Unit '(Well Development to Basin Account)	462
Greeff Fabrics (Recharged to groundwater)	16
Mobil Oil Corporation (Charged to City of Los Angeles' water right)	4
Philips Components (Recharged to groundwater)	80
Rockwell International (Charged to City of Los Angeles' water right)	325
3M-Pharmaceutical (Recycled for on-site use)	13
Total	900
Parties Without Rights	
Harper, Cecilia De Mille	15
Physical Solution	
Angelica Healthcare Services (various uses)	0
Forest Lawn Cemetery Assn. (Charged to City of Glendale's water right)	400
Sportsmen's Lodge (Charged to City of Los Angeles' water right)	0
Toluca Lake Property Owners (Charged to City of Los Angeles' water right)	30
Valhalla Memorial Park (Charged to City of Burbank's water right)	298
Waste Management Disposal Services of California	0
Total	728
Groundwater Dewatering	
Auto Stiegler (Charged to City of Los Angeles' water right)	21
First Financial Plaza Site (Charged to City of Los Angeles' water right)	47
Trillium Corporation (Charged to City of Los Angeles' water right)	35
Metropolitan Transportation Agency (MTA) (Charged to Basin Account)	73
	176
Total Extractions:	2,166

2.6 Imports and Exports of Water

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

The imported supplies to ULARA are from the Los Angeles Aqueducts and the Metropolitan Water District (MWD). Los Angeles Aqueduct water consists of runoff from the Eastern Sierra Nevada and groundwater from Owens Valley; MWD supplies consists of State Water Project and Colorado River Aqueduct waters.

Exports from ULARA include imported Los Angeles Aqueduct and MWD water (pass-through), and groundwater from the San Fernando Basin. Exports of wastewater are by pipeline to Hyperion Treatment Plant.

Table 2-6 summarizes the nontributary imports and exports from ULARA during the 1993-94 and 1994-95 Water Years, and Figure 2.3 shows the monthly extractions and imports.

FIGURE 2.3 - TOTAL MONTHLY EXTRACTIONS AND GROSS IMPORTS

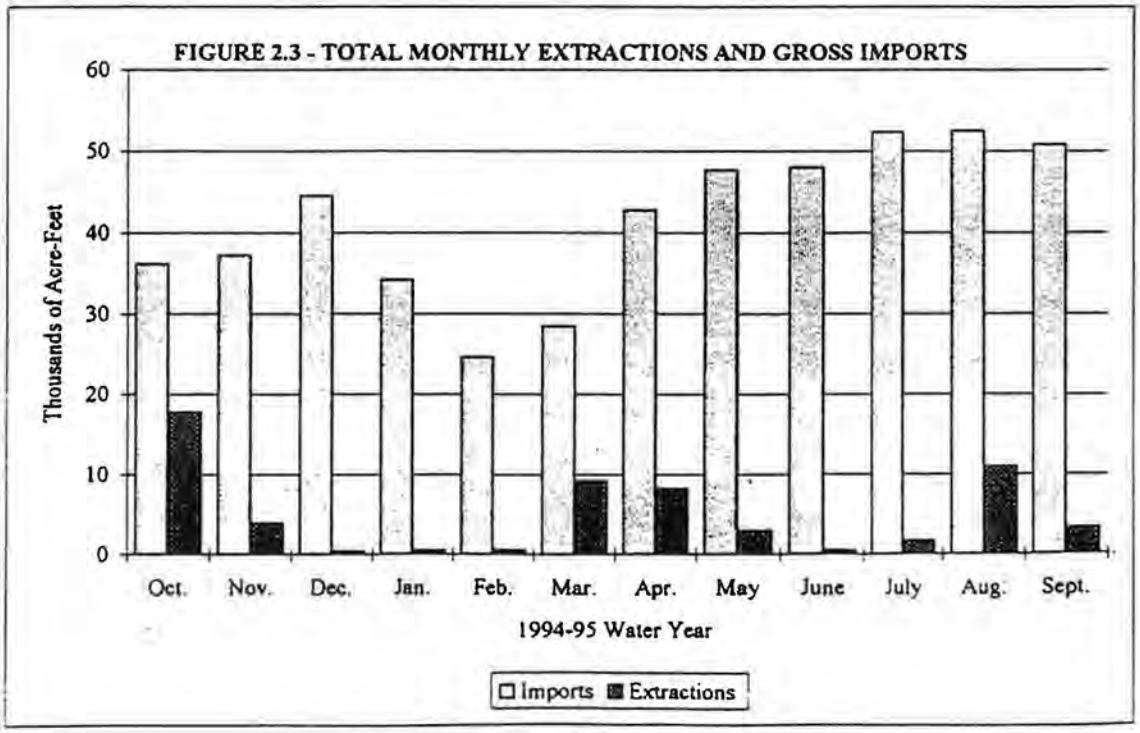


TABLE 2-6: ULARA NONTRIBUTARY WATERS IMPORTS AND EXPORTS
(acre-feet)

Source and Agency	Water Year 1993-94	Water Year 1994-95
Gross Imported Water		
Los Angeles Aqueduct		
City of Los Angeles	184,675	353,168
MWD Water		
City of Burbank	18,074	17,173
Crescenta Valley County Water District	1,175	979
City of Glendale	31,019	26,219
City of Los Angeles *	310,315	99,371
La Canada Irrigation District*	1,009	949
Las Virgenes Municipal Water District*	5,858	5,899
City of San Fernando	92	10
Total MWD Water	367,542	150,600
Total Imported Water	552,217	503,768
Exported Water (Pass-through)		
Los Angeles Aqueduct		
City of Los Angeles	87,762	168,898
MWD water		
City of Los Angeles	143,180	46,519
Total Exported Water	230,942	215,417
Net Imported Water Used in ULARA:	321,275	288,351

* Deliveries to those portions of these Districts that are within ULARA

2.7 Water Reclamation

Water reclamation presently provides a source of water for irrigation, industrial, and recreational uses. In the future, water reclamation could provide water for groundwater recharge within the ULARA spreading basins. Six wastewater reclamation plants are in operation in ULARA. The Las Virgenes Municipal Water District operates a water reclamation facility outside ULARA but uses part of the treated water in ULARA. The goal of the East Valley Water Recycling Project is to use up to 35,000 acre-feet/year of reclaimed water from the Tillman Plant for groundwater recharge. This is discussed in Appendix D. Table 2-7 summarizes the 1994-95 reclamation plant operations, and Plate 6 shows their location.

TABLE 2-7: 1994-95 WASTEWATER RECLAMATION PLANT OPERATIONS
(acre-feet)

Plant/Agency	Treated Water	Discharged to		Reclaimed Water
		L.A. River	Hyperion	
City of Burbank	6,465	6,127	4,233	2,480 (a)
Los Angeles-Glendale	21,578	14,205	3,080	3,262 (b)
Donald C. Tillman	71,711	60,955	10,141	616 (c)
Indian Hills Mobile Homes				20 (d)
The Independent Order of Foresters	61	0	0	61 (d)
Rocketdyne (Canoga Park)	N/A	N/A	N/A	N/A (e)
Las Virgenes MWD	—	0	0	985 (f)
Total	99,815	81,287	17,454	7,424

(a) Of the total reclaimed water (2,480 AF), 2,380 AF was delivered to the Burbank power plant. Of that, 476 ac-ft is for cooling and 1,904 AF is for discharge to the river. The latter is also included in the "river discharges" column. 100 AF was used by CalTrans, the Media City Center, and City water trucks.

(b) Of the total reclaimed water (3,262 AF), 596 AF was delivered to Glendale for use in Glendale's Phosphate Plant and for irrigation water for CalTrans and Forest Lawn; 580 AF was for in plant use; 1,706 AF was was delivered to Griffith Park by Los Angeles for irrigation; and 380 AF was used by CalTrans, Lake Side, Sinai Memorial Park, and Universal City MCA for irrigation.

(c) Reclaimed water was for in plant use.

(d) Reclaimed water is used for irrigation.

(e) Rocketdyne: Treated water is reused within the facility.

(f) Portion of reclaimed water is used within ULARA for irrigation.

2.8 Water Level Elevations

For the first time, the 1996 Watermaster Report introduces computer simulated groundwater contours for the Spring (April) and the Fall (September) of 1995. Previously, the groundwater contour maps were developed by using actual water level data to interpolate the contours, and manually plotting the interpolations. The 1995 contours were produced by using the San Fernando Basin (SFB) Groundwater Flow Model. The SFB model was initially developed during the Remedial Investigation (RI) Study of Groundwater Contamination in the San Fernando Valley. The RI study was funded through the U.S. EPA's Superfund program.

The model is comprised of up to four layers, in the deepest portion of the eastern SFB, and includes 22,016 cells, ranging in size from 1,000 to 1,000 feet to 3,000 by 3,000 feet. The model parameters were calibrated by matching the simulated hydraulic-head fluctuations with the historical water level fluctuations measured at selected key monitoring wells for a time period of 10 years. The 1995 contours were simulated by incorporating the estimated monthly recharge (e.g. spread water, precipitation, etc.) and discharge (groundwater extractions, rising water, etc.) values for the 1994-95 water year. The model was then run for twelve consecutive stress periods beginning October 1994 through September 1995. The simulated head values at the end of the April and September stress periods were then plotted by utilizing a groundwater contour software package.

The simulated Spring and Fall 1995 Groundwater Contour Maps are shown as Plates 11 and 12. These contours are intended to depict the general trend of groundwater flow for April and September of 1995. Up-to-date groundwater elevations for specific locations can be obtained by contacting the Watermaster's Office at (213) 367-0921.

Plate 13 exhibits the change in groundwater elevation from the Fall of 1994 to the Fall of 1995. The increase in groundwater levels in the north portion of the San Fernando Basin represents the large volume of native runoff water spread in the Hansen, Pacoima, and Tujunga spreading grounds in 1995. Plate 14 exhibits groundwater flow directions and estimated groundwater velocities in ULARA. Figure 2.4 shows historic hydrographs of wells throughout ULARA and their locations.

2.9 Groundwater Storage

San Fernando Basin

The total groundwater storage capacity of the San Fernando Basin was estimated in the Report of Referee to be approximately 3,200,000 acre-feet, of which a regulatory storage capacity of 360,000 acre-feet is required by the Judgment.

The estimated change in groundwater storage for 1994-95 is +79,132 acre-feet (Table 2-8). From the start of safe yield operation in the Fall of 1968 through 1994-95, the amount of groundwater in storage has increased by +311,209 acre-feet. However, during the 1968-95 period there has been an accumulation of 407,499 acre-feet of stored water credit through spreading and in-lieu activities of the parties. Such groundwater can be extracted at any time by the credited parties in excess of normal pumping rights. If this water were to be removed, the cumulative change in storage since 1969 would be -96,290 acre-feet.

An annual comparison is made between the hydrologic conditions of the water year and change in storage. Table 2-8 summarizes the annual precipitation and change in storage from 1968-69 through 1994-95. Plate 15 shows the cumulative change in storage from Fall 1928 to the present.

Sylmar Basin

The groundwater storage capacity of the Sylmar Basin is approximately 310,000 acre-feet. The estimated change in storage for 1994-95 is +1,490 acre-feet, and the cumulative change in storage from 1968-69 through 1994-95 is +3,932 acre-feet.

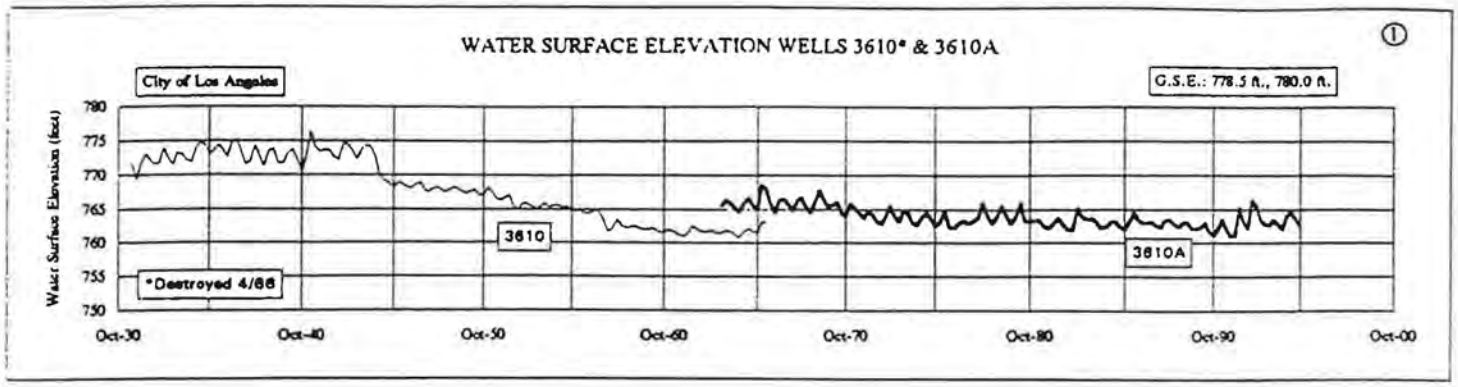
Verdugo Basin

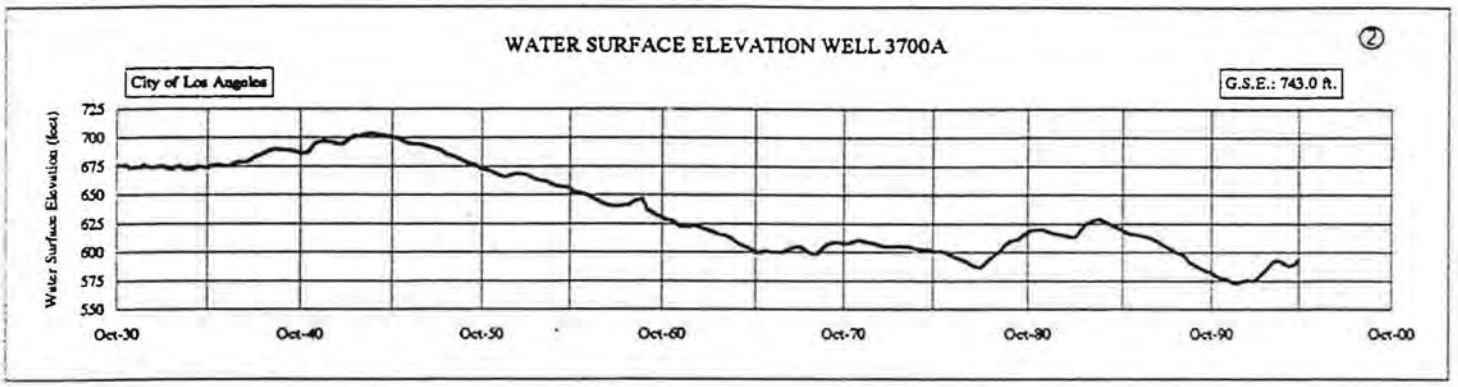
The groundwater storage capacity of the Verdugo Basin is approximately 160,000 acre-feet. The estimated change in storage for 1994-95 is -2,444 acre-feet, and the cumulative change in storage from 1968-69 through 1994-95 is -4,217 acre-feet.

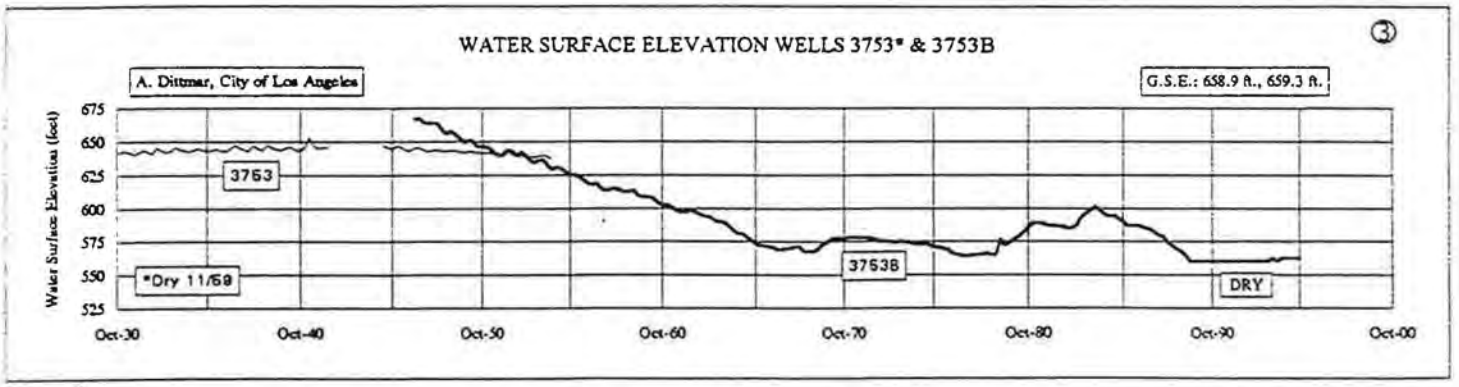
Eagle Rock Basin

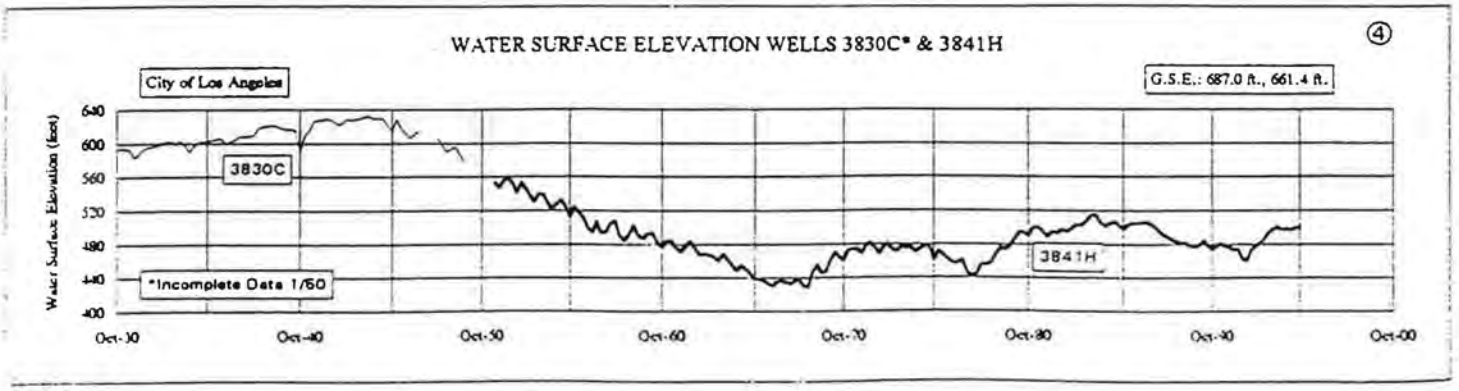
The estimated change in storage is +108 acre-feet.

SAN FERNANDO BASIN

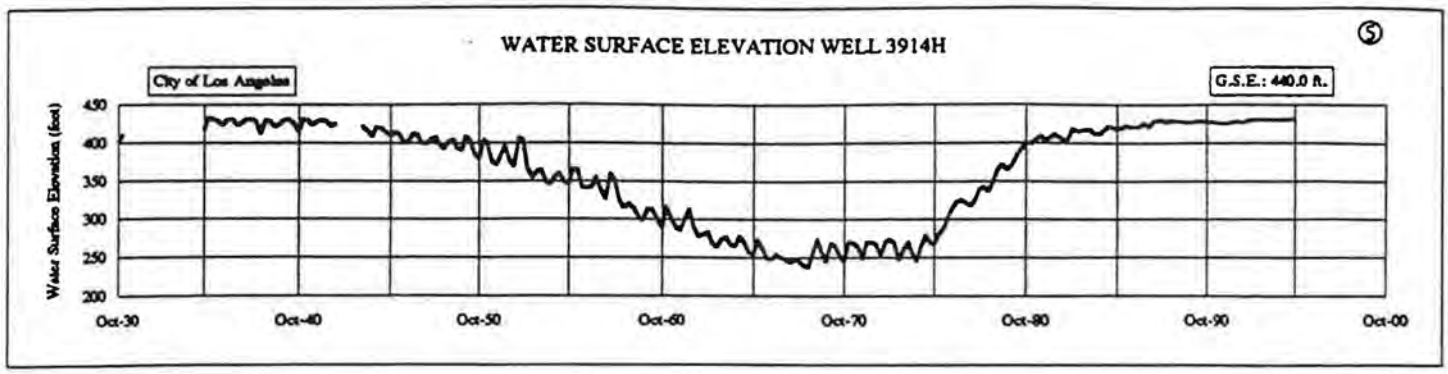


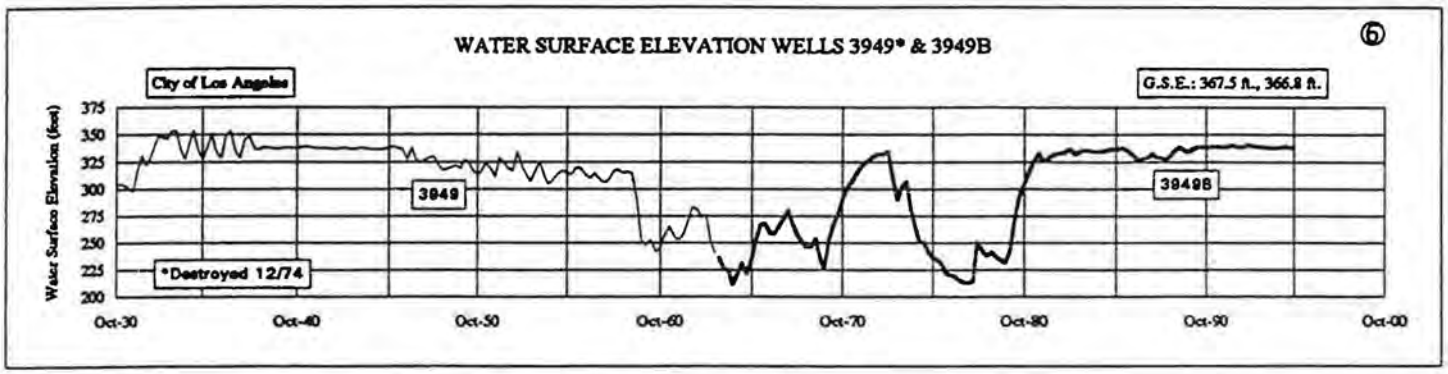


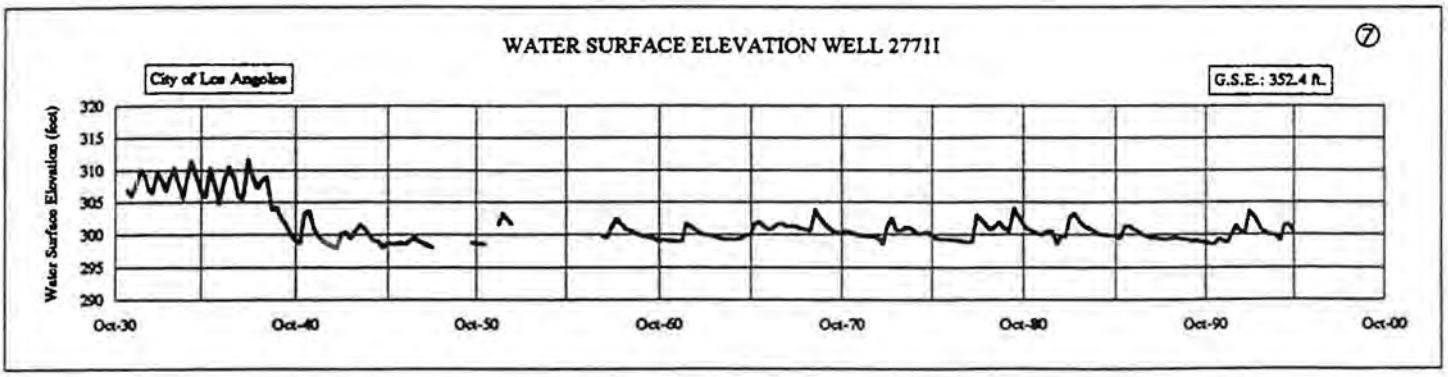




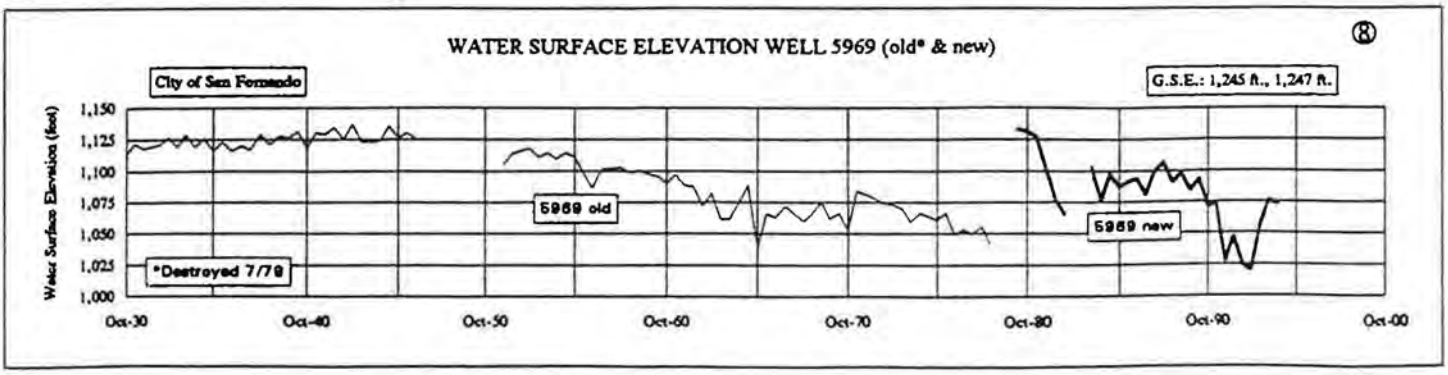
SAN FERNANDO BASIN



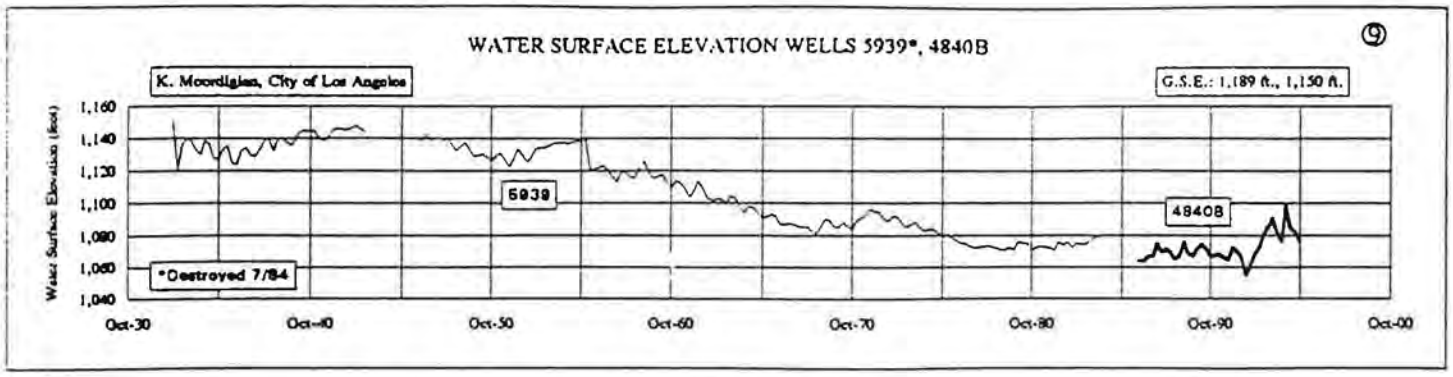




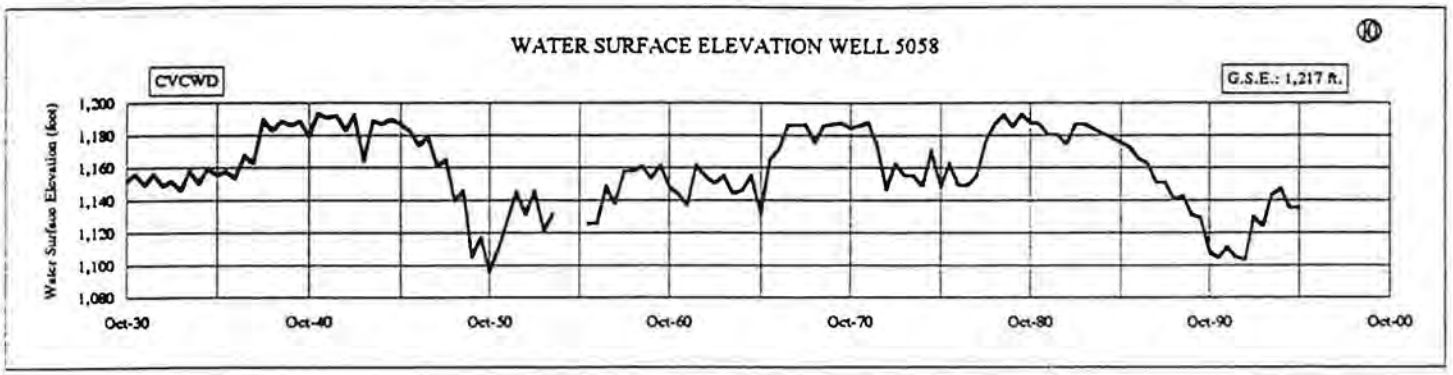
SYLMAR BASIN



SYLMAR BASIN



VERDUGO BASIN



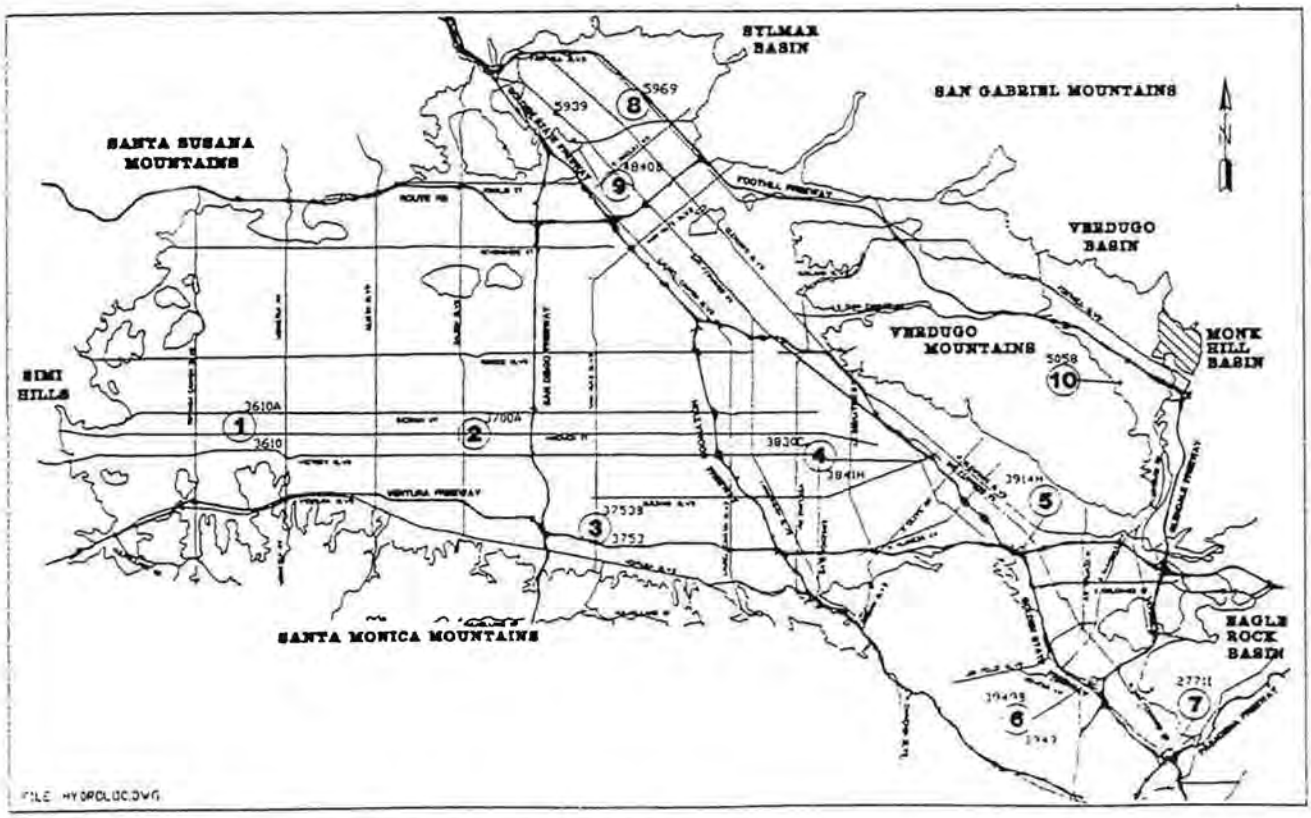


FIGURE 2.4 - HYDROGRAPHS OF WELLS THROUGHOUT ULARA AND WELL LOCATION MAP

2.10 Water Supply and Disposal - Basin Summaries

Tables 2-9A, 2-9B, 2-9C, and 2-9D summarize water supply and disposal in the San Fernando, Sylmar, Verdugo, and Eagle Rock Basin, respectively. The Watermaster made computations of subsurface outflows based on similar computations made by the State Water Rights Board in the Report of Referee.

2.11 Extraction Rights and Stored Water Credit - Basin Summaries

San Fernando Basin

Tables 2-10A and 2-11A show the calculation of San Fernando Basin extraction rights for the 1995-96 Water Year and stored water credit (as of October 1, 1995) for the Cities of Burbank, Glendale, and Los Angeles. All rights are based on the City of Los Angeles vs. City of San Fernando, et al., Judgment, dated January 26, 1979.

Sylmar Basin

Tables 2-10B and 2-11B show the calculation of Sylmar Basin extraction rights for the 1995-96 Water Year and stored water credit (as of October 1, 1995) for the Cities of Los Angeles and San Fernando. All rights are based on the March 22, 1984 stipulation between the City of San Fernando and the City of Los Angeles (filed with the Superior Court).

TABLE 2-8: CHANGE IN GROUND WATER STORAGE SAN FERNANDO BASIN

Water Year	Valley Floor Precipitation (Inches)	Change in Storage (AF)	Cumulative Change in Storage (AF)
1968-69	29.00	79,240	79,240 *
1969-70	10.50	(9,740)	69,500
1970-71	15.57	15,340	84,840
1971-72	8.10	(17,090)	67,750
1972-73	20.65	17,020	84,770
1973-74	15.75	(21,820)	62,950
1974-75	14.74	(22,580)	40,370
1975-76	9.90	(30,090)	10,280
1976-77	14.19	(50,490)	(40,210)
1977-78	35.43	136,150	95,940
1978-79	21.76	78,080	174,020
1979-80	30.25	99,970	273,990
1980-81	11.04	(32,560)	241,430
1981-82	17.18	(530)	240,900
1982-83	39.64	121,090	361,990
1983-84	9.97	(63,180)	298,810
1984-85	11.00	(31,690)	267,120
1985-86	20.27	(7,980)	259,140
1986-87	5.99	(31,940)	227,200
1987-88	18.62	(5,000)	222,200
1988-89	9.12	(30,550)	191,650
1989-90	8.20	(29,941)	161,709
1990-91	14.38	(14,122)	147,587
1991-92	30.05	411	147,998
1992-93	36.62	106,317	254,315
1993-94	10.19	(22,238)	232,077
1994-95	33.36	79,132	311,209
26 Year Average	18.57	11,526	

* Assumes storage as of October 1, 1968, to be zero.

TABLE 2-9A: SUMMARY OF 1994-95 WATER SUPPLY AND DISPOSAL
SAN FERNANDO BASIN
(acre-feet)

Water Source and Use	City of Burbank	City of Glendale	City of Los Angeles	City of San Fernando	All Others	Total
Extractions						
Municipal Use	2,590	53	55,478	—	1,121	59,242
Testing	0	0	0	—	—	0
Physical Solution (a)	298	400	—	—	—	698
Non-consumptive Use	—	—	—	—	347	347
Total	2,888	453	55,478	0	1,468	60,287
Imports						
LA Aqueduct Water	—	—	345,805	—		345,805
MWD Water	17,173	26,219	93,545	10	5,899 (c)	142,845
Groundwater from Sylmar Basin	—	—	2,311	3,113	—	5,424
Total	17,173	26,219	441,661	3,123	5,899	494,075
Reclaimed Water Use	2,480	633	3,245	0	1,066	7,424
Exports						
LA Aqueduct Water	—	—	168,898	—	—	168,898
MWD Water out of ULARA			46,519			46,519
to Verdugo Basin	—	2,684		—		2,684
Groundwater	—	—	53,783		—	53,783
Total	0	2,684	269,200	0	0	271,884
Total Delivered Water	22,541	24,621	231,184	3,123	8,433	289,902
Water Delivered to Hill and Mountain Areas	—	—	39,831	—	—	39,831
Water Outflow						
Surface (Sta. F-57C-R)	—	—	—	—	—	438,567
Subsurface	—	—	—	—	—	376
Sewage	4,233	15,955	71,000 (b)	1,984	—	93,172
Reclaimed Water to the LA River	6,127	—	—	—	—	6,127
Total	10,360	15,955	71,000	1,984	0	538,242

(a) Includes Valhalla (Burbank) and Forest Lawn (Glendale)
(b) Estimated from historic data.
(c) Las Virgenes Municipal Water District

TABLE 2-9B: SUMMARY OF 1994-95 WATER SUPPLY AND DISPOSAL
SYLMAR BASIN
(acre-feet)

Water Source and Use	City of Los Angeles	City of San Fernando	All Others	Total
Total Extractions	2,311	3,421	1 (a)	5,733
Imports				
LA Aqueduct Water	6,806	--	--	6,806
MWD Water	1,809		--	1,809
Total	8,615	0	0	8,615
Exports (transfers) Groundwater to the San Fernando Basin	2,311	3,113	0	5,424
Total Delivered Water	8,615	308	1	8,924
Water Outflow				
Subsurface	460 (b)	--	--	460
Sewage	830 (c)	179	--	1,009
Total	1,290	179	0	1,469

(a) Pumping for landscape irrigation by Santiago Estates. The overlying right of Meurer Engineering in the sale of this property 10/95 is under investigation by the Watermaster.

(b) Estimated in the Report of Referee.

(c) Estimated.

TABLE 2-9C: SUMMARY OF 1994-95 WATER SUPPLY AND DISPOSAL
VERDUGO BASIN
(acre-feet)

Water Source and Use	Crescenta Valley County Water District	City of Glendale	La Canada Irrigation District	City of Los Angeles	Total
Total Extractions	3,710 (a)	1,633	0	—	5,343
Imports					
LA Aqueduct Water	—	—	—	557	557
MWD Water	979	2,684	949	148	4,760
Total	979	2,684	949	705	5,317
Exports	0	0	0	0	0
Total Delivered Water	4,689	4,317 (b)	949	705	10,661
Water Outflow					
Subsurface to:					
Monk Hill Basin	—	—	—	—	300 (c)
San Fern. Basin	—	—	—	—	70 (c)
Sewage	1,679	1,096	0	190	2,965
Total	1,679	1,096	0	190	3,335

(a) Administrative Committee and Watermaster approval, on a temporary basis, that CVCWD may pump in excess of its prescriptive rights and until the city of Glendale is able to pump its complete prescriptive right. Appendix I.

(b) Verdugo Basin metered sales x 105%.

(c) Maximum with high groundwater levels (Report of Referee).

TABLE 2-9D: SUMMARY OF 1994-95 WATER SUPPLY AND DISPOSAL
EAGLE ROCK BASIN
(acre-feet)

Water Source and Use	City of Los Angeles	Deep Rock Water Company	McKesson Water Products Co.	Total
Total Extractions	0	0 (a)	198 (a)	198
Imports				
LA Aqueduct Water	0	--	--	0
MWD Water	3,869	--	--	3,869
Total	3,869	0	0	3,869
Exports				
Groundwater	0	0	198	198
Total Delivered Water	3,869	0	0	3,869
Water Outflow				
Surface	--	--	--	0
Subsurface	0 (b)	--	--	0
Sewage	1,940 (c)	0	0	1,940
Total	1,940	0	0	1,940

(a) Deep Rock Water Co. and McKesson Water Products Co. (formerly Sparkletts Drinking Water Co.) are allowed to pump under a stipulated agreement with The City of Los Angeles; extractions are limited to 500 AF/year, and they are allowed to export equivalent amounts.

(b) Estimated in Supplement No. 2 to Report of Referee for dry years 1960-61. Currently considered insignificant.

(c) Estimated.

TABLE 2-10A: CALCULATION OF 1995-96 EXTRACTION RIGHTS SAN FERNANDO BASIN

(acre-feet)

	City of Burbank	City of Glendale	City of Los Angeles
Total Delivered Water, 1994-95	22,541	24,621	231,184
Water Delivered to Hill and Mountain Areas, 1994-95	---	---	39,831
Water Delivered to Valley Fill, 1994-95	22,541	24,621	191,353
Percent Recharge Credit	20.0%	20.0%	20.8%
Return Water Extraction Right	4,508	4,924	39,801
Native Safe Yield Credit	---	---	43,660
Total Extraction Right for the 1995-96 Water Year (a)	**4,508**	**4,924**	**83,461**

(a) Does not include stored water credit.

TABLE 2-10B: CALCULATION OF 1995-96 EXTRACTION RIGHTS SYLMAR BASIN

(acre-feet)

	City of Los Angeles	City of San Fernando	All Others
Extraction Right for the 1995-96 Water Year (a)	3,105	3,105	(b)

(a) Does not include stored water credit. The safe yield of the Sylmar Basin is 6,210 acre-feet. Effective October 1, 1984 safe yield less pumping by two overlying parties, is equally shared by Los Angeles and San Fernando.

