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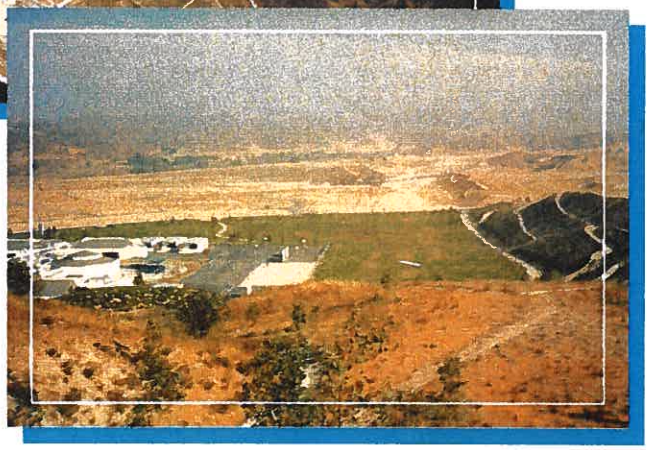

WEST VALLEY AREA STUDY

MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

REPORT NO. 1042

WEST VALLEY PROJECT AREA STUDY

March 1993

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Chapter 1

EXECUTIVE SUMMARY

The West Valley Area Study projects population and water demands, evaluates the need, and presents conceptual alternatives for a West Valley Project. This executive summary introduces the basic findings and conclusions of this report.

A. THE WEST VALLEY SERVICE AREA

The West Valley study area is located in northwestern Los Angeles and southeastern Ventura counties. The area includes four member agencies: Calleguas Municipal Water District (Calleguas MWD); the City of Los Angeles Department of Water and Power's (LADWP's) west San Fernando Valley area; Las Virgenes Municipal Water District (Las Virgenes MWD); and West Basin Municipal Water District's (West Basin MWD's) western service area. Calleguas MWD receives imported supplies from Metropolitan through West Valley Feeder No. 2 by way of the Santa Susana Pass tunnel. West Valley Feeder No. 1 is currently being leased by LADWP. The lease will expire in 1999. LADWP has expressed an interest in maintaining permanent use of West Valley Feeder No. 1.

B. AREA WATER DEMANDS AND SUPPLIES

1. Population and Demand Growth

Metropolitan projects its water demands based on the adopted population and growth management plan of the Southern California Association of Governments (SCAG). SCAG population forecasts indicate an increase in Metropolitan's West Valley service area from slightly less than 1.4 million in 1995 to approximately 1.7 million by 2010. Utilizing the same growth rate from year 2005 to 2010, Metropolitan estimates the population will grow to

2.2 million by 2030. This represents a 64 percent increase in population for the West Valley service area. A corresponding increase in normal water demand from 300,000 to over 500,000 acre-feet per year is expected, assuming established conservation Best Management Practices (BMPs) are employed. Metropolitan can expect to supply 45 to 55 percent of this demand, with the balance comprised of local supplies and LADWP's imported Owens Valley supply. Peak imported water demands in the West Valley service area are projected to increase to approximately 710 cubic feet per second (cfs) by year 2010 and to 960 cfs by 2030.

An additional demand on peak conveyance is anticipated due to limitations in utilizing a major storage facility in the Calleguas MWD service area. This storage facility, Lake Bard, has traditionally been used extensively during peak-summer periods to reduce peaking in conveyance facilities. However, constraints imposed by new legislation of the surface water treatment rule require retreatment facilities which will reduce Calleguas MWD's ability to use Lake Bard as a peaking facility by 50 percent, or 100 cfs. Existing facilities are inadequate to meet the projected demand and peaking management operations.

2. Local Supplies

Local water in the West Valley service area consists primarily of groundwater supplies within Calleguas MWD's service area. These groundwater basins are significantly overdrawn, on the order of 40,000 acre-feet per year, and with the exception of the North Las Posas Basin, have total dissolved solids (TDS) and nitrate contamination problems. There is an ordinance in place by the Fox Canyon Groundwater Management Agency (GMA) aimed at reducing groundwater overdraft and achieving safe yield by the year 2010.

Reclaimed water, used primarily for landscaping and irrigation, accounts for about 7 percent of water use in the West Valley service area. Use of reclaimed water is expected to increase significantly by year 2020, and will account for less than 10 percent of water use.