(b) Successor interest to overlying pumping rights Meurer Engineering by new property owners is being investigated. Santiago Estates (Home Owners Group) are pumping for irrigation.

TABLE 2-11A: CALCULATION OF STORED WATER CREDIT
SAN FERNANDO BASIN
(acre-feet)

	City of Burbank	City of Glendale	City of Los Angeles
1. Stored Water Credit (as of October 1, 1994)	55,810	44,457	265,943
1a. Physical Solution Payment	2,200		(2,200)
1b. Physical Solution Credit	802	1,112	
1c. Credit for 1993-94 Extraction	378		
1d. Credit for Spreading MWD Supply	2,000		(2,000)
2. Extraction Right for the 1994-95 Water Year	4,913	5,166	88,290
3. 1994-95 Extractions			
Party Extractions	2,590	144	55,478
Physical Solution Extractions	298	400	462
Total:	2,888	544	55,940
4. Total 1994-95 Spread Water	0	0	0
5. Stored Water Credit (as of October 1, 1995)	**63,215**	**50,191**	**294,093**

Note: Item 5 = 1+1a + 1b+1c+2 - 3 + 4

1a. Burbank exercized option for part on Physical Solution pumping and paid Los Angeles for 2200 AF.

1b. Credit for Physical Solution Pumping in 1978-1993 by Burbank (Valhalla) and Glendale (Forest Lawn) approved by the Administrative Committee 8/3/95.

1c. No charge against party extraction rights for pumping for testing purposes only. Credit for Burbank OU pumping deduction in 93-94.

1d. Burbank paid Los Angeles for delivery of MWD water in 1994-95 used for groundwater replenishment.

TABLE 2-11B: CALCULATION OF STORED WATER CREDIT
SYLMAR BASIN
(acre-feet)

	City of Los Angeles	City of San Fernando	All Others
1. Stored Water Credit (as of October 1, 1994)	2,704	2,359	—
2. Extraction Right for the 1994-95 Water Year	3,105	3,105	—
3. Total 1994-95 Extractions	2,311	3,421	1 (a)
4. Stored Water Credit (as of October 1, 1995)	**3,498**	**2,043**	—

Note: Item 4 = 1 + 2 - 3

(a) Santiago Estates pumping is under investigation.

3. WATER QUALITY, TREATMENT, AND REMEDIAL INVESTIGATION ACTIVITIES

3. WATER QUALITY, TREATMENT, AND REMEDIAL INVESTIGATION ACTIVITIES

3.1 Water Quality

Imported Water

1. Los Angeles Aqueduct 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 on record was 320 mg/L on April 1, 1946. TDS concentration on August 8, 1995 was 110 mg/L.

2. 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 high TDS concentration of 875 mg/L in August 1955 and a low of 625 mg/L in April 1959. The average TDS concentration over the 34-year period was approximately 740 mg/L. Tests conducted at Lake Matthews showed an average TDS concentration of 701 mg/L for the 1994-95 Fiscal Year.

3. 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 has had a high TDS concentration of 410 mg/L and a low of 247 mg/l. Tests conducted at the Joseph Jensen Filtration Plant showed an average TDS concentration of 338 mg/L during the 1994-95 Fiscal Year.

4. Colorado River/Northern California water were first blended at Weymouth Plant in May, 1975. 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 and is sodium-calcium, sulfate-bicarbonate in character. In September 1995, flows in the Los Angeles River at the Arroyo Seco showed a TDS concentration of 667 and a total hardness of 270 mg/L. These

values also reflect the inclusion of rising groundwater in the Los Angeles River reach between Los Feliz Blvd. and Gage F-57C-R.

Groundwater

Groundwater in ULARA is moderately hard to very hard. The character of groundwater 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 in character.

Groundwater is generally within the recommended limits of the California Title 22 Drinking Water Standards, except for: 1) areas of the eastern San Fernando Valley where high concentrations of TCE, PCE, and nitrates are present; 2) wells in the western end of the San Fernando Basin having excess concentrations of sulfate; and 3) areas throughout the Verdugo Basin and in various portions of the San Fernando Basin, where there are abnormally high concentrations of nitrate. In each area the groundwater delivered is either being treated or blended in order to meet State Drinking Water Standards.

A history of the TDS content in the various water sources and mineral analyses of imported, surface, and groundwaters are contained in Appendix F.

3.2 Groundwater Quality Management Plan

During the 1994-95 Water Year, the Interagency Coordinating Committee continued to implement the recommendations of the "Groundwater Quality Management Plan - San Fernando Valley Basins" issued in July 1983. The objective of this effort is to protect and upgrade the quality of stored water held in ULARA. Special emphasis is placed on monitoring and removing the organic contaminants Trichloroethylene (TCE) and Perchloroethylene (PCE) found in the groundwater. Table 3-1 summarizes the number of wells in the ULARA well fields exceeding the Maximum Contaminant Levels of the California Drinking Water Standards of 5 ppb for TCE and 5 ug/L for PCE.

TABLE 3.1 - 1994-95 NUMBER OF WELLS IN THE ULARA WELL FIELDS EXCEEDING CALIFORNIA STATE MCL FOR TCE AND PCE

	Number of Wells Exceeding Contaminant Level													
	City of Los Angeles									Sub-	Others			Grand
	NH	CS	P	HW	E	W	TJ	V	AE	Total	B	G	CVCWD	Total
TCE Levels ug/L														
5-20	8	X	0	0	2	2	3	1	0	16	0	3	0	19
20-100	6	X	3	5	0	4	0	0	6	24	5	4	0	33
>100	2	X	0	1	0	0	0	0	1	4	4	1	0	9
Total	16	X	3	6	2	6	3	1	7	44	9	8	0	61
PCE Levels ug/L														
5-20	6	X	0	3	0	1	0	1	0	11	1	2	1	15
20-100	1	X	3	1	0	0	0	0	1	6	3	0	0	9
>100	0	X	0	0	0	0	0	0	0	0	4	0	0	4
Total	7	X	3	4	0	1	0	1	1	17	8	2	1	28

Well Fields:
- NH - North Hollywood
- CS - Crystal Springs
- P - Pollock
- HW - Headworks
- E - Erwin
- W - Whitnall
- TJ - Tujunga (added this year)
- V - Verdugo
- AE - LADWP Aeration Tower Wells
- B - City of Burbank
- G - City of Glendale
- CVCWD - Crescenta Valley County Water District

Notes:
1) Wells are categorized based upon maximum TCE and PCE values attained during the 1994-95 Water Year, where data was not available for 1994-95, data from the most recent water year was used.
2) MCL: Maximum Contaminant Level
3) ug/L: Micrograms per liter

3.3 Underground Tanks, Sumps, and Pipelines

The City of Los Angeles Fire Department (LAFD) continues to implement the State-mandated Underground Storage Tank Program (UST) and is actively carrying on a program to bring the large number of underground tanks in the San Fernando Valley into compliance with current law. During the 1994-95 Water Year, a total of 116 sites were remediated under the direction of the LAFD.

The main focus of the LAFD UST in ULARA has been the monitoring and removal of gasoline, diesel, and their related constituents from the soils, in order to prevent contamination of the underlying groundwater. If a site investigation indicates contamination, the site is referred to the Los Angeles Regional Water Quality Control Board (RWQCB) for further action. Since October 1, 1988, 2,497 sites have been assigned to the Underground Tank Plan Check Unit and of these, 1,040 have been remediated. In addition 727 sites have been referred to the RWQCB.

3.4 Private Sewage Disposal Systems (PSDS)

In order to eliminate existing commercial and industrial PSDS and their discharges of wastewater to the groundwater basin, a sanitary sewer construction program has been in progress for many years. This program is continuing to systematically install sanitary sewers in eighteen designated areas throughout the San Fernando Valley. At the end of the 1994-1995 water year, a total of twelve areas have had construction completed, and six areas are in various stages of right-of-way acquisition and processing. Plate 8 shows the locations of the Districts.

The Industrial Waste Management Division (formerly the Enforcement Division) of the Bureau of Sanitation continued to pursue the enforcement aspect to the PSDS elimination program. There had been good compliance with the mandatory sewer hook-up ordinance and more than one thousand properties have already abandoned PSDS and connected to the public sewer.

A group of 120 owners of PSDS were recently notified of the requirement to discontinue use of their PSDS and connect to newly constructed sanitary sewers. There has been good compliance with the mandatory sewer hookup ordinance and more than 1,100 properties have already abandoned PSDS and connected to public sewer.

3.5 Landfills

Solid Waste Assessment Test (SWAT) reports, for major SWAT Rank 1 to 4 landfills in the Los Angeles area have been completed and submitted to the RWQCB for approval. The reports reviewed by RWQCB are listed in Table 3-2.

As stipulated by Article 5 of Chapter 15, a follow-on sampling program under an Evaluation Monitoring Plan was required for some landfills due to the presence of volatile organic compounds in the underlying groundwater.

The SWAT report of the Pendleton landfill, owned by the Water System of the Los Angeles Department of Water and Power (LADWP) was approved by the RWQCB subject to two additional semiannual monitorings to verify the results of program testing. The latter monitorings have been completed and the results submitted to the RWQCB.

3.6 San Fernando Valley Remedial Investigation (RI) and Related Activities

A remedial investigation (RI) of groundwater contamination in the San Fernando Valley was initiated in July 1987 by the United States Environmental Protection Agency (EPA) to characterize the San Fernando Basin (SFB) and the Verdugo Basin and their contamination with TCE and PCE. The LADWP was selected by the EPA to serve as the its lead agency in conducting the RI and entered into a cooperative agreement that has provided over $21 million in federal funding to LADWP since July 1987. In August 1987, the LADWP selected James M. Montgomery, Consulting Engineers, Incorporated (JMM) to serve as its consultant to perform various RI tasks.

The report, "Remedial Investigation of Groundwater Contamination in the San Fernando Valley," was completed in December 1992 and is a comprehensive, five-volume report which presents the findings and characterizations of the SFB and the Verdugo Basin with regard to their geology, hydrogeology, and nature and extent of contamination. The RI report also provides a description and the documentation of the SFB Groundwater Flow Model, summarizes the RI field investigation activities, and evaluates potential risks to human health and the environment.

The SFB Groundwater Flow Model was developed as a part of the San Fernando Valley Remedial Investigation and is a comprehensive, three-dimensional, regional-scale model. A three-

TABLE 3-2: LANDFILLS WITH SWAT INVESTIGATIONS

(reported to Interagency Coordinating Committee)

Name	Rank	Status	Current Owner	Location	SWAT Report Completed	Final SWAT Submitted	Phase II SWAT Required	Approved by RWQCB	Site Leak	Type of Emission	Further Groundwater Monitoring
Bradley West	1	Open	WMDSC	Sun Valley, Southeast of Sheldon Street	6/87	11/90		4/92	Y/G	NHA i/o	d
Sheldon-Arleta	1	Closed	City of Los Angeles Bureau of Sanitation	Sun Valley District Near Hollywood & Golden State Freeways	5/87	5/87		2/90	U		b
Scholl Canyon	1	Open	City of Glendale	San Rafael Hills, 1 mile West of Rose Bowl.	7/87	4/88		8/90	Y/G	NHA i	d
Scholl Canyon	2	Closed	City of Glendale	San Rafael Hills, 1 mile West of Rose Bowl	7/87	1/91		12/93	P		c
Bradley East	2	Closed	WMDSC	Southeast of Sheldon St.	6/87	11/90		4/92	Y/G	NHA i/o	b*
Sunshine Cyn	2	Closed	Browning - Ferris Industries	Southeast Santa Susana Mtns. West of Golden State Fwy.	7/88	7/89		4/94			a
Gregg Pit/Bentz	2	Closed	Cal Mat Properties	Between Pendleton Street and Tujunga Ave	7/89	7/89		2/90	Y/G	NHA	b
Branford	2	Closed	City of Los Angeles Bureau of Sanitation	Sun Valley District Northwest of Tujunga Wash	7/88	10/90	X				c
Cal Mat (Sun Valley #3)	2	Open	Cal Mat Properties	Sun Valley District Northeast of Glenoaks Blvd	7/88	11/90		6/92	N		e
Lopez Canyon	2	Open	City of Los Angeles Bureau of Sanitation	North of Hansen Dam Between Lopez and Kagel Cyn.	6/88	6/88	X				a
Toyon Canyon	2	Closed	City of Los Angeles Bureau of Sanitation	Griffith Park	6/88	3/89		4/91	Y/L	NHA i	b*
Tuxford Pit	2	Closed	Aadlin Bros. (Los Angeles By-Products Co.)	Sun Valley District Southwest of Golden State Freeway and Tujunga Ave.	6/88	12/90		6/92	P		b*
Penrose	2	Closed	Los Angeles By-Products Co.	N. of Strathern St., Tujunga Ave.	6/88	7/89		9/89	Y/G	NHB i/o	b
Newberry	3	Closed	Los Angeles By-Products Co.	N. of Strathern St., Tujunga Ave.	6/88	7/89		9/89	Y/G	NHB i/o	b
Hewitt Pit	2	Closed	Cal Mat Properties	North Hollywood District Hollywood Fwy., Laurel Canyon Blvd.	6/88	7/89		5/91	Y/G	NHB i	
CalMat (old) Bradley Land-fill Complex	3	Closed	WMDSC	Sun Valley District Sheldon St., San Fernando	7/88	7/89		4/92	Y/G	Inert Site	b*
Pendleton St.	4	Open	Department of Water & Power	Sun Valley intersection Pendelton St., Glenoaks Blvd.	7/90	5/91		6/92	N		c
Stough Park	2	Open	City of Burbank	Bel Air Dr. & Cambridge Dr.	6/88	12/88		4/90	Y/G	NHA	a*

* Groundwater contamination Evaluation Monitoring Program (EMP) required under chapter 15.

(a) All open landfills are required to have groundwater monitoring under Chapter 15. Monitoring results are submitted to the Regional Board quarterly.

(b) Closed landfills with groundwater monitoring required under Chapter 15. Monitoring results are submitted to the Regional Board periodically

(c) Subject to SWAT requirements. Further monitoring may be required under Chapter 15

(d) Under Chapter 15 Corrective Action Program (CAP), after completion of EMP.

(e) Semi-annual groundwater monitoring

(i) Inorganic (o)- Organic

U - Undetermined due to dry wells

Y - Yes N - no G- gas L-liquid

P - Pending leakage determination.

NHA - Non-Hazardous but above state drinking water regulatory levels, H - Hazardous waste based on Title 22, CCR.

NHB - Non-Hazardous but below state drinking water regulatory levels., H - Hazardous waste based on Title 22, CCR.

dimensional mass transport model is being developed for the SFB. The model has been utilized for the East Valley Water Recycling Project and other groundwater remediation projects to analyze the storage, characteristics, and quality of groundwater in the SFB.

EPA's consultant, CH2M HILL, continues to periodically sample the 87 groundwater monitoring wells that were installed as part of the RI. CH2M HILL also obtains groundwater quality and groundwater elevation data from the LADWP, other municipalities, and various agencies and facilities in the San Fernando Valley to update the SFB database. CH2M HILL utilizes the data to produce contaminant plume maps.

The RI Report and semi-annual sampling reports are available for public use at the Superfund Primary Information Repositories, which are located in the following agencies' libraries: City of Glendale, City of Burbank, LADWP, California State University-Northridge, and the University of California - Los Angeles.

The LADWP also maintains a current SFB database for use with the SFB flow model and generation of groundwater contour maps and contaminant plume maps. CH2M HILL forwards current groundwater quality data for incorporation into the LADWP database.

3.7 Water Treatment

EPA Operable Units

The EPA is proceeding with enforcement actions against potentially responsible parties (PRPs) for the North Hollywood, Burbank, Glendale North, and Glendale South Operable Units (OUs), which are part of the EPA's overall, long-term groundwater remediation activities in the San Fernando Valley. The OUs are described below.

1. North Hollywood OU - The North Hollywood OU which was funded by USEPA and DHS, continued to operate satisfactorily during the 1994-95 water year, treating a total of 550 million gallons (1,688 acre-feet) of groundwater.

2. Burbank OU - Lockheed started pumping and delivering groundwater to Burbank on January 3, 1996, pursuant to Phase I of the Consent Decree. The flows range from 3,000 gpm to 6,000 gpm. The nitrates range from 42 - 60

mg/L with an average of 50 mg/L. The treated water is blended with MWD water to reduce the nitrates to approximately 33 mg/L which is an acceptable level under the Consent Decree. An average of 500 acre feet per month of groundwater is currently being pumped; the effluent has non-detectable levels for all VOCs. Phase II of the project is slated for completion in 1998 and is planned to increase the pumping capacity to 9,000 gpm. The City of Burbank is working with Los Angeles and Glendale to determine whether they can accept some portion of the additional treated groundwater. The EPA has decided to eliminate Phase III of the Consent Decree which would have increased the total pumping to 12,000 gpm. The additional 3,000 gpm pumping was intended to be reinjected.

3. Glendale North and Glendale South OUs - The City of Glendale and the DreamWorks Inc. have reached an agreement for the development of the original proposed treatment site, the Crystal Springs Yard, as an animation studio. The treatment plant will be relocated to city property at the Glendale Recyling Center approximately 500 feet from the previously proposed location. One additional well to a deeper zone will be drilled to increase the total project water to 5,000 gpm. This will result in a significant reduction of the nitrate level in the processed water. The change in site has delayed the process by three to four months. The revised schedule proposes a construction date beginning the Fall of 1996.

4. Pacoima Area Investigation

A potential groundwater contaminant plume has been identified in the Pacoima district near the intersection of the Simi (118) Freeway and San Fernando Road (Plate 7). The contaminant plume is comprised of volatile organic carbon compounds (VOCs) with levels upward of 12,000 ug/L of TCE, 3,900 ug/L of PCE and 7,600 ug/L of 1,1,1-TCA. These sites are approximately 3.5 miles upgradient of LADWP's Tujunga wellfield. The Tujunga Wellfield can supply up to 120 cfs of groundwater and is presently not significantly impacted by solvent contamination. LADWP is working in cooperation with the RWQCB, Cal-EPA Department of Toxics Substance Control, the USEPA, and the Watermaster's Office to develop a plan to further investigate the extent and nature of the contaminant plumes that exist near the identified companies: Kleinert Industries, Inc., Price Pfister, Inc., and

Holchem, Inc. LADWP plans to install at least two monitoring wells downgradient of these three sites to enhance the contaminant characterization and provide an early warning detection system for the Tujunga Wellfeld. The monitoring well data will assist the RWQCB and Cal-EPA in their enforcement actions.

Other Treatment Facilities

1. Advanced Oxidation Process (AOP) Plant - During the spring of 1995, LADWP conducted eight operational test series in which TCE and PCE concentrations were introduced into the plant influent water at levels up to 477 ug/L TCE and 163 ug/L of PCE. The AOP Plant demonstrated its strong treatment capability by decomposing both TCE and PCE in the influent down to below MCL in the Plant effluent. The AOP by-products in the Plant effluent were mostly not detected or negligible except for Assimilable Organic Carbon and bromate. The findings of this investigation are expected to increase confidence in ozone/hydrogen peroxide technology for the removal of VOCs in groundwater for drinking purposes.

2. Glendale-Verdugo Park Water Treatment Plant (VPWTP) - The City has completed construction of the Verdugo Park Water Treatment Plant. This facility is expected to be operational in the summer of 1996. This facility will have a capacity of 1,150 gpm and will treat water from the two new low capacity wells (referred to as Verdugo Wells A & B) and the water supplies in the old Verdugo Pickup horizontal infiltration system. The three existing wells and the VPWTP alone will not permit the use of the City's rights of 3856 acre feet per year to the basin supplies. Additional extraction capactiy in the Verdugo Basin will be required. The existing wells and VPWTP will produce about 2,700 acre-feet/year; the remaining 1,000 acre-feet will come from other basin sources not currently identified.

3. Glenwood Nitrate Water Treatment Plant - The Crescenta Valley County Water District's Glenwood Nitrate Water Treatment Plant, which uses an ion-exchange process for nitrate removal, continued to operate satisfactorily during

the water year 1994-95. A total of 530 million gallons (1,627 acre-feet) of groundwater was treated.

4. Pollock Well Field Remediation Project - The start of the construction phase of the Pollock Wells Treatment Plant, planned to treat 3,000 gallons per minute of groundwater, is slated for August 1996. The Pollock Project's main focus is to reduce rising groundwater flowing past gaging station F-57C-R. The groundwater will be processed through liquid-phase granular activated carbon (GAC) vessels intended for VOC removal, followed by blending of the chlorinated groundwater to reduce nitrate levels. The processed water will then be delivered to LADWP's distribution system. The pumping pattern, through two existing wells, will be for a period of six-months each year.

5. Headworks Well Field Remediation

   The reactivation of the Headworks wellfield is in the conceptual planning stage. The development of the alternatives analysis will contemplate all available treatment technology, including AOP processes, such as ozone and hydrogen peroxide, ultra-violet with hydrogen peroxide, and more conventional processes, such as Aeration and liquid-phase GAC. The project goal is to restore the use of a combination of six wells combining for a flow of approximately 14,000 gpm. Present characterization of the aquifer shows that TCE and PCE concentrations are approximately 200 ug/L and 100 ug/L, respectively.

6. Burbank GAC Treatment Plant - The City of Burbank Lake Street GAC System allowed 2,590 acre feet of water to be processed in 1994-95 from the combined pumping of Burbank Wells No.7 and No.15. Treatment Plant production will be reduced beginning in the water year 1995-96 in order to comply with the EPA Consent Decree project.

3.8 Groundwater Quality Investigations

During the 1994-95 Water Year, several groundwater contamination investigations were performed at various sites. As part of these investigations groundwater monitoring wells have

been drilled and groundwater has been extracted for the purpose of well development, testing or cleanup. Some of the major sites and their activities through April 1996 are summarized below:

Philips Components

Groundwater remediation, which involves extraction, air-stripping, and recharge through a trench was started in July 1988. The main contaminant in methylene chloride (MEC) which has been found only in Extraction Well (EW-1), and in a nearby monitoring well (MW-19). Concentrations of MEC have decreased by two orders of magnitude since July 1988. During 1994-95, 80 acre-feet were pumped, treated and recharged. The TCE and PCE present in most of the monitoring wells is believed to originate off-site, to the north. During November 1995, three air sparging and two soil vapor extraction wells were installed near extraction well EW-1. The system's operation is expected to expedite the removal of residual methylene chloride from the localized area. Redevelopment and installation of a new well pump at EW-1 raised the well yield from 45 gpm to 65 gpm.

Rockwell-Rocketdyne (Canoga Park)

Contaminants include chloroform, TCE, PCE, 1,1-DCE, TCA and Freon 113. There are also free-floating hydrocarbons derived from several upgradient service stations. There are 85 monitoring wells--65 in the shallow zone, 14 in the upper zone, and 6 in the lower zone. Additionally there are another 31 monitoring wells near the four upgradient service stations. Nine extraction wells feed a treatment facility in the southeast portion of the property. During the 1994-95 Water Year, about 325 acre-feet were pumped. A soil investigation workplan is being prepared for the site to be submitted to the LARWQCB. Groundwater re-use options are being evaluated including: onsite cooling towers, a roof cooling system, and reinjection.

3M (Formerly Riker Lab)

The main pollutant is chloroform. There has been a groundwater extraction and treatment system since 1988. REW-1 and REW-2 pump from the shallow zone and RMW-1 from the lower water-bearing zone. There are numerous monitoring wells on the property, and off-site to the south. Treatment is by three GAC columns in series, thence to an on-site holding tank. The pumping rate of the three wells is demand driven for the cooling tower. During the 1994-95 Water Year the amount pumped through the interim groundwater treatment system was 13 acre-feet. A soil vapor extraction system has been installed and start-up is anticipated in 1996. Acetone levels have been below NPDES requirement which allows eliminating the polishing pond. Start up for the groundwater treatment facility is expected within the first or second quarter of 1996.

Allied-Signal (Formerly Bendix Corp.)

The only VOC that was detected above 5µg/ L was TCE in three of the ten monitor wells. Nitrates are in the range of 27-76 mg/L. There is no remediation system. Allied-Signal was named a potentially responsible party (PRP) by the EPA for the Burbank OU. Allied Signal is continuing to negotiate with the EPA regarding its share of the Superfund cleanup costs.

Hughes (Canoga Park)

The most prominent contaminant is 1,1-DCE with lesser amounts of TCE, PCE, TCA, and 1,1-DCA. Petroleum compounds (BTEX) are found in the northwest area (buildings 269 and 270). TDS is in excess of the Basin Plan objectives, and may not be discharged to the Los Angeles River, even though the origin of the high TDS is related to the naturally occurring groundwaters. As a result of the high TDS, the treatment plant effluent is stored in holding tanks, and used for on-site irrigation. 16 of the 17 wells pump approximately 8,500 gallons per day into the tank.

Greeff Fabrics (Formerly Wickes)

The main contaminant from an on-site source is chlorotoluene. Other plumes from off-site sources are mostly TCE and PCE. There are three extraction wells. The pumped water is treated by chemical oxidation and returned to the groundwater via a percolation trench. As a result of decreased efficiency in the percolation trench to accept treated water, the trench acceptance rate dropped to approximately 9 gpm by April 1995. Greeff Fabrics was granted permission to expand the percolation trench approximately 25 feet east of the existing trench in May 1995 by the RWQCB. The new trench has resulted in significantly increased ability to percolate water back into the ground. Percolation rates are typically running at approximately 15 gpm. The RWQCB granted closure of soil remediation activities in October 1995 because of low concentrations of VOCs. 35 acre-feet of groundwater have been extracted, treated, and discharged to the percolation trench since the Ground Water Extraction and Treament System was started in March 1993.

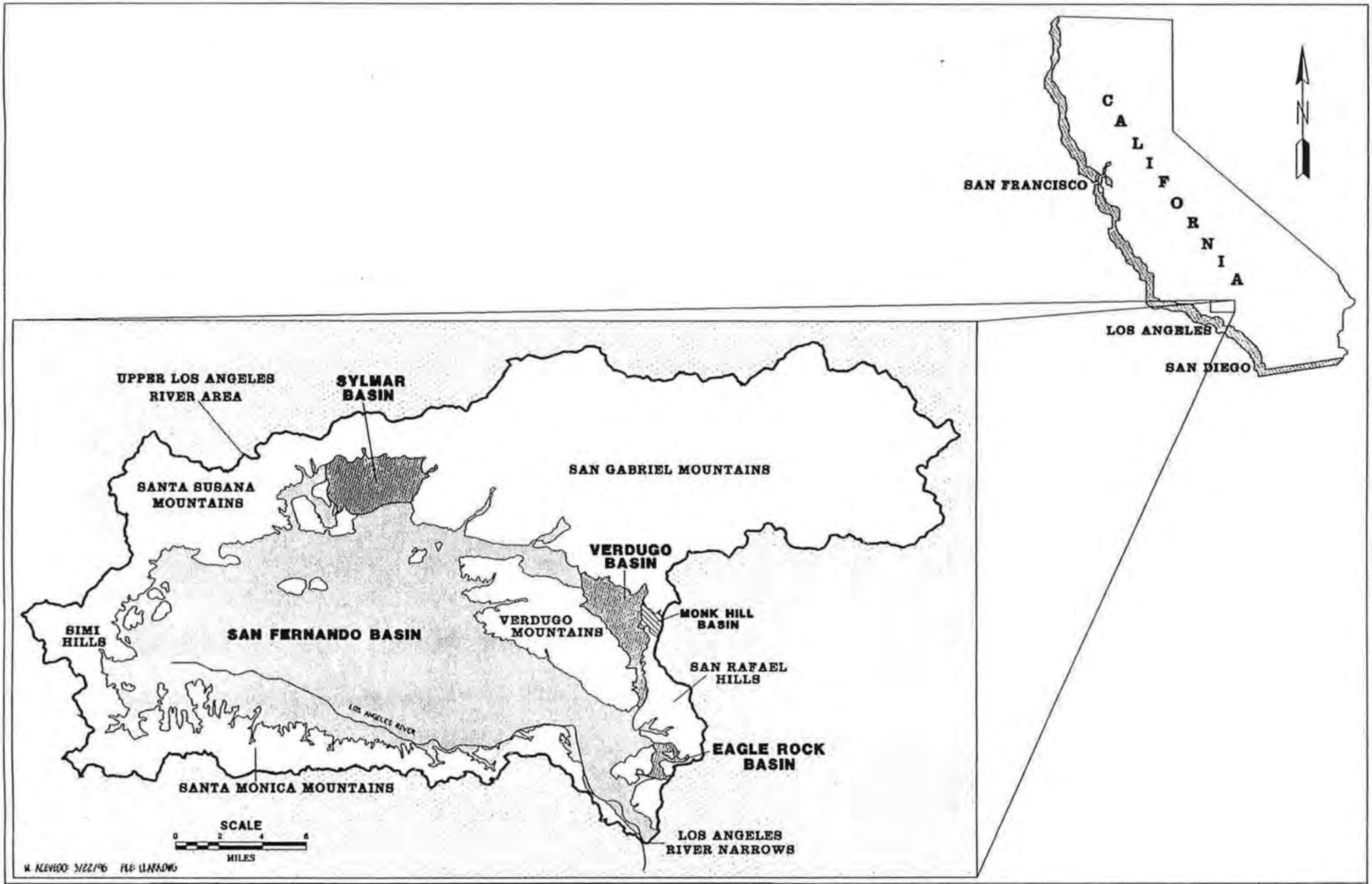
Taylor Yard (Narrows Area)

The remediation of the Taylor Yard of the Southern Pacific Transportation Company is under the jurisdiction of the Department of Toxic Substances Control (DTSC) of the California Environmental Protection Agency (Cal-EPA). To expedite the remediation, the Taylor Yard has been divided in two parts - active yard and sale parcel. Part of the Taylor Yard was sold to Metropolitan Transportation Authority (MTA) for an MTA industrial facility. The two areas of contamination previously reported are in the northern part of the Taylor Yard and in the northeast section. The LADWP's Pollock well project will be controlling the north section plume of VOCs.

There is a contaminated zone along a portion of the NE property line near San Fernando Road that has impeded effective cleanup activities. There is no apparent source of the oil found on site. There is an area, approximately one acre in size, that contains a free oily product at a depth of approximately 30 feet below the ground surface, with the depth to groundwater at 40 feet. A survey with a rapid optical survey tool is being conducted to evaluate the actual extent of the oily material and establish requirements to meet cleanup goals. Phase II will require the installation of additional wells. The Department of Toxic Substances Control reports that there is no clear evidence that the Southern Pacific Transportation Company is responsible for the spill found with the Taylor Yard.

The field investigation report will consist of four phases:
Phase 1: Initiation of groundwater monitoring
Phase 2: Vapor probe survey
Phase 3: Hydro punch and soil boring
Phase 4: Focused groundwater investigation

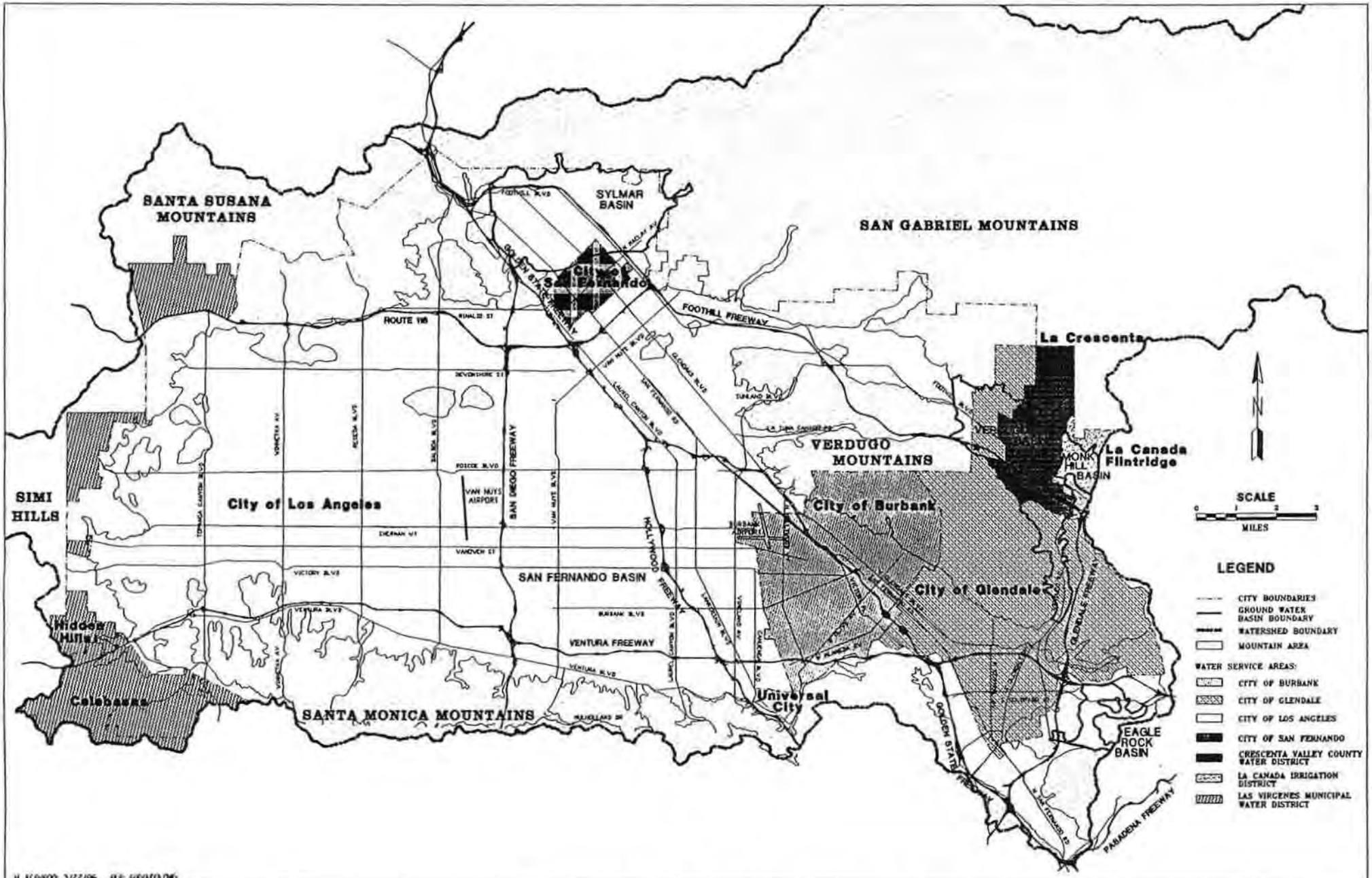
PLATES



1994-95 Water Year ULARA Watermaster Report

Upper Los Angeles River Area: Vicinity and Location Map

PLATE 1

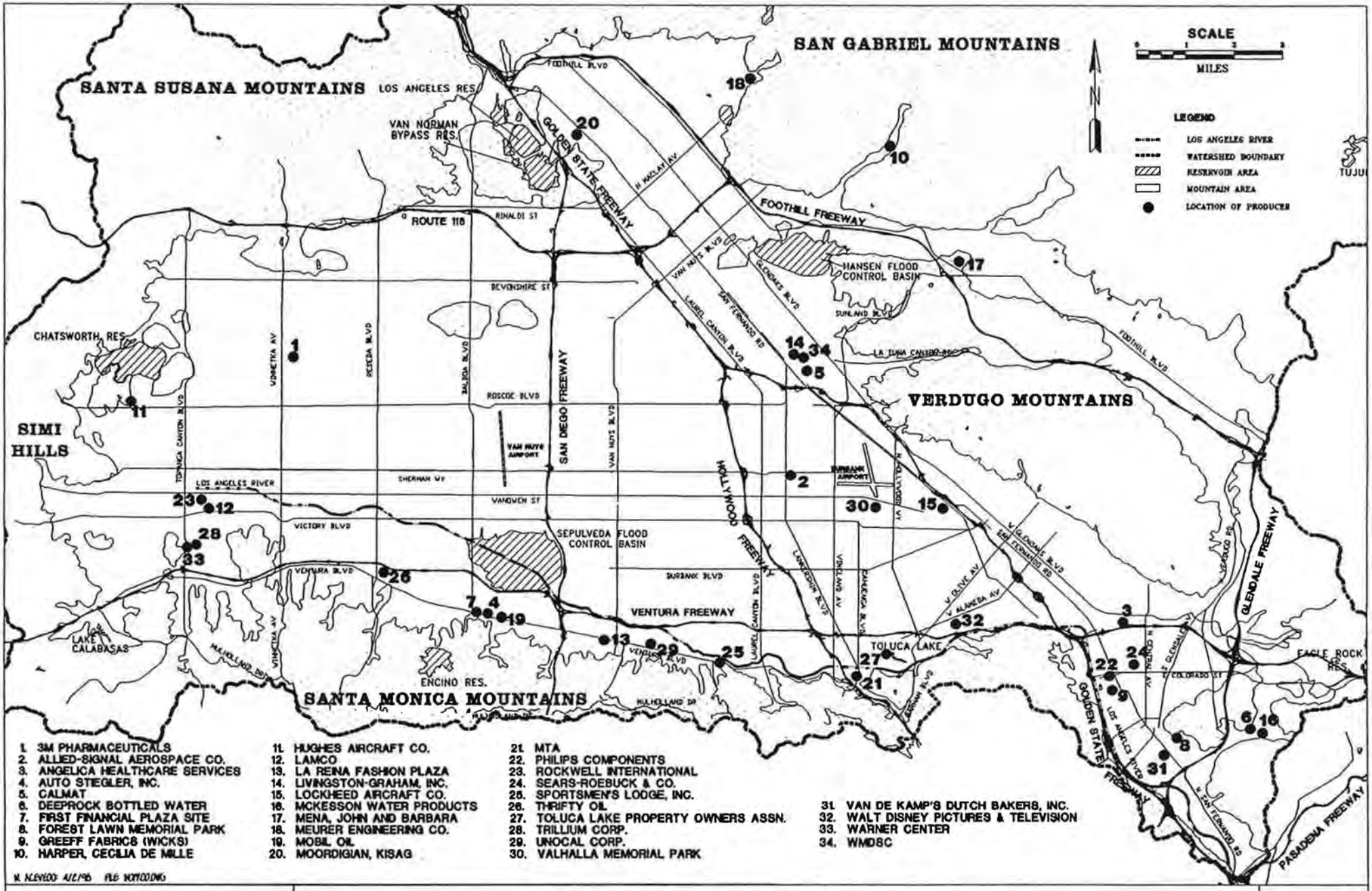


M. KLEVEDO 3/22/96 FILE: SERVAREA.DWG

1994-95 Water Year
ULARA Watermaster
Report

Upper Los Angeles River Area:
Water Service Areas of Public Agencies

PLATE 2



1994-95 Water Year
ULARA Watermaster Report

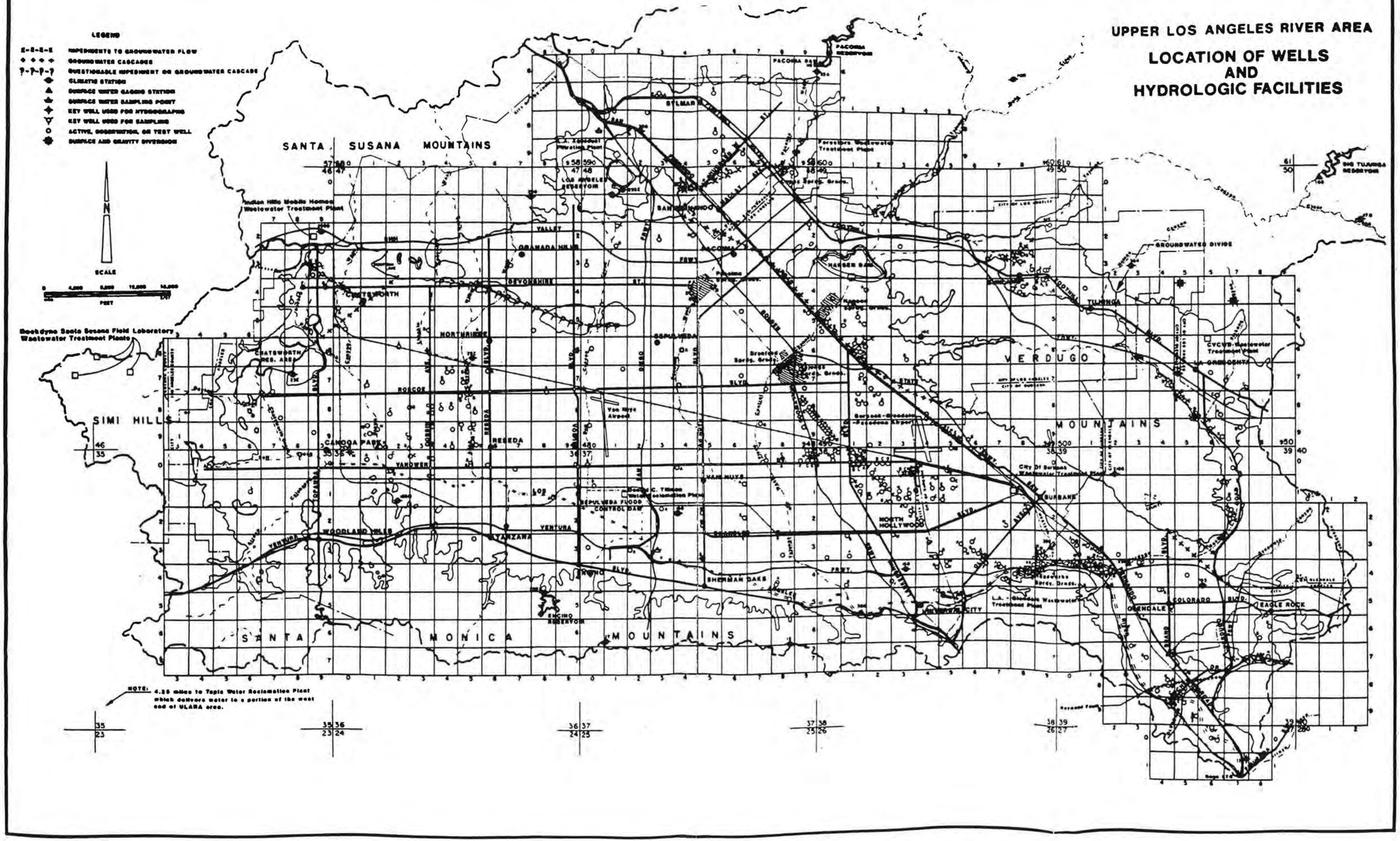
Upper Los Angeles River Area: Locations of Individual Producers

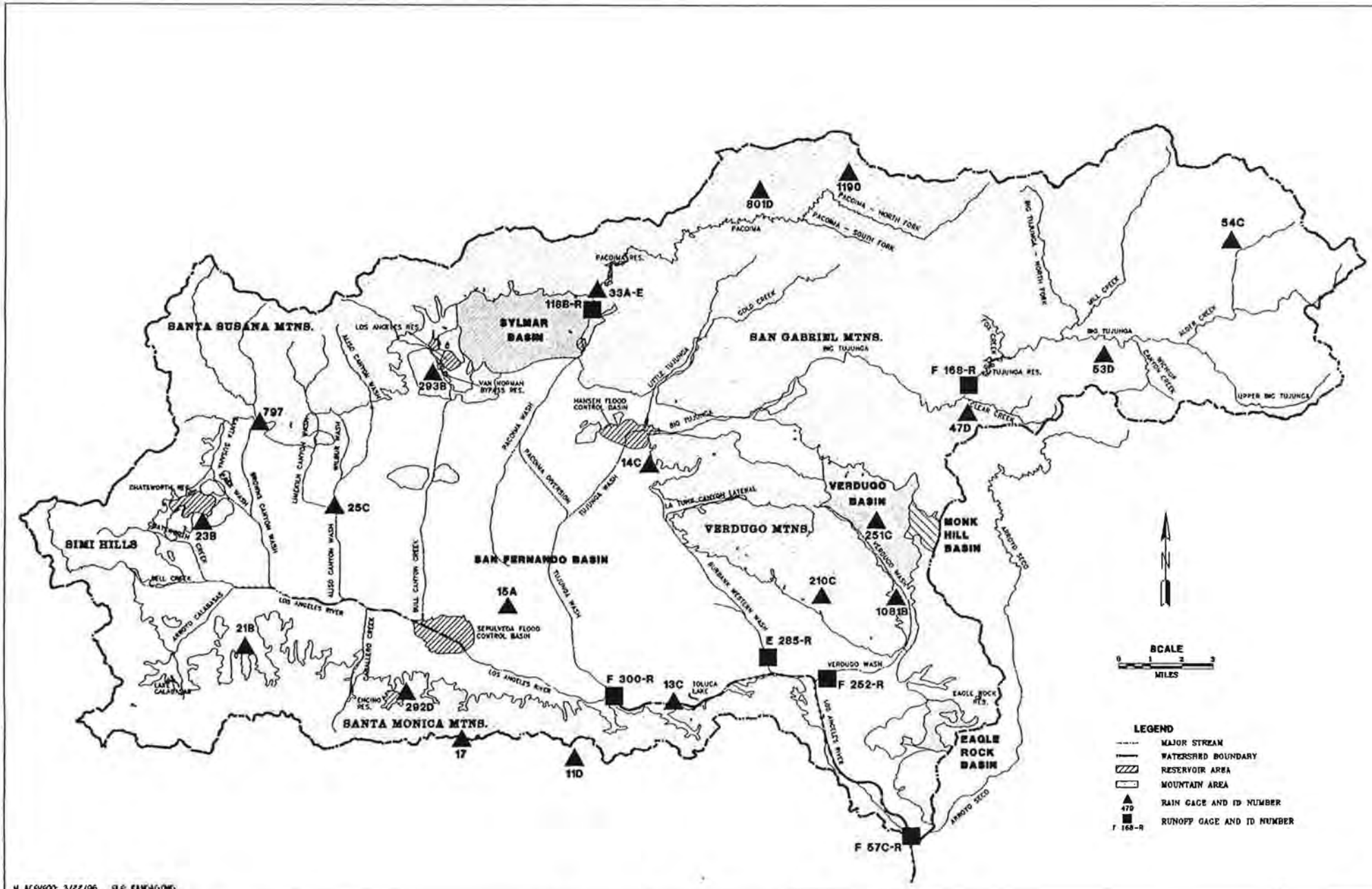
PLATE 3

PLATE 4

UPPER LOS ANGELES RIVER AREA

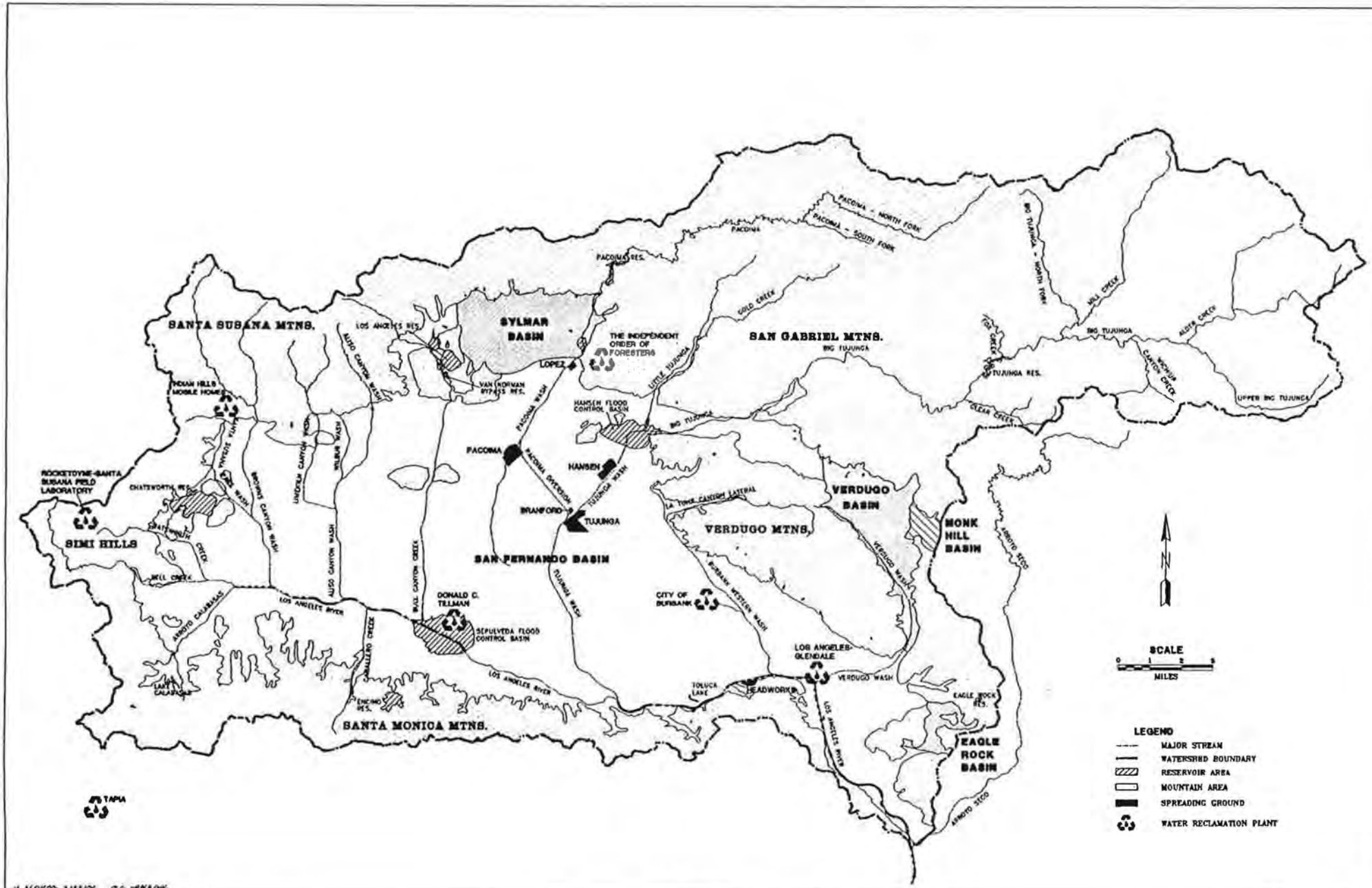
LOCATION OF WELLS AND HYDROLOGIC FACILITIES





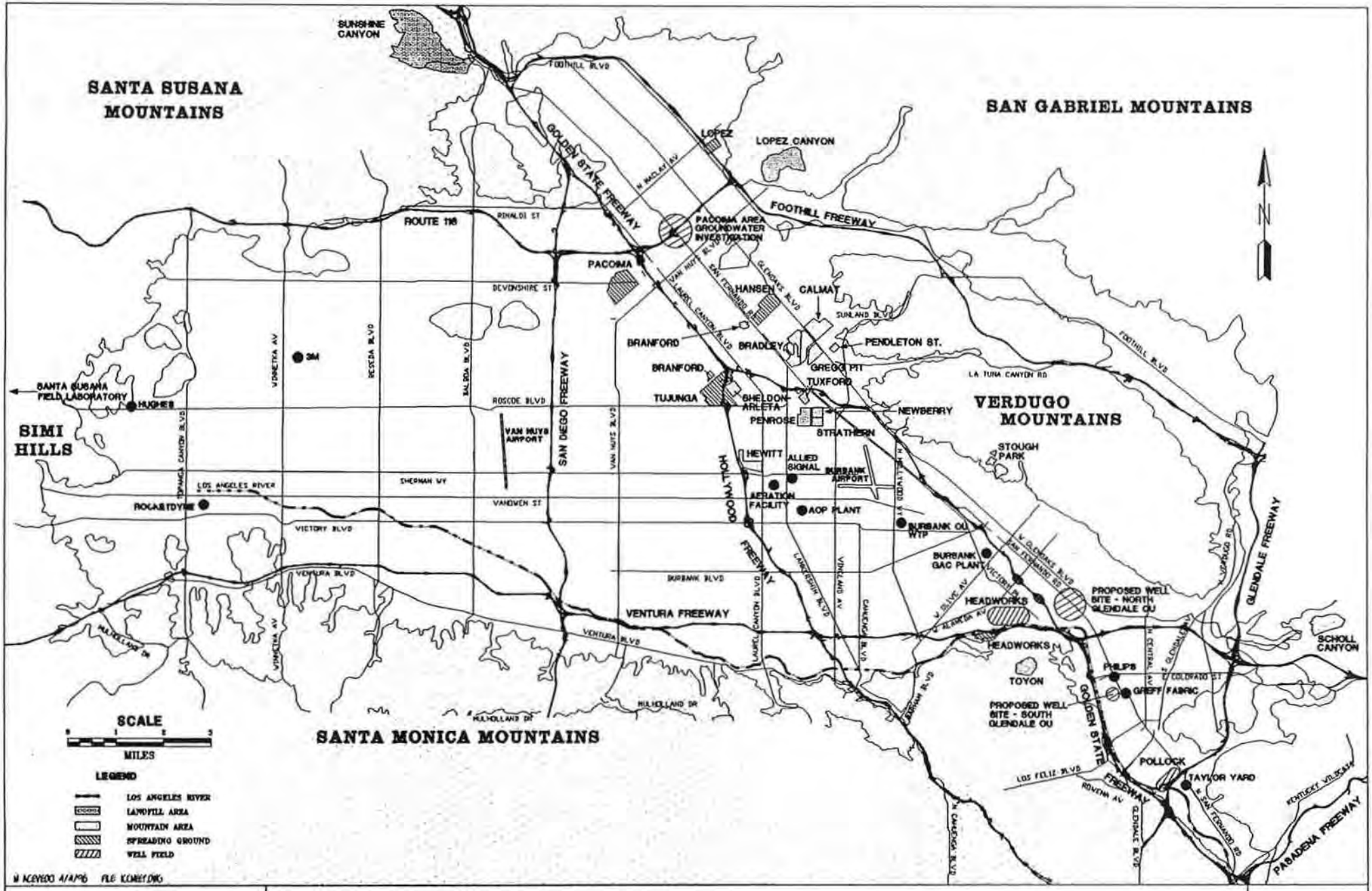
M. ACEVEDO 3/22/96 FILE: RAINGAGE

1994-95 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Locations of Rain and Runoff Measuring Stations	PLATE 5



M. ACEVEDO 3/22/96 FILE: WMBDWG

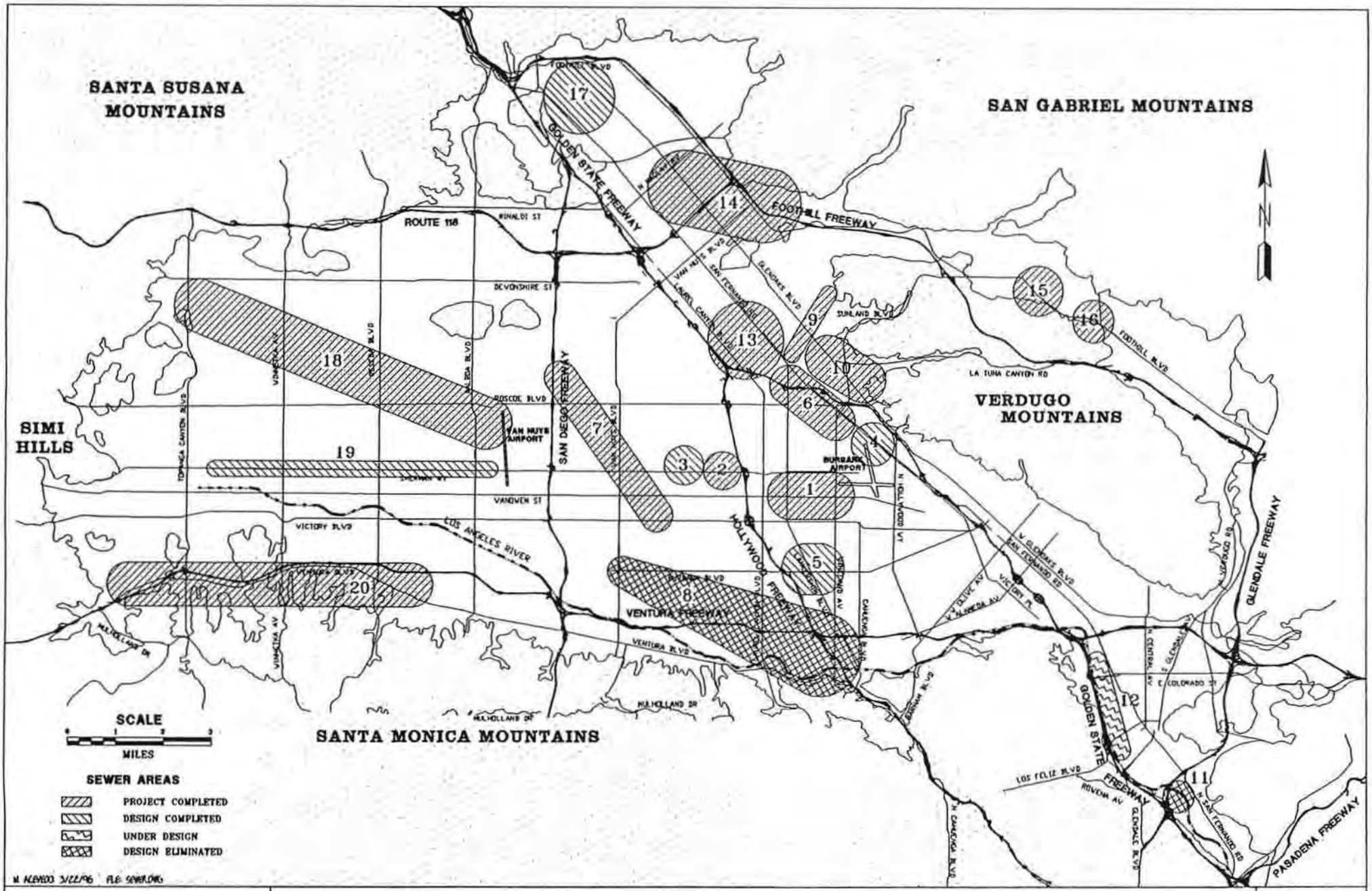
1994-95 Water Year ULARA Watermaster Report	Upper Los Angeles River Area: Spreading Basins and Water Reclamation Plants	PLATE 6



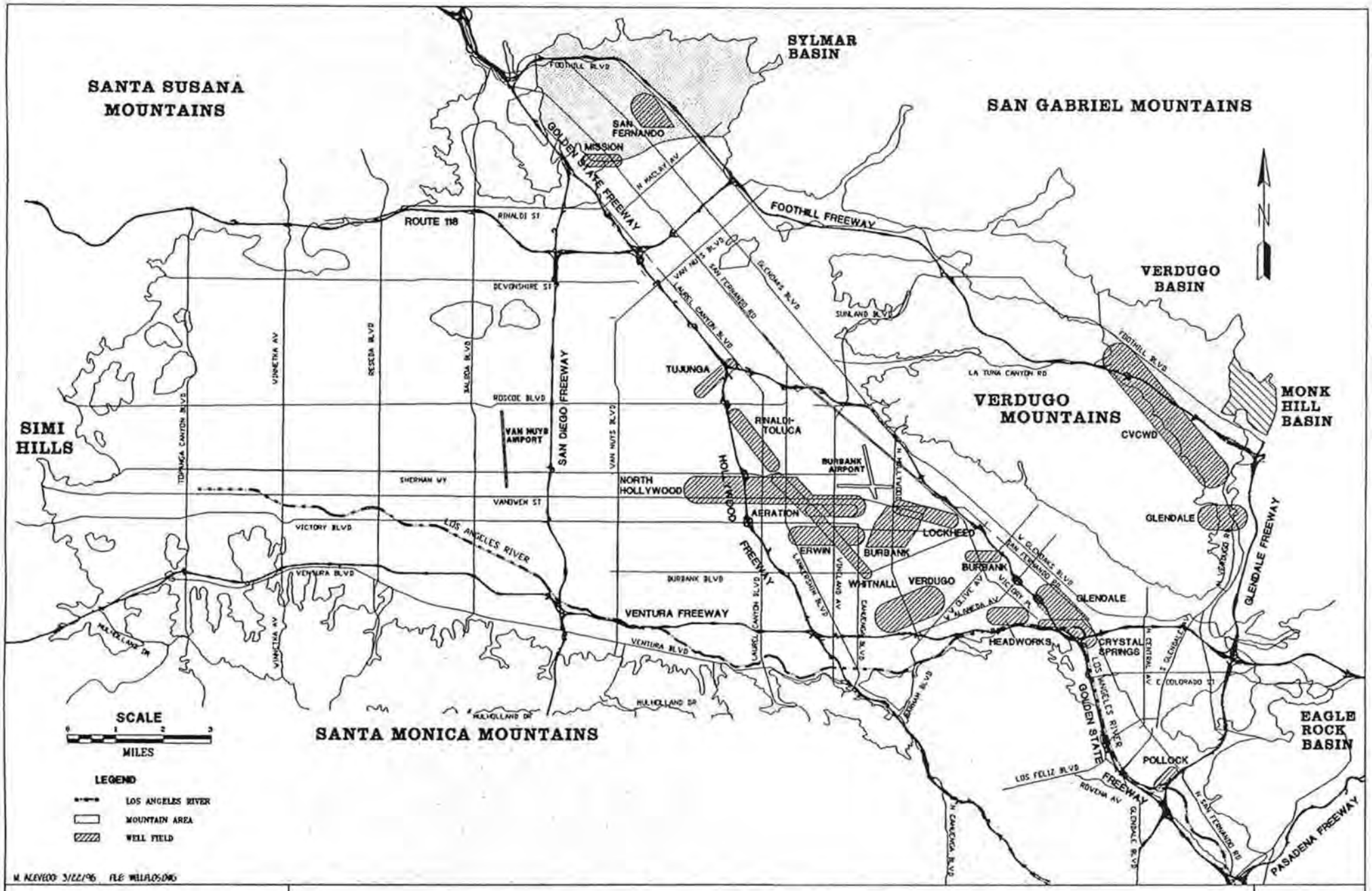
1994-95 Water Year
ULARA Watermaster Report

RELEVANT SITE AND LANDFILL LOCATIONS

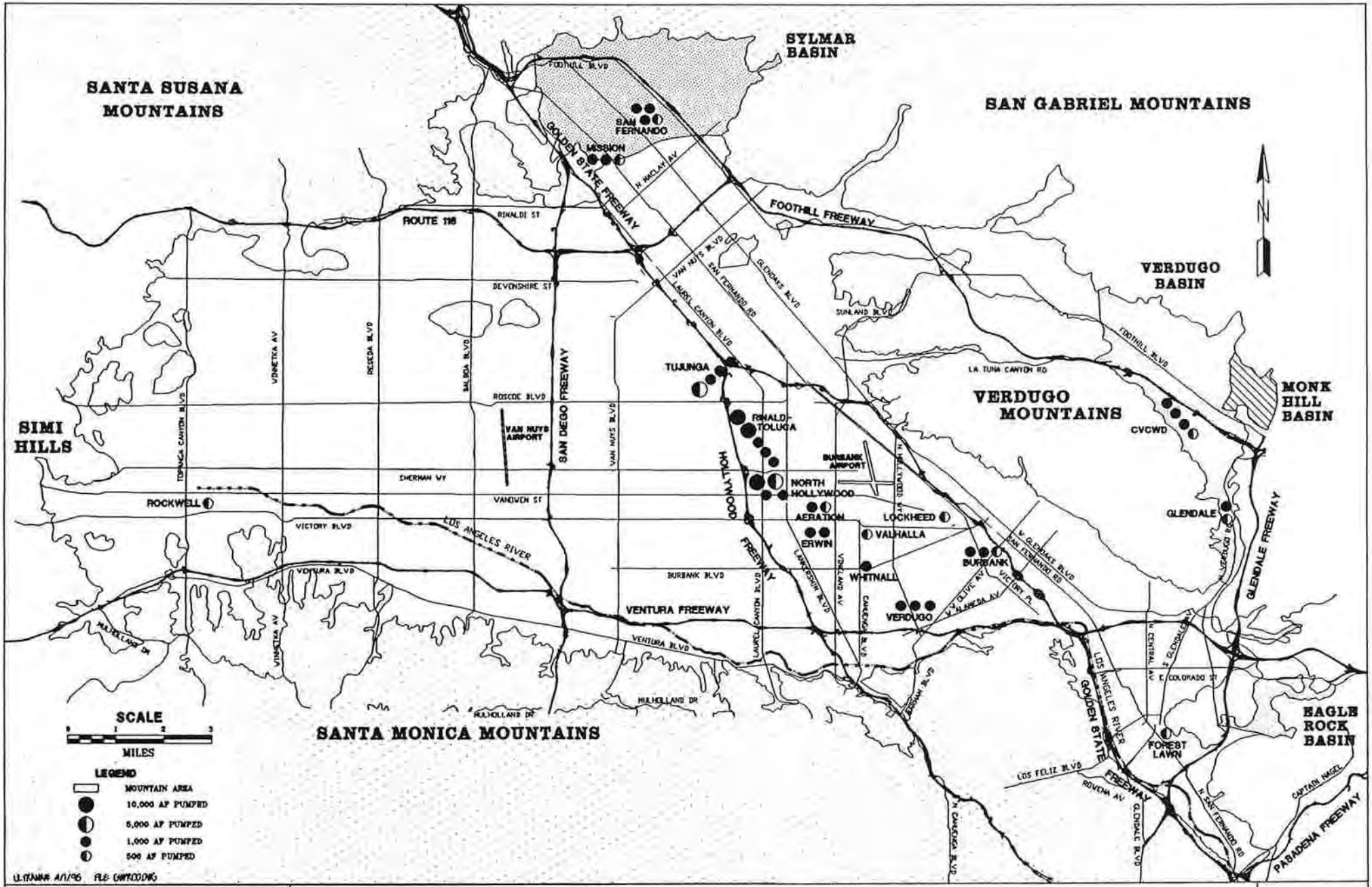
PLATE 7



1994-95 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Los Angeles Bureau of Sanitation Sewer Construction Program**	PLATE 8



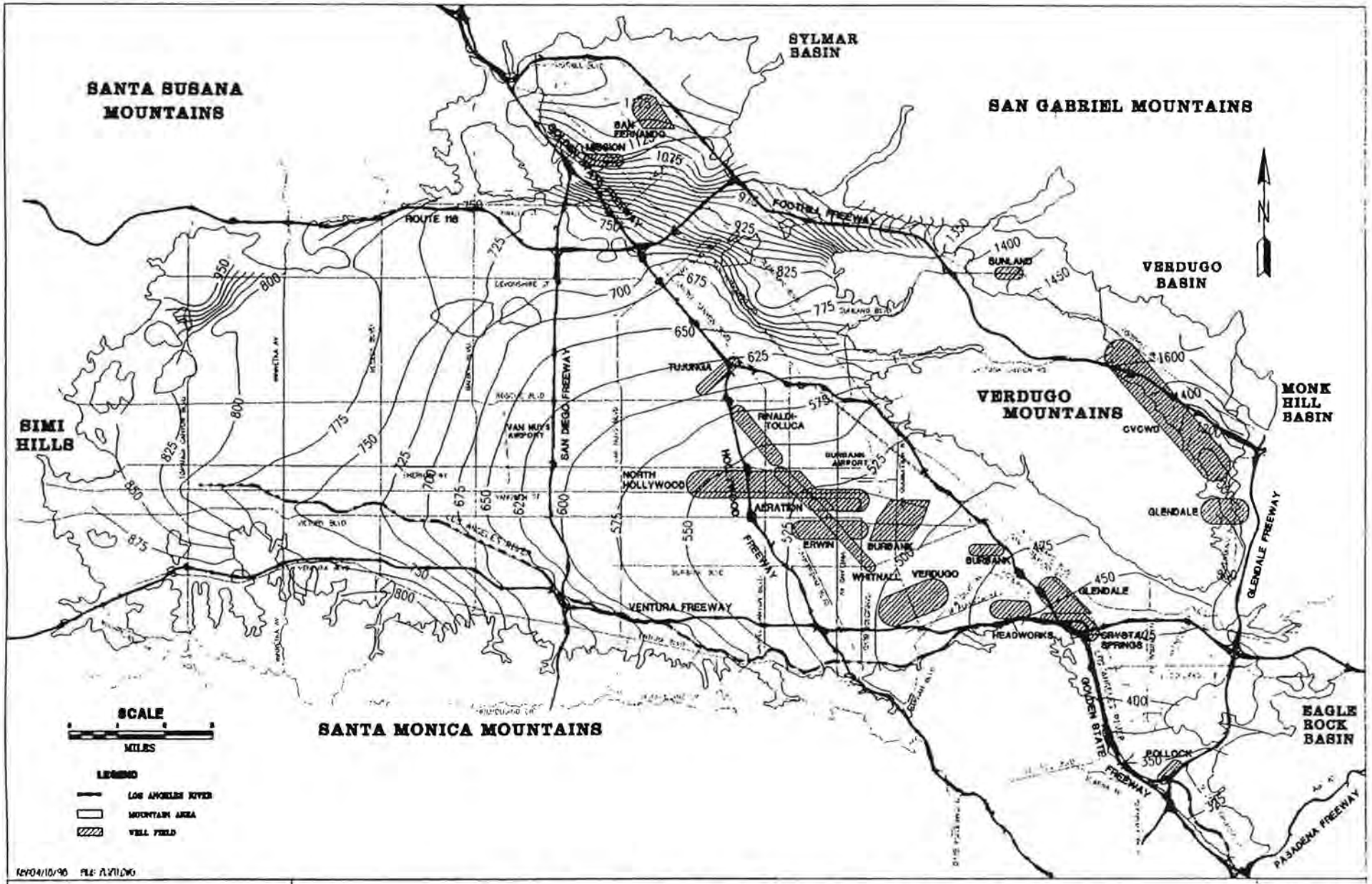
1994-95 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Well Field Locations**	PLATE 9



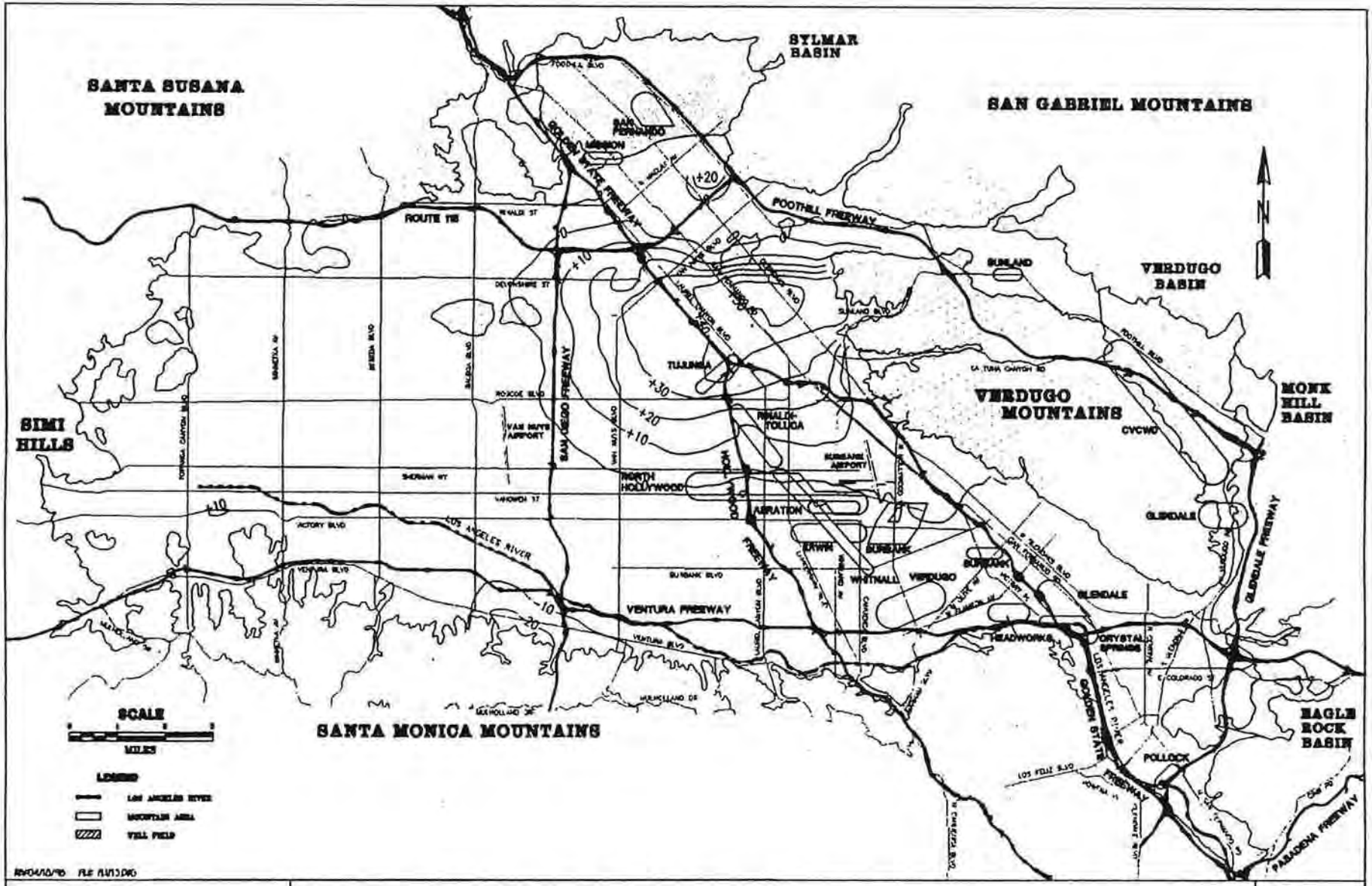
1994-95 Water Year ULARA Watermaster Report

Upper Los Angeles River Area: Pattern of Groundwater Production

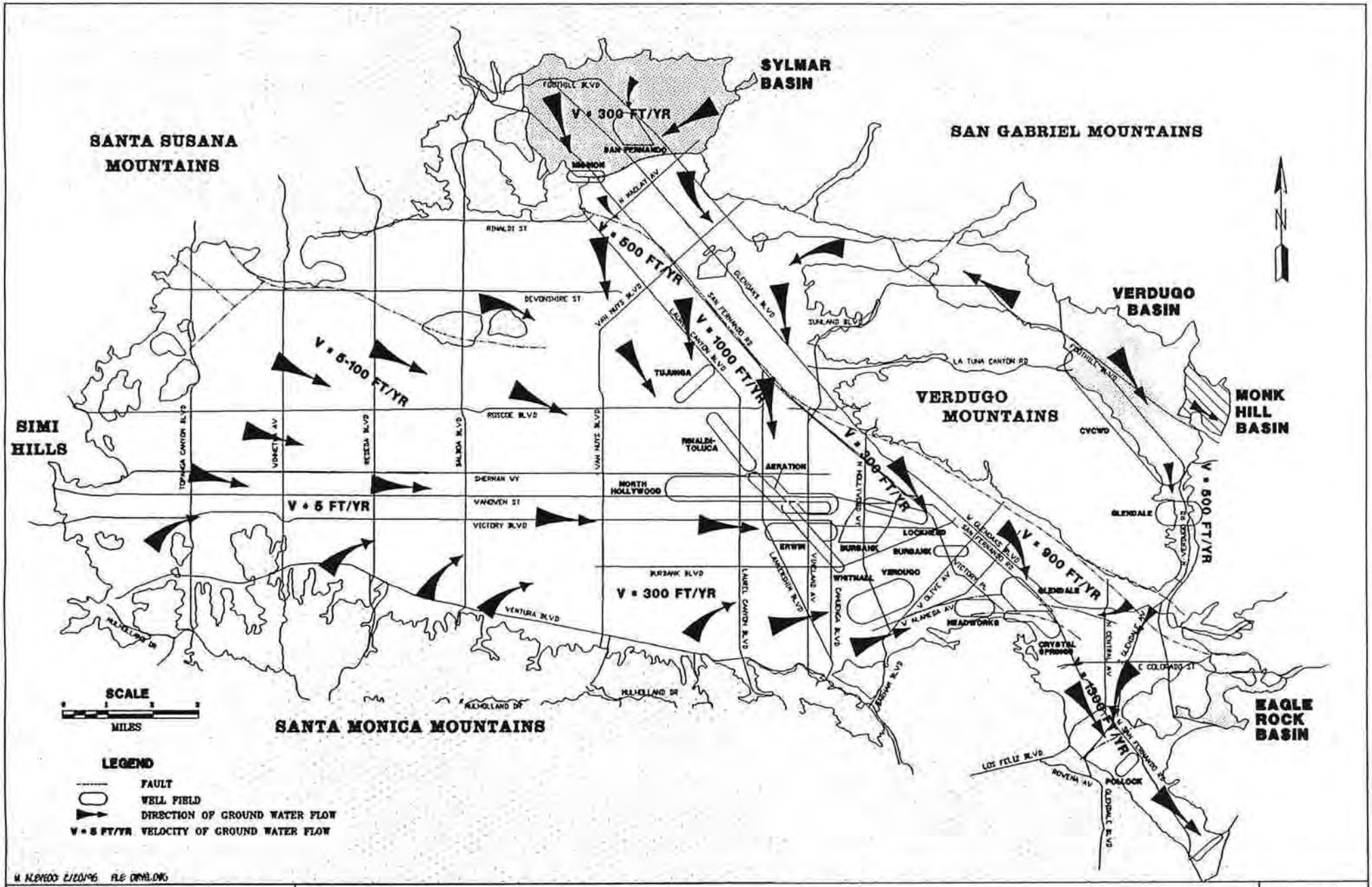
PLATE 10



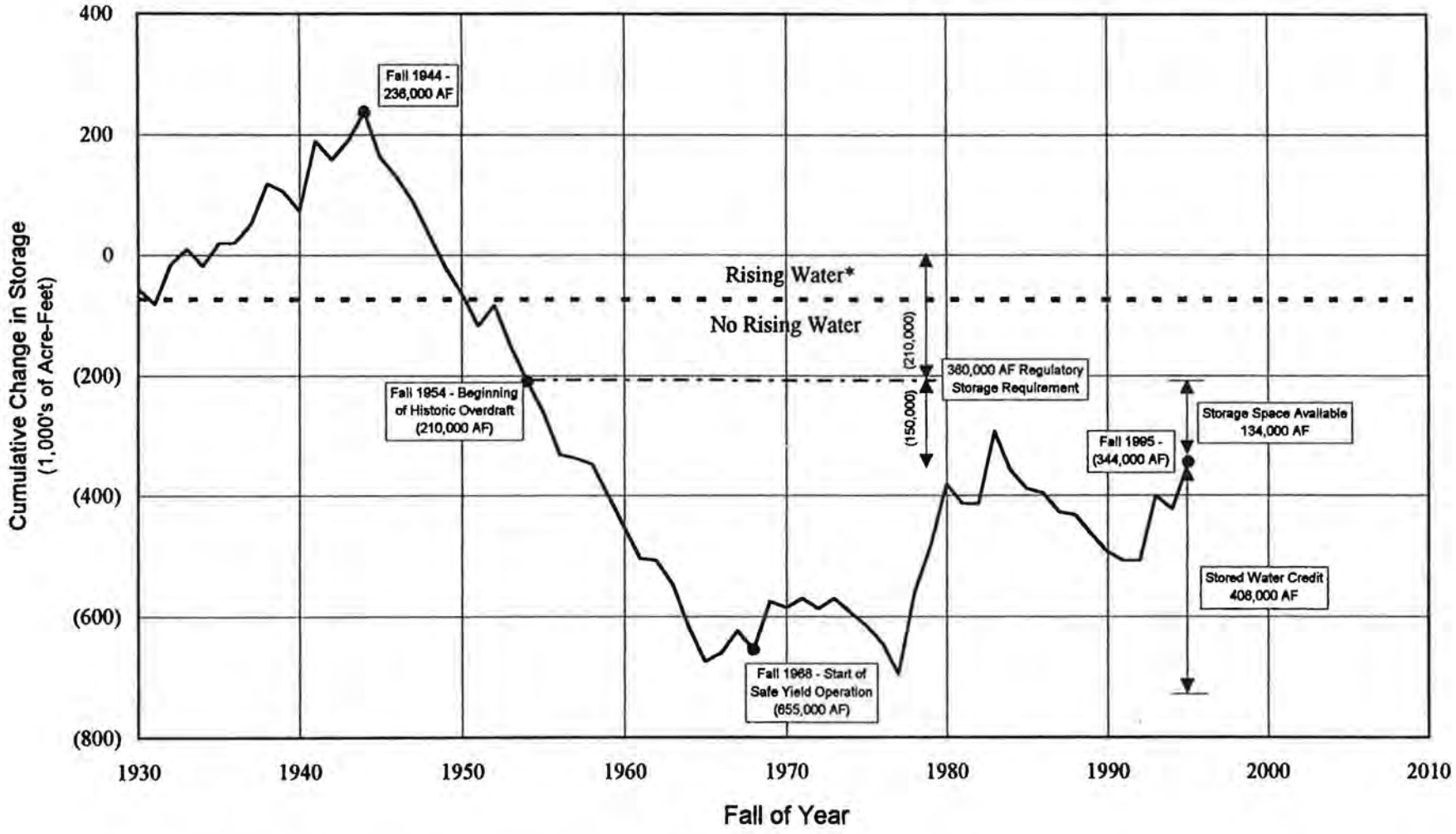
1994-95 Water Year ULARA Watermaster Report	**Simulated Groundwater Contours** FALL (September) 1995	PLATE 12



1994-95 Water Year ULARA Watermaster Report	**Change in Groundwater Elevations FALL 1994 - FALL 1995**	PLATE 13



1994-95 Water Year ULARA Watermaster Report	**Upper Los Angeles River Area: Estimated Directions and Velocities of Groundwater Flow**	PLATE 14



* This line indicates levels at which excess rising ground water occurs and can be controlled by reduction of storage. Rising ground water can also occur naturally at lower levels.