3. Imported Supplies and Distribution Facilities

There are two major Metropolitan pipelines capable of transporting treated state project water from Metropolitan's Joseph Jensen Filtration Plant (Jensen plant) to the West Valley member agencies. They are the West Valley Feeder No. 1, with a capacity of 100 cfs, and the West Valley Feeder No. 2, with a capacity of 310 cfs. However, LADWP has been exclusively leasing West Valley Feeder No. 1 since 1979 to convey water from its treatment plant to meet demands in its service area. LADWP has virtually exhausted all available capacity in West Valley Feeder No. 1. In addition to indicating a desire to continue to utilize this feeder, LADWP may look to Metropolitan to provide additional capacity to meet demands.

LADWP imports water into the service area from its Owens Valley supplies through its Los Angeles Aqueduct Filtration Plant and its own distribution system. The major LADWP trunk lines in the West Valley service area include the Granada Trunk Line, West Valley Feeder No. 1 (also known as the Rinaldi Trunk Line), the Roscoe Trunk Line and the Susana Trunk Line.

C. NEED FOR THE WEST VALLEY PROJECT

1. Imported Water Demands

The imported water demand peak in the West Valley service area is expected to

increase from 650 cfs in 1995 to 960 cfs by 2030. Presently, the total imported water pipeline capacity in the service area is approximately 640 cfs. Peak demands are expected to exceed pipeline capacities by the year 2000; and an additional 300 cfs would be required by 2030.

Treated imported water in the West Valley service area is being supplied by Metropolitan's Joseph Jensen Filtration Plant (Jensen plant) and LADWP's Los Angeles Aqueduct Filtration Plant. These plants provide service to a wide area, including supplementing the East Valley and Common Pool service areas. The Jensen plant is undergoing expansion from 620 cfs to 1160 cfs. The expansion, in conjunction with the Central Pool Augmentation Plant, will provide sufficient capacity until about year 2010.

2. Reliable Deliveries to West Valley Member Agencies

Imported water is delivered to Calleguas MWD and Las Virgenes MWD through a single pipeline, West Valley Feeder No. 2. The West Valley feeders cross the Northridge Hills fault zone and are near the Santa Susana fault. These zones are classified as potentially active faults. The Santa Susana tunnel, the sole source of imported water for Calleguas MWD, is located near the faults. It is Metropolitan's goal to provide a second source of supply from an alternate delivery point whenever possible to ensure system reliability and operational flexibility. To the extent that new facilities are constructed to provide additional conveyance capacity, it may be preferable to provide it from an alternate delivery point.

3. West Valley Storage Requirement

There is very little storage within Metropolitan's service area on the west side of the system. Castaic and Pyramid lakes, historically counted on to provide emergency and

drought carryover storage, are State Water Project reservoirs owned and operated by DWR and are used primarily as regulatory facilities.

There exists a unique opportunity to store surplus winter supplies in an existing groundwater basin for future use in the event of interruption of delivery of supplies to the West Valley service area. The North Los Posas groundwater basin within the Calleguas MWD service area has the potential to store approximately 300,000 acre-feet. The utilization of the North Los Posas Basin would provide water in emergencies or serve as carryover storage for use during dry years.

D. PROJECT CONCEPTS

Project concepts have been narrowed to two general alternatives. The first alternative, the San Fernando Valley Feeder, would include a total length of approximately 148,000 feet (28 miles) of 96-inch-diameter pipeline. Metropolitan facilities would account for about 45,000 feet (8.5 miles) of the total length. This alternative would originate at the Sepulveda Feeder in the San Fernando Valley, traverse westerly through the San Fernando Valley to the Santa Susana Pass, into Simi Valley, and terminate at Lake Bard within the Calleguas MWD service area.

The second alternative, the Santa Clara River Valley Feeder, would include a total length of about 175,000 (33 miles) of 96-inch-diameter pipeline. Similarly, Metropolitan facilities would be comprised of approximately 120,000 feet (23 miles) of the total length. The pipeline would begin near Castaic Lake Water Agency's Rio Vista Treatment plant in the City

of Santa Clarita. This alternative would generally parallel the Santa Clara River westerly and then turn southerly through the Big Mountain Range via a new tunnel into the Moorpark or Simi Valley area. Both alternatives would include North Los Posas groundwater basin injection/extraction facilities located within the Calleguas MWD service area, as well as local distribution facilities to convey water to Lake Bard.