1994-95 Water Year ULARA Watermaster Report	**San Fernando Basin: Cumulative Change in Groundwater Storage**	PLATE 15

PLATE 15 - ULARA WATERMASTER REPORT

SAN FERNANDO BASIN
CUMULATIVE CHANGE IN GROUNDWATER STORAGE

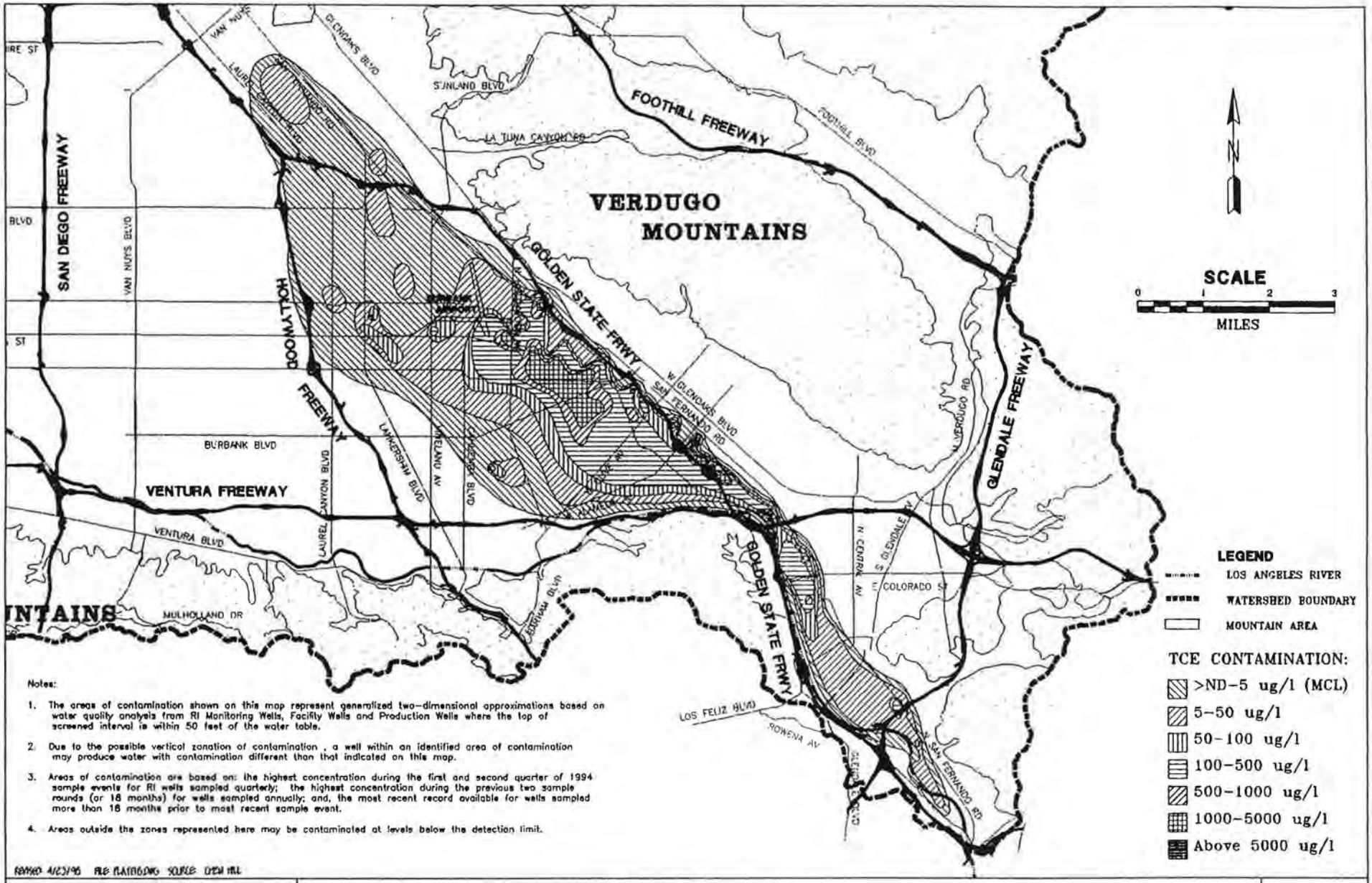
Fall of Year	Change in Storage	Cumulative Chg. in Storage	Cumulative Chg. in Storage/1,000	Cumulative Chg. in Storage (1944)	Cumulative Chg. in Storage/1,000
1928	0	0	0		
1929	(41,510)	(41,510)	(42)		
1930	(15,690)	(57,200)	(57)		
1931	(26,320)	(83,520)	(84)		
1932	67,030	(16,490)	(16)		
1933	26,640	10,150	10		
1934	(28,560)	(18,410)	(18)		
1935	38,040	19,630	20		
1936	1,000	20,630	21		
1937	30,660	51,290	51		
1938	66,420	117,710	118		
1939	(12,540)	105,170	105		
1940	(32,650)	72,520	73		
1941	116,850	189,370	189		
1942	(31,230)	158,140	158		
1943	31,030	189,170	189		
1944	47,200	236,370	236	0	0
1945	(74,180)	162,190	162	(74,180)	(74)
1946	(33,300)	128,890	129	(107,480)	(107)
1947	(41,200)	87,690	88	(148,680)	(149)
1948	(52,770)	34,920	35	(201,450)	(201)
1949	(56,360)	(21,440)	(21)	(257,810)	(258)
1950	(43,390)	(64,830)	(65)	(301,200)	(301)
1951	(53,290)	(118,120)	(118)	(354,490)	(354)
1952	33,720	(84,400)	(84)	(320,770)	(321)
1953	(68,280)	(152,680)	(153)	(389,050)	(389)
1954	(56,770)	(209,450)	(209)	(445,820)	(446)
1955	(51,370)	(260,820)	(261)	(497,190)	(497)
1956	(71,390)	(332,210)	(332)	(568,580)	(569)
1957	(6,280)	(338,490)	(338)	(574,860)	(575)
1958	(9,160)	(347,650)	(348)	(584,020)	(584)
1959	(52,160)	(399,810)	(400)	(636,180)	(636)
1960	(53,080)	(452,890)	(453)	(689,260)	(689)
1961	(50,770)	(503,660)	(504)	(740,030)	(740)
1962	(3,590)	(507,250)	(507)	(743,620)	(744)
1963	(40,390)	(547,640)	(548)	(784,010)	(784)
1964	(70,220)	(617,860)	(618)	(854,230)	(854)
1965	(57,850)	(675,710)	(676)	(912,080)	(912)
1966	14,970	(660,740)	(661)	(897,110)	(897)
1967	36,720	(624,020)	(624)	(860,390)	(860)
1968	(31,350)	(655,370)	(655)	(891,740)	(892)
1969	79,240	(576,130)	(576)	(812,500)	(813)

CHGSTOR.XLS

PLATE 15 - ULARA WATERMASTER REPORT

SAN FERNANDO BASIN
CUMULATIVE CHANGE IN GROUNDWATER STORAGE

Fall of Year	Change in Storage	Cumulative Chg. in Storage	Cumulative Chg. in Storage/1,000	Cumulative Chg. in Storage (1944)	Cumulative Chg. in Storage/1,000
1970	(9,740)	(585,870)	(586)	(822,240)	(822)
1971	15,340	(570,530)	(571)	(806,900)	(807)
1972	(17,090)	(587,620)	(588)	(823,990)	(824)
1973	17,020	(570,600)	(571)	(806,970)	(807)
1974	(21,820)	(592,420)	(592)	(828,790)	(829)
1975	(22,580)	(615,000)	(615)	(851,370)	(851)
1976	(30,090)	(645,090)	(645)	(881,460)	(881)
1977	(50,490)	(695,580)	(696)	(931,950)	(932)
1978	136,150	(559,430)	(559)	(795,800)	(796)
1979	78,080	(481,350)	(481)	(717,720)	(718)
1980	99,970	(381,380)	(381)	(617,750)	(618)
1981	(32,560)	(413,940)	(414)	(650,310)	(650)
1982	(530)	(414,470)	(414)	(650,840)	(651)
1983	121,090	(293,380)	(293)	(529,750)	(530)
1984	(63,180)	(356,560)	(357)	(592,930)	(593)
1985	(31,690)	(388,250)	(388)	(624,620)	(625)
1986	(7,980)	(396,230)	(396)	(632,600)	(633)
1987	(31,940)	(428,170)	(428)	(664,540)	(665)
1988	(5,000)	(433,170)	(433)	(669,540)	(670)
1989	(30,550)	(463,720)	(464)	(700,090)	(700)
1990	(29,941)	(493,661)	(494)	(730,031)	(730)
1991	(14,122)	(507,783)	(508)	(744,153)	(744)
1992	411	(507,372)	(507)	(743,742)	(744)
1993	106,317	(401,055)	(401)	(637,425)	(637)
1994	(22,238)	(423,293)	(423)	(659,663)	(660)
1995	79132	(344,161)	(344)	(580,531)	(581)



Notes:

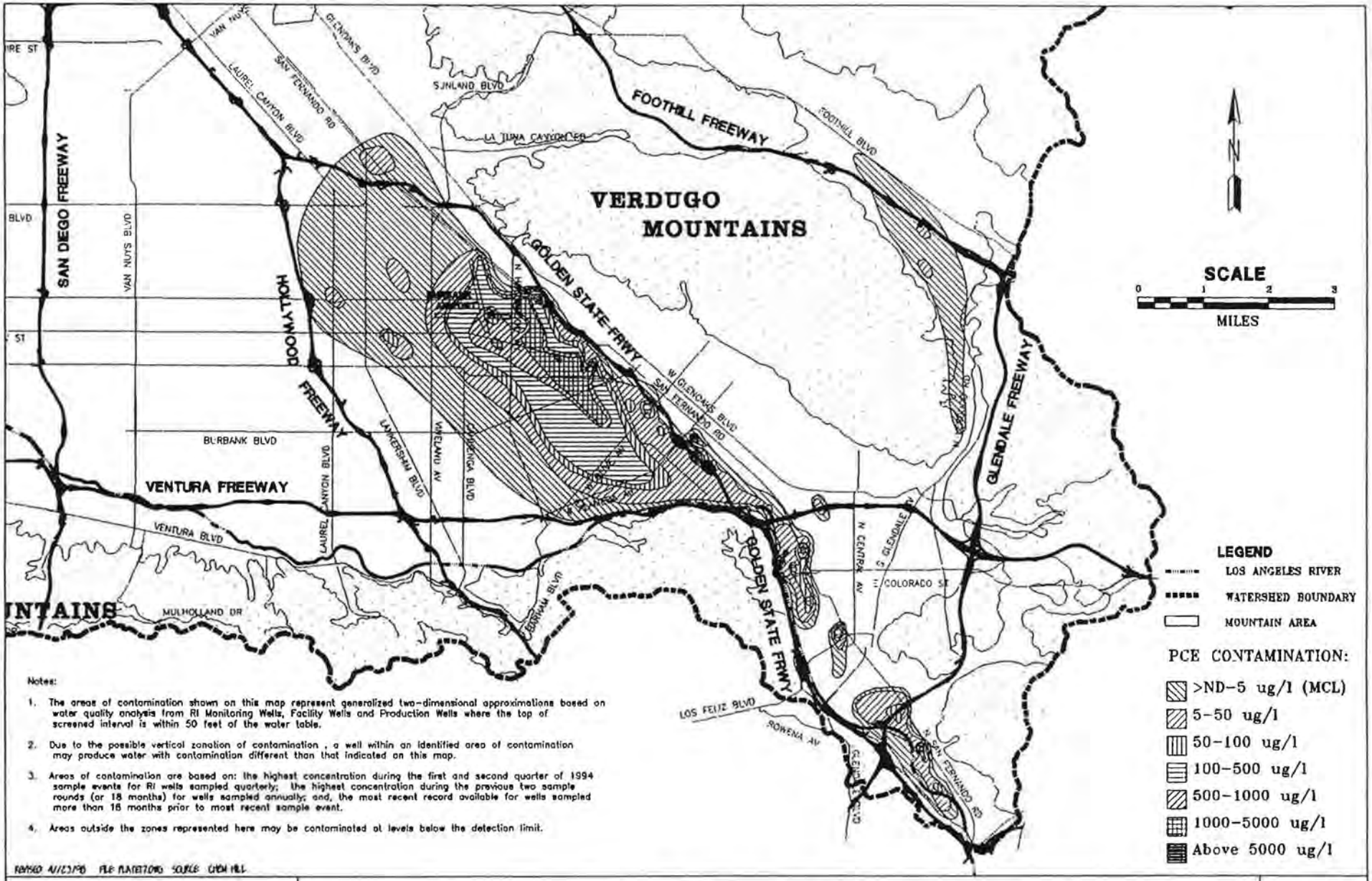
1. The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality analysis from RI Monitoring Wells, Facility Wells and Production Wells where the top of screened interval is within 50 feet of the water table.
2. Due to the possible vertical zonation of contamination , a well within an identified area of contamination may produce water with contamination different than that indicated on this map.
3. Areas of contamination are based on: the highest concentration during the first and second quarter of 1994 sample events for RI wells sampled quarterly; the highest concentration during the previous two sample rounds (or 18 months) for wells sampled annually; and, the most recent record available for wells sampled more than 18 months prior to most recent sample event.
4. Areas outside the zones represented here may be contaminated at levels below the detection limit.

REVISED 4/23/96 FILE PLATE16.DWG SOURCE: DREW HILL

1994-95 Water Year ULARA Watermaster Report

San Fernando Basin: TCE Contamination [ug/l] in the Upper Zone [Spring 1995]

PLATE 16



Notes:

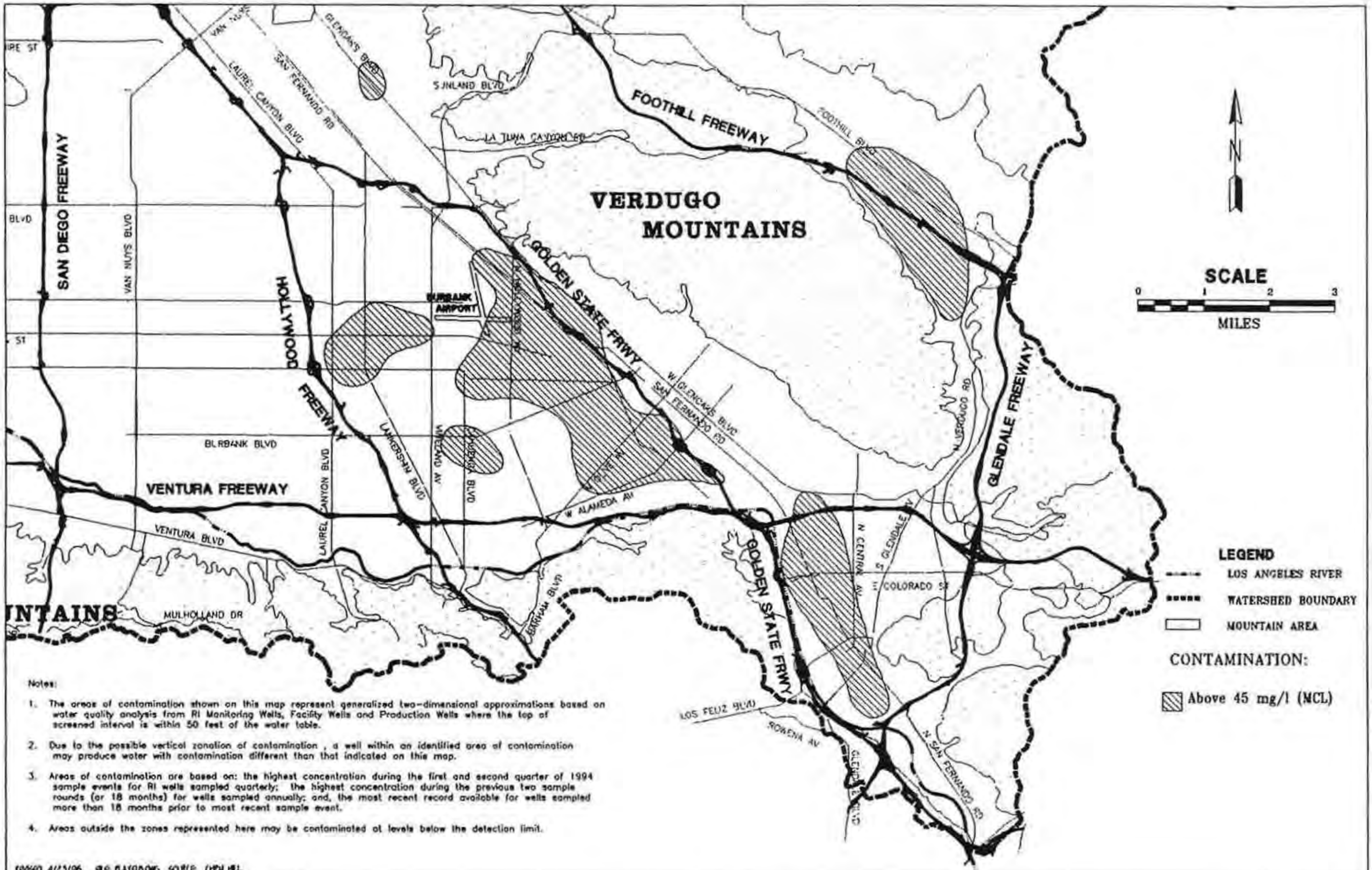
1. The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality analysis from RI Monitoring Wells, Facility Wells and Production Wells where the top of screened interval is within 50 feet of the water table.
2. Due to the possible vertical zonation of contamination , a well within an identified area of contamination may produce water with contamination different than that indicated on this map.
3. Areas of contamination are based on: the highest concentration during the first and second quarter of 1994 sample events for RI wells sampled quarterly; the highest concentration during the previous two sample rounds (or 18 months) for wells sampled annually; and, the most recent record available for wells sampled more than 18 months prior to most recent sample event.
4. Areas outside the zones represented here may be contaminated at levels below the detection limit.

REVISED 4/12/96 FILE PLATE17PCE SOURCE CH2M HILL

1994-95 Water Year ULARA Watermaster Report

San Fernando Basin PCE Contamination [ug/l] in the Upper Zone [Spring 1995]

PLATE 17

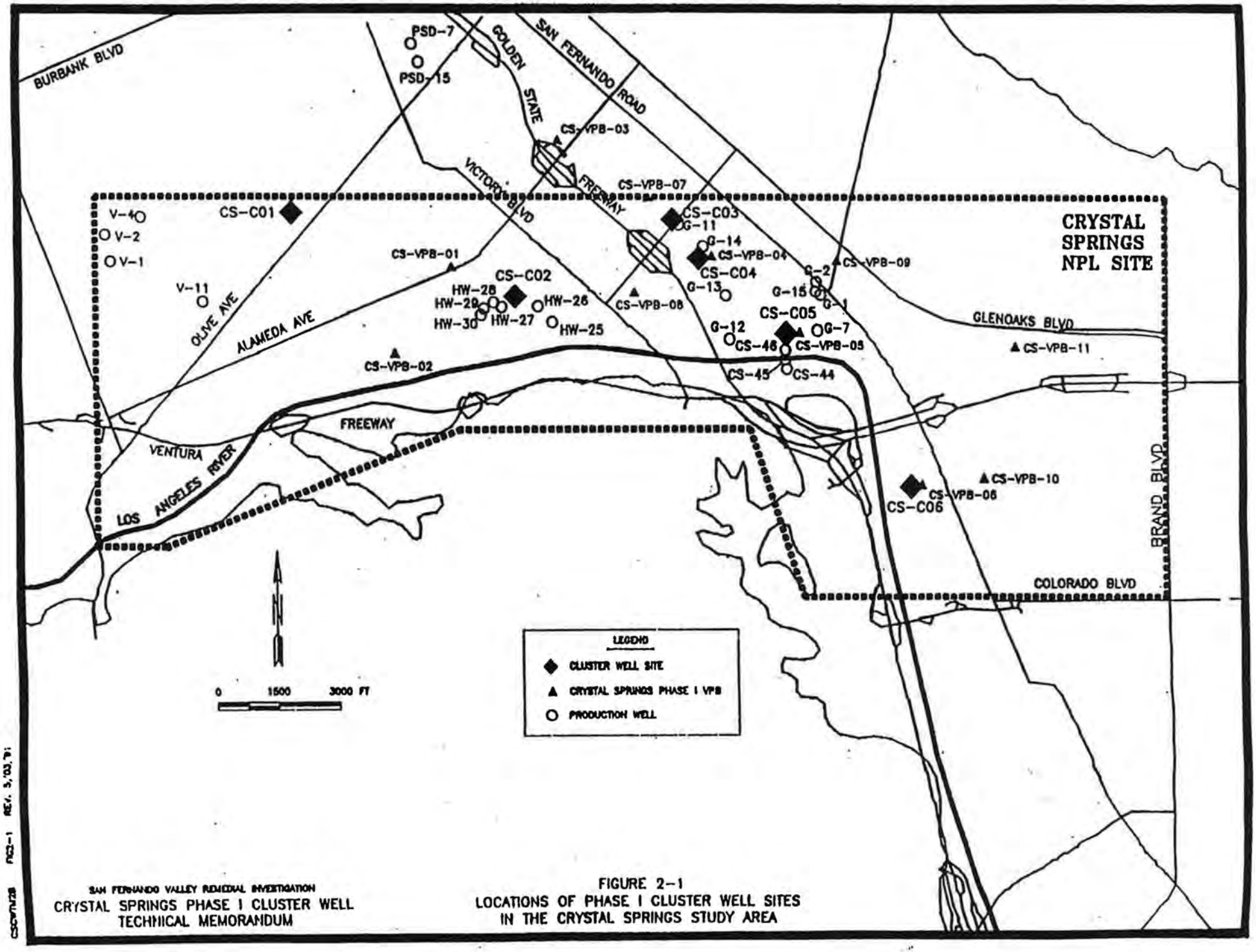


Notes:

1. The areas of contamination shown on this map represent generalized two-dimensional approximations based on water quality analysis from RI Monitoring Wells, Facility Wells and Production Wells where the top of screened interval is within 50 feet of the water table.
2. Due to the possible vertical zonation of contamination, a well within an identified area of contamination may produce water with contamination different than that indicated on this map.
3. Areas of contamination are based on: the highest concentration during the first and second quarter of 1994 sample events for RI wells sampled quarterly; the highest concentration during the previous two sample rounds (or 18 months) for wells sampled annually; and, the most recent record available for wells sampled more than 18 months prior to most recent sample event.
4. Areas outside the zones represented here may be contaminated at levels below the detection limit.

REVISED 4/23/96

1994-95 Water Year ULARA Watermaster Report	San Fernando Basin: NO_3 Contamination [ug/l] in the Upper Zone [Spring 1995]	PLATE 18



SAN FERNANDO VALLEY REMEDIAL INVESTIGATION
CRYSTAL SPRINGS PHASE I CLUSTER WELL
TECHNICAL MEMORANDUM

FIGURE 2-1
LOCATIONS OF PHASE I CLUSTER WELL SITES
IN THE CRYSTAL SPRINGS STUDY AREA

PLATE 20

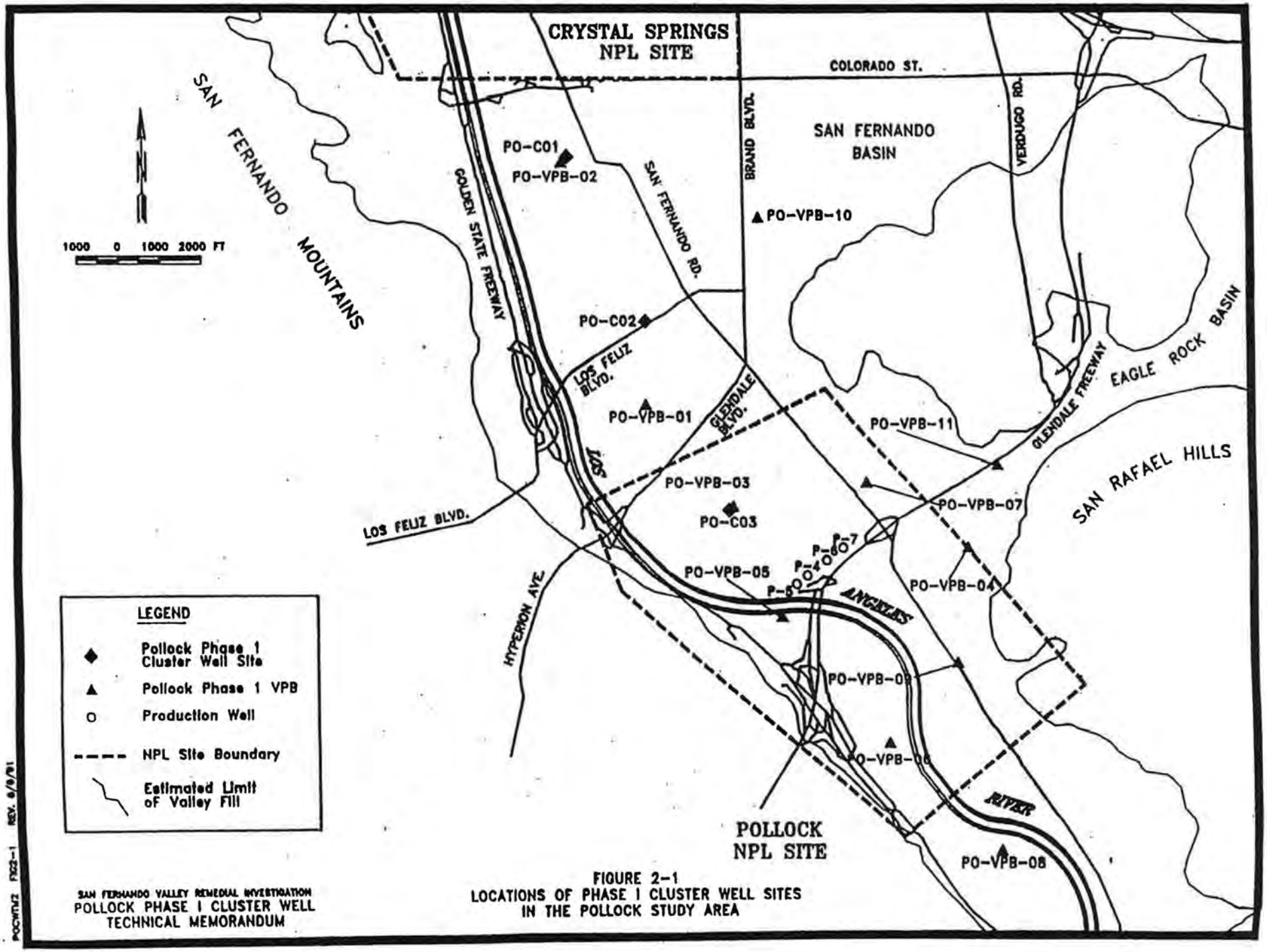
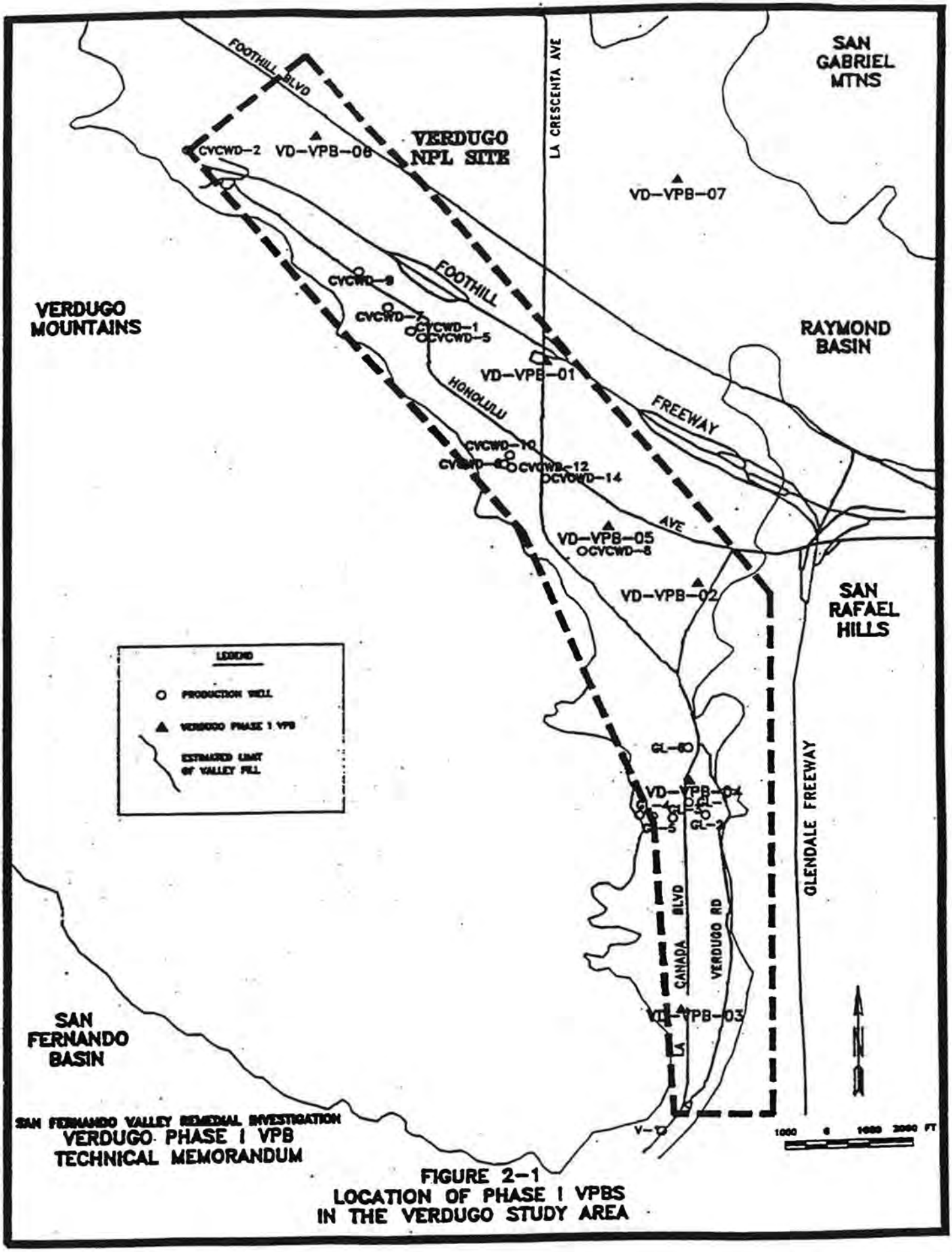


FIGURE 2-1
LOCATIONS OF PHASE I CLUSTER WELL SITES
IN THE POLLOCK STUDY AREA

SAN FERNANDO VALLEY REMEDIAL INVESTIGATION
POLLOCK PHASE I CLUSTER WELL
TECHNICAL MEMORANDUM

POCMTV2 FIG2-1 REV. 6/8/91

PLATE 21



SAN FERNANDO VALLEY REMEDIAL INVESTIGATION
VERDUGO PHASE I VPB
TECHNICAL MEMORANDUM

FIGURE 2-1
LOCATION OF PHASE I VPBS
IN THE VERDUGO STUDY AREA

APPENDICES

APPENDIX A

GROUND WATER EXTRACTIONS

GROUND WATER EXTRACTIONS
1994-95 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	1994 Oct.	Nov.	Dec.	1995 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin														
Angelica Healthcare Services														
3934A	M050A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Auto Stiegler														
---	---	0.57	0.15	0.61	1.31	2.09	2.03	1.88	2.94	1.95	2.07	2.66	2.75	21.01
Burbank, City of														
3841C	6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3882P	7	149.14	110.90	41.04	96.60	78.14	143.83	94.86	145.37	92.81	121.81	144.78	66.02	1,285.30
3851E	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3851K	13A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3882T	15	120.92	94.42	118.19	117.60	113.85	122.51	94.80	122.98	78.88	127.41	122.99	69.71	1,304.26
3841G	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	270.06	205.32	159.23	214.20	191.99	266.34	189.66	268.35	171.69	249.22	267.77	135.73	2,589.56
CalMat														
4916A	2	21.81	107.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	129.11
4916	3	0.00	1.57	5.25	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.31
	Total:	21.81	108.87	5.25	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	139.42
First Financial Plaza Site														
N/A	F.F.P.S.	1.03	1.07	1.36	5.89	6.73	10.50	6.17	4.41	3.05	2.47	2.21	2.02	46.91
Forest Lawn Memorial Park														
3947A	2	15.01	14.26	14.15	0.77	8.05	1.74	6.51	7.54	20.15	28.59	30.39	11.97	159.13
3947B	3	17.37	15.51	16.03	0.83	8.78	1.94	7.39	8.73	23.22	32.74	34.58	13.62	180.74
3947C	4	0.02	0.00	0.00	0.00	0.00	0.12	4.23	0.00	0.00	14.71	29.25	11.61	59.94
3858K	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	32.40	29.77	30.18	1.60	16.83	3.80	18.13	16.27	43.37	76.04	94.22	37.20	399.81
Glendale, City of														
3924N	STPT 1	13.73	3.73	3.00	1.99	2.38	1.67	7.45	1.06	0.77	2.80	6.23	4.50	49.31
3924R	STPT 2	0.02	0.00	0.00	0.00	0.03	0.52	0.37	0.00	0.05	2.30	0.59	0.00	3.88
GVENT	GVENT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	13.75	3.73	3.00	1.99	2.41	2.19	7.82	1.06	0.82	5.10	6.82	4.50	53.19
Greeff Fabrics														
-----	-------	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	16.44
Harper, Cecelia DeMille														
4940A	NORTH	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	15.00
Lockheed - Burbank Operable Unit														
3871L	VO-1	0.00	0.00	0.00	0.00	11.21	29.26	0.00	2.74	5.86	0.02	0.02	0.92	50.03
3861G	VO-2	0.00	0.54	31.76	11.56	11.06	27.05	0.00	0.64	4.06	0.22	1.28	0.91	89.08
3861K	VO-3	0.00	0.43	31.26	13.46	14.40	6.08	12.58	0.33	4.20	0.00	0.00	0.46	83.20
3861L	VO-4	0.00	0.62	0.01	0.35	20.67	6.50	11.53	0.00	0.00	0.00	2.65	0.45	42.78
3850X	VO-5	0.00	0.42	0.00	0.32	4.30	3.42	0.00	0.11	5.13	0.24	13.80	30.77	58.51
3850Z	VO-6	0.00	0.40	0.00	12.37	2.54	8.09	0.00	2.30	6.96	0.03	10.46	12.89	56.04
3850	VO-7	0.00	0.37	0.00	2.79	20.73	8.74	0.00	0.05	7.02	0.00	19.70	22.98	82.38
	Total:	0.00	2.78	63.03	40.85	84.91	89.14	24.11	6.17	33.23	0.51	47.91	69.38	462.02

GROUND WATER EXTRACTIONS

1994-95 WATER YEAR

(acre-feet)

LACDPW Well No.	Owner Well No.	1994 Oct.	Nov.	Dec.	1995 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
San Fernando Basin (cont'd)														
Livingston-Graham, Inc.														
4916B	SnVal	0.04	0.05	0.09	0.01	0.01	0.02	0.04	0.04	0.06	0.03	0.04	0.05	0.48
Mena, John & Barbara														
4973J		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.96
Metropolitan Transportation Authority														
--	1065	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00
--	1075	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00
--	1130	--	--	--	--	--	--	6.00	17.00	14.00	13.00	12.00	9.66	71.66
--	1140	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00
--	1150	--	--	--	--	--	--	0.00	0.00	0.00	0.00	0.00	1.60	1.60
	Total:	0.00	0.00	0.00	0.00	0.00	0.00	6.00	17.00	14.00	13.00	12.00	11.26	73.26
Mobil Oil Corporation														
---	---	0.00	0.00	0.00	0.00	0.00	0.01	0.42	0.73	1.08	0.65	0.49	0.74	4.12
Philips Components														
---	---	7.87	7.24	6.72	7.41	5.43	7.35	7.82	6.18	5.91	6.43	3.80	8.07	80.23
Rockwell International														
---	E-1 to E-9	24.89	20.28	25.43	33.63	36.58	23.36	29.51	34.38	28.39	21.56	22.60	24.13	324.74
Sears Roebuck & Co.														
3945	3945	17.20	16.60	16.19	16.05	16.67	17.02	17.01	17.33	17.96	17.94	18.17	17.96	206.10
Sportsmen's Lodge														
3785A	1	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.03	0.00	0.00	0.08
3M-Pharmaceuticals														
---	---	1.02	0.78	1.01	1.50	1.19	1.15	1.21	0.47	1.36	1.04	1.05	0.80	12.58
Toluca Lake Property Owners Association														
3845F	3845F	2.77	4.44	0.39	0.00	0.00	0.42	1.69	3.31	4.16	4.53	4.71	4.61	31.03
Trillium Corporation														
Well #1	---	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	15.24
Well #2	---	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	19.92
	Total:	2.93	2.93	2.93	2.93	2.93	2.93	2.93	2.93	2.93	2.93	2.93	2.93	35.16
Valhalla Memorial Park and Mortuary														
3810K	4	18.41	8.78	11.52	0.00	7.84	28.29	28.29	28.29	28.29	28.29	72.14	37.99	298.13
Waste Management Disposal Services of Calif.														
4916D		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Walt Disney Pictures and Television														
3874E	EAST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3874F	WEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3874G	NORTH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GROUND WATER EXTRACTIONS
1994-95 WATER YEAR
(acre-feet)

LACDPW Well No	Owner Well No	1994 Oct.	1994 Nov.	1994 Dec.	1995 Jan.	1995 Feb.	1995 Mar.	1995 Apr.	1995 May	1995 June	1995 July	1995 Aug.	1995 Sept.	TOTAL
San Fernando Basin (cont'd)														
Los Angeles, City of														
Aeration (A)														
3800E	A-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810U	A-2	20.96	8.82	12.49	16.74	16.73	20.13	17.92	11.11	13.06	12.87	12.94	0.59	164.36
3810V	A-3	35.38	32.35	22.96	27.66	27.66	30.96	23.89	15.24	26.05	15.79	27.04	1.07	286.05
3810W	A-4	31.77	6.04	0.00	0.00	0.00	0.00	17.90	26.56	21.94	23.14	33.33	29.15	189.83
3820H	A-5	8.29	5.17	5.14	8.86	0.00	16.96	16.96	6.81	8.01	8.49	0.00	0.00	84.69
3821J	A-6	34.02	33.91	5.37	0.00	0.00	0.00	22.75	10.67	4.68	28.71	28.76	38.26	207.13
3830P	A-7	37.70	32.78	29.50	23.07	23.07	33.74	27.89	16.50	17.58	23.64	23.66	32.48	321.61
3831K	A-8	41.16	38.52	31.98	30.69	30.69	36.34	27.18	19.99	33.24	12.19	26.58	44.07	372.63
	A Total:	209.28	157.59	107.44	107.02	98.15	138.13	154.49	106.88	124.56	124.83	152.31	145.62	1,626.30
Crystal Springs (CS)														
3914L	CS-45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3914M	CS-46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CS Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Erwin (E)														
3831H	E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821T	E-2A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3831G	E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821F	E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3831F	E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821H	E-6	146.33	34.34	0.00	0.00	0.00	111.06	185.00	61.13	0.00	164.00	261.13	106.49	1,069.48
3811F	E-10	161.16	38.25	0.00	0.00	0.00	136.06	226.30	73.82	0.00	200.45	303.35	26.40	1,165.79
	E Total:	307.49	72.59	0.00	0.00	0.00	247.12	411.30	134.95	0.00	364.45	564.48	132.89	2,235.27
Headworks (H)														
3893L	H-26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893K	H-27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893M	H-28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893N	H-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3893P	H-30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	H Total:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North Hollywood (NH)														
3800	NH-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3780A	NH-4	0.00	0.00	0.00	0.00	0.00	10.74	0.00	0.00	0.00	0.00	0.00	0.00	10.74
3810S	NH-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3770	NH-7	0.00	0.00	0.00	0.00	0.00	82.04	103.97	22.79	0.00	0.00	123.55	0.00	332.35
3810	NH-11	0.00	18.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.56
3810A	NH-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810B	NH-14A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790B	NH-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3820D	NH-16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	353.53	46.02	399.55
3820C	NH-17	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28

GROUND WATER EXTRACTIONS
1994-95 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	1994 Oct.	Nov.	Dec.	1995 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
							San Fernando Basin (cont'd)							
North Hollywood (NH), cont'd														
3820B	NH-18	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	136.27	74.93	211.43
3830D	NH-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830C	NH-20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3830B	NH-21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790C	NH-22	156.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	144.16	13.82	314.50
3790D	NH-23	88.15	52.36	0.00	0.00	0.00	215.47	264.73	47.33	0.00	11.77	346.02	0.00	1,025.83
3800C	NH-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790F	NH-25	0.00	0.00	0.00	0.00	0.00	156.95	231.17	28.12	0.06	0.00	277.98	0.00	694.28
3790E	NH-26	192.98	44.28	0.00	0.00	0.00	137.60	205.62	27.06	0.00	0.00	172.47	0.00	780.01
3820F	NH-27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810K	NH-28	19.92	52.64	61.95	55.97	137.21	0.00	166.57	432.04	15.31	172.35	149.86	6.97	1,270.79
3810L	NH-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3800D	NH-30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810T	NH-31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3770C	NH-32	0.00	0.00	0.00	0.00	0.00	168.25	258.24	37.55	0.00	0.00	308.33	0.00	772.37
3780C	NH-33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3790G	NH-34	67.45	0.00	0.00	0.00	0.00	192.90	224.70	0.00	0.00	0.00	185.78	105.46	776.29
3830N	NH-35	318.80	76.52	0.00	0.00	0.00	143.11	338.17	42.83	0.00	0.00	207.07	0.00	1,126.50
3790H	NH-36	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56
3790J	NH-37	411.92	85.65	0.00	0.00	0.00	202.52	228.74	103.03	0.00	0.00	248.73	26.97	1,307.56
3810M	NH-38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810N	NH-39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3810P	NH-40	390.66	93.23	0.00	0.00	0.00	326.03	443.89	199.93	0.00	0.00	485.10	59.15	1,997.99
3810Q	NH-41	271.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.00	272.43
3810R	NH-42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	261.84	0.00	261.84
3790K	NH-43A	210.54	49.50	0.00	0.00	0.00	172.79	234.27	105.50	0.00	0.00	253.97	88.38	1,114.95
3790L	NH-44	363.75	94.35	0.00	0.00	0.00	319.00	434.64	195.77	0.00	0.00	406.29	166.98	1,980.78
3790M	NH-45	492.31	114.14	0.00	0.00	0.00	315.56	464.48	84.25	0.36	0.00	489.27	171.14	2,131.51
	NH Total:	2,986.61	681.23	61.95	55.97	137.21	2,442.96	3,599.19	1,326.20	15.73	184.12	4,551.11	759.82	16,802.10
Pollock (P)														
3959E	P-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3958H	P-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3958J	P-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	P Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rinaldi-Toluca (RT)														
4909E	RT-1	405.28	107.28	0.00	0.00	0.00	361.31	345.59	38.72	0.00	0.00	199.93	22.52	1,480.63
4898A	RT-2	470.11	125.44	0.00	0.00	0.00	425.34	409.68	46.85	0.11	0.00	235.74	28.35	1,741.62
4898B	RT-3	483.43	129.27	0.00	0.00	0.00	182.39	51.12	0.00	0.13	0.00	392.79	29.24	1,268.37
4898C	RT-4	513.18	136.50	0.00	0.00	0.00	194.92	54.45	0.00	0.00	0.00	417.97	31.49	1,348.51
4898D	RT-5	534.62	141.81	0.00	0.00	0.00	487.44	224.72	0.00	0.00	0.00	190.35	0.00	1,578.94
4898E	RT-6	530.38	143.02	0.00	0.00	0.00	199.19	0.00	0.00	0.18	0.00	372.49	31.35	1,276.61
4898F	RT-7	491.39	131.75	0.00	0.00	0.00	189.46	0.00	0.00	0.00	0.00	412.78	0.00	1,225.38
4898G	RT-8	333.50	93.02	0.00	0.00	0.00	181.58	0.00	0.00	0.00	0.00	394.30	0.00	1,002.40

GROUND WATER EXTRACTIONS
1994-95 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	1994 Oct.	1994 Nov.	1994 Dec.	1995 Jan.	1995 Feb.	1995 Mar.	1995 Apr.	1995 May	1995 June	1995 July	1995 Aug.	1995 Sept.	TOTAL
							San Fernando Basin (cont'd)							
Rinaldi-Toluca (RT), cont'd														
4898H	RT-9	457.26	121.90	0.00	0.00	0.00	168.98	0.00	0.00	0.00	0.00	370.38	207.32	1,325.84
4909G	RT-10	532.44	142.01	0.00	0.00	0.00	478.97	218.38	0.00	0.00	0.00	262.09	236.61	1,870.50
4909K	RT-11	480.49	127.34	0.00	0.00	0.00	427.47	410.00	46.25	0.11	0.00	388.06	210.05	2,089.77
4909H	RT-12	510.36	130.95	0.00	0.00	0.00	438.31	421.96	47.86	0.13	0.00	242.30	216.02	2,007.89
4909J	RT-13	497.52	132.03	0.00	0.00	0.00	445.59	428.32	48.39	0.18	0.00	239.41	220.73	2,012.17
4909L	RT-14	503.72	128.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	632.62
4909M	RT-15	516.72	137.10	0.00	0.00	0.00	449.44	429.26	47.97	0.00	0.00	249.54	220.11	2,050.14
	RT Total:	7,260.40	1,928.30	0.00	0.00	0.00	4,630.39	2,993.48	276.04	0.84	0.00	4,368.15	1,453.79	22,911.39
Tujunga (T)														
4887C	T-1	563.98	53.63	0.00	0.00	0.00	146.23	0.00	0.59	0.00	0.00	0.00	0.50	764.93
4887D	T-2	591.01	56.11	0.00	0.00	0.00	146.23	0.00	0.71	0.00	0.00	0.00	0.50	794.56
4887E	T-3	542.38	53.60	0.00	0.00	0.00	158.67	0.00	59.50	0.00	0.00	0.00	0.39	814.54
4887F	T-4	567.45	53.97	0.00	0.00	0.00	0.84	0.00	76.40	0.00	0.00	0.00	0.39	699.05
4887G	T-5	554.30	53.08	0.00	0.00	0.00	0.00	0.00	76.23	0.00	0.00	0.00	0.00	683.61
4887H	T-6	587.03	56.13	0.00	0.00	0.00	0.00	0.00	79.79	0.00	0.00	0.00	0.00	722.95
4887J	T-7	578.26	37.56	0.00	0.00	0.00	0.00	0.00	34.20	0.00	0.00	0.00	0.00	650.02
4887K	T-8	586.28	38.15	0.00	0.00	0.00	0.00	0.00	15.70	0.00	0.00	0.00	0.00	640.13
4886B	T-9	581.48	55.37	0.00	0.00	0.00	158.05	0.00	78.05	0.00	0.00	0.00	0.00	872.95
4886C	T-10	561.37	53.99	0.00	0.00	0.00	151.99	0.00	41.96	0.00	0.00	0.00	0.00	809.31
4886D	T-11	298.33	17.06	0.00	0.00	0.00	150.94	0.00	0.57	0.00	0.00	0.00	0.00	466.90
4886E	T-12	50.57	18.32	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.00	69.62
	T Total:	6,062.44	546.97	0.00	0.00	0.00	912.95	0.00	464.43	0.00	0.00	0.00	1.78	7,988.57
Verdugo (V)														
3863H	V-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3863P	V-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3863J	V-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.11	0.63
3863L	V-11	214.17	49.40	0.00	0.00	0.00	164.18	266.09	86.89	0.00	254.17	321.02	155.85	1,511.77
3853G	V-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3854F	V-22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3844R	V-24	180.88	42.10	0.00	0.00	0.00	137.55	225.66	73.64	0.00	216.29	285.33	136.40	1,297.85
	V Total:	395.05	91.50	0.00	0.00	0.00	301.73	491.75	160.53	0.52	470.46	606.35	292.36	2,810.25
Whitnall (W)														
3820E	W-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821B	W-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821C	W-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3821D	W-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	0.00	0.09	1.42
3821E	W-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.73
3831J	W-6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3832K	W-7	157.35	37.10	0.00	0.00	0.00	121.60	196.96	106.15	0.00	140.31	151.56	190.86	1,101.89
3832L	W-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GROUND WATER EXTRACTIONS
1994-95 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	1994 Oct.	Nov.	Dec.	1995 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL:
San Fernando Basin (cont'd)														
Whitnall (W), cont'd														
3832M	W-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3842E	W-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	W Total:	157.35	37.10	0.00	0.00	0.00	121.60	196.96	106.15	0.00	141.64	151.56	191.68	1,104.04
Los Angeles, City of														
	Total:	17,378.62	3,515.28	169.39	162.99	235.36	8,794.88	7,847.17	2,575.18	141.65	1,285.50	10,393.96	2,977.94	55,477.92
San Fernando Basin Total:		17,794.71	3,926.62	434.63	454.33	527.39	9,161.63	8,167.09	2,980.21	468.01	1,718.16	10,906.90	3,270.01	60,288.15
Sylmar Basin														
Los Angeles, City of														
Plant	Mission	475.35	479.80	12.51	0.00	0.00	0.00	0.00	0.00	0.00	380.56	426.34	536.16	2,310.72
Meurer Engineering														
5998	3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.60
San Fernando, City of														
5969D	2A	268.44	218.53	211.46	172.70	129.24	118.66	134.14	129.88	179.05	240.43	261.14	249.58	2,313.25
5959	3	19.27	25.81	27.02	33.32	55.96	77.68	98.25	118.26	90.24	89.26	96.19	75.34	806.60
5969	4	6.57	11.82	11.32	13.13	20.88	29.05	35.78	40.56	31.25	36.32	36.09	28.73	301.50
5968	7A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	294.28	256.16	249.80	219.15	206.08	225.39	268.17	288.70	300.54	366.01	393.42	353.65	3,421.35
Sylmar Basin Total:		769.68	736.01	262.36	219.20	206.13	225.44	268.22	288.75	300.59	746.62	819.81	889.86	5,732.67
Verdugo Basin														
Crescenta Valley County Water District														
5058B	1	10.10	22.09	24.44	0.00	10.18	24.75	48.76	50.56	47.52	36.43	33.95	35.74	344.52
5036A	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5058H	5	43.81	12.29	0.00	3.59	0.19	0.22	7.06	3.77	46.85	75.33	63.16	20.85	277.12
5058	6	25.37	20.46	23.18	20.87	14.56	20.54	22.10	23.20	17.27	25.26	26.07	13.14	252.02
5017B	7	19.67	0.55	0.00	0.00	2.82	0.11	0.00	0.00	1.93	8.60	35.58	18.43	87.69
5069J	8	63.05	58.79	40.99	62.81	57.33	42.54	51.18	51.64	52.61	73.29	73.74	49.54	677.51
5017D	9	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.00	2.41	54.61	49.41	30.01	136.75
5058D	10	8.41	33.98	45.41	67.70	61.84	68.98	66.74	65.04	64.59	25.21	22.80	35.35	566.05
5058E	11	20.22	31.44	29.13	19.74	8.23	0.17	0.00	13.63	23.69	18.76	44.82	19.07	228.90

GROUND WATER EXTRACTIONS
1994-95 WATER YEAR
(acre-feet)

LACDPW Well No.	Owner Well No.	1994 Oct.	Nov.	Dec.	1995 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	TOTAL
							Verdugo Basin (cont'd)							
Crescenta Valley County Water District, cont'd														
5058J	12	68.31	72.16	66.76	61.97	57.15	58.43	66.73	62.39	67.82	71.00	73.16	62.21	788.09
5069F	14	3.43	14.39	12.26	23.57	26.27	18.81	21.04	18.58	16.40	44.50	44.75	40.66	284.66
	PICK	5.27	5.01	5.10	5.07	4.59	5.29	5.70	5.89	5.65	5.73	5.86	5.82	64.98
	Total:	267.64	271.16	247.27	265.32	243.16	240.15	289.31	294.70	346.74	438.72	473.30	330.82	3,708.29
Glendale, City of														
3961-3971	GL3-5	62.19	62.15	53.86	53.76	36.23	47.91	74.66	83.51	63.39	55.76	69.24	52.69	715.35
3970	GL-6	95.69	76.72	95.75	84.70	72.12	88.71	38.22	54.01	6.98	126.50	84.54	93.71	917.65
---	MM-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total:	157.88	138.87	149.61	138.46	108.35	136.62	112.88	137.52	70.37	182.26	153.78	146.40	1,633.00
Verdugo Basin Total:		425.52	410.03	396.88	403.78	351.51	376.77	402.19	432.22	417.11	620.98	627.08	477.22	5,341.29

							Eagle Rock Basin							
McKesson Water Products														
3987A	1	0.46	6.86	3.44	7.43	4.36	5.58	5.72	4.42	6.87	5.56	7.70	5.75	64.15
3987B	2	9.19	0.62	8.08	2.89	4.98	5.12	5.63	6.44	6.02	6.34	7.24	7.50	70.05
3987F	3	7.03	6.30	3.76	4.68	4.28	5.94	3.34	5.49	4.59	6.28	6.34	6.11	64.14
	Total:	16.68	13.78	15.28	15.00	13.62	16.64	14.69	16.35	17.48	18.18	21.28	19.36	198.34
Eagle Rock Basin Total:		16.68	13.78	15.28	15.00	13.62	16.64	14.69	16.35	17.48	18.18	21.28	19.36	198.34

ULARA Total:		19,006.59	5,086.44	1,109.15	1,092.31	1,098.65	9,780.48	8,852.19	3,717.53	1,203.19	3,103.94	12,375.07	4,656.45	71,560.45

APPENDIX B

KEY GAGING STATIONS SURFACE RUNOFF

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

F57C-R LOS ANGELES RIVER ABOVE ARROYO SECO

DAILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1994 TO SEP 1995

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	181	189	140	127	165	152	681	143	166	159	164	162
2	179	227	152	124	162	490	681	141	171	156	170	162
3	194	206	151	1,150	163	1,070	392	146	167	158	132	154
4	638	204	154	6,910	151	377	167	143	164	160	164	155
5	1,290	197	158	858	153	3,650	183	153	160	148	163	156
6	132	198	153	174	157	1,330	166	150	153	159	168	147
7	122	203	162	10,600	161	734		143	156	158	174	141
8	115	335	151	18,900	391	354		146	156	159	178	143
9	114	222	144	19,900	323	283		150	155	159	186	143
10	118	1,030	149	15,900	149	4,930		152	154	160	187	143
11	127	152	150	5,210	143	7,730		152	148	159	203	143
12	126	137	158	2,560	145	1,830		155	153	151	201	149
13	132	142	689	1,090	759	1,360		148	155	144	190	156
14	143	143	140	1,060	3,330	1,230		154	151	149	214	148
15	158	143	142	1,030	470	1,070		615	228	152	225	145
16	149	147	144	987	267	953	MALFUNCTION.	169	1,040	155	á 256	150
17	153	145	143	975	213	903		159	171	151	244	142
18	147	152	141	978	197	889		160	130	150	232	138
19	149	148	142	974	193	879		164	132	149	225	146
20	150	151	137	951	186	866		168	131	152	222	172
21	161	162	141	942	173	1,650		171	120	148	234	150
22	158	157	140	942	159	677		170	141	152	234	150
23	154	149	135	2,360	152	2,300		186	139	143	229	141
24	160	147	1,500	12,800	168	683		193	128	152	214	137
25	171	146	834	7,810	164	686		164	128	151	200	149
26	155	275	117	1,430	160	686		179	140	149	185	151
27	171	145	124	1,280	166	686		153	147	143	198	154
28	178	152	129	1,270	165	679	155	147	139	151	200	153
29	184	143	121	1,260	------	672	147	149	142	151	184	154
30	185	132	119	1,250	------	672	144	156	144	155	179	152
31	195	------	119	638	------	672	------	166	------	157	164	------
TOTAL	6,339	6,079	6,979	122,440	9,185	41,143	2,716	5,350	5,409	4,740	6,169	4,486
MEAN	206	203	225	3,950	328	1,327	302	173	180	153	199	150
MAX	1,290	1,030	1,500	19,900	3,330	7,730	681	615	1,040	160	256	172
MIN	114	132	117	124	143	152	144	141	120	143	163	137
AC-FT	12,670	12,060	13,840	242,900	18,220	81,610	5,387	10,610	10,730	9,402	12,240	8,898

CAL YEAR 1994	TOTAL	37,986	MEAN	104	MAX	1,500	MIN	106	AC-FT	75,340
WTR YEAR 1995	TOTAL*	221,085	MEAN	643	MAX	19,900	MIN	114	AC-FT	438,500

* Incomplete Record

MAXIMUM INSTANTANEOUS PEAK IS 44,900 CFS AT 22:00 ON 03/10/95.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

F168-R BIG TUJUNGA CREEK BELOW BIG TUJUNGA DAM

DAILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1994 TO SEP 1995

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.8	1.4	2.6	1.8	140	19.7	110	80.2	29.7	9.9	3.5	3.1
2	.8	1.4	2.5	1.8	109	30.3	70.7	80.2	29.7	8.0	3.5	3.1
3	.8	1.4	2.4	1.8	60.2	30.3	49.9	80.2	29.7	8.0	3.5	3.1
4	9.6	1.4	2.1	102	60.2	59.6	64.4	46.2	29.7	8.0	3.5	3.1
5	8.8	1.4	1.9	136	60.2	142	69.7	29.1	29.7	8.0	3.5	3.1
6	3.1	1.4	1.7	34.0	60.2	327	65.6	29.1	29.7	8.0	3.5	3.1
7	1.4	2.9	1.5	32.8	60.2	63.0	65.6	29.1	29.7	8.0	3.5	3.1
8	1.4	1.4	1.4	60.3	60.2	63.0	65.6	29.1	29.7	8.0	3.5	3.1
9	1.4	1.4	1.8	57.5	60.2	63.0	65.6	29.1	29.7	8.0	3.5	3.1
10	1.4	5.2	1.8	285	60.2	63.0	65.6	29.1	29.7	8.0	3.5	3.1
11	1.4	5.2	1.1	475	60.2	393	65.6	29.1	29.7	8.0	3.5	3.1
12	1.4	1.4	.8	389	60.2	459	65.6	29.1	29.7	8.0	3.5	3.1
13	1.4	1.4	.7	221	60.2	461	65.6	29.1	29.7	8.0	3.5	3.1
14	1.4	1.4	.6	94.7	133	465	65.6	29.1	29.7	8.0	3.5	3.1
15	1.4	1.4	.4	94.7	187	434	65.6	29.1	32.7	8.0	3.5	3.1
16	1.4	5.2	.4	94.7	125	362	65.6	29.1	34.6	8.0	3.5	3.1
17	1.4	1.4	.3	66.5	121	362	68.6	29.1	34.4	8.0	3.5	3.1
18	1.4	1.4	.3	52.3	115	294	70.1	29.1	29.7	8.0	3.5	3.1
19	1.4	1.4	.2	52.3	115	175	70.1	29.1	29.7	8.0	3.5	3.1
20	1.4	1.4	.8	52.3	113	175	70.1	29.1	29.7	8.0	3.5	3.1
21	1.4	1.4	2.2	52.3	112	175	70.1	29.1	29.7	8.0	3.5	3.1
22	1.4	1.4	1.5	52.3	112	175	70.1	29.1	29.7	8.0	3.5	3.1
23	1.4	1.4	1.6	57.5	57.5	175	70.1	29.1	29.7	6.0	3.5	3.1
24	1.4	1.4	2.1	370	30.3	175	57.6	29.1	29.7	5.0	3.5	3.1
25	1.4	1.4	2.3	306	30.3	175	40.0	29.1	29.7	5.0	3.5	3.1
26	1.4	5.2	2.6	323	30.3	175	60.1	29.1	23.2	5.0	3.5	3.1
27	1.4	1.4	2.6	222	30.3	175	80.2	29.1	19.9	5.0	3.5	3.1
28	1.4	1.4	2.6	170	9.8	175	80.2	29.1	13.2	5.0	3.5	3.1
29	1.4	1.4	2.6	170	------	175	80.2	29.1	9.9	5.0	3.5	3.1
30	1.4	1.4	2.6	170	------	132	80.2	29.1	9.9	5.0	3.5	3.1
31	1.4	------	2.6	170	------	110	------	29.1	------	5.0	3.5	------
TOTAL	58.9	58.7	50.6	4,368.6	2,232.7	6,257.9	2,054.0	1,072.5	831.2	223.9	108.5	93.0
MEAN	1.9	2.0	1.6	141	79.7	202	68.5	34.6	27.7	7.2	3.5	3.1
MAX	9.6	5.2	2.6	475	187	465	110	80.2	34.6	9.9	3.5	3.1
MIN	.8	1.4	.2	1.8	9.8	19.7	40.0	29.1	9.9	5.0	3.5	3.1
AC-FT	117	116	100	8,665	4,428	12,410	4,074	2,127	1,649	444	215	184

CAL YEAR 1994	TOTAL	3,574.3	MEAN	9.8	MAX	113	MIN	0	AC-FT	7,089
WTR YEAR 1995	TOTAL	17,410.5	MEAN	47.7	MAX	475	MIN	.2	AC-FT	34,530

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

F252-R VERDUGO WASH AT ESTELLE AVENUE

DAILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1994 TO SEP 1995

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	2.3	2.0	2.9	6.7	2.2	2.7	2.3	2.6	2.5	2.0	1.7
2	2.3	2.3	2.0	2.3	4.2	2.0	2.6	2.2	2.8	2.5	2.0	1.7
3	2.3	2.3	2.0	3.1	2.7	123	2.6	2.4	2.5	2.5	2.0	1.7
4	2.3	2.3	2.0	847	2.6	51.8	2.5	2.3	2.5	2.5	2.0	1.7
5	2.3	2.3	2.0	223	2.5	1,010	2.5	2.5	2.6	2.5	2.0	1.7
6	2.3	2.3	2.0	34.7	2.3	254	2.5	3.5	2.8	2.5	2.0	1.6
7	2.3	2.3	2.3	93.1	2.3	31.2	2.7	2.0	2.8	2.5	2.0	1.5
8	2.3	2.3	2.3	676	2.6	16.3	2.6	2.0	2.8	2.5	2.0	1.1
9	2.3	2.3	2.3	478	2.6	11.2	2.7	1.9	2.8	2.5	2.0	1.0
10	2.3	2.3	2.3	1,710	2.3	173	2.6	2.1	2.8	2.5	2.0	1.2
11	2.3	2.3	2.3	1,310	2.1	1,030	2.4	2.3	2.8	2.5	2.0	1.7
12	2.3	2.3	2.3	470	2.0	402	2.3	2.2	2.8	2.5	2.0	1.7
13	2.3	2.3	9.6	154	56.2	26.4	2.0	1.9	3.6	2.3	2.0	1.7
14	2.3	2.3	9.2	8.0	1,060	6.5	2.0	3.1	3.9	2.3	2.0	1.7
15	2.3	2.3	8.2	8.8	15.5	3.2	1.6	11.9	11.5	2.3	2.0	1.7
16	2.3	2.3	7.2	8.4	3.2	2.9	2.7	2.6	371	2.3	1.9	2.1
17	2.3	2.8	7.2	6.1	1.7	1.7	5.0	2.5	95.0	2.3	1.7	2.0
18	2.3	3.9	6.5	4.0	1.4	1.7	42.7	2.5	10.9	2.2	1.7	2.0
19	2.3	3.8	6.2	2.7	1.5	2.5	58.5	2.5	4.1	2.0	1.7	2.0
20	2.3	2.7	6.2	2.6	1.8	2.9	30.3	2.5	2.3	2.0	1.7	2.1
21	2.3	2.3	6.2	2.6	2.0	469	18.2	2.5	2.3	2.0	1.7	2.3
22	2.3	1.9	6.2	2.7	2.4	59.4	11.9	2.5	2.3	2.0	1.7	2.3
23	2.3	1.9	6.2	164	2.9	514	9.7	2.5	2.3	2.0	1.7	2.2
24	2.3	1.9	216	1,320	2.8	61.3	7.4	3.2	2.3	2.0	1.7	2.0
25	2.3	2.0	398	1,220	2.8	24.3	3.7	3.9	2.3	2.0	1.7	2.0
26	2.3	2.1	53.6	603	2.6	14.3	2.2	3.7	2.3	2.0	1.7	2.0
27	2.3	2.1	32.0	32.2	2.5	10.6	2.1	2.8	2.3	2.0	1.7	2.0
28	2.3	2.3	9.1	10.1	2.3	8.1	2.0	2.8	2.3	2.0	1.7	2.0
29	2.3	2.2	7.5	8.2	------	6.9	2.0	2.8	2.3	2.0	1.7	2.0
30	2.3	2.0	5.2	7.3	------	4.9	2.2	2.8	2.3	2.0	1.7	2.0
31	2.3	------	4.7	7.7	------	3.2	------	2.8	------	2.0	1.7	------
TOTAL	71.3	70.7	830.8	9,422.5	1,196.5	4,330.5	236.9	89.5	557.9	69.7	57.4	54.4
MEAN	2.3	2.4	26.8	304	42.7	140	7.9	2.9	18.6	2.2	1.9	1.8
MAX	2.3	3.9	398	1,710	1,060	1,030	58.5	11.9	371	2.5	2.0	2.3
MIN	2.3	1.9	2.0	2.3	1.4	1.7	1.6	1.9	2.3	2.0	1.7	1.0
AC-FT	141	140	1,648	18,690	2,373	8,589	470	178	1,107	138	114	108

CAL YEAR 1994	TOTAL	4,049.9	MEAN	11.1	MAX	398	MIN	0	AC-FT	8,033
WTR YEAR 1995	TOTAL	16,988.1	MEAN	46.5	MAX	1,710	MIN	1.0	AC-FT	33,700

MAXIMUM INSTANTANEOUS PEAK IS 4,460 CFS AT 10:15 ON 01/10/95.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

E285-R BURBANK-WESTERN STORM DRAIN

DAILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1994 TO SEP 1995

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	6.0	6.4	11.6	31.6	12.8	14.1	14.1	17.7	13.6	12.8	14.1
2	7.9	5.3	5.3	10.5	28.6	38.2	13.2	14.1	18.2	13.9	12.8	14.9
3	7.9	5.0	5.3	92.9	24.5	290	12.6	14.3	18.2	13.5	14.2	15.4
4	181	4.3	4.8	495	21.1	269	11.0	14.1	18.2	13.8	14.8	14.6
5	452	3.8	4.6	149	18.2	313	10.2	14.1	18.2	14.1	14.3	15.2
6	130	3.4	4.6	86.1	15.7	38.8	9.9	14.1	18.2	13.7	14.1	15.4
7	70.0	3.1	4.3	191	14.9	28.6	9.0	14.1	18.2	13.9	14.6	15.0
8	30.4	2.8	3.9	170	14.1	21.1	8.4	14.0	18.8	13.3	15.4	15.4
9	21.8	2.4	3.4	145	59.4	15.9	7.9	14.1	19.7	14.1	15.4	15.3
10	17.8	328	3.6	743	56.1	397	7.1	14.1	19.7	14.1	15.3	14.4
11	15.1	167	2.8	168	43.0	705	6.7	14.3	18.7	14.1	14.1	14.6
12	13.2	25.8	3.5	156	34.8	333	6.7	15.1	18.2	14.1	15.3	14.1
13	11.8	16.5	251	56.8	44.6	81.5	6.7	15.4	19.0	14.1	15.4	14.7
14	11.0	12.8	176	39.3	118	83.0	6.1	16.2	19.7	14.1	15.4	15.0
15	10.2	11.6	193	34.8	54.3	18.2	6.0	18.0	21.0	14.1	15.4	14.1
16	9.4	11.5	46.7	32.6	35.7	18.2	146	18.5	169	14.1	16.1	15.1
17	9.0	11.5	30.8	24.6	24.5	18.2	16.2	18.2	65.1	13.5	16.8	14.9
18	9.0	11.5	25.6	20.5	16.7	18.2	14.1	17.0	14.3	13.0	16.8	14.8
19	9.0	10.6	21.8	17.9	11.2	18.2	14.1	18.1	11.0	12.8	15.6	14.3
20	8.3	10.2	19.9	16.2	12.8	16.8	14.1	17.7	11.3	12.8	15.5	14.7
21	7.9	9.3	19.6	14.8	12.8	318	14.1	17.0	14.2	12.8	15.8	14.5
22	7.9	9.0	16.7	13.1	12.8	271	14.1	16.8	15.8	12.8	15.4	14.0
23	7.9	8.1	15.4	45.0	12.8	327	14.1	16.8	14.9	12.8	15.4	13.9
24	7.9	7.9	185	166	12.8	22.9	14.1	17.9	14.2	13.7	15.4	13.7
25	7.9	7.1	299	111	12.8	21.2	14.1	18.0	13.4	14.1	15.0	12.8
26	7.9	7.5	220	87.0	12.8	20.3	14.1	16.8	13.2	14.1	15.4	11.8
27	7.7	7.1	37.4	79.9	12.8	19.7	14.1	16.8	13.6	14.1	14.3	11.5
28	6.7	6.7	24.7	65.3	12.8	18.2	14.1	16.8	13.6	13.9	14.1	11.5
29	6.7	6.3	18.8	52.0	------	17.7	14.1	17.7	14.1	14.1	14.4	11.3
30	6.3	6.0	14.9	42.9	------	16.8	14.1	17.4	13.4	12.9	14.4	10.2
31	6.0	------	13.1	36.3	------	15.7	------	16.9	------	12.8	14.1	------
TOTAL	1,113.8	728.1	1,681.9	3,374.1	782.2	3,803.2	481.1	498.5	692.8	422.8	463.8	421.2
MEAN	35.9	24.3	54.3	109	27.9	123	16.0	16.1	23.1	13.6	15.0	14.0
MAX	452	328	299	743	118	705	146	18.5	169	14.1	16.8	15.4
MIN	6.0	2.4	2.8	10.5	11.2	12.8	6.0	14.0	11.0	12.8	12.8	10.2
AC-FT	2,209	1,444	3,336	6,692	1,551	7,544	954	989	1,374	839	920	835

CAL YEAR 1994	TOTAL	8,286.9	MEAN	22.7	MAX	452	MIN	2.4	AC-FT	16,440
WTR YEAR 1995	TOTAL	14,463.5	MEAN	39.6	MAX	743	MIN	2.4	AC-FT	28,690

MAXIMUM INSTANTANEOUS PEAK IS 6,880 CFS AT 23:30 ON 03/10/95.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

F300-R LOS ANGELES RIVER AT TUJUNGA AVENUE

DAILY DISCHARGE IN CUBIC FEET PER SECOND WATER YEAR OCT 1994 TO SEP 1995

Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96.4	74.2	72.0	79.0		87.1	113	77.0	67.5	70.4	90.1	71.0
2	90.7	95.2	76.9	79.9		146	107	76.6	68.7	69.8	89.4	73.3
3	102	79.7	69.5	824		251	103	76.7	69.0	69.5	96.1	67.7
4	425	70.8	63.5	4,650		188	98.6	77.0	69.3	69.6	79.6	67.4
5	635	70.6	77.4	897		2,200	94.4	78.0	69.4	69.0	83.2	70.7
6	105	70.4	73.7	125		526	85.5	78.1	69.5	68.4	86.1	68.6
7	78.4	72.5	83.8	1,560		190	135	77.6	69.0	68.2	88.6	65.6
8	63.6	144	67.5	871		165	133	76.7	68.8	67.9	88.2	67.9
9	70.4	84.2	65.6	714		155	118	77.5	68.8	67.6	84.9	66.0
10	84.7	526	73.5	10,800		2,260	106	78.0	68.7	68.0	88.0	63.5
11	80.9	80.4	69.3	4,570		6,470	99.7	78.0	68.0	67.9	90.0	64.9
12	84.5	71.2	87.7	2,050		1,130	96.7	78.4	67.7	67.5	85.0	66.8
13	63.8	71.8	363	567		618	95.6	77.2	67.6	66.9	73.2	68.7
14	91.2	72.2	86.1	340		507	92.2	75.6	67.0	66.6	76.7	66.6
15	93.9	73.9	86.9	454		347	89.1	164	65.2	66.3	81.6	67.6
16	78.9	75.2	87.3	213		265	645	143	227	66.2	93.0	71.6
17	81.8	73.6	85.3	155		168	154	117	155	66.3	93.6	63.9
18	63.0	75.6	76.2	141		161	165	103	126	66.0	87.7	60.9
19	80.8	75.1	79.8	132		157	151	96.0	110	71.6	83.0	73.9
20	82.9	74.7	72.6	134		153	120	90.2	102	73.8	85.1	85.4
21	91.2	81.0	83.3	171		618	106	85.6	95.4	72.1	91.5	72.1
22	89.3	75.9	79.6	111		180	98.1	82.3	90.5	72.5	88.6	68.0
23	76.5	71.0	72.9	790		1,030	92.7	80.5	87.1	71.6	90.6	57.9
24	82.0	70.1	1,050	5,060	87.3	193	88.4	79.9	83.7	73.6	89.7	53.7
25	87.9	66.5	379	3,590	84.0	164	85.7	75.9	80.6	75.4	86.0	64.5
26	88.0	150	69.5		81.3	159	84.3	74.4	78.4	74.3	79.8	64.7
27	80.6	65.6	84.4		81.2	154	82.0	71.5	77.0	75.8	87.1	67.8
28	82.4	73.0	83.1		88.8	146	82.4	69.1	75.3	75.3	79.2	69.3
29	85.4	74.0	74.1		------	138	82.0	66.7	73.7	74.3	72.4	64.0
30	85.2	66.5	71.8		------	130	81.1	65.9	72.1	73.1	74.2	63.0
31	69.5	------	73.2		------	121	------	66.6	------	70.8	57.9	------
TOTAL	3,470.9	2,824.9	3,938.5	39,077.9	422.6	19,177.1	3,684.5	2,614.0	2,558.0	2,176.3	2,620.1	2,017.0
MEAN	112	94.2	127	1,563	84.5	619	123	84.3	85.3	70.2	84.5	67.2
MAX	635	526	1,050	10,800	88.8	6,470	645	164	227	75.8	96.1	85.4
MIN	63.0	65.6	63.5	79.0	81.2	87.1	81.1	65.9	65.2	66.0	57.9	53.7
AC-FT	6,884	5,603	7,812	77,510	838	38,040	7,308	5,185	5,074	4,317	5,197	4,001
					*	*						

CAL YEAR 1994 TOTAL 37,875.6 MEAN 104 MAX 1,410 MIN 55.8 AC-FT 75,130

WTR YEAR 1995 TOTAL* 84,581.8 MEAN 252 MAX 10,800 MIN 53.7 AC-FT 167,800

* Incomplete Record

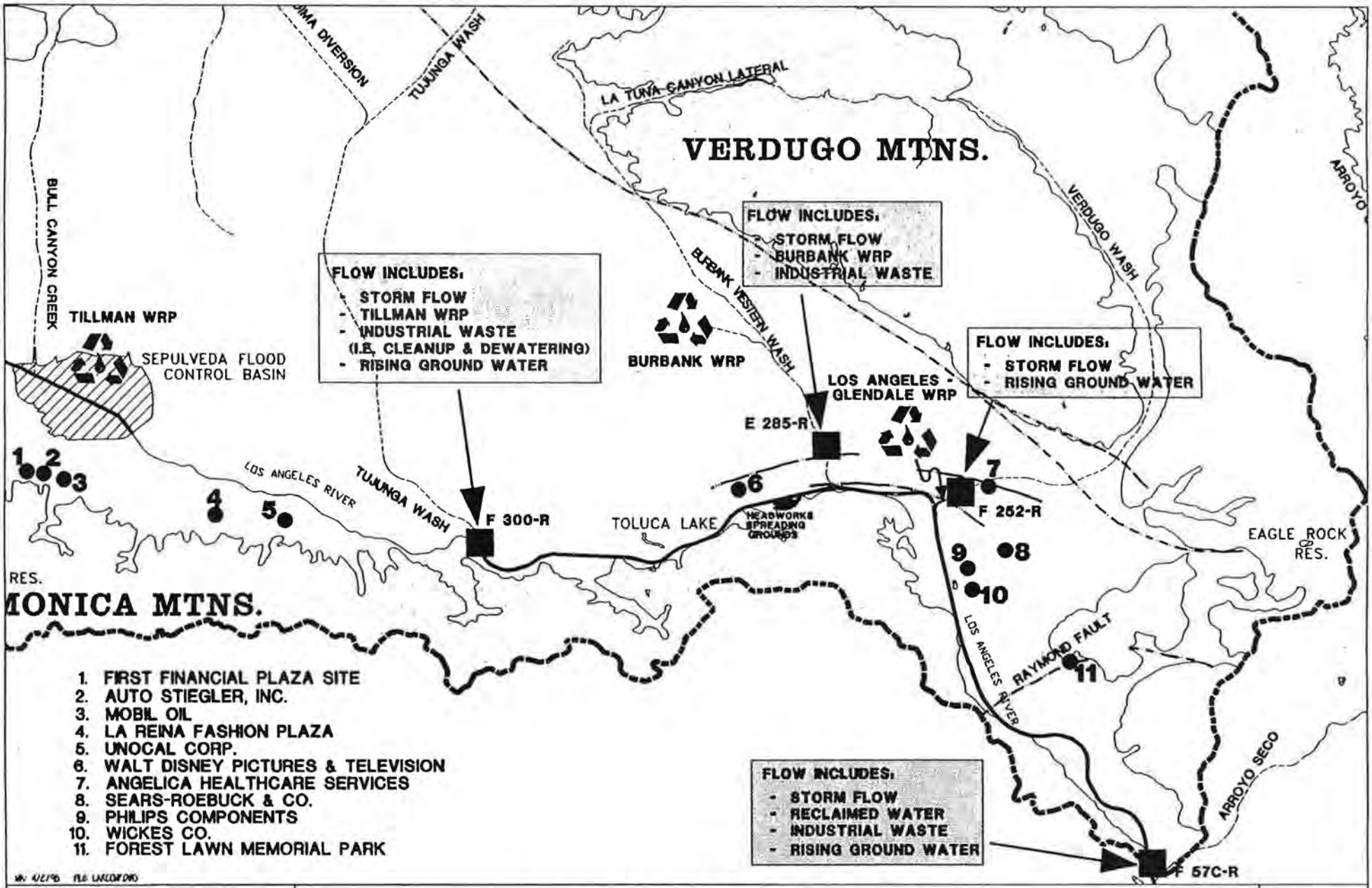
MEAN DAILY DISCHARGE WERE FROM ALERT STATION FOR OCT., 1994.

APPENDIX C

COMPONENTS OF LOS ANGELES RIVER FLOW

UPPER LOS ANGELES RIVER AREA: COMPONENTS OF LOS ANGELES RIVER FLOW; 1994-95 WATER YEAR

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
TOTAL FLOW AT GAGE F-57C-R														F-57C-R: Storm, Reclaimed, Industrial, Rising Ground Water
Total:	12670	12060	13840	242900	18220	81610	5387	10610	10730	9402	12240	8898	438567	F300-R: storm, Tillman, industrial waste, and rising water
														E285-R :storm, Burbank WRP, industrial waste
														F252-R: storm, rising water
I. RECLAIMED WATER DISCHARGED TO L.A. RIVER IN ULARA														
Tillman:	2963	2817	2759	3292	2767	3415	2942	2959	2265	2217	2426	2569		: Record
L.A.-Glendale:	1046	1046	1228	1406	1140	1277	1110	1162	1264	1266	1142	1117		: Record
Burbank WRP:	520	504	520	520	470	520	504	520	504	520	520	504		: Record divided total (6127) by 12
Total:	4529	4367	4507	5218	4377	5212	4556	4641	4033	4003	4088	4190	53721	
II. INDUSTRIAL WATER DISCHARGED TO L.A. RIVER IN ULARA														
Upstream of F300-R	44	37	46	66	73	58	61	68	56	45	46	49		: From F300-R separation of flow
Between F300-R and Rubber Dam														
Disney	0	0	0	0	0	0	0	0	0	0	0	0		
Other:	123	119	123	123	111	123	119	123	119	123	123	119		:20% of discharges 'Upstream of F300-R'; approximately 2cfs
Between Rubber Dam and F57C-R														
Headworks:	0	0	0	0	0	0	0	0	0	0	0	0		:pilot project record
Industrial waste:	430	417	430	430	388	430	417	430	417	430	430	417		:7 cfs assumed
Western Drain:	224	-16	300	705	895	1046	173	462	489	317	398	330		: From E285-R separation of flow
Total:	821	557	899	1324	1467	1657	770	1083	1081	915	997	915	12488	
III. RISING WATER IN L.A. RIVER IN ULARA														
Total:	408	408	408	408	408	408	408	408	408	408	408	408	4900	: See Section 2.3 of the Watermaster's Report



1994-95 Water Year
ULARA Watermaster
Report

Upper Los Angeles River Area: Components of Los Angeles River Flow

FIGURE C.1

APPENDIX D

EAST VALLEY WATER RECLAMATION PROJECT

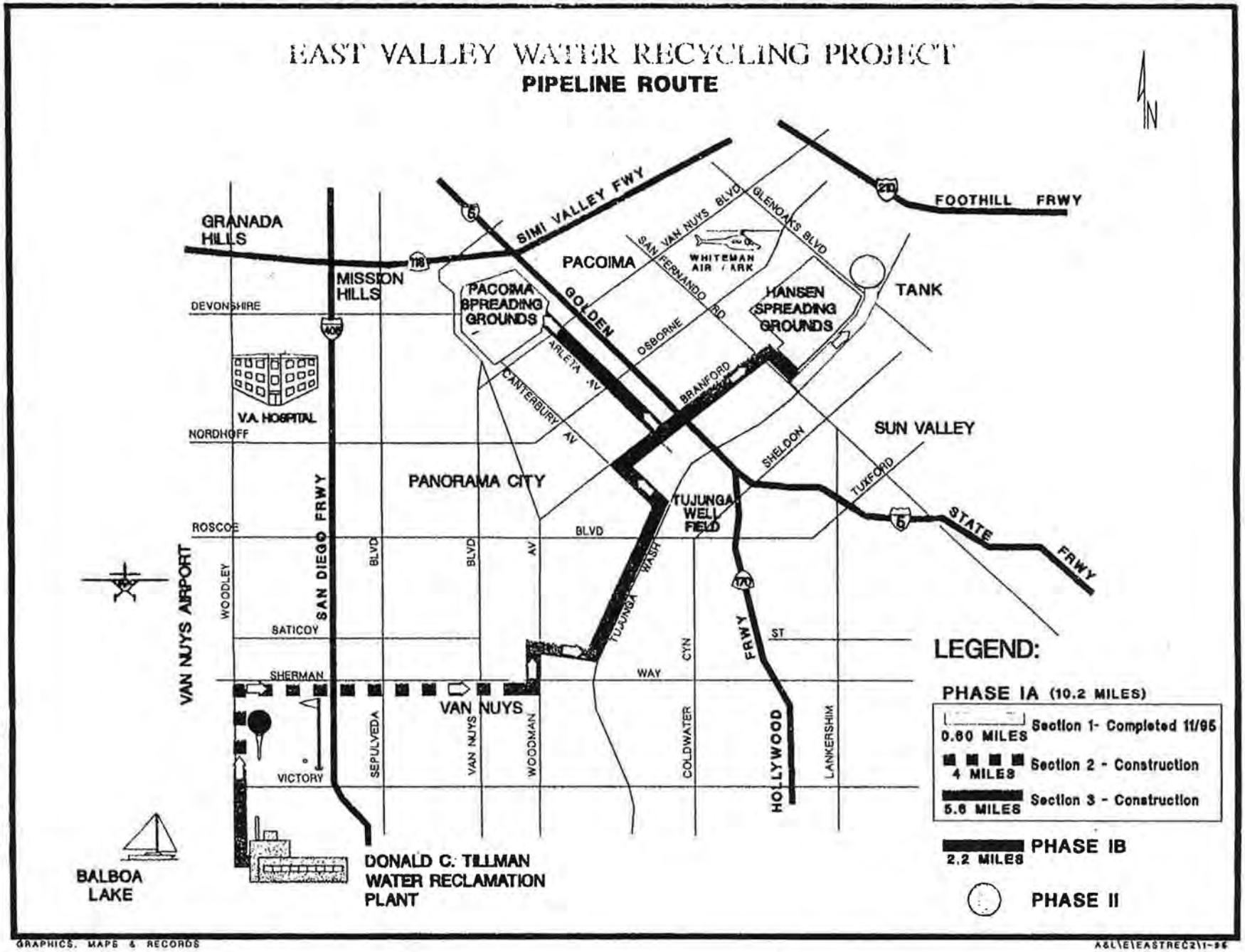

EAST VALLEY WATER RECYCLING PROJECT
PIPELINE ROUTE
N
GRANADA HILLS
MISSION HILLS
DEVONSHIRE
NORDHOFF
ROSCOE
SATICOY
SHERMAN WAY
VICTORY
SIMI VALLEY FWY
FOOTHILL FRWY
PACOIMA
SAN FERNANDO RD
VAN NUYS BLVD
GLENOAKS BLVD
WHITEMAN AIR PARK
PACOIMA SPREADING GROUNDS
HANSEN SPREADING GROUNDS
TANK
GOLDEN
OSBORNE
ARLETA AV
CANTERBURY AV
BRANFORD
SHELDON
TUXFORD
SUN VALLEY
STATE FRWY
V.A. HOSPITAL
PANORAMA CITY
TUJUNGA WELL FIELD
TUJUNGA WASH
SAN DIEGO FRWY
VAN NUYS AIRPORT
WOODLEY
SEPULVEDA BLVD
VAN NUYS BLVD
WOODMAN AV
VAN NUYS
COLDWATER CYN
HOLLYWOOD FRWY
LANKERSHIM ST
BALBOA LAKE
DONALD C. TILLMAN WATER RECLAMATION PLANT
LEGEND:
PHASE IA (10.2 MILES)
0.60 MILES Section 1- Completed 11/95
4 MILES Section 2 - Construction
5.6 MILES Section 3 - Construction
2.2 MILES PHASE IB
PHASE II
GRAPHICS, MAPS & RECORDS
A&L\E\EASTREC2\1-96

Figure A

EAST VALLEY WATER RECYCLING PROJECT
MARCH 1996

Purpose

In June of 1990, the Los Angeles City Council adopted a goal of reusing about 40 percent of the City's wastewater by 2010. In keeping with this goal, the Department of Water and Power (Department) has plans to reuse about 80,000 acre feet per year (AFY) of recycled water, equivalent to about 10 percent of the City's future water supply, by 2010 to replace potable water use in the City. Increasing recycled water use will improve the reliability of the overall water supply of the City because it will reduce dependency on imported water. The East Valley Water Recycling Project (EVWRP) is the cornerstone of the City's water recycling efforts and will ultimately fulfill nearly half of this goal.