E. COORDINATED OPERATIONS IN THE WEST VALLEY

All facility alternatives considered have been addressed in terms of the coordinated operation of the West Valley member agency delivery facilities. These agencies are interconnected to some extent. Potential alternatives are available from member agency interconnections, such as LA-33 on West Valley Feeder No. 2. A potential new connection between Las Virgenes and Calleguas MWDs will also be considered. Groundwater conjunctive-use operations have been be assumed for all alternatives.

1. Local Facilities Operations

The most significant local facilities associated with coordinated operations are the 10,000-acre-foot Lake Bard Reservoir located in the Calleguas MWD service area and the 9,500-acre-foot Westlake Reservoir located near the western boundary of Las Virgenes MWD.

2. Memorandum of Understanding (MOU)

An MOU exists between Metropolitan, Calleguas MWD, and the Castaic Lake Water Agency (CLWA) which would allow their joint sharing of treatment and conveyance

facilities, should Metropolitan determine that a new conveyance pipeline alignment along the Santa Clara River is the preferred alternative for meeting the needs of the West Valley service area.

F. SCHEDULE

The West Valley Project is needed by about the year 2000. A Notice of Preparation was released in the Fall of 1992. It is anticipated that the Environmental Impact Report will be certified in late 1993. Following design and construction, it is anticipated that the West Valley Project will be on-line by the year 2000.