Project Description

Thirteen miles of 54" diameter pipe and a pump station will be designed and constructed to convey up to 35,000 AFY of recycled water from the Donald C. Tillman Water Reclamation Plant to the Sun Valley area of the San Fernando Valley. Ultimately, about 32,000 AFY would be percolated through the soil into the groundwater supply. Additional facilities will include more pipeline, a booster pump station, and a tank to deliver the remainder for irrigation and industrial uses. The Department has received a permit for the first phase of the EVWRP (Phase IA) to initially use 10,000 AFY for recharge only at the Hansen Spreading Grounds. Phase IB of the EVWRP is planned to deliver additional water to Pacoima Spreading Grounds. Phase II of the EVWRP will include additional facilities to deliver water to industrial and irrigation customers.

Benefits

Once completed, the use of this local source of water will lessen the demand on imported supplies by providing an economical alternative. It will replace a portion of the Mono Basin water no longer available for export. It will reduce the likelihood of severe water conservation measures in the future on residents and the business community throughout the city. The overall reliability of the water supply for the entire City will be improved.

Environmental Documentation

An environmental impact report for the EVWRP was completed and certified by the Department's Board of Water and Power Commissioners in August 1991. An additional study about the impact of this project on cultural resources was completed in October 1994 to comply with federal environmental documentation requirements.

The Department will be coordinating closely with regulatory and other agencies for the design, construction, and operation of this project to ensure that all requirements for reclaimed water use are satisfied. Also, mitigating measures to minimize environmental impacts, such as maintaining minimum flows in the Los Angeles River, will be a part of this project

Regulatory Requirements

On September 18, 1995, a permit was issued by the Regional Water Quality Control Board (Regional Board) to allow the use of up to 10,000 AFY of recycled water for groundwater recharge at the Hansen Spreading Grounds. The Regional Board has already approved the use of reclaimed water for irrigation and industrial applications for the EVWRP in March 1993.

The EVWRP will have sufficient safeguards to ensure that it is operated safely to protect public health. Information, including results of extensive groundwater modeling simulations, were submitted to both the Regional Board and State Department of Health Services for their review and approval to recharge up to 10,000 AFY of recycled water. It was demonstrated that EVWRP Phase 1A can be expected to meet all regulatory requirements. The blended water upon extraction will continue to meet all drinking water standards. In addition, the following also will ensure a safe operation:

- Reclaimed water will meet all drinking water standards before spreading
- On average, no more than 20% of any well water will be reclaimed water
- On average, about 200 feet of soil will be between the ground surface and groundwater, 10 times the minimum depth required
- About 6000 feet will separate the point of recharge and the closest production well, 12 times the minimum distance required
- Water will be retained for at least 5 years before extraction, 10 times the minimum requirement.
- Additional disinfection treatment will be provided upon extraction.

The EVWRP includes an extensive groundwater monitoring program to provide added protection, which will include 10 monitoring wells located between the area of recharge and the extraction wells to monitor changes in water quality. These wells will also serve as an "early warning" system to identify any adverse water quality impacts before the groundwater is extracted and distributed to customers.

Financing

The estimated cost of the EVWRP is approximately $56 million. Up to 25 percent of the cost for the EVWRP will be funded by the federal government through the Federal Reclamation Projects Authorization and Adjustment Act of 1992 (HR 429), P.L. 102-575. The Department also has received approval for state funding through the Environmental Water Act of 1989 (AB 444) for up to 50 percent of the project's cost. A third source will be revenue collected from surcharges dedicated specifically for water reclamation projects in the Department's water rate structure.

The Local Projects Program of the Metropolitan Water District of Southern California may provide rebates once the project is operational, subject to an evaluation of eligibility.

Cost to Ratepayers

Because state and federal funding will cover 75% of the capital cost of the EVWRP, only 25% or about $14 million of this project needs to be funded by ratepayers. Spread out over a 4-year period, and assuming 15 billing units (1 b.u. = 100 cubic foot) per month for a typical single family residence, the cost per month for typical customers will be $0.20.

Schedule - Phase IA

Conceptual Planning	June 1990 - June 1991
Environmental Documentation	July 1990 - August 1991
Regional Board approval for Title 22 uses	October 1991 - June 1992
Regional Board approval for groundwater recharge	March 1991 - September 1995
Detailed Design	July 1992 - December 1996
Advertise/Bid/Award Contracts	December 1995 - February 1997
Construction (Force Account)	September - November 1995
Construction (Contract)	July 1996 - October 1998
Startup and testing	November - December 1998

Progress to Date

- Regional Water Quality Control Board issued a permit for groundwater recharge on September 18, 1995.
- Construction of 3100 feet of pipe in the Hansen Spreading Grounds was completed in December 1995.
- The Draft Monitoring Plan was submitted to regulatory agencies for their review and approval on December 18, 1995. Several subsequent meetings were held to review this plan.
- Two monitoring wells were constructed in the Hansen Spreading Grounds.
- Plans and specifications for 22,000 feet of pipeline were advertised on February 21, 1996. Bid opening is scheduled for April 8, 1996.
- Design criteria for the pumping station continue to be developed as part of a joint effort with the City's Departments of Public Works and Recreation and Parks.
- Requests for reimbursements were submitted to the federal government.

Remaining Challenges

Although recycled water has been safely used locally for groundwater recharge by the Orange County Water District since the late 1940s, and by the Water Replenishment District of Southern California since 1962, the EVWRP has not progressed without challenge. After the groundwater recharge permit for Phase 1A of the EVWRP was issued by the RWQCB in September 1995, Miller Brewing Company filed an appeal with the State Water Resources Control Board in an attempt to stop the project. Miller Brewing Company's interest in the EVWRP stems from a similar project proposed by the Upper San Gabriel Valley Municipal Water District (USGVMWD) which might potentially impact some of Miller's production wells in Irwindale. However, in early 1996 an agreement was reached between the USGVMWD and Miller Brewing Company for a down-scaled recharge project in the San Gabriel Valley, and the suspension of Miller's appeal filed against the permit for the EVWRP. Due to the resolution of these issues, progress on the EVWRP is anticipated to continue on schedule.

APPENDIX E

WATER QUALITY DATA

REPRESENTATIVE MINERAL ANALYSES OF WATER

Well Number or Source	Date Sampled	Spec. Cond. µmho/c	Mineral Constituents in milligrams per liter (mg/l)												TDS mg/l	Hardness as $CaCO_3$ mg/l
			pH	Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	NO_3	F	B		
Imported Water																
Colorado River Water at Eagle Rock Reservoir	1995	1028	8.1	71	28.5	103	4.7	0	141	263	96	1.06	4.7	0.16	614	289
LA Aqueduct Influent	8/8/95	168	7.4	14.5	2.41	15.3	-	0	68.3	13	8	1.68	0.31	0.21	110	57
LA Aqueduct/MWD Filtration Plant Influent	8/8/95	172	7.52	14.4	2.35	15.2	-	0	70.2	13.4	8	0.44	0.31	0.19	111	54
State Water Project at Joseph Jensen Filtration Plant (Influent)	94/95 FY	573	7.9	35	15.5	57	3.4	0	118	87	61	2.42	0.29	0.43	338	148
Surface Water																
Tillman Rec. Plant Discharge to LA River	1995 CY	-	6.9	41	12	92	12	-	-	120	101	1.5	0.6	0.8	534	152
Los Angeles River at Arroyo Seco	9/95	981	8.0	68.1	24.3	96.5	9.75	ND	171	191	108	7.4	0.3	0.575	666	270
LA/Glendale Rec. Plant Discharge to LA River	1995 CY	-	7.2	50	19	117	13	-	-	175	142	2.42	0.06	0.7	673	202
Ground Water																
(San Fernando Basin - Western Portion)																
4757C (Reseda No. 6)	10/13/83	944	7.8	115	31	43	2.1	-	301	200	33	2.6	0.31	0.24	595	416
(San Fernando Basin - Eastern Portion)																
3810 (a) (No. Hollywood No. 11)	5/9/95	513	7.2	60.2	13.7	25.2	-	0	226	64.4	12.74	8.06	0.44	0.02	301	209
3841C (Burbank No. 7) (c)	4/19/94	557	9.0	62.9	15.1	39.3	0	ND	214	46	28	14.75	0.56	-	316	199
3913H (Grandview No. 16)	12/93	540	7.9	56	13	33	3.6	1.2	225	56	24	13	0.5	-	330	193
(San Fernando Basin - L.A. Narrows)																
3959E (Pollock No. 4) (b)	3/8/93	794	7.5	77	24	49	NA	0	242	103	58	37.3	0.33	0.38	559	284
(Sylmar Basin)																
4840J (Mission No. 5)	11/30/94	653	7.3	81.6	17	34.5	-	0	251	37.3	35.2	27.33	0.33	0.36	426	271
5959 (San Fernando No. 3)	9/3/94	630	7.6	59	22	27	2.7	0.58	225	67	25	21	0.39	-	360	238
(Verdugo Basin)																
3971 (Glorietta No. 3)	6/23/92	840	7.0	86	32	39	3.3	0.1	226	115	75	52.8	0.21	-	500	346
5058 (CVCWD No. 14)	2/9/93	705	7.2	68	27	30	2.5	0.21	201	76	56	54	0.33	-	410	281

(a) Substituted for No. Hollywood No. 30

(b) Substituted for Pollock No. 6

APPENDIX F

DEWATERING AND REMEDIATION PROJECTS

DEWATERING AND REMEDIATION PROJECTS

No.	Company	Contact	Address	ID	Start Date
1	Danalax Engineering Corp.	Krell, Alex	11239 Ventura Blvd.	P	
2		Henkin, Doug	8806 Etiwanda Ave.	P	
3	Delta Tech. Engineering	Abbasi, Z. A.	12800 Ventura Blvd.	P	
4	Helfman, Hoffman & Associates	Varadi, Ivan	5550 Topanga Canyon	D	Jun 19, 1989
5	Encino Spectrum Project	Helfman, Haloosim & Ass.	15503 Ventura Blvd.	D	Jun 14, 1989
6	Home Savings of America	Eli Silon & Associates	13949 Ventura Blvd.	D	Jun 14, 1989
7	Warner Center Ent. Complex	Tsuchiyama and Kaino	5955 Owensmouth Ave.	D	Jun 26, 1989
8	T Violes Construction Company	Viole, Tim, Jr.	15840 Ventura Blvd.	P	
9	Mobil Oil	Alton Geoscience	16461 Ventura Blvd.	R	May 11, 1989
10		Eccleston, C. W.	22020 Clarendon St.	P	
11	Thrifty Oil	Delta Tech. Eng.	18226 Ventura Blvd.	R	Feb 2, 1990
12		Marks, Ronald	5348 Topanga Canyon	P	
13		Helfman, Haloosim & Ass.	21820 Burbank Blvd.	P	
14	Park Hill Medical Plaza	Anjomshoaa, Mahmoud	7303 Medical Center Dr.	D	Dec 27, 1989
15	Danalex Engineering		12050 Ventura Blvd.	P	
16	Ellis Plumbing Co.	Ellis, Chris	4235 Mary Ellen Ave.	P	
17	Tarzana Office Plaza	Varadi Engineering	18701 Burbank Ave.	P	
18	Helfman, Haloosim & Associates	Varadi, Ivan	5350 White Oak Ave.	P	
19	California Environmental	Buckley, Charlie	5455 Van Nuys Blvd.	R	Oct 4, 1989
20	First Financial Plaza Site	Slade, Richard	16830 Ventura Blvd.	D	Oct 9, 1987
21	Trillium	Lewis, Bill	6310 Canoga Ave.	D	Apr 27, 1988
22	LAMCO	O'Neil, John	21300 Victory Blvd?	D	Apr 27, 1988
23	La Reina Fashion Plaza	Blumenfeld, Dolores	14622 Ventura Blvd.	D	Apr 27, 1988
24	Rockwell International	Lafflam, S. R.	6633 Canoga Park Ave.	R	Jun 10, 1990
25	Lockheed	Helgerson, Ron	E. Empire Ave.	R	Jan 5, 1989
26	3M Pharmaceutical	Lee, M. E.	19901 Nordhoff St.	R	Feb 8, 1989
27	Philips Components	Smith, Wade	4561 Colorado St.	R	Jul 14, 1987
28	Auto Stiegler	Stiegler, John	16721 Ventura Blvd.	D	Oct 31, 1987
29	Sherway Properties	Vasquez, Rodney	4477 Woodman Ave.	P	
30	Ellis Plumbing Co.	Ellis, Chris	19951 Roscoe Blvd.	P	
31	Metropolitan Transit Authority	Higgins, John	Metro Red Line	TD	April, 1995
32	Greeff Fabrics	Edelson, Bruce	4000 Chevy Chase Dr.	R	March, 1993

Notes:

1) ID - Refers to the type of project;

D: Permanent dewatering required.

P: No dewatering required presently, however there is potential for dewatering in the future.

R: Ground water remediation site.

TD: Temporary Dewatering

2) Start Date - Date project was brought to the attention of the ULARA Watermaster.

APPENDIX G

WELLS DRILLED FOR GROUNDWATER INVESTIGATIONS

WELLS DRILLED FOR GROUND WATER INVESTIGATIONS

1994-95 WATER YEAR

1. Allied Signal
   No new wells were drilled.

2. Hughes Missile Systems Company
   No new wells were drilled.

3. Lockheed Aircraft Corp.
   No new wells were drilled.

4. City of Los Angeles
   Two new monitoring wells were drilled in the East Valley, EV-1 and EV-2. A total of five wells were destroyed: Pollock Well No.5 and Crystal Springs Well No.47 during 1995 and Crystal Springs Well Nos. 44, 45, and 46 in February 1996.

5. Philips Components
   No new wells were drilled.

6. Rocketdyne (Canoga Park Facility)
   No new wells were drilled.

7. 3M
   No new wells were drilled.

8. Walt Disney
   Disney has three extraction wells in which the pumps have been pulled in preparation for destruction.

APPENDIX H

LANDFILLS -- SWAT REPORT SUMMARY

STATUS OF LANDFILLS
SOLID WASTE ASSESSMENT TEST REPORTS

Attached are sixteen summary reports on the status of various landfills that exist within the Upper Los Angeles River Area (ULARA). For each of these landfills a Solid Waste Assessment Test (SWAT) Report was prepared and submitted to the Los Angeles Regional Water Quality Control Board.

These are reports prepared by the ULARA Watermaster and staff. Updated status reports will be available in the future as data becomes available. The date that gas control systems are installed and the depth-to-water at the landfill site are significant parameters as to the potential impact on groundwater in the alluvial area. Additional work is required in obtaining these data. A better understanding of the San Fernando Basin's increased hardness and total dissolved solids levels will be provided when these data are available.

Included in the summary sheets provided are the name and owner of the various landfills, along with location maps and general hydrogeologic information at the landfill site.

The following landfills are included in this report:

1. Bradley East
2. Bradley West
3. Branford Street
4. CalMat (Sun Valley #3)
5. CalMat (Old) Class 3 Site
6. Gregg Pit/Bentz
7. Hewitt
8. Lopez Canyon
9. Penrose/Newberry
10. Pendleton Street
11. Sheldon-Arleta
12. Scholl Canyon
13. Stough Park
14. Sunshine Canyon
15. Toyon
16. Tuxford

The SWAT program has been discontinued after completion of only 4 ranks of landfills in an original group that included 15 ranks. SWAT activities now include only a study of previously submitted reports. The controlling program now is Article 5 of Chapter 15, which became effective on July 1, 1991. However, this program was deemed unsuitable by the USEPA for RCRA authorization and had to be revised. The DHS and SWRCB agreed to jointly draft a suitable replacement. Among the changes are the requirements to analyze for many more VOCs, and to subject the results to more sophisticated statistical techniques. If a leak is detected, an Evaluation Monitoring Program (EMP) is required, followed by a Corrective Action Program (CAP).

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Bradley East Disposal Site (Bradley Landfill complex)

OWNER - Valley Reclamation Company

LOCATION - Sun Valley District. Southeast of Sheldon Street and San Fernando Road.

GEOLOGY - Holocene and Late Pleistocene alluvium in the Hansen subarea northeast of San Fernando Road.

GROUND WATER FLOW DIRECTION - Southeasterly

GENERAL OPERATIONS - Part of the 138-acre Bradley Landfill complex. Started accepting trash in 1960. Residential and commercial refuse with low moisture and nonhazardous waste. Stopped accepting trash in the early 1980s. Contains about 7.5 million tons of trash.

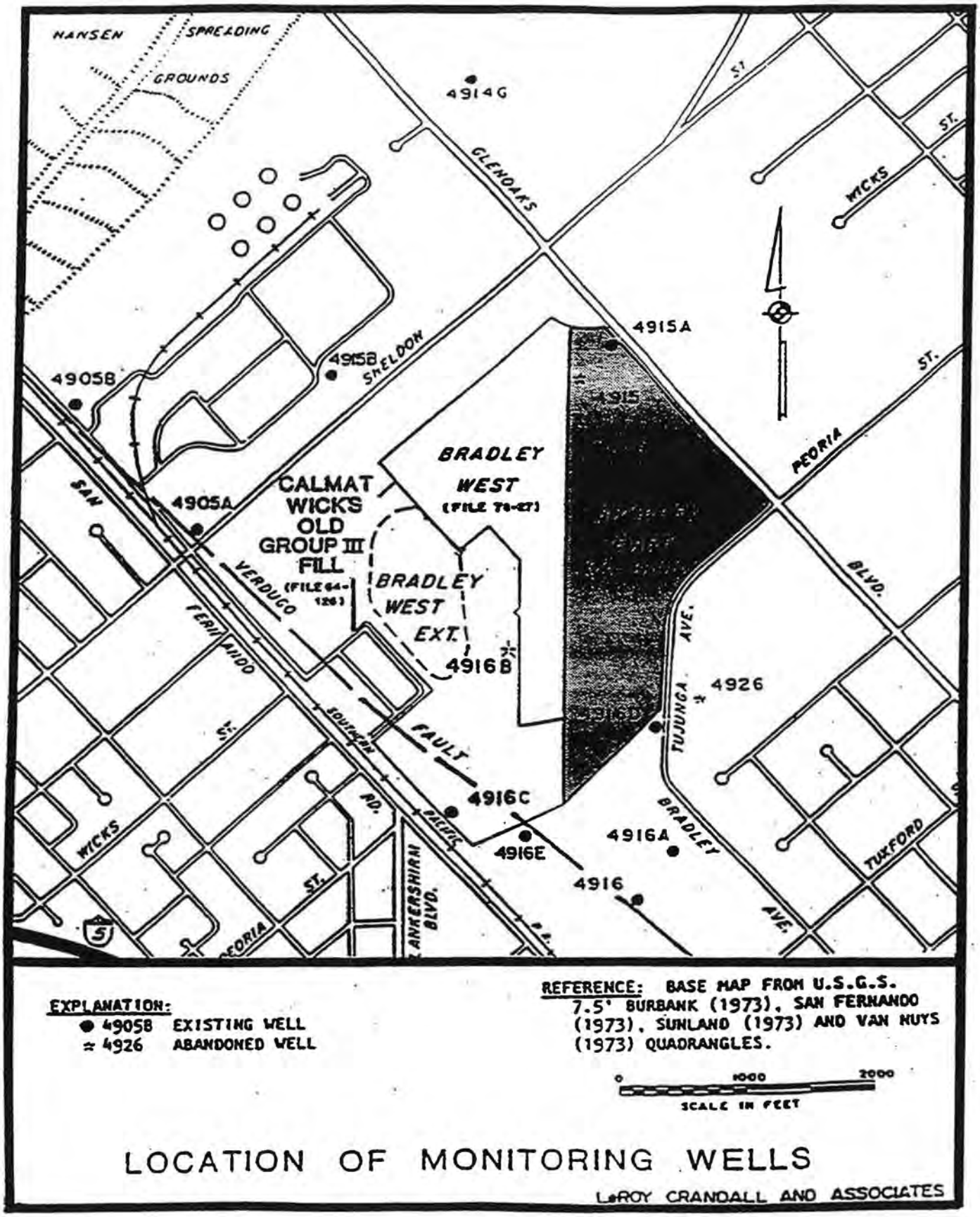
GAS CONTROL SYSTEM - Yes

LEACHATE CONTROL AND MONITORING - Has no liner. No visible seeps on western slope. No leachate in monitoring wells. No formal leachate collection system.

GROUND WATER QUALITY MONITORING - The SWAT reports completed in June 1987 and November 1990 provide the background ground water quality data upgradient and downgradient of the Bradley East Landfill.

REPORTS -
SWAT Report (Rank 2) - June 26, 1987 - LeRoy Crandall and Associates

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Final SWAT Report (Rank 2) was approved by the RWQCB in April 1992. Non-hazardous substances were detected in monitoring wells above State drinking water regulatory levels. Although this landfill has been closed, an EMP will be required. A CAP will be required upon completion of the EMP.



1. BRADLEY EAST DISPOSAL SITE

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Bradley West Disposal Site (Part of Bradley Landfill complex)

OWNER - Valley Reclamation Company

LOCATION - Sun Valley District. Southeast of Sheldon Street and northeast of San Fernando Road.

GEOLOGY - Holocene and Late Pleistocene alluvium in the Hansen subarea northeast of the Verdugo Fault.

GROUND WATER FLOW DIRECTION - Southeasterly

GENERAL OPERATIONS - Originally designed during the period 1975 to 1977. Started accepting trash in 1981 -- relatively dry, inert or decomposable, nonhazardous. Bradley West extension was designed according to 1984 Subchapter 15 requirements, and has a clay liner and leachate collection system.

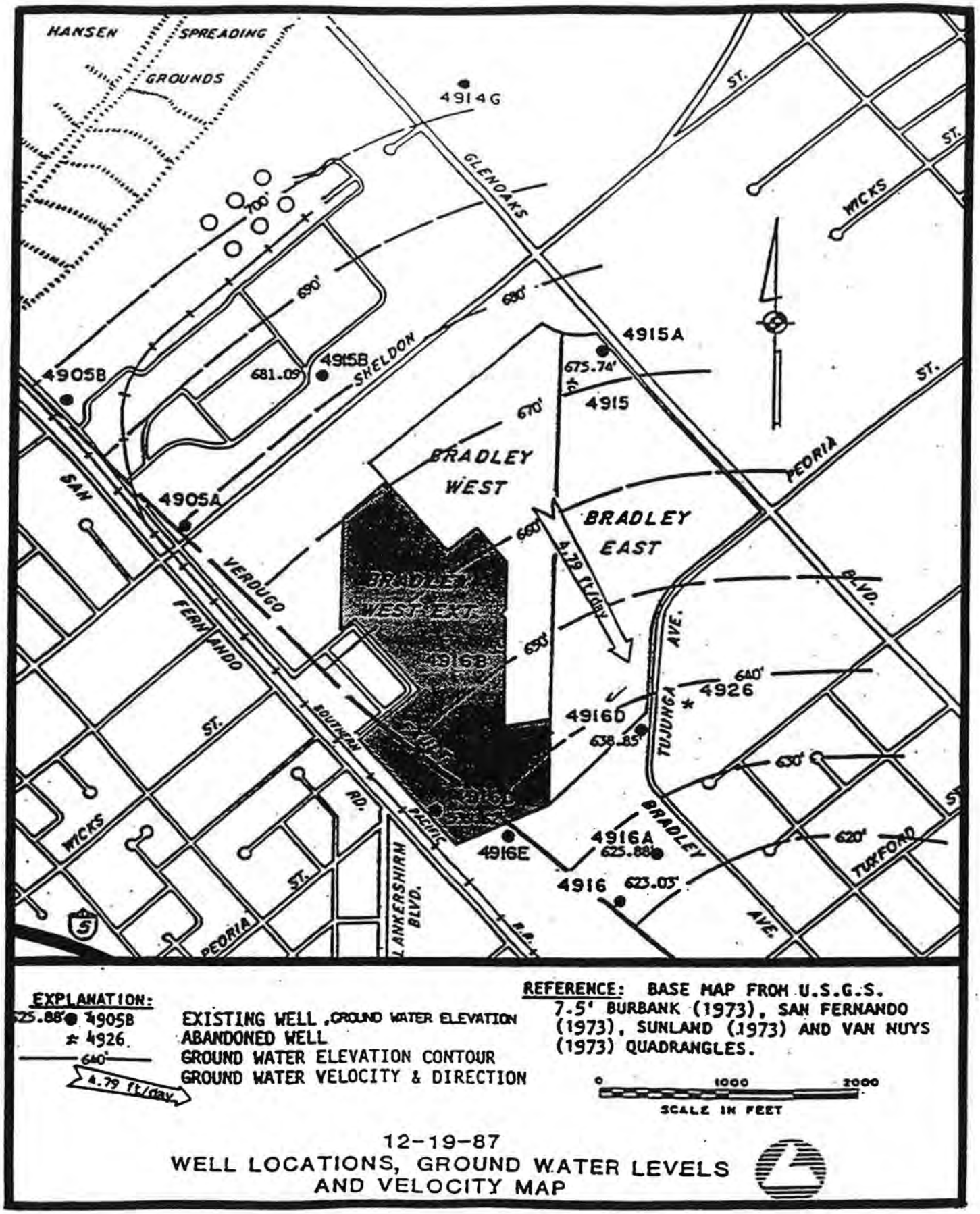
GAS CONTROL SYSTEM - Date started is unknown.

LEACHATE CONTROL AND MONITORING - First system in operation since 1980. Other systems have been installed as operations have expanded. As of June 26, 1987, no leachate was detected. There was ponding during the water year 1981-82 and about 1/2 million gallons of water percolated into the trash prism. As placed, trash has about 25-percent moisture. Holding capacity is 40- to 53-percent moisture.

GROUND WATER QUALITY MONITORING - May be slight increase in chloride and total dissolved solids with lower water levels. No evidence of chloride increase due to landfill; no evidence of increase in bicarbonate due to the landfill. Liner and gas control system seem to be effective in preventing gas from reaching the water table.

REPORTS -
SWAT Report (Rank 1) - June 25, 1987 - LeRoy Crandall and Associates
SWAT Report Supplement - March 21, 1988 - Law Environmental

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Final SWAT Report (Rank 1) was approved by the RWQCB in April 1992. Non-hazardous substances were detected in monitoring wells above State drinking water regulatory levels. An EMP is required.



EXPLANATION:

625.88' ● 4905B — EXISTING WELL, GROUND WATER ELEVATION

≠ 4926 — ABANDONED WELL

640' — GROUND WATER ELEVATION CONTOUR

4.79 ft/day — GROUND WATER VELOCITY & DIRECTION

REFERENCE: BASE MAP FROM U.S.G.S. 7.5' BURBANK (1973), SAN FERNANDO (1973), SUNLAND (1973) AND VAN NUYS (1973) QUADRANGLES.

0 1000 2000

SCALE IN FEET

12-19-87

WELL LOCATIONS, GROUND WATER LEVELS AND VELOCITY MAP

2. BRADLEY WEST DISPOSAL SITE

STATUS AS OF MAY 1995

SWAT Not Completed

NAME OF LANDFILL - Branford Sanitary Landfill

OWNER - City of Los Angeles, Bureau of Sanitation

LOCATION - Sun Valley District. Southwest of San Fernando Road, northwest of Tujunga Wash.

GEOLOGY - Holocene and Late Pleistocene alluvium just southwest of the Verdugo Fault. Old gravel pit.

GENERAL OPERATIONS - Class II landfill operated by the City of Los Angeles, Department of Sanitation. Not open to the public. Accepted only solid, nonhazardous waste.

TIME OF OPERATION - Landfilling began on August 5, 1957 and continued through January 25, 1961. About 435,000 tons of trash were deposited.

MINIMUM ELEVATION OF TRASH - 70 feet below ground surface.

ELEVATION RANGE OF WATER TABLE - In early 1988, depth to ground water was 334 to 344 feet.

GROUND WATER QUALITY MONITORING - Two SWAT wells drilled - one upgradient (ITB-1) and one downgradient (ITB-2). Later, two additional wells were drilled downgradient on CalMat property.

REPORTS -
SWAT Report (Rank 2) - June 1988 - International Technology Corporation

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Final SWAT Report submitted October 1990. Rejected SWAT Report April 1992 due to inadequate monitoring procedures which are under review. Although this landfill has been closed it is still subject to SWAT requirements. Further monitoring may be required under Chapter 15.

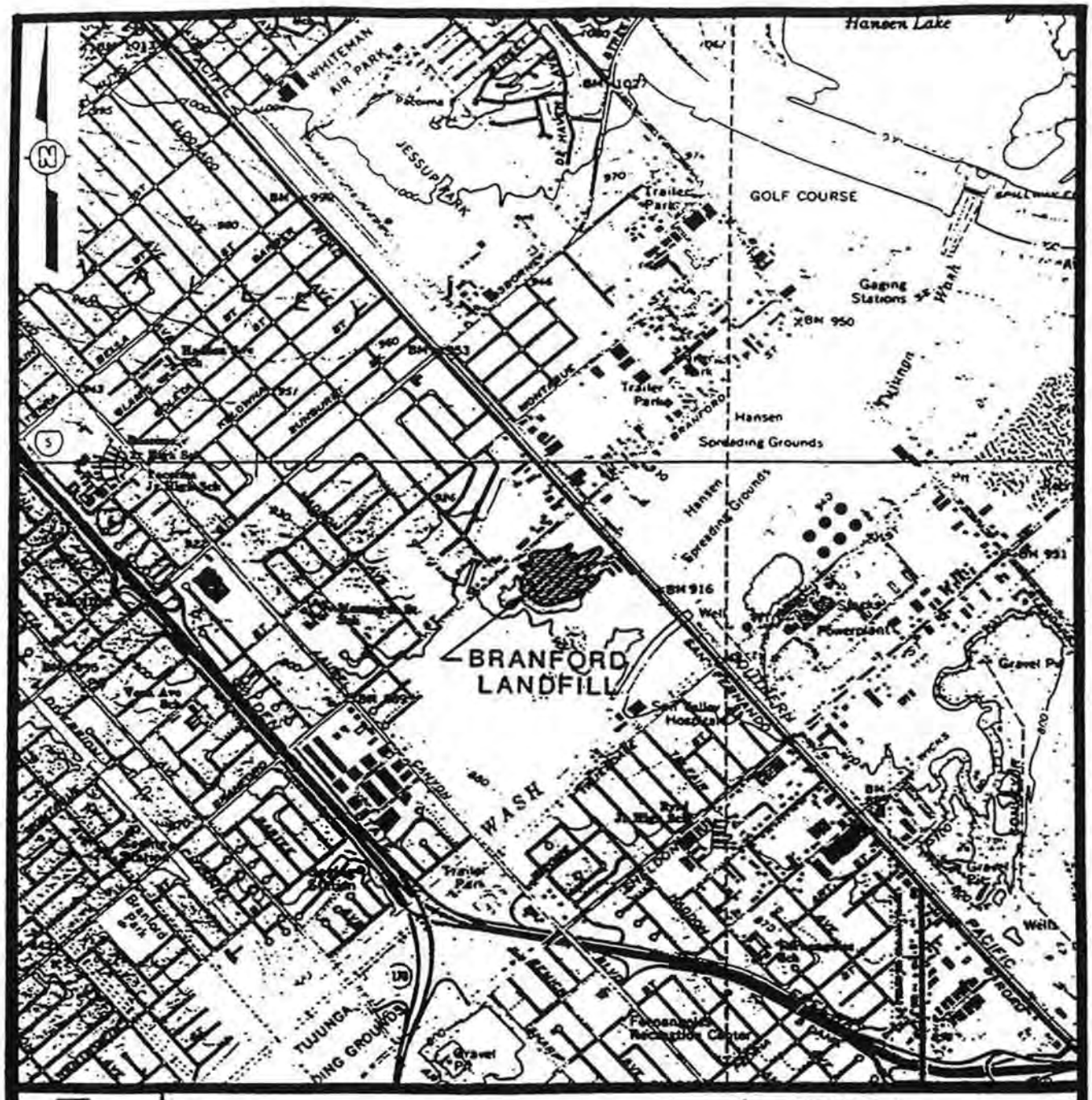


FIGURE 1

SITE LOCATION MAP
BRANFORD LANDFILL

PREPARED FOR

BUREAU OF SANITATION
DEPARTMENT OF PUBLIC WORKS
CITY OF LOS ANGELES

INTERNATIONAL TECHNOLOGY CORPORATION

REFERENCE:
USGS 7.5 MINUTE TOPOGRAPHIC MAPS OF VAN NUYS AND SAN FERNANDO, CALIFORNIA QUADRANGLES. DATED: 1966 AND PHOTOREVISED 1972 FOR BOTH SCALE: 1:24,000

3. BRANFORD SANITARY LANDFILL

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - CalMat Landfill (Sun Valley #3)

OWNER - CalMat Properties

LOCATION - Sun Valley District. Northeast of Glenoaks Boulevard and northwest of Peoria Street.

GEOLOGY - Holocene and Late Pleistocene alluvium in the Hansen subarea northeast of the Verdugo Fault.

GROUND WATER FLOW DIRECTION - Mostly southeasterly along the Verdugo Fault.

GENERAL OPERATIONS - Covers 125 acres in an active gravel quarry. Open to the public since 1983 for general rubble and demolition debris (nondecomposable). No metal other than embedded rebar. As of July 1, 1988, contained about 1 million tons of trash. Receives about 75,000 tons per month. Has 15-year permit (to 1998). Total capacity, 75 million tons.

GAS CONTROL SYSTEM - Not needed because the trash is inert.

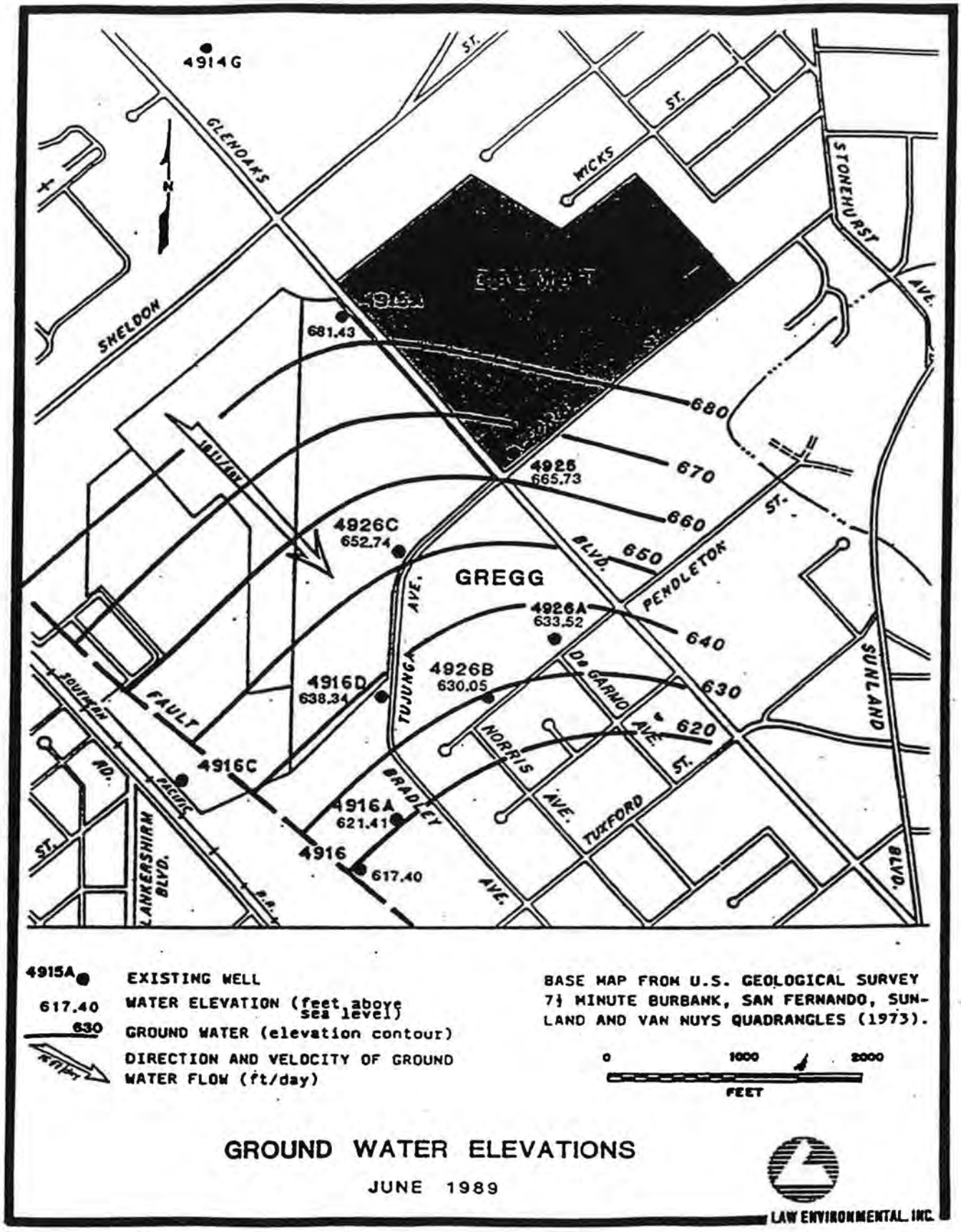
VADOSE ZONE MONITORING - One soil boring into the vadose zone. No contamination found.

LEACHATE CONTROL AND MONITORING - No evidence of leachate production.

GROUND WATER QUALITY MONITORING - Background quality is obtained from the Bradley Landfill complex SWAT wells. Quarterly sampling started in April 1988. There are regional plumes of trichloroethylene which are unrelated to the landfill. There are two different water types under the landfill which appear to be related to two different alluvial channels.

REPORTS -
SWAT Report (Rank 2) - July 1, 1988 - Law Environmental
SWAT Report Supplement - July 1989 - Law Environmental

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Final SWAT Report (Rank 2) approved in June 1992. No evidence of leakage. No further monitoring will be required.



4. CALMAT LANDFILL(SUN VALLEY #3)

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - CalMat (Old) Class 3 Site

OWNER - Valley Reclamation Company

LOCATION - Sun Valley District. Southeast of Sheldon Street and northeast of San Fernando Road.

GEOLOGY - Holocene and Late Pleistocene alluvium in the Hansen subarea northeast of the Verdugo Fault.

GENERAL OPERATIONS - Part of the 138-acre Bradley Landfill complex. Formerly a concrete wash-out area. Now accepts only inert fill.

GAS CONTROL SYSTEM - Not needed.