Chapter 2

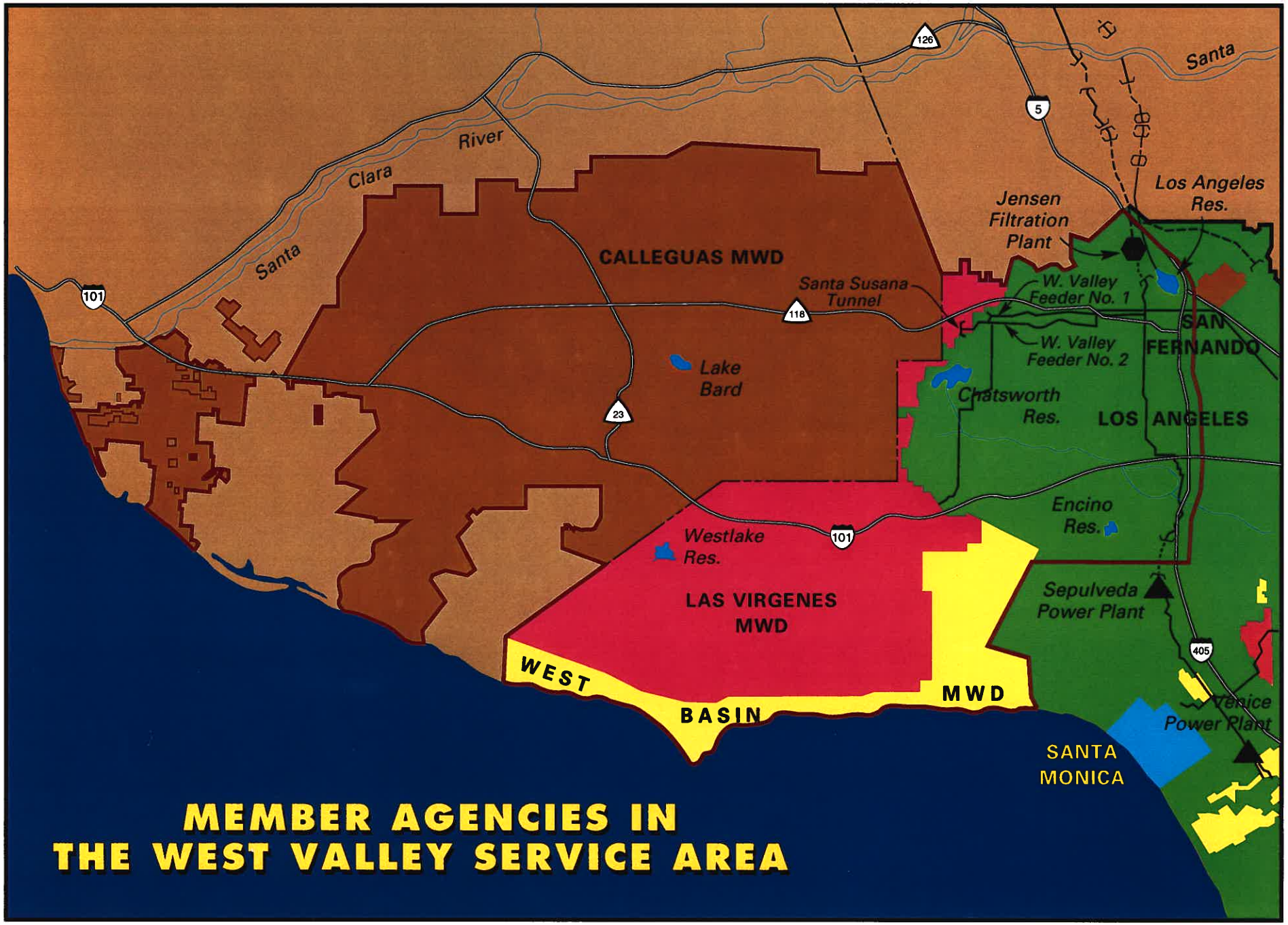
INTRODUCTION

The purpose of this report is to assess the need for future supplemental water conveyance facilities which may be required to meet demands in the West Valley to around the year 2030. Growing peak-week demands, as well as future peaking constraints in local water supplies, indicate that additional facilities may be required to meet the needs of Metropolitan's West Valley member agencies.

Metropolitan provides supplemental water to a large portion of the west San Fernando Valley and southeastern Ventura County. Its West Valley member agencies include Calleguas Municipal Water District (Calleguas MWD), the City of Los Angeles Department of Water and Power's (LADWP's) western service area, Las Virgenes Municipal Water District (Las Virgenes MWD), and West Basin Municipal Water District's (West Basin MWD's) western service area. The West Valley service area is shown in Figure 2-1. Treated water deliveries are made through Metropolitan's West Valley Feeder No. 2 to Calleguas MWD and Las Virgenes MWD. West Basin MWD is not presently taking delivery of water from this side of the service area. LADWP has an emergency service connection (LA-33) on West Valley Feeder No. 2 and has been leasing West Valley Feeder No. 1 since 1979 to convey water from its treatment plant to meet demands in its service area. While that lease is due to expire in July 1999, LADWP has expressed an interest in maintaining use of West Valley Feeder No. 1 beyond that date.

A. PURPOSE OF AREA STUDY

The purpose of this area study is to evaluate the need for water facilities and to discuss different facility alternatives that may be constructed to meet the needs of the West



MEMBER AGENCIES IN THE WEST VALLEY SERVICE AREA

FIGURE 2-1

Valley member agencies. The area study assesses water demands, local water supplies, and existing water conveyance and treatment facilities. From this assessment, conceptual project alternatives have been developed to satisfy area needs. The general alternatives are presented in this report. Consistent with Metropolitan's mission statement, final facility alternatives will be developed in an environmentally and economically responsible way.

B. REPORT ORGANIZATION

This report is organized into seven chapters. Chapter 1, the Executive Summary, summarizes the purpose, scope, and major findings and recommendations of the area study. It primarily serves as an independent document to inform Metropolitan's Board members, management, and others with an interest in the West Valley conveyance and conjunctive-use project, of these findings and recommendations. Chapter 2 introduces study objectives and report organization. Chapter 3 discusses West Valley area water demands and estimation procedures. Chapter 4 discusses the need for new West Valley conveyance facilities. Chapter 5 describes two general concepts for a potential project to meet the needs of the West Valley member agencies. Coordinated operations and institutional and policy issues are presented in Chapter 6. Finally, preliminary project cost estimates and a project schedule are presented in Chapter 7.

Chapter 3

AREA WATER DEMANDS AND STORAGE REQUIREMENTS

A. INTRODUCTION

This chapter characterizes water supplies and demands and provides an estimate of imported water needs and storage requirements for the northwestern portion of Metropolitan's service area. Growing water demands within this area, known as the West Valley area, will require additional water conveyance and groundwater storage facilities to meet the needs of Metropolitan's West Valley member agencies during the period of 2000 to 2030. The analysis of water demand and storage needs presented in this chapter is based on the following basic assumptions:

- Adoption of Southern California Association of Governments (SCAG) population, housing, employment, and land use plans, and their associated water needs;
- Implementation of "Best Management Practices" (BMPs) in water conservation in the West Valley service area utilizing Metropolitan's Conservation Credits Program;
- Implementation of all identified, potential wastewater reclamation and reuse projects, utilizing Metropolitan's Local Projects Program; and
- Maximum development and use of groundwater storage basins utilizing Metropolitan's seasonal storage pricing programs and groundwater recovery program.

The SCAG 1989 Growth Management Plan was the primary source for population, housing, and employment data used in this report. Metropolitan adopts SCAG's

projections because SCAG is the designated regional planning agency, and its projections are also used by other planning agencies in Southern California.

1. The West Valley Study Area

The study area encompasses a total of 848 square miles; 633 square miles are included in the Las Virgenes MWD, Calleguas MWD, and the western portion of West Basin MWD service areas. The West Valley portion of LADWP's service area adds an additional 215 square miles.

The southerly base of the Santa Susana Mountains forms the northern boundary of this area, while the City of Malibu and the Santa Monica Mountain range forms the southern boundary of the region. The area is bounded on the east by the Golden State Freeway and Van Nuys Boulevard and on the west by the Pacific Ocean in the Oxnard area.

a. Climate

In addition to exhibiting significant seasonal climatic variations, the inland areas of the West Valley experience an average daytime high temperature of 91°F in the summer, compared to a more moderate 74°F that prevails in the coastal areas. Consequently, water demands per capita in the inland areas are considerably higher than those in the coastal areas.

Rainfall varies less in the study area. The average annual rainfall at the Canoga Park weather station (inland valley area) is 16 inches per year, compared to 14.5 inches at the Oxnard station (the coastal plain).

b. Demographic Characteristics

For the West Valley service area, Metropolitan estimates its water demands based on the adopted population and growth management plan of the SCAG regional government organization. Approximately every three years, SCAG convenes appointed officials from the region and agrees on population, housing, employment, and land use objectives (PHEL), along with a set of infrastructure plans needed to support their demographic goals (Southern California Association of Governments 1989). The regional population, housing, and jobs goals are allocated among communities in such a way as to best meet jobs/housing balances, reduce vehicle miles traveled, and meet other social and resource goals. The adopted SCAG growth management plan is used by virtually all of the planning and operating agencies who carry out regional planning for transportation, water and wastewater, compliance with state and federal air quality standards, and related functions. Metropolitan plans its water distribution system facilities to support the regional governments' adopted plans by matching its water demand forecasts to SCAG's PHEL goals.

The SCAG population forecasts indicate that population in Metropolitan's West Valley service area is expected to increase from slightly less than 1.4 million in 1995 to slightly greater than 1.7 million by the year 2010. Because SCAG's population forecast only extends to 2010, Metropolitan estimated the 2020 and 2030 population by applying the same growth rate from 2005 to 2010 to the period between 2010 and 2030. This forecast results in a 2030 population of 2.2 million, an average increase of 25,100 people per year between 1995 and

2030. This projection of population growth is lower than that observed in the 1980s, and represents a declining growth pattern from the present rate.

Growth in population, housing, and employment over the next 20 years will not be uniform throughout the study area. Expected population growth patterns in the four component regions are shown in Table 3-1. The fastest growth rate is expected to occur in the Calleguas MWD region. This projection is partially explained by anticipated annexation to Metropolitan's service area of the recently developed land on the Oxnard Plain. Newly constructed buildings are generally connected to city water systems to obtain water of suitable quality.

Table 3-1

PROJECTED POPULATION FOR THE WEST VALLEY STUDY AREA
(acre-feet per year)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	521,617	572,658	621,294	679,903	808,179	960,656	84
2 Las Virgenes	75,763	82,942	89,111	95,279	97,303	99,327	31
3 West Basin	32,341	33,662	37,033	38,902	42,830	47,154	46
4 West Valley-LA	751,035	805,795	857,398	910,974	1,024,820	1,152,894	54
Total	**1,380,756**	**1,495,057**	**1,604,836**	**1,725,058**	**1,973,132**	**2,260,031**	**64**

Although the rate of population increase will be most modest in the West Valley-Los Angeles area, the increase is the largest in absolute terms. The growth rate in the West Basin MWD service area will be similar to that of LADWP. However, since it is a smaller area, the absolute increase will also be small. The growth rate in the Las Virgenes MWD service area is expected to be the lowest among the four areas.