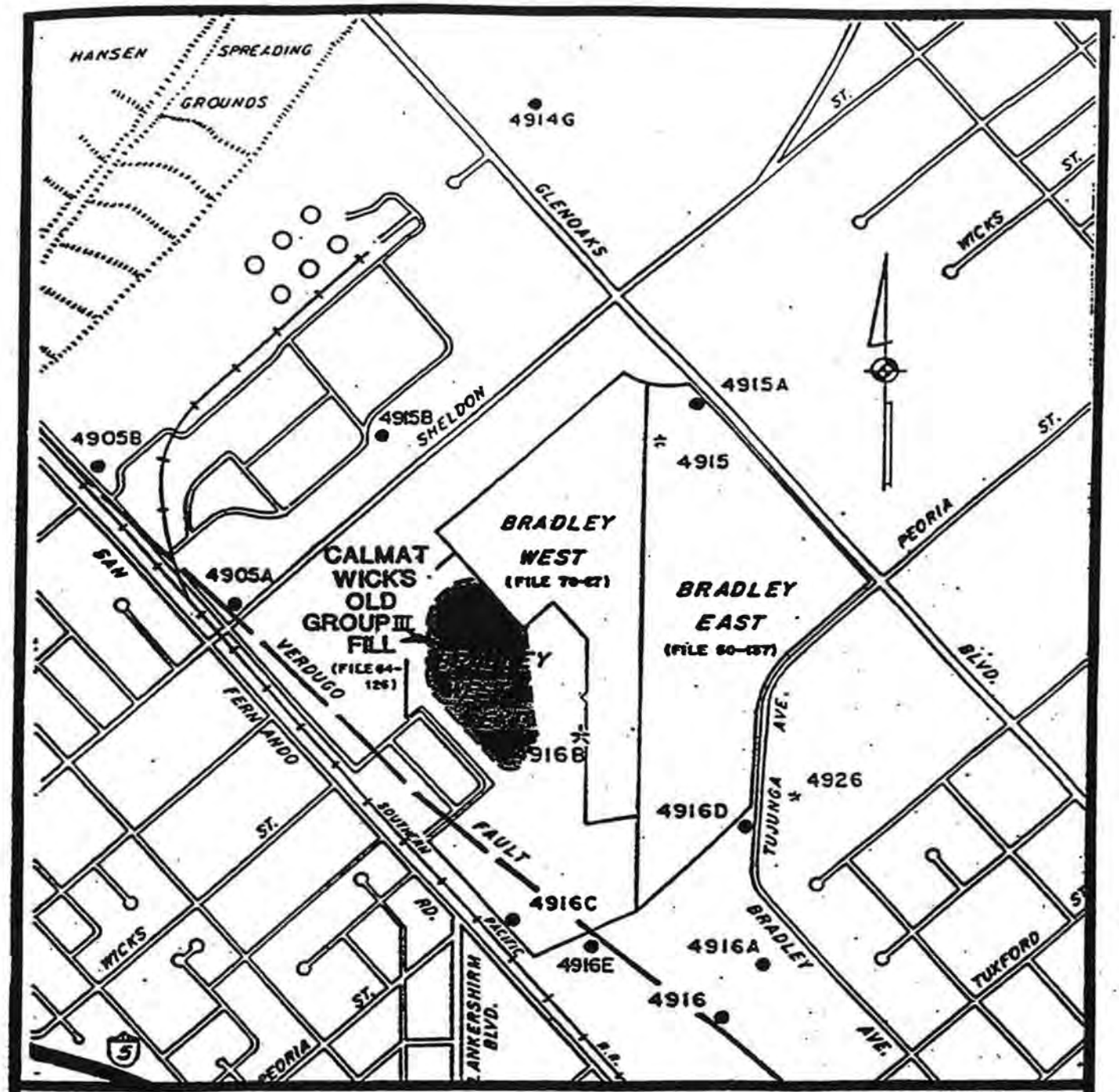
VADOSE ZONE MONITORING - Tried nine borings in 1986. Could not drill through concrete and steel.

LEACHATE CONTROL AND MONITORING - No liquid in any of the borings.

GROUND WATER QUALITY MONITORING - Started in this area in 1980. Higher total dissolved solids at lower levels is attributed to naturally higher salinities with depth. Increasing hardness could be related to landfill gas in one of the other landfills in the complex. High hardness is considered reversible.

REPORTS -
SWAT Report - June 26, 1987 - LeRoy Crandall and Associates

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Final SWAT Report submitted November 1990. Revised Water Monitoring Plan, required by Article 5 of Chapter 15, is under review. The Evaluation Monitoring Program required is under review. SWAT Report approved April 1992.



5. CALMAT (OLD) CLASS 3 SITE

96

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Gregg Pit/Bentz Disposal Sites

OWNER - CalMat Company

LOCATION - Southwest side of Glenoaks Boulevard between Pendleton Street and Tujunga Avenue.

GEOLOGY - Holocene and Late Pleistocene alluvium northeast of the Verdugo Fault. In the Hansen subarea.

GROUNDWATER FLOW DIRECTION - Mostly southerly, changing to southeasterly along the Verdugo Fault.

GENERAL OPERATIONS - Gregg Pit Approximately 30 acres in size. Operated from 1955 to 1963. Accepted combustible and noncombustible wastes, but specified wet or hazardous wastes were prohibited. The eastern portion was reactivated after the main Gregg Fill closed in 1963. Bentz Dump The reactivated area, which closed in 1963 to 1966, accepted only demolition debris. It was filled to street level but is still settling. Sign notes "clean fill dirt wanted". An estimated 3.5 million cubic yards of "debris and dirt" has been deposited with this combined operation.

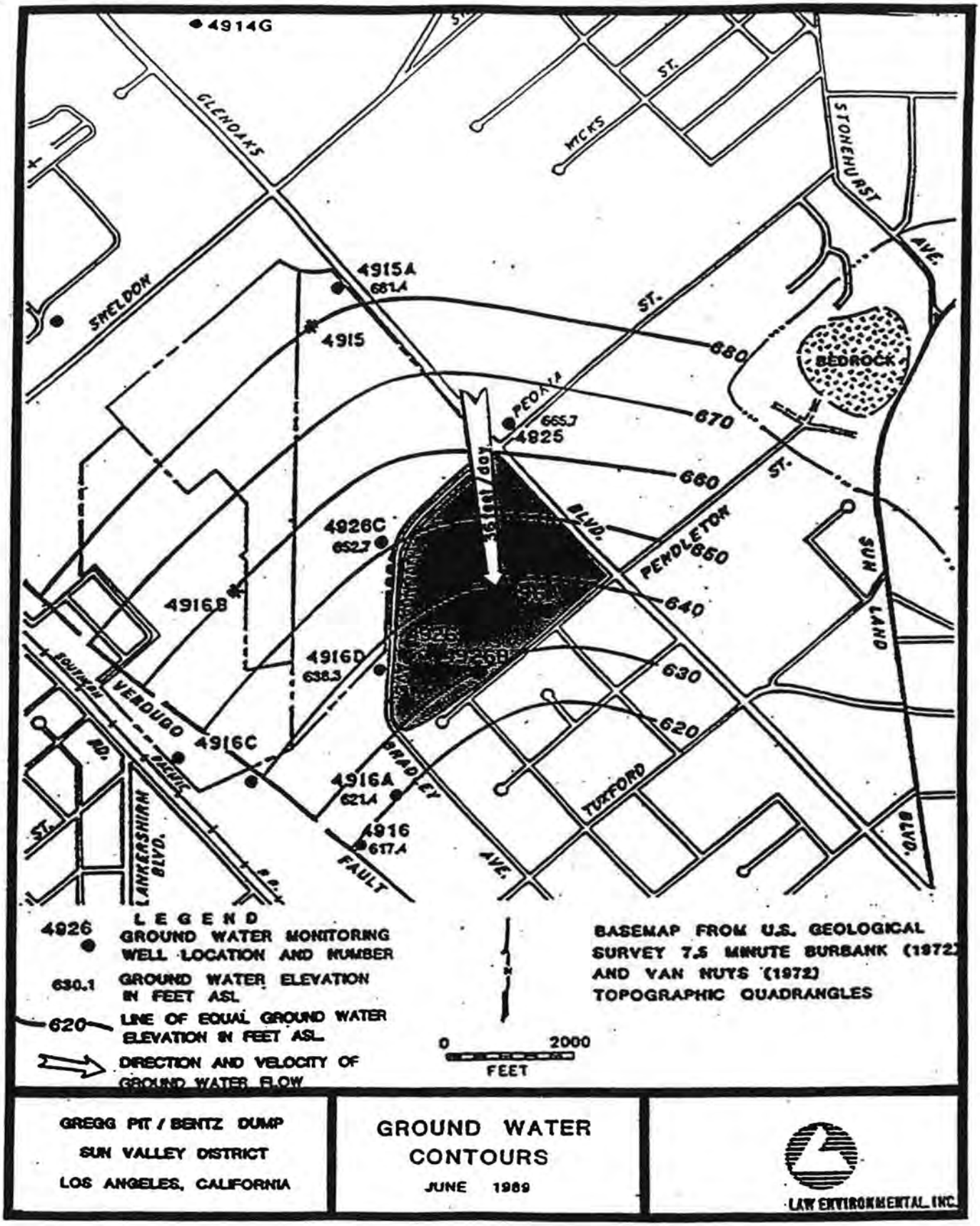
GAS CONTROL SYSTEM - Four wells and a gas flare were installed in 1987 (32 years after the first trash was placed). The system produces about 310 cubic feet per minute of gas consisting of 30-percent methane, 30-percent carbon dioxide, nitrogen and trace gases.

LEACHATE CONTROL AND MONITORING - A leachate test hole was drilled into the deepest part of the trash. No leachate was found.

GROUND WATER QUALITY MONITORING - Share monitoring wells with the program for the Bradley Landfill complex. Two monitoring wells drilled along Pendleton Street. Pumps with packers used to sample the uppermost 20 feet of saturation. Landfill gas contains no tetrachloroethylene (PCE), and the PCE found in upgradient wells is believed to be coming from an industrial area. Fill is not releasing hazardous wastes to ground water.

REPORTS -
SWAT Report (Rank 2) - July 1, 1989 - Law Environmental

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - SWAT Report (Rank 2) approved in February, 1990. There is evidence of possible leakage of non-hazardous substances in monitoring wells above State drinking water regulatory levels. Although this landfill has been closed further monitoring will be required under Chapter 15.



6. GREGG PIT / BENTZ

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Hewitt Landfill (Closed)

OWNER - CalMat Properties

LOCATION - North Hollywood District, between the Hollywood Freeway and Laurel Canyon Boulevard, and north of Sherman Way. Just southwest of the Rinaldi-Toluca Well Field.

GEOLOGY - Holocene and Late Pleistocene alluvium of the San Fernando Basin.

GROUND WATER FLOW DIRECTION - A little north of east.

GENERAL OPERATIONS - Operated by Los Angeles By-Products Company. Opened to the public from 1962 to November 12, 1975. Below elevations 555 to 560 feet waste was limited to solid inert materials. Above those elevations, accepted solid commercial and residential waste.

GAS CONTROL SYSTEM - Installed during the mid-70s, and about 12 years after landfilling started.

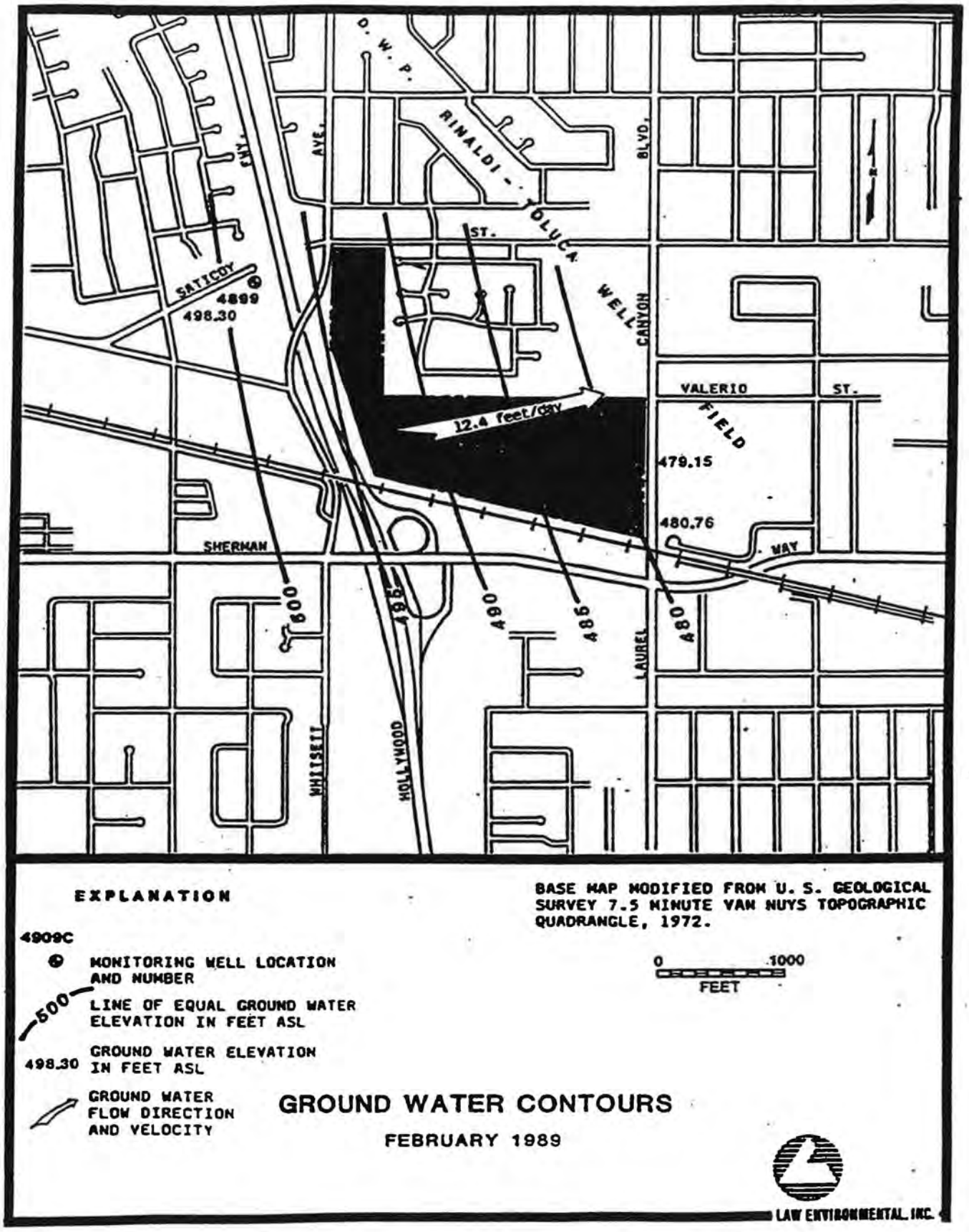
VADOSE ZONE MONITORING - Two Timco Teflon Lysimeters were installed to depths of 50 and 52 feet. Too little moisture to sample.

LEACHATE CONTROL AND MONITORING - A leachate well drilled in the trash showed moist conditions but no free leachate.

GROUND WATER QUALITY MONITORING - Has one upgradient and two downgradient wells. Use pump with inflatable packer to sample the top 20 feet of the saturated zone. One downgradient well has four perforated zones with grout seals. Upgradient samples show trichloroethylene and tetrachloroethylene above action levels, and high nitrates (over 70 mg/1). These are believed to be derived from upgradient sources, the plumes from which are passing under the landfill. High bicarbonates in downgradient wells may be related to gas production before the gas control system was in operation. Low chlorides indicate leachate cannot be an important contributor to ground water.

REPORTS -
SWAT Report (Rank 2) - June 6, 1988 - Law Environmental
Final SWAT Report - July 1, 1989 - Law Environmental

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - SWAT Report approved in May 1991. Non-hazardous substances were detected but were below State drinking water regulatory levels. No further monitoring will be required.



7. HEWITT LANDFILL

200

STATUS AS OF MAY 1995

SWAT Not Completed

NAME OF LANDFILL - Lopez Canyon Sanitary Landfill

OWNER - City of Los Angeles, Bureau of Sanitation

LOCATION - In the foothills north of Hansen Dam, between Lopez Canyon and Kagel Canyon.

GEOLOGY - Underlain by Modelo, Towsley and/or Pico formations on the south limb of Merrick (or Little Tujunga) syncline. Quaternary terrace deposits near southeastern boundary of the property. Thin Holocene alluvium tributary to San Fernando Valley. Also, the San Fernando Fault (a reverse fault) lies between the landfill and the San Fernando Valley alluvium.

HYDROGEOLOGY - Ground water is found in the thin Holocene alluvium and in fractures in the underlying bedrock. It is seasonal and may not be found in summer. Elevations of the ground water decrease to the north but no single ground water surface occurs beneath the landfill.

GENERAL OPERATIONS - Began accepting refuse in 1975. Closed to the public. Accepts only nonhazardous solid waste fill of municipal origin on 392-acre site. Canyons A and B (presently active) are not lined. Disposal Area C (not yet significantly active) will be lined and equipped with subdrains as well as leachate collection and removal systems.

GAS CONTROL SYSTEM - Yes.

VADOSE ZONE MONITORING - Two lysimeters installed in the canyon below Disposal Area A.

LEACHATE CONTROL AND MONITORING - A leachate well was drilled into the deepest part of the trash in Disposal Area B to a depth of 178 feet. No liquid was encountered during the drilling.

GROUND WATER QUALITY MONITORING - Two upgradient and three downgradient monitoring wells. Only ground water encountered was in shallow silty sand near the lower-debris basin in Disposal Area B. Native water is highly mineralized. The landfill is dry with no evidence of leakage.

SURFACE WATER AND SUBDRAIN SAMPLING - Site runoff is collected and then routed into storm drains. Acetone and toluene in runoff are believed due to a reaction between landfill gas and the runoff water. The gas control system is expected to reduce the formation of these substances.

REPORTS -
SWAT Report (Rank 2) - June 22, 1988 - Law Environmental
SWAT Report Supplement - July 1, 1989

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - There is ongoing monitoring under Chapter 15. Construction for the required SWAT wells was delayed due to landfill expansion but is now complete.

BASEMAP FROM U.S. GEOLOGICAL SURVEY
7½ MINUTE SAN FERNANDO (1972) AND
SUNLAND (1972) QUADRANGLES.

SITE LOCATION MAP

Project No. 58-6425-11

LAW ENVIRONMENTAL INC.

8. LOPEZ CANYON LANDFILL

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Penrose and Newberry Landfills (closed); Strathern Pit

OWNER - Los Angeles By-Products Company

LOCATION - Sun Valley District. North of Strathern Street on both sides of Tujunga Avenue.

GEOLOGY - Holocene and Late Pleistocene alluvium of the Tujunga alluvial cone. Southwest side of the Verdugo Fault.

GROUND WATER FLOW DIRECTION - Formerly to the south but now to the southwest because of pumping in the Rinaldi-Toluca Well Field.

GENERAL OPERATIONS - Penrose started accepting trash in 1960. Open to the public until March 1985. Dry nonhazardous waste (15 million cubic yards). Filled to 45 feet above grade. Settles two or more feet per year. Site is vacant except for an extraction/power generating plant. Newberry was open to the public from about 1948 to May 1955. Filled to level of surrounding streets with dry nonhazardous trash. Still settling. Low spots refilled with dirt. Two auto dismantlers and a ready-mix plant on site.

GAS CONTROL SYSTEM - Newberry has none. Penrose started operation in early 1980s.

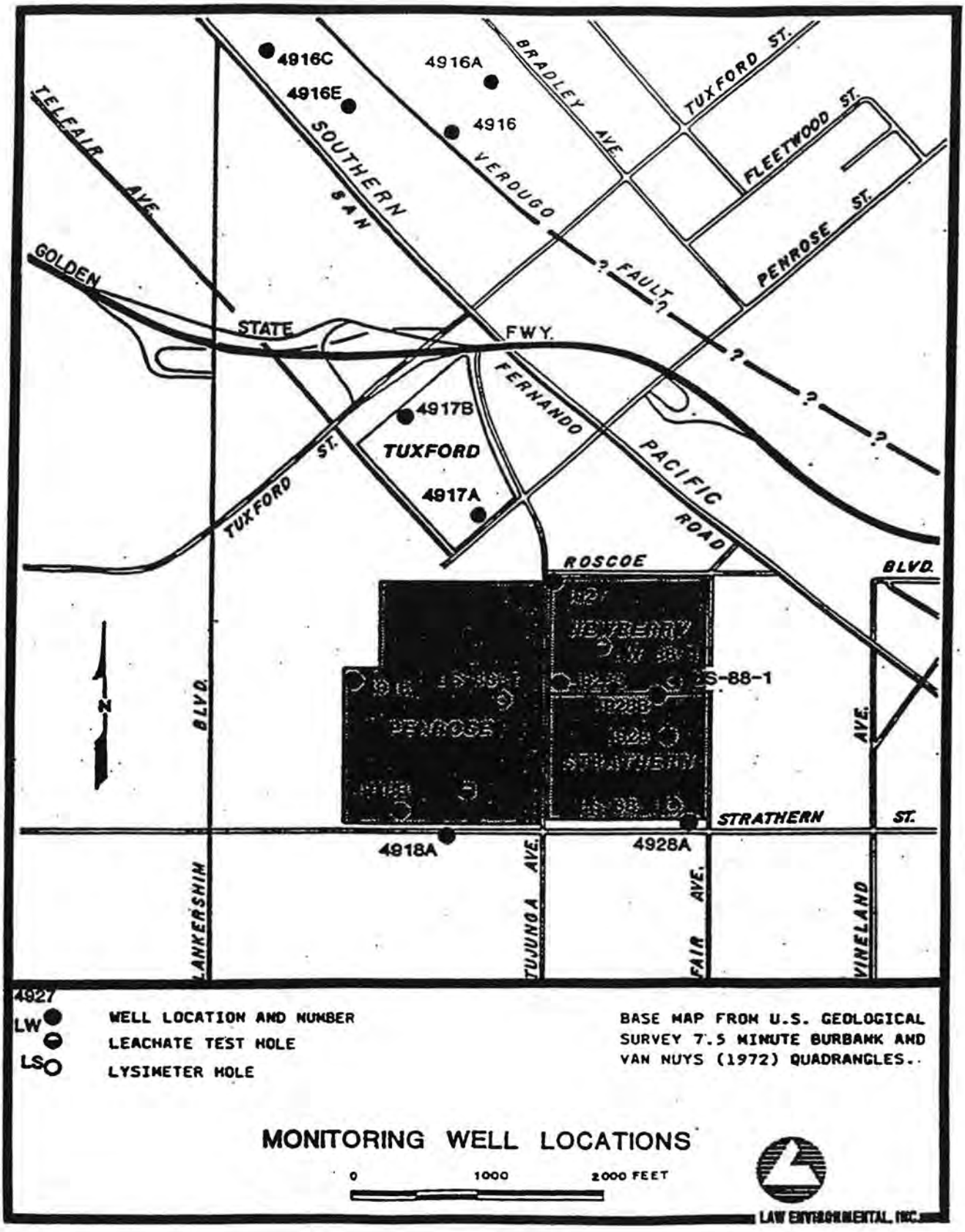
VADOSE ZONE MONITORING - Pressure-vacuum lysimeters were installed in the Penrose and Newberry Landfills and in the bottom of the Strathern Pit. Could not get a sample from any of these.

LEACHATE CONTROL AND MONITORING - Penrose - Replacement gas well showed 8- to 30-percent (25-percent average) moisture in trash samples. No leachate was found. Newberry - In leachate test hold, moisture was 9.8 to 20.8 percent. No liquid leachate was found.

GROUND WATER QUALITY MONITORING - Five wells have been monitored since 1985. Two new SWAT wells were drilled. Pump with packer samples uppermost 20 feet of saturated zone. SWAT monitoring started in April 1988. Rise and fall of trichloroethylene concentrations seems to be related to regional plumes moving through the area. High nitrates in upgradient wells. High levels of carbon dioxide in wells may be related to the period of time when the Penrose gas collection system was undergoing improvements. Generally speaking, these landfills are not affecting ground water quality.

REPORTS -
SWAT Report - June 29, 1988 - Law Environmental
SWAT Report Supplement - July 1, 1989 - Law Environmental

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Approved SWAT Reports in September 1989. There is evidence of leakage of non-hazardous substances, but below State drinking water regulatory levels. Detection monitoring will continue, but no EMP required at this time.



9. PENROSE / NEWBERRY LANDFILLS (CLOSED)

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Pendleton Street Landfill

OWNER - City of Los Angeles, Department of Water and Power

LOCATION - Southeast side of Pendleton Street, about 700-1600 feet northeast of Glenoaks Boulevard.

GEOLOGY - Holocene and Late Pleistocene alluvium in the Hansen subarea which lies to the northeast of the Verdugo Fault. North of La Tuna Canyon Fault.

GROUND WATER FLOW DIRECTION - Mostly southerly, changing to southeasterly toward the Verdugo Fault.

GENERAL OPERATIONS - Area of 15 acres, of which 10 acres have already been filled. Not open to the public. Accepts only water-soluble, nondecomposable, inert solids, mainly construction debris from Los Angeles Department of Water and Power sources.

GAS CONTROL SYSTEM - None required.

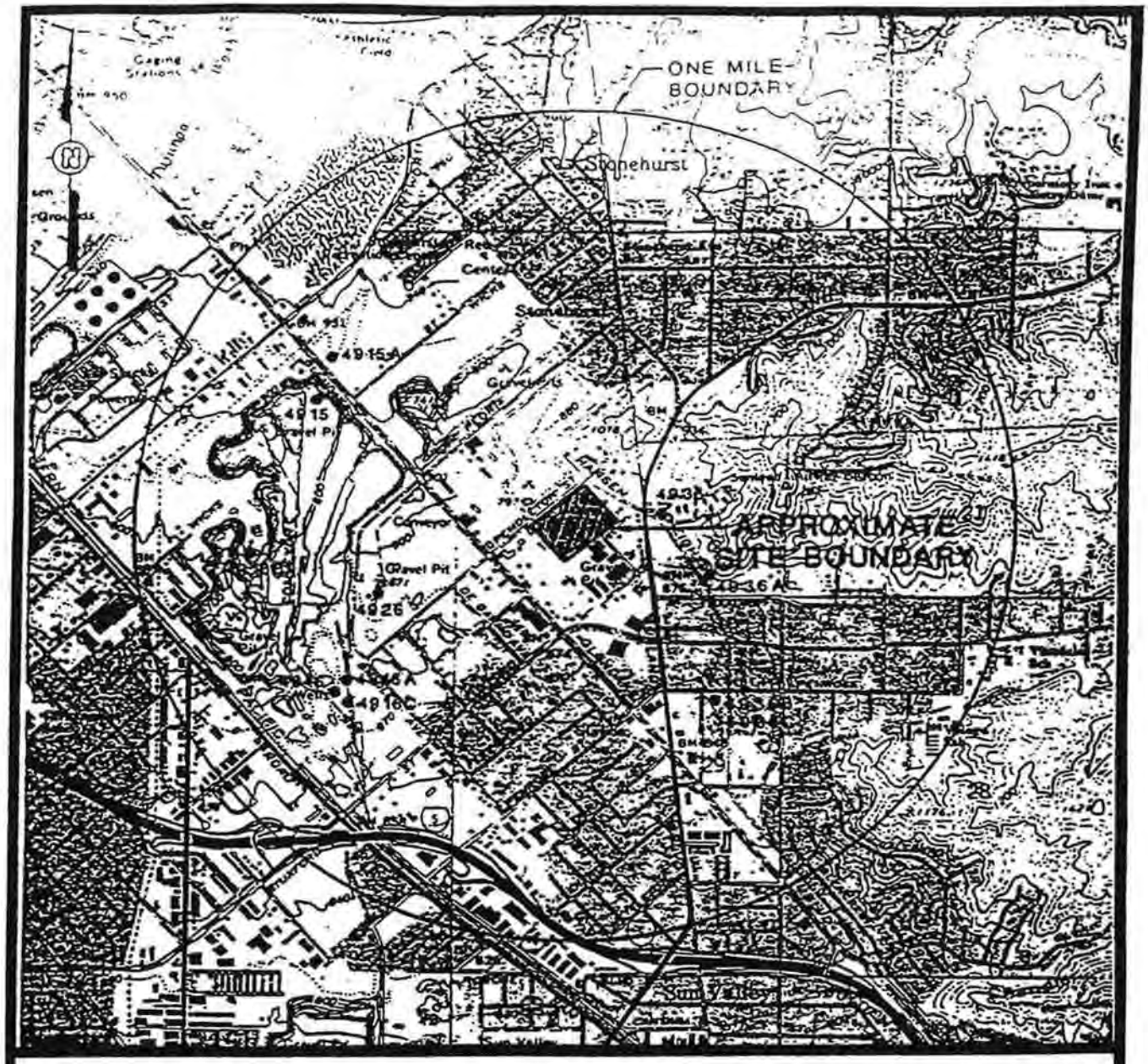
VADOSE ZONE MONITORING - None required.

LEACHATE CONTROL AND MONITORING - No containment structures, drainage control, covers, liners, leachate collection, or leak detection systems.

GROUND WATER QUALITY MONITORING - Three monitoring wells on periphery of property.

REPORTS -
SWAT Report (Rank 4) - June 1990 - International Technology Corporation

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Final SWAT Report submitted May 1991. Approved SWAT Report conditionally June 1992. Two semi-annual samplings were required, which are under review. Further monitoring may be required under Chapter 15.



LEGEND:

4936 ● WELL LOCATION AND WELL NUMBER (WELL NUMBER ACCORDING TO LOS ANGELES COUNTY WELL NUMBERING SYSTEM)

SCALE

0 2000 4000 FEET

REFERENCE:

U.S.G.S. 7.5 MINUTE TOPOGRAPHIC MAP OF BURBANK, SAN FERNANDO, SUNLAND, AND VAN NUYS; CALIFORNIA QUADRANGLES; DATED: 1966, PHOTOREVISED: 1972

LOCATIONS OF WELLS WITHIN ONE MILE OF THE SITE PENDLETON STREET LANDFILL

PREPARED FOR

CITY OF LOS ANGELES
DEPARTMENT OF WATER AND POWER
LOS ANGELES, CALIFORNIA

INTERNATIONAL TECHNOLOGY CORPORATION

10. PENDLETON STREET LANDFILL

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Scholl Canyon Landfill - (Active and Inactive)

OWNER - Los Angeles County - 85 acres; City of Glendale - 200 acres; Southern California Edison Company - 25 acres. Operated by Los Angeles County Sanitation Districts. Upon completion of fill, entire property will go to City of Glendale.

LOCATION - In the City of Glendale, on the southwestern flank of the San Rafael Hills, about one mile west of the Rose Bowl.

GEOLOGY - Canyon cut in quartz diorite gneiss. Thin alluvium is tributary to San Fernando Valley.

GENERAL OPERATIONS - Class III site open to the public. Operations began March 22, 1961. Accepts residential, commercial, and some industrial wastes, but no liquid or hazardous wastes. Weathered rock and colluvium is used for cover.

GAS CONTROL SYSTEM - Yes in both active and inactive areas. Inactive-original system replaced in 1987-89. Building pipeline to use gas in Glendale Power Plant. Active-since 1971-73.

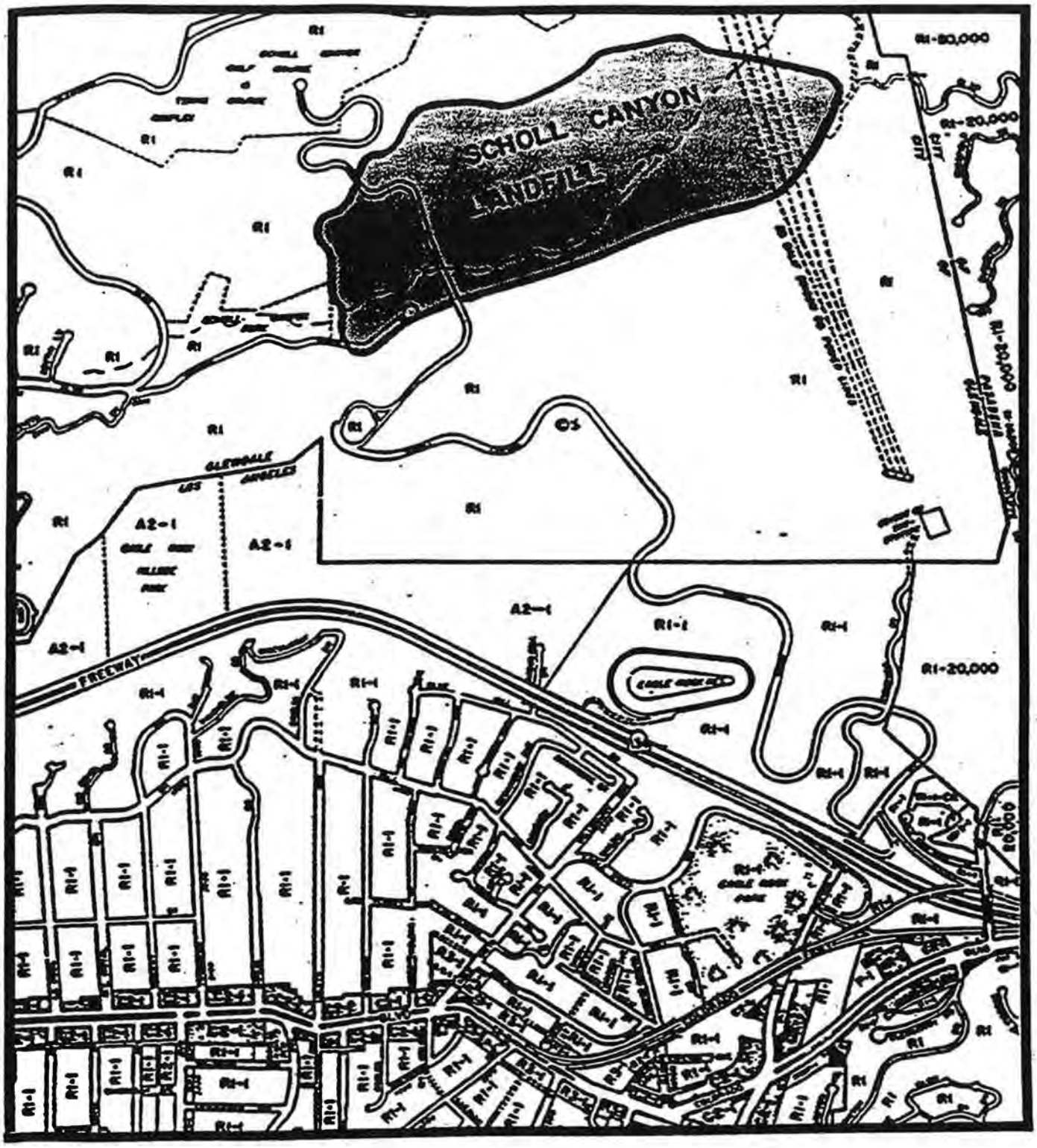
VADOSE ZONE MONITORING - Not required.

LEACHATE CONTROL AND MONITORING - Two subsurface barriers to cut off alluvial underflow. Extraction wells upgradient from barriers. Alluvial monitoring wells downgradient from barriers.

REPORTS -
Stone Geological Service - 1967
Converse Consultants - 1984
Woodward-Clyde - 1986
Earth Technology - 1987
SWAT Report - July 1, 1987 - Dale Hinkel
SWAT Progress Report - April 15, 1988, County Sanitation Districts

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD -
Active - (Rank 1) SWAT Report completed July 1987. Final SWAT Report completed April 1988. SWAT Report approved August 1990. Revised monitoring program required by Article 5, Chapter 15 is under review. EMP has been completed. CAP will be submitted soon.

Inactive - (Rank 2) - SWAT Report completed July 1987. Final SWAT Report approved in December 1993. Revised monitoring plan has been submitted and is under review.



12. SCHOLL CANYON LANDFILL

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Sheldon-Arleta Landfill

OWNER - City of Los Angeles, Bureau of Sanitation

LOCATION - Sun Valley District. Near the Hollywood and Golden State Freeways. Just to the east and southeast of the Tujunga Spreading Grounds.

GEOLOGY - Holocene and Late Pleistocene alluvium southwest of the Verdugo Fault. Old gravel pit.

GROUND WATER FLOW DIRECTION - Southerly to southeasterly, depending on spreading in the Tujunga Spreading Grounds.

GENERAL OPERATIONS - Started accepting trash (low moisture, nonhazardous) as of February 1962. Only inert materials allowed below 700-foot elevation. Filled by July 1974, at which time about 6 million tons of trash had been deposited. Partial clay barriers to prevent inundation of trash by water spread at the Tujunga Spreading Grounds.

MINIMUM ELEVATION OF TRASH - 700 feet.

GAS CONTROL SYSTEM - In 1967, about five years after the start of operation, methane was detected in an adjoining residential area and raised the concern about explosions. In mid-1969, the first gas extraction system was installed consisting of three wells in native soil. In 1971, eighteen 25-foot wells were installed, with the collected gas burned and discharged to the atmosphere. In 1973, a 100-foot well was installed. From 1974 through 1976, landfill gas was delivered to the Valley Steam Plant. In 1980, eighteen 100-foot wells were drilled to replace the earlier 25-foot holes.

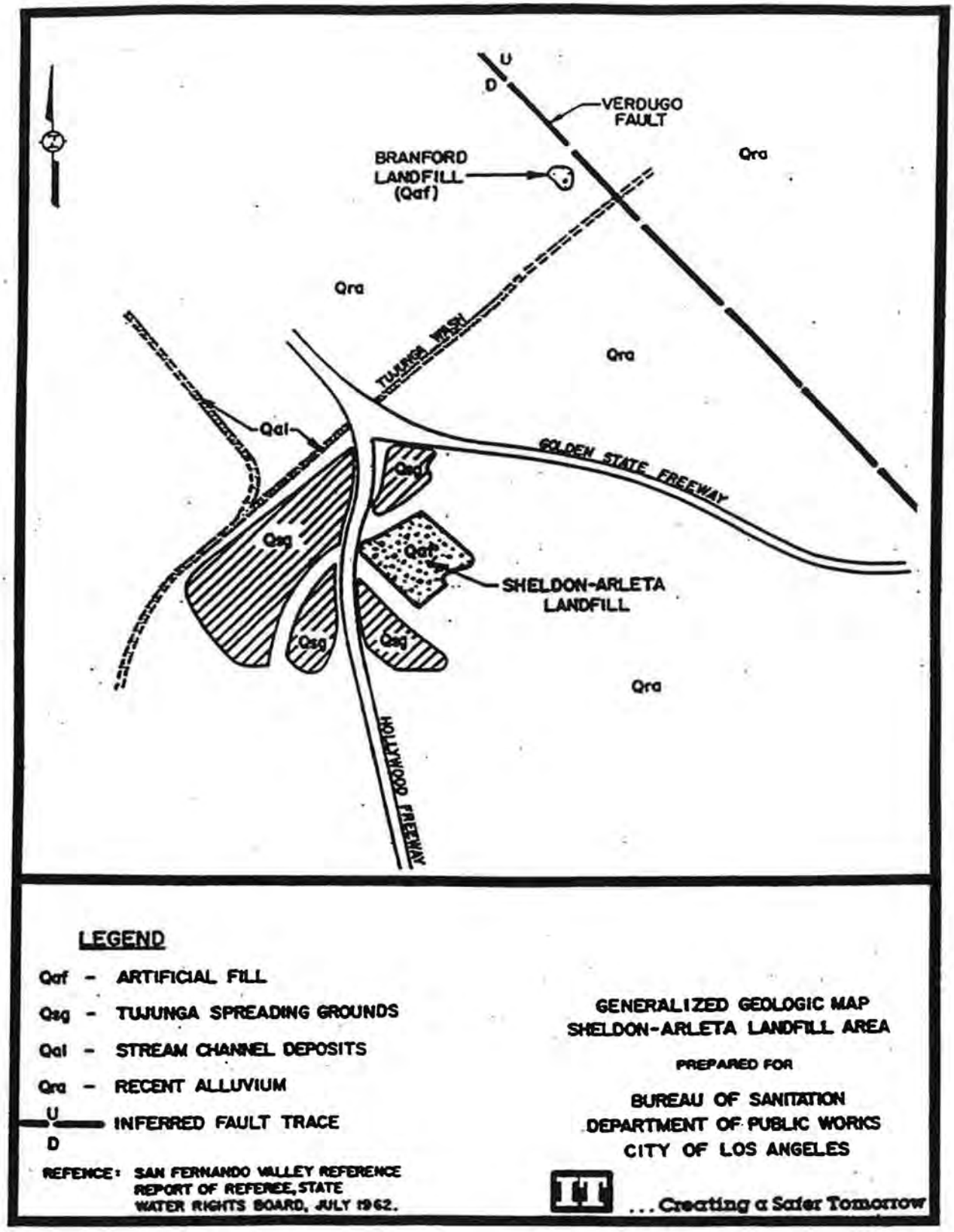
VADOSE ZONE MONITORING - Only two of 25 soil samples showed moisture above 25 percent. Additional sampling will be done after spreading.

LEACHATE CONTROL AND MONITORING - No evidence of leachate buildup within the landfill. Will be sampled again after spreading at the Tujunga Spreading Grounds.

GROUND WATER QUALITY MONITORING - A well drilled downgradient (Wickes Well) showed a sharp increase in bicarbonate hardness and carbon dioxide between 1967 and 1972, then a sharp decrease in 1972 after the gas control system began operating effectively. This same "temporary wave" of hardness may have later affected some of the Rinaldi-Toluca production wells.

REPORTS -
SWAT Report (Rank 1) - May 7, 1987 - International Technology Corporation

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Final Swat Report (Rank 1) approved by the RWQCB in February 1990. The water table has dropped to more than 100 ft below the bottom of the trash and the monitoring wells are dry. These are being checked quarterly to see if water levels rise. If so monitoring will continue under Chapter 15.



11. SHELDON-ARLETA LANDFILL

208

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Stough Park Landfill

OWNER - City of Burbank

LOCATION - Southwest flank of the Verdugo Mountains.