B. WATER DEMAND PROJECTION

1. Procedure

In general, future water demands in the Metropolitan service area are estimated using an econometric model (MWD-MAIN) which takes into consideration the population, number and type of housing units, housing values, water and wastewater prices, commercial and industrial employment, water conservation, and other variables related to urban water use. Model results provide residential, commercial, industrial, and public/unaccounted for water use for 57 model areas (51 cities and water districts and 6 county residual areas) in Metropolitan's service area.

Since Las Virgenes and Calleguas MWDs are modelled areas in MWD-MAIN, the model results can be used directly. The specific regions within the LADWP and West Basin MWD service areas are only portions of the larger areas being modelled. Their respective projected water needs were computed using equivalent per capita water use factors derived from the modelled areas containing them and their corresponding projected populations.

At this point, the model provides the total normal municipal and industrial (M&I) water demands for these four areas. The term "total" is used to indicate the total consumptive water needs in these areas. Metropolitan provides supplemental water to meet a portion of the total needs. The term "normal" is used to suggest that the forecast was computed by assuming an average climate based on the past 30 years.

Peak-week imported water demands are calculated from normal M&I demands using the following steps:

a. Project normal agricultural demand based on a review of historical trends and discussions with local water agency authorities;

b. Add the projected agricultural demand to the modelled urban demand to yield the total normal demand;

c. Adjust total normal water demands to total above-normal demands (based on analyses of weather effects on water use);

d. Estimate availability of local water supplies;

e. Determine the imported water demand as the difference between above-normal water demands and available local supplies; and

f. Obtain peak-week water demands to annual water use ratio from recent historic data and apply the ratio to the results from (e). These results are the peak-week imported water demands.

Peak-week imported water demands are then compared to existing conveyance facilities' capacities to determine if additional facilities are required.

2. Water Conservation Programs

Metropolitan has aggressively pursued conservation programs for the past ten years, making the largest monetary commitment to water conservation in the nation. These tactics include pricing incentives to retrofit residential buildings and industrial sites with water conserving fixtures and a *Conservation Credits Program* under which Metropolitan offers member agencies a substantial cash incentive for projects that demonstrate water savings.

Metropolitan is now participating in a statewide urban water conservation plan known as BMPs (Best Management Practices). BMPs rely on proven technologies to reduce water use, including changes in the plumbing code to ensure the best available technology at all new construction.

But the primary element of Metropolitan's educational and information programs is to provide public and private agencies, as well as private customers, with information on how to save water, and to convince them that water is worth saving. In this context, Metropolitan has provided information for efficient irrigation and low-water use landscaping. Metropolitan has also implemented residential water audits including a leak detection and repair search, and the distribution of low-flow shower heads and toilet modifications. On another level, Metropolitan is assisting in the retrofitting of toilets and other sanitary fixtures in public

buildings built before 1980, and is helping enforce the new California plumbing code that requires 1.6 gallon-a-flush toilets in all new or remodeled buildings installed after 1992.

3. Municipal and Industrial Urban Water Demand

Projected urban water demands with and without conservation BMPs for the four areas in the study area are shown in Table 3-2 and 3-3. Increases in urban demands follow the same general pattern seen in Table 3-1 for population growth. Calleguas MWD will experience the greatest rate of urban water demand increase, followed by a moderate rate projected for West Basin MWD and LADWP's West Valley areas. Las Virgenes MWD will experience the lowest percentage increase.

Table 3-2

TOTAL MUNICIPAL AND INDUSTRIAL WATER DEMAND IN THE WEST VALLEY STUDY AREA (NORMAL-YEAR PROJECTION--WITHOUT CONSERVATION) (acre-feet per year)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	128,582	143,794	158,372	174,378	209,087	250,687	95
2 Las Virgenes	22,511	25,063	27,535	30,338	31,930	33,596	49
3 West Basin	9,609	10,171	11,443	12,387	14,055	15,949	66
4 West Valley-LA	176,850	193,986	210,250	226,806	257,101	291,814	65
Total	**337,552**	**373,014**	**407,600**	**443,909**	**512,173**	**592,046**	**75**

Table 3-3

TOTAL MUNICIPAL AND INDUSTRIAL WATER DEMAND IN THE WEST VALLEY STUDY AREA (NORMAL-YEAR PROJECTION--WITH BMPs) (acre-feet per year)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	116,255	126,348	134,992	147,726	175,597	208,727	80
2 Las Virgenes	20,534	22,294	24,452	26,144	26,699	27,255	33
3 West Basin	8,686	9,056	10,079	10,779	11,848	13,044	50
4 West Valley-LA	159,438	172,011	184,275	195,891	220,372	247,913	55
Total	**304,913**	**329,709**	**353,798**	**380,540**	**434,516**	**496,939**	**63**

If there were no conservation efforts in the area, overall M&I demand in the study area is expected to increase by 75 percent between 1995 and 2030 as shown in Table 3-2. With water conservation BMPs in place, the increase is expected to be limited to 63 percent as shown in Table 3-3. Overall BMPs are expected to reduce M&I demands by 19 percent in the year 2030.

4. Agricultural Water Use

There still exists significant irrigated agricultural land in the Calleguas MWD service area. However, there is little agricultural water use in the other three areas. Projected water demands for agricultural use, noted in Table 3-4, are primarily for use in Calleguas MWD. Urban development is expected to replace some of the agricultural land, resulting in a

Table 3-4

AGRICULTURAL WATER USE IN THE WEST VALLEY STUDY AREA
(acre-feet per year)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	20,000	18,550	17,375	16,200	13,800	11,800	-41
2 Las Virgenes	0	0	0	0	0	0	0
3 West Basin	0	0	0	0	0	0	0
4 West Valley-LA	1,200	1,200	1,200	1,200	1,200	1,200	0
Total	**21,200**	**19,750**	**18,575**	**17,400**	**15,000**	**13,000**	**-39**

41 percent decrease in agricultural water demand. LADWP will experience a constant use of agricultural water in its service area to the year 2030. However, it should be noted that agricultural water use accounts for only a small portion of overall demand in the study area (approximately 7 percent in 1995, decreasing to 3 percent by 2030).

Major agricultural activity occurs in the unincorporated areas of the Oxnard Plain. Agricultural water use in this area is not included in this analysis since it currently lies outside of Metropolitan's service area. As these agricultural areas are converted to urban use, it is likely that they would be annexed into Metropolitan's service area.

Table 3-5

TOTAL NORMAL WATER DEMAND IN THE WEST VALLEY STUDY AREA
(acre-feet per year)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	136,255	144,898	152,367	163,926	189,397	220,,527	62
2 Las Virgenes	20,534	22,294	24,452	26,144	26,699	27,255	33
3 West Basin	8,686	9,056	10,079	10,779	11,848	13,044	50
4 West Valley-LA	160,638	173,211	185,475	197,091	221,572	249,113	55
Total	**326,113**	**349,459**	**372,373**	**397,940**	**449,516**	**509,939**	**56**
Note: Based on implementation of conservation BMPs. Without conservation BMPs, projected demands are:							
	358,752	**392,764**	**426,175**	**461,309**	**527,173**	**605,046**	**69**

5. Total Normal-Year Demand

Table 3-5 shows the total projected normal-year water demand for the study area. This represents the projected average quantity of water required annually in the study area under normal weather conditions. Total demand is projected to grow 56 percent from 1995 to 2030, even with conservation BMPs.

Table 3-6 shows projected per capita water use, based on the assumption of normal weather conditions with BMPs, for the four areas in the study area. It is important to note how the per capita use remains relatively constant with BMPs. Without BMPs, per capita use would increase due to (1) increasing standard of living, (2) movement from the milder

Table 3-6

NORMAL PER CAPITA WATER USE IN THE WEST VALLEY STUDY AREA
(gallons per capita per day)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	199.00	197.00	194.00	194.00	194.00	194.00	-3
2 Las Virgenes	242.00	240.00	245.00	245.00	245.00	245.00	1
3 West Basin	239.80	240.20	243.00	247.40	247.00	247.00	3
4 West Valley-LA	189.60	190.60	191.90	192.00	192.20	192.00	1
Weighted Average	**197.30**	**196.90**	**196.70**	**197.70**	**196.30**	**196.00**	**-1**

coastal regions of the study area to the hotter inland areas, and (3) increasing number of people in the work force.