GEOLOGY - Landfill is underlain by metamorphic and igneous basement rocks of lower-Cretaceous to pre-Cambrian age that form the Verdugo Mountains.

HYDROGEOLOGY - Ground water is present in some fractures as evidenced by groundwater discharge at on-site ephemeral springs.

GROUND WATER FLOW DIRECTION - Ground water is present in both the alluvium and bedrock in one of the landfills (#2). Groundwater flow direction would be southerly.

GENERAL OPERATIONS - In operation since 1949. Consists of three fill areas (#1 - 31 acres up to 130 feet thick; #2 - 15 acres up to 70 feet thick; #3 - 24 acres up to 110 feet thick). Accepts nonhazardous waste and inert waste.

MINIMUM ELEVATION OF TRASH - Elevation data not available. Landfills have up to 110 feet of material deposited within canyons to bedrock.

GAS CONTROL SYSTEM - LFG gas collection/recovery system installed mid-summer 1988. Other gas migration control/monitoring systems installed in 1981.

ELEVATION RANGE OF WATER TABLE - Landfill in mountains and canyons. Ground water occurs mainly in fractured rock. No water table.

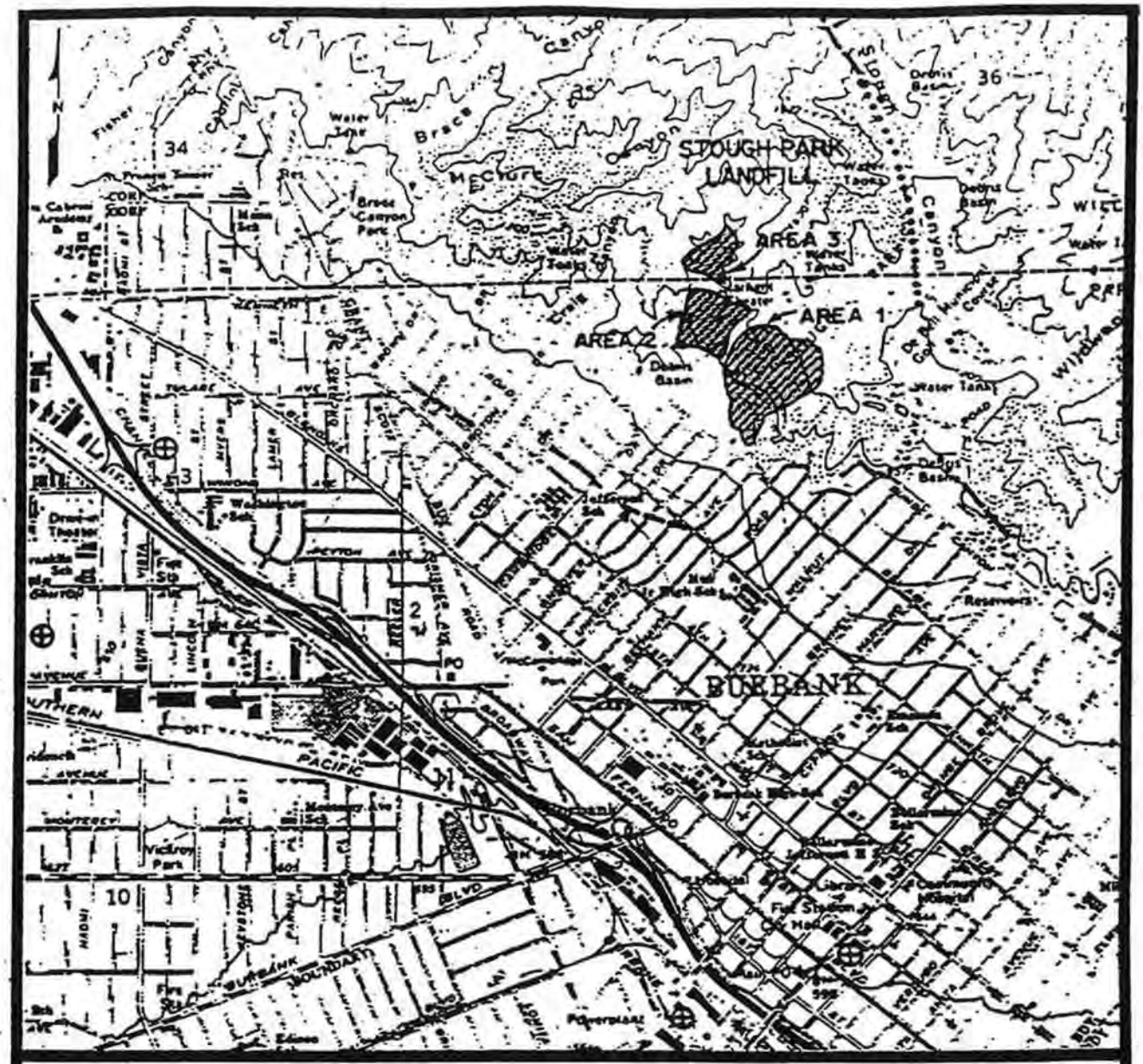
VADOSE ZONE MONITORING - None required.

LEACHATE CONTROL AND MONITORING - No appreciable amount of water has infiltrated the landfill to generate lechate. Drainage of runoff controlled.

GROUND WATER QUALITY MONITORING - Seven monitoring wells drilled to depths between 60 and 510 feet to monitor the shallow alluvium and deep bedrock.

REPORTS -
SWAT Report - June 1988
Final SWAT Report - December 1988 - Approved by LARWQCB - April 1990.

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Revised Monitoring Plan, required by Article 5 of Chapter 15, is under review. An EMP is required and is under review.



13. STOUGH PARK LANDFILL

STATUS AS OF MAY 1995

SWAT Not Completed

NAME OF LANDFILL - Sunshine Canyon Sanitary Landfill

OWNER - Browning-Ferris Industries

LOCATION - Southeast margin of the Santa Susana Mountains, west of the Golden State Freeway.

GEOLOGY - Underlain by the Towsley formation which has been folded along east-west axes into the Pico anticline and Oat Mountain syncline. Unnamed fault ("A") trends southeasterly across the site. Towsley formation is mainly sandstone with lesser amounts of siltstone, mudstone and conglomerate. The interstitial permeability of the Towsley formation is low, as is the secondary hydraulic conductivity of the fracture systems. Surficial deposits consist of alluvium, colluvium and landslides as much as 50-feet thick.

HYDROGEOLOGY - Sunshine Canyon is separated from the San Fernando Valley by a narrow, rock-walled canyon with thin alluvium. Upstream from this constriction the alluvium is recharged by slope runoff and direct penetration of rainfall. 24 piezometers were drilled into the alluvium and Towsley formation. Ground water was found in the alluvium and beneath the lower slopes in the Towsley formation. Ground water flow follows the axes of the canyons.

GENERAL OPERATIONS - There is an existing 230-acre Class III landfill which has operated continuously since 1958. This permit expired in September 1991. Accepts only nonhazardous wastes at 6,400 tons per day or about 2.0 million tons per year. Expect an increase from12,000 to 14,000 tons per day.

GAS CONTROL SYSTEM - In operation since November 1981. Extracts (nine wells), processes, sells or flares the landfill gas (up to 3.0 million cubic feet per day).

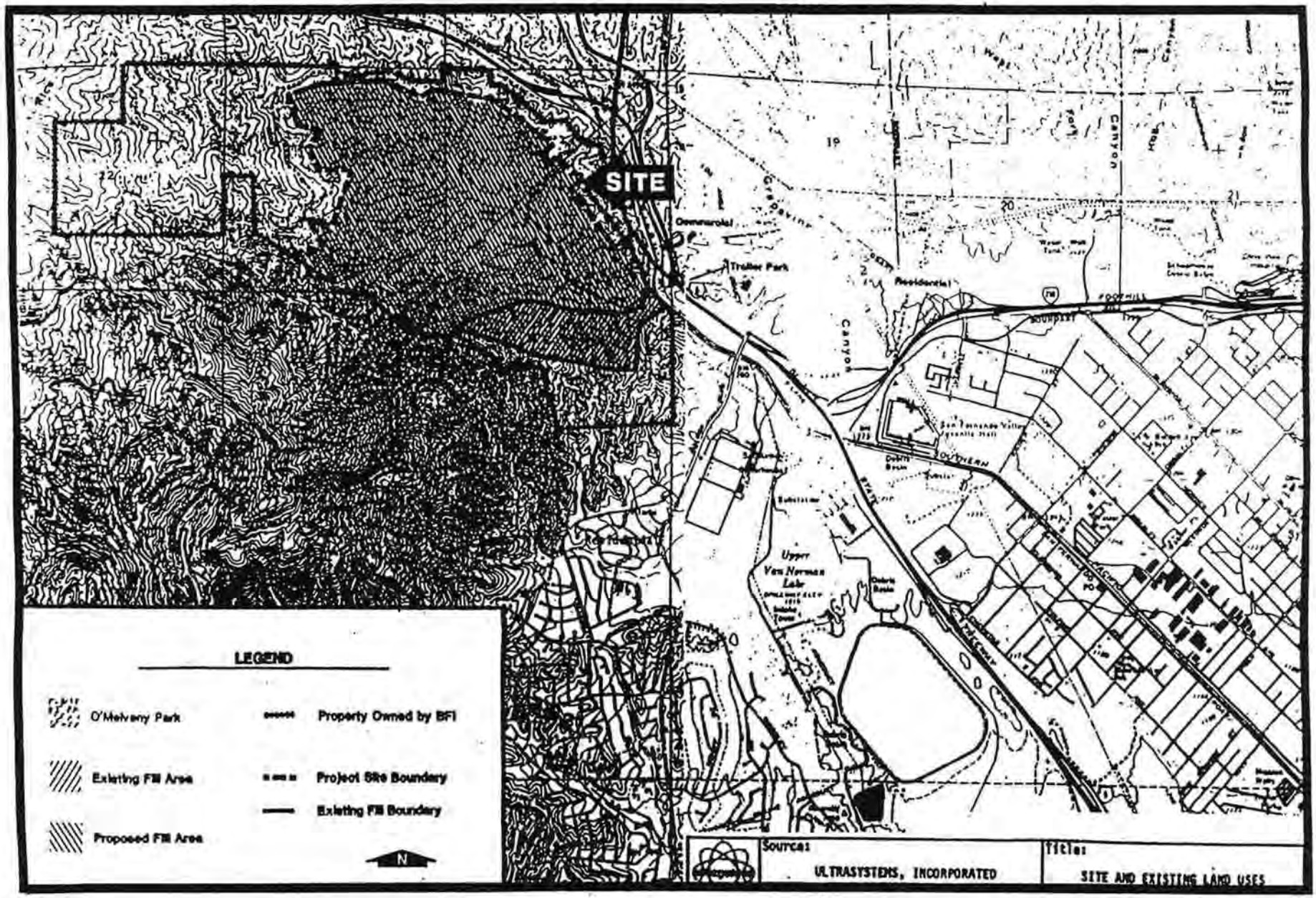
VADOSE ZONE MONITORING - No volatile organics detected in five lysimeter wells.

LEACHATE CONTROL AND MONITORING - The main concern is the potential for leachate leaving Sunshine Canyon and joining the ground water of the San Fernando Valley.

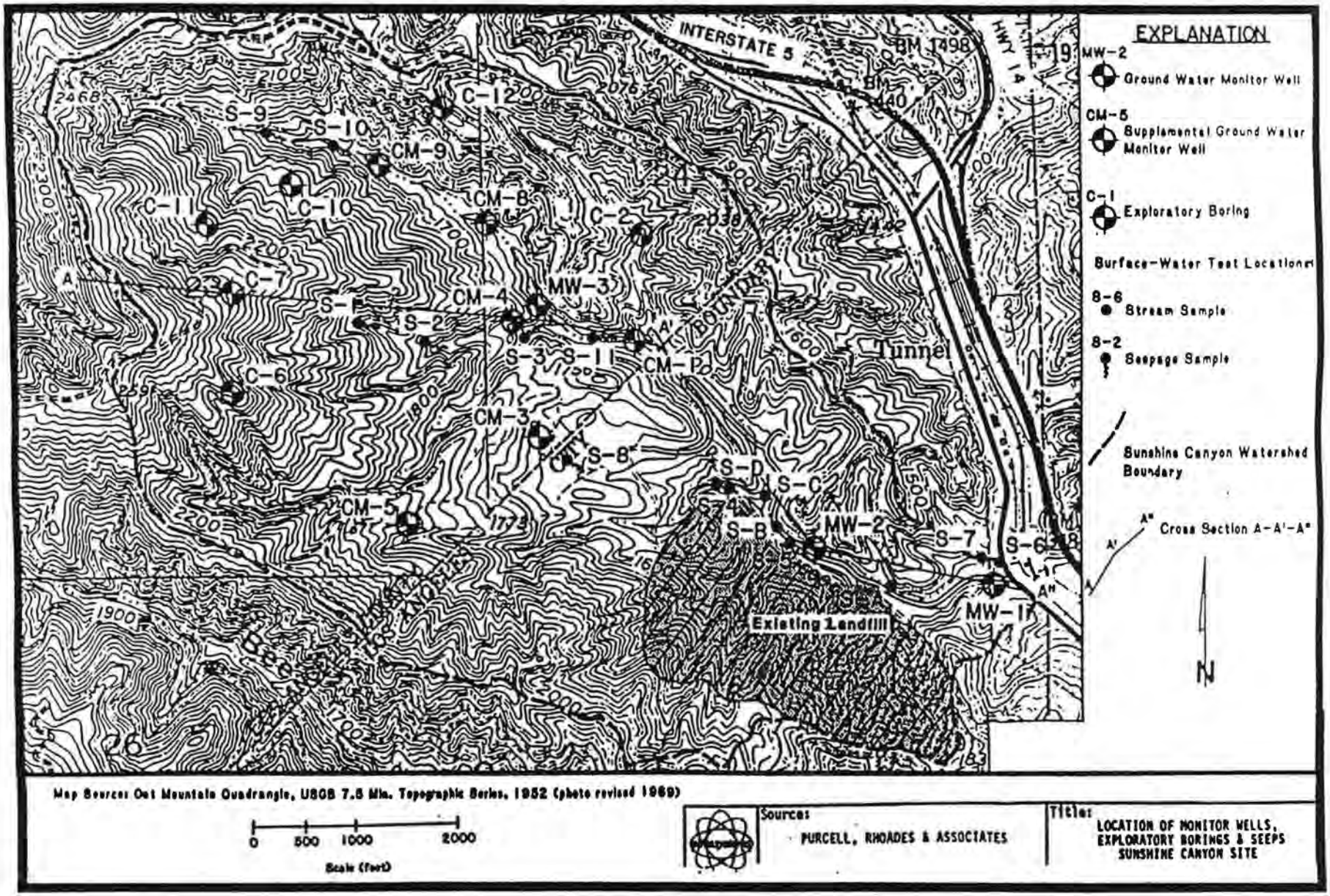
GROUND WATER QUALITY MONITORING - The native waters of the Towsley formation are of poor quality because of excessive total dissolved solids, but rather low in chloride. The appearance of much higher chlorides in downgradient monitoring well MW-1 raises the suspicion of leachate contribution from the landfill, but there are other possible explanations. The source(s) of these chlorides have yet to be defined.

REPORTS -
SWAT Report (Rank 2) - July 1, 1988 - Purcell, Rhoades and Associates
SWAT Addendum - July 26, 1989 - Purcell, Rhoades and Associates
Draft Environmental Impact Report Landfill Extension - April 1989 - Ultrasystems

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Revised Monitoring Plan, required by Article 5 of Chapter 15, is under review. One additional alluvial background and three alluvial downgradient wells were required to determine possible sources for elevated chloride levels. An eMP will be required under Chapter 15.



14a. SUNSHINE CANYON LANDFILL



14b. SUNSHINE CANYON LANDFILL

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Tuxford Landfill (Closed)

OWNER - Los Angeles By-Products Company

LOCATION - Sun Valley District. Just south of the Golden State Freeway, on the west side of Tujunga Avenue.

GEOLOGY - On alluvial cone of Tujunga Wash southwest of the Verdugo Fault. Former gravel pit (20 acres).

GROUND WATER FLOW DIRECTION - Southeasterly

GENERAL OPERATIONS - Was open to the public. Closed before 1984. Accepted only dry nonhazardous wastes.

MINIMUM ELEVATION OF TRASH - Original bottom of the gravel pit was about Elevation 710 feet.

GAS CONTROL SYSTEM - Started operation between June 1988 and June 1989. Fill has an impermeable cover (paving).

ELEVATION RANGE OF WATER TABLE - 514 feet in February 1989. Possibly as high as 697 feet in 1948.

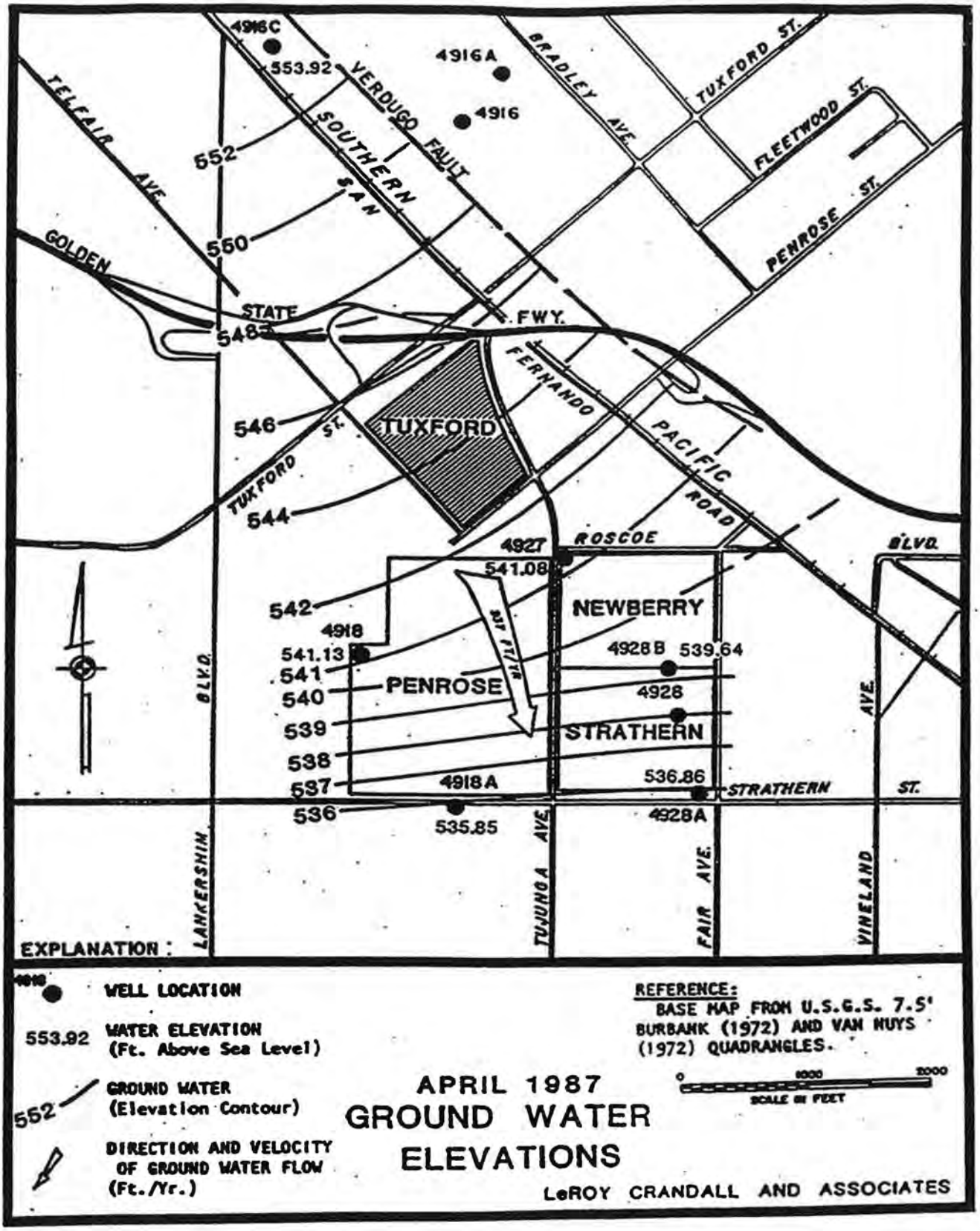
VADOSE ZONE MONITORING - Two wells drilled to 50 feet. Cannot generate enough suction to get a liquid sample.

LEACHATE CONTROL AND MONITORING - Five wells drilled to 100 feet. No leachate encountered.

GROUND WATER QUALITY MONITORING - Shares monitoring wells with Penrose/Newberry/ Strathern. Sampled by a pump with packer. Two wells upgradient and two wells downgradient. Volatile organic compounds are above action levels -- appear to be coming from upgradient. High nitrates in two upgradient wells (84 and 88 mg/l) are probably related to earlier dairy operations. Landfill does not appear to be generating any hazardous pollutants.

REPORTS -
SWAT Report (Rank 2) - June 29, 1989 - Law Environmental
SWAT Report Supplement - July 1, 1989 - Law Environmental

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Final SWAT Report submitted December 1990. Approved SWAT Report June 1992. Leakage determination not yet made; awaiting study of background ground water contamination. EMP required under Chapter 15 is underway.



16. TUXFORD LANDFILL

220

STATUS AS OF MAY 1995

SWAT Completed

NAME OF LANDFILL - Toyon Landfill

OWNER - City of Los Angeles, Bureau of Sanitation

LOCATION - Griffith Park

GEOLOGY - In old rocks away from alluvium of San Fernando Valley and the Los Angeles Narrows. Arkosic sandstones and conglomerates of the Miocene Hollycrest formation along a northwest-trending overturned anticline and displaced along a northeast-trending fault.

GENERAL OPERATIONS - 90 acres. Operated from 1957 to February 1986 for the placement of a total of 16 million tons of household trash. Fills a former northeast-facing canyon with 140 to 290 feet of trash. Never open to the public.

GAS CONTROL SYSTEM - Gas samples from 16 perimeter probes are analyzed monthly for toxic constituents. Gas is collected from 30 duplex- and 41 single-pipe wells 40 to 100 feet deep. Power plant operated by Pacific Lighting Systems consists of six 150-HP generators which deliver 9.4 megawatts to the Southern California Edison Company.

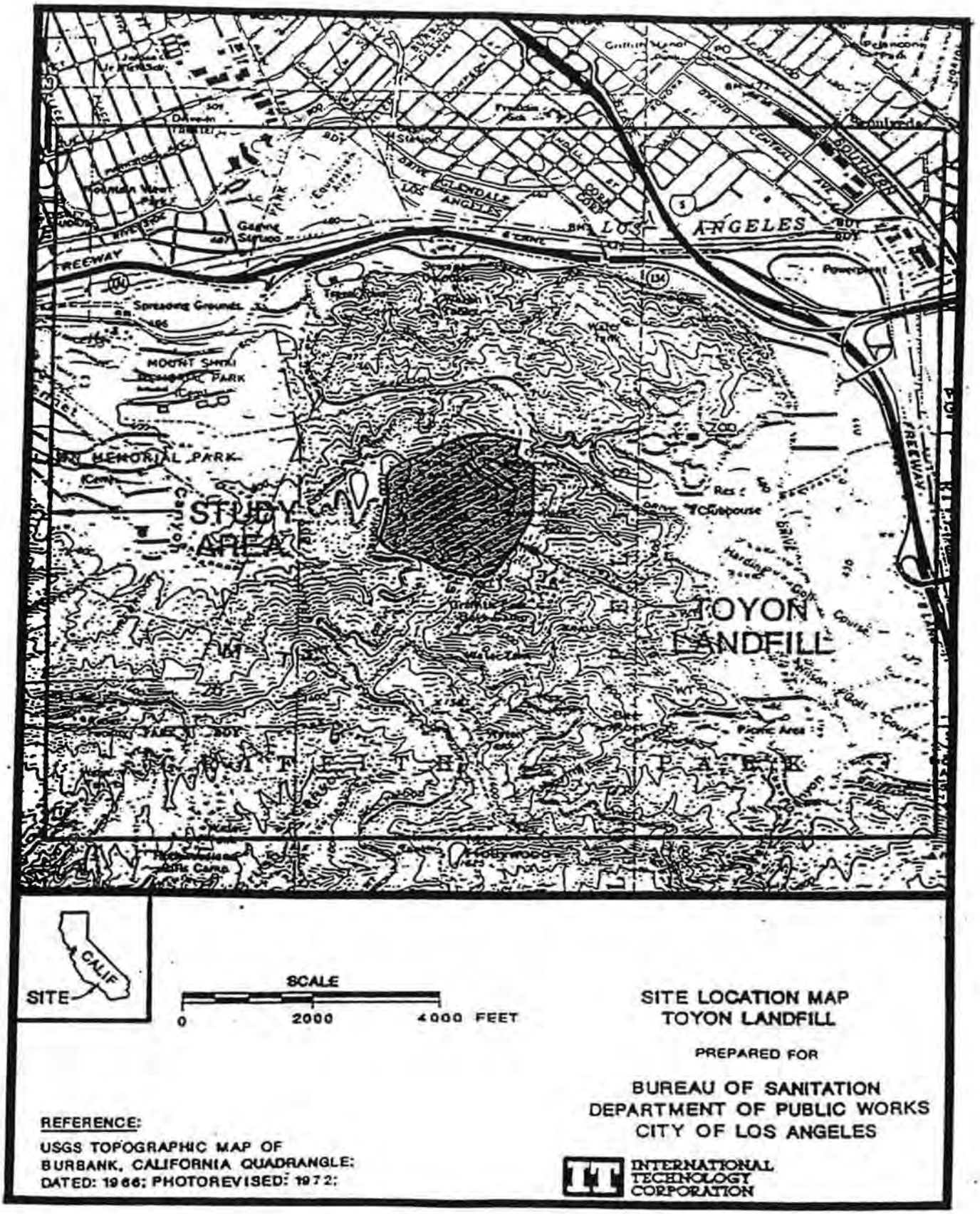
VADOSE ZONE MONITORING - None

LEACHATE CONTROL AND MONITORING - Three systems of perforated pipes in the gravel-filled trenches, which drain to sewer. Total leachate flow of 3 to 7 gpm. No liners or containment structures.

GROUND WATER QUALITY MONITORING - Six monitoring wells around periphery. Direction of ground water flow in old fractured rocks is poorly known. Some evidence of leachate in the monitoring wells, with chlorides, bicarbonates and sodium above background levels. However, significant concentrations of toxic pollutants are not believed to be migrating away from the landfill.

REPORTS -
SWAT Report (Rank 2) - June 1988 - International Technology Corporation
Final SWAT Report - March 1989

STATUS WITH LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD - Approved Final SWAT Report April 1991. Evidence of leakage of non-hazardous substances above State drinking water regulatory levels.. Closure Plan is under review. Revised Monitoring Plan, required by Article 5 of Chapter 15, is under review. EMP has been received and is under review. Waste discharge requirements (WDR) have been changed. Now under Monitoring and Reporting Program (MRP). Closure will require an MRP.



15. TOYON LANDFILL

APPENDIX I

CRESCENTA VALLEY COUNTY WATER DISTRICT

CVCWD

Crescenta Valley County Water District

2700 Foothill Boulevard, La Crescenta, California 91214
Phone (818) 248-3925 Fax (818) 248-1659

September 16, 1995

Mr. Mel Blevins, Watermaster
Upper Los Angeles River Area
P.O. Box 111, Room 1455
Los Angeles, CA 90051

SUBJECT: **VERDUGO BASIN FLEXIBILITY PUMPING**

This letter serves to confirm our telephone conversation of September 11, 1995 regarding flexibility pumping in the Verdugo Basin and Watermaster Policies and Procedures.

I informed you that as the 1994-95 water year is nearing an end, it appears that the District will exceed its adjudicated groundwater pumping rights for the second consecutive year, perhaps by greater than 10%. We also discussed the concept of replacing overextractions through underpumping as noted in the July 1993 Watermaster Policies and Procedures.

I would like to request a clarification of the Policies and Procedures regarding Verdugo Basin pumping. As long as the combined adjudicated groundwater rights of both Glendale and CVCWD (7150 AF/YR) are not attained, the basin is in surplus and overextractions by a single party should not apply. To my knowledge, this is the existing situation as Glendale continues to underpump their portion of the basin. You concurred with this concept during our phone conservation and also pointed out that groundwater law in California has been generally consistent with this approach.

Perhaps a revision of Section 2.8 of the Policies and Procedures is in order. As you suggested, language and methodology might also be added allowing for annual carryover of underpumped rights in the Verdugo Basin. I look forward to discussing this issue further with you and the Administrative Committee at our upcoming October 10,

1995, meeting. I would expect shortly thereafter a written clarification or policy revision which will better enable the District to perform its water resource planning.

Very truly yours,

CRESCENTA VALLEY COUNTY
WATER DISTRICT

Michael G. Sovich
General Manager

cc: Don Froelich, Water Services Administrator,
City of Glendale

UPPER LOS ANGELES RIVER AREA WATERMASTER

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

MELVIN L. BLEVINS – WATERMASTER

OFFICE LOCATION:
111 North Hope Street, Room 1455
Los Angeles, CA 90012
TELEPHONE: (213) 367-1020
FAX: (213) 367-1131

MAILING ADDRESS:
ULARA WATERMASTER
P.O. Box 111, Room 1455
Los Angeles, CA 90051-0100

December 12, 1995

Mr. Michael G. Sovich
General Manager
Crescenta Valley County Water District
2700 Foothill Boulevard
La Crescenta, California 91214

Dear Mr. Sovich:

Crescenta Valley County Water District (CVCWD) -
Verdugo Basin - Water Years 1994-95 and 1995-96

This is in response to your letter of September 16, 1995 and various phone calls regarding the CVCWD pumping groundwater in excess of its water right within the Verdugo Basin (3,294 acre-feet per year [AF/yr]) for the water years 1994-95 and 1995-96. As we previously discussed in various phone calls, when a basin's safe yield is under-pumped and water is lost (flowing to the ocean), other parties with water rights within that basin may be allowed to pump the surplus. In the ULARA Administrative Committee meeting of October 10, 1995, a motion was passed to allow CVCWD to pump 300 to 400 AF/yr above its water rights for the water years 1994-95 and 1995-96 (Attachment 1).

Presently, there is an average (23 years - 1971 through 1994) of 2,600 AF/yr of groundwater flowing from the Verdugo Basin as rising water outflow. This is due, in part, to the under-pumping of the basin's safe yield (7,150 AF/yr). Therefore, as the ULARA Watermaster, I recommended to the ULARA Administrative Committee that CVCWD be allowed to pump above its water right an additional 300 to 400 AF/yr for 1994-95 and 1995-96, without having to pay it back in subsequent years. The Administrative Committee motion of October 10, 1995 allows for this to happen.

Concern was expressed by Mr. Donald Froelich, representative for Glendale, that this extra pumping by CVCWD may impact Glendale's ability to pump its water right (3,856 AF/yr). Presently, Glendale is not pumping its water rights (average of 2,432 AF/yr compared to their rights of 3,856 AF/yr). An evaluation will be made by Glendale's consultant -

Mr. Richard Slade, with technical support from the ULARA Watermaster's office.

There will be no change in the ULARA Watermaster's Policies and Procedures (dated July 1993) at present. The CVCWD can pump additional groundwater for 1994-95 and 1995-96 (up to 400 AF/yr). The ULARA Watermaster's should be kept informed of all of CVCWD's pumping activities, as per usual.

If you have any questions or require additional information, please contact me at (213) 367-1020.

Sincerely,

MELVIN L. BLEVINS
ULARA Watermaster

Enclosures

c: Mr. Ricardo Gonzales, Jr.
Metropolitan Transportation Authority
Mr. Gary Yamamoto, California Department of Health Services
Dr. Robert P. Ghirelli, California
Regional Water Quality Control Board
Dr. John F. Mann, Jr., ULARA Watermaster Consultant
Mr. Gerald A. Gewe, Los Angeles
Department of Water and Power
Mr. Richard A. Nagel, Assistant ULARA Watermaster
Ms. Patricia T. Kiechler, Administrator to ULARA Watermaster

<u>ULARA Administrative Committee Members</u>
Mr. Fred Lantz, President, City of Burbank
Mr. Michael Sovich, Crescenta Valley County Water District
Mr. Michael Drake, City of San Fernando
Mr. Don Froelich, City of Glendale
Mr. Robert Y. Yoshimura, City of Los Angeles

APPENDIX J

LOCKHEED -- BURBANK OPERABLE UNIT

UPPER LOS ANGELES RIVER AREA WATERMASTER

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

MELVIN L. BLEVINS – WATERMASTER

OFFICE LOCATION:
111 North Hope Street, Room 1455
Los Angeles, CA 90012
TELEPHONE: (213) 367-1020
FAX: (213) 367-1131

MAILING ADDRESS:
ULARA WATERMASTER
P. O. Box 111, Room 1455
Los Angeles, CA 90051-0100

April 25, 1996

Mr. Ron Helgerson
Program Director
Lockheed-Martin
Corporate Environmental
Safety and Health
2550 N. Hollywood Way, Suite 301
Burbank, CA 91505

Dear Mr. Helgerson:

Exemption for Burbank O.U. Test Pumping
Production - April 1994 through December 1995

This is in response to your letter of December 11, 1995 and the various phone calls to one another during 1995 and 1996, regarding an exemption for the Burbank O.U. This letter confirms that the test pumping activities by Lockheed from April 1994 through December 1995 (totaling 857.74 AF) is exempt from payment.

As ULARA Watermaster, I recommended to the ULARA Administrative Committee at the December 12, 1995 meeting that Lockheed not be charged for the groundwater produced during the Burbank O.U. testing between April 1994 and December 1995. The ULARA Administrative Committee approved of this recommendation at the December 12, 1995 meeting (Attachment 1).

Lockheed started pumping for groundwater delivery to Burbank (for consumptive use purposes) on January 3, 1996, pursuant to Phase I of the Consent Decree. All water pumped by Lockheed and delivered to Burbank for their water supply will now be charged against Burbank's water rights. Any change in status of pumping for groundwater cleanup by Lockheed should be reported to the ULARA Watermaster. This matter was confirmed in the January 24, 1996 ULARA Administrative Committee meeting (Attachment 2).

If you have any questions regarding this matter, please contact me at (213) 367-1020 or Ms. Patricia T. Kiechler at (213) 367-0921. Thank you for working with me on this matter, so that it could be resolved to everyone's satisfaction.

Sincerely,

MELVIN L. BLEVINS
ULARA Watermaster

Enclosures

c: Mr. Gary Yamamoto, California
Department of Health Services
Dr. Robert P. Ghirelli, California
Regional Water Quality Control Board (RWQCB)
Mr. Hank Yacoub, RWQCB
Dr. John F. Mann, Jr.
ULARA Watermaster Consultant
Mr. Gerald A. Gewe, Los Angeles
Department of Water and Power
Mr. Richard A. Nagel
Assistant ULARA Watermaster
Ms. Patricia T. Kiechler
Administrator to ULARA Watermaster

ULARA Administrative Committee Members
Mr. Fred Lantz, President, City of Burbank
Mr. Michael Sovich, Crescenta Valley County Water District
Mr. Michael Drake, City of San Fernando
Mr. Don Froelich, City of Glendale
Mr. Robert Y. Yoshimura, City of Los Angeles

APPENDIX K

METROPOLITAN TRANSPORTATION AUTHORITY

UPPER LOS ANGELES RIVER AREA WATERMASTER

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

MELVIN L. BLEVINS – WATERMASTER

OFFICE LOCATION:
111 North Hope Street, Room 1455
Los Angeles, CA 90012
TELEPHONE: (213) 367-1020
FAX: (213) 367-1131

MAILING ADDRESS:
ULARA WATERMASTER
P.O. Box 111, Room 1455
Los Angeles, CA 90051-0100

December 12, 1995

Mr. John Higgins, Utilities Coordinator
Metro Red Line
Metropolitan Transportation Authority
County of Los Angeles
818 West Seventh Street, Suite 300
Los Angeles, California 90017

Dear Mr. Higgins:

Metropolitan Transportation Authority (MTA)
Metro Red Line Dewatering Project

This is in response to our various letters and phone calls to one another during 1994 and 1995, regarding the Los Angeles County MTA Metro Red Line construction project within the Upper Los Angeles River Area (ULARA). As ULARA Watermaster, I recommended to the ULARA Administrative Committee that MTA not be charged for the groundwater produced during the construction of its public-related Metro Red Line within the San Fernando Basin. The temporary discharge of groundwater for dewatering purposes was estimated by MTA to be approximately 1,200 acre-feet over a two-year period. Any groundwater collected and discharged to the Los Angeles River on a permanent basin after the Metro Red Line is constructed would have to be accounted for by MTA.

Approval regarding the MTA Red Line project was provided by the ULARA Watermaster and ULARA Administrative Committee in a motion at the ULARA Administrative Committee meeting on October 10, 1995 (Attachment 1).

Each month the MTA will be required to submit a production report for its dewatering project to the ULARA Watermaster Office. Please review the production report form and add meter number/identification and the appropriate conversion factors, so that an individual form can be provided. In the meantime, please fill in the production amounts since your construction activities began (Attachment 2).

If you have any questions regarding this matter, please contact me at (213) 367-1020 or Ms. Patricia T. Kiechler at (213) 367-0887. Thank you for working with me on this matter, so that it could be resolved to everyone's satisfaction.

Sincerely,

MELVIN L. BLEVINS
ULARA Watermaster

MLB:ww

Enclosures

c: Mr. Ricardo Gonzales, Jr., MTA
Mr. Gary Yamamoto, California
Department of Health Services
Dr. Robert P. Ghirelli, California
Regional Water Quality Control Board (RWQCB)
Mr. David Bacharowski, RWQCB
Dr. John F. Mann, Jr.
ULARA Watermaster Consultant
Mr. Gerald A. Gewe, Los Angeles
Department of Water and Power
Mr. Richard A. Nagel
Assistant ULARA Watermaster
Ms. Patricia T. Kiechler
Administrator to ULARA Watermaster

ULARA Administrative Committee Members
Mr. Fred Lantz, President, City of Burbank
Mr. Michael Sovich, Crescenta Valley County Water District
Mr. Michael Drake, City of San Fernando
Mr. Don Froelich, City of Glendale
Mr. Robert Y. Yoshimura, City of Los Angeles

bc: Edward A. Schlotman
James F. Wickser/
Norman L. Buehring
Robert L. Simmons
Wayne E. Kruse
Ali A. Karimi
Melvin L. Blevins

ULARA Watermaster

718A-HIGGINS.DOC

APPENDIX L

ACTION ITEMS 1995-96

ACTION ITEMS

WATERMASTER ACTIVITIES FOR 1995-96 REPORT

- Investigate Possible Well Drilling Activity in the Northridge Hills Area
- Investigate the Status of the Disney Wells and Associated Water Rights
- Address CalMat Mining Operations and Impacts to Water Rights
- Investigate the Santiago Estates Succession of Meurer Overlying Water Rights
- Watermaster Site Visit to Basin De-waterers and Small Pumpers (i.e. DeMille and others)
- Re-evaluation of Rising Water Outflow at Gage F57
- Investigate the Status of Angelica Healthcare Pumping

APPENDIX M

CONVERSION FACTORS

CONVERSION FACTORS

Quantity	Metric Unit	Customary Unit	To Convert to Customary Unit Multiply Metric Unit By	To Convert to Metric Unit Multiply Customary Unit By
Length	millimeters (mm)	inches (in)	0.03937	25.4
	centimeters (cm)	inches (in)	0.3937	2.54
	meters (m)	feet (ft)	3.2808	0.3048
	kilometers (km)	miles (mi)	0.62139	1.6093
Area	square millimeters (mm^2)	square inches (in^2)	0.00155	645.16
	square meters (m^2)	square feet (ft^2)	10.764	0.092903
	square meters (m^2)	acres (ac)	0.00025	4046.9
	hectares (ha)	acres (ac)	2.4710	0.40469
	square kilometers (km^2)	square miles (mi^2)	0.3861	2.590
Volume	liters (L)	gallons (gal)	0.26417	3.7854
	megaliters	million gallons (10^6 gal)	0.26417	3.7854
	cubic meters (m^3)	gallons (gal)	264.17	0.003785
	cubic meters (m^3)	cubic feet (ft^3)	35.315	0.028317
	cubic meters (m^3)	cubic yards (yd^3)	1.308	0.76455
	cubic meters (m^3)	acre-feet (ac-ft)	0.00081	1233.5
	cubic decameters (dam^3)	acre-feet (ac-ft)	0.8107	1.2335
Flow	cubic meters per second (m^3/s)	cubic feet per second (ft^3/s)	35.315	0.028327
	liters per second (L/s)	cubic feet per second (ft^3/s)	0.035325	28.317
	liters per second (L/s)	gallons per minute (gal/min)	15.850	0.06309
	liters per minute (L/min)	gallons per minute (gal/min)	0.26417	3.7854
	liters per day (L/day)	gallons per day (gal/day)	0.26417	3.7854
	megaliters per day (ML/day)	million gallons per day (mgd)	0.26417	3.7854
	cubic decameters per day (dam^3/day)	acre-feet per day (ac-ft/day)	0.8107	1.2335
Mass	kilograms (kg)	pounds (lb)	2.2046	0.45359
	megagrams (Mg)	tons	1.1.023	0.90718
Velocity	meters per second (m/s)	feet per second (ft/s)	3.2808	0.3048
Concentration	milligrams per liter (mg/L)	parts per million (ppm)	1.0	1.0
Temperature	degrees Celsius (°C)	degrees Fahrenheit (°F)	(1.8 x °C)+32	(°F - 32)/1.8