Per capita water use is relatively high in the Las Virgenes MWD region because of its hotter inland climate and a large amount of hillside irrigation and landscaping. Developments in that area typically incorporate a large amount of landscaping which requires irrigation for maintenance. Per capita water use is similarly high in the West Basin MWD area. This is mostly attributed to the fact that this is a higher income area.

6. Total Above-Normal Demand

Water systems operate in response to weather variations. In its planning process, Metropolitan anticipates water needs during normal weather conditions, and provides for

contingency capacity to meet above-normal water demands during hot, dry periods. Above-normal demands occur during these periods of below-average rainfall and above-normal temperatures.

A statistical analysis was conducted to evaluate weather related impacts on water use based on historic weather and urban water use data in Metropolitan's service area. The results of this analysis provided a probability distribution of demands for both above- and below-normal conditions.

This distribution was then used to establish the percent deviation from water demand under normal conditions, given a desired confidence level. For facility planning, a confidence level of 95 percent has been selected. This implies that, 95 percent of the time, facilities designed to this above-normal level will meet demands.

Results of the analysis indicate a range of 4 to 10 percent deviation from projected normal demands for the various areas at the 95-percent confidence level. For Metropolitan's service area as a whole, it is about 6.5 percent. For Calleguas' service area, it is about 9.0 percent, due to its hotter climate. These deviations in percent factors (1.09 for Calleguas and 1.065 for the rest of the study area) were applied to the normal projections, with BMPs, from Table 3-5. These results are shown in Table 3-7.

7. Imported Water Demands

Imported water demands for the study area are that portion of the total demand which must be met by imported water supplies. Imported water demands are determined by

Table 3-7

ABOVE NORMAL WATER DEMAND IN THE WEST VALLEY STUDY AREA
(acre-feet per year)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	148,518	157,939	166,080	178,679	206,443	240,374	62
2 Las Virgenes	21,869	23,743	26,041	27,843	28,434	29,027	33
3 West Basin	9,251	9,645	10,734	11,480	12,618	13,892	50
4 West Valley-LA	171,079	184,470	197,531	209,902	235,974	265,305	55
Total	**350,717**	**375,796**	**400,386**	**427,904**	**483,469**	**548,598**	**56**

subtracting from the total above-normal demand, all local water supplies and existing and potential water reclamation and reuse projects.

a. Area Water Supplies

Water supplies for the West Valley study area are obtained from a variety of imported and local water sources. Imported water is available from the State Water Project and from the Los Angeles Aqueduct (LA Aqueduct). State Water Project supplies are treated through Metropolitan's Jensen plant in the San Fernando Valley. The LADWP's Los Angeles Aqueduct Filtration Plant, which treats all of the imported LA Aqueduct supplies, can also provide some treatment capacity for State Water Project supplies via an interconnection with Metropolitan's delivery facilities. Treated imported water is delivered through Metropolitan's

West Valley and Calabasas Feeders and through LADWP's distribution system. In addition to imported supplies, the area also has local groundwater and reclaimed water supplies.

Until recently, LADWP has used supplies imported via the LA Aqueduct to meet all of its demands in the West Valley area. However, due to the reduction in LA Aqueduct supplies, LADWP has begun to increasingly rely on supplemental water imported by Metropolitan. LADWP's local groundwater supplies to the West Valley-Los Angeles area are minimal. More substantial groundwater supplies, however, are available to meet a portion of Calleguas MWD's demand.

Total water use in fiscal year 1990 in the study area was approximately 322,000 acre-feet. Of this, approximately 144,000 acre-feet, or forty-five percent of this total water demand, was supplied by Metropolitan. The remainder was met by local supplies or supplies imported through the LA Aqueduct. Agricultural water use (28,170 acre-feet, or 8 percent of total use) was incurred in Calleguas MWD.

The West Valley-Los Angeles area used primarily its own imported sources to meet the demand in the study area. Las Virgenes MWD, on the other hand, is largely dependent on Metropolitan supplies. Calleguas MWD, however, finds itself between the two extremes. Its dependence on Metropolitan is expected to increase as the population in this area continues to grow.

The total local supplies in the West Valley study area are shown in Table 3-8 and described in the following sections.

Table 3-8

LOCAL SUPPLIES IN THE WEST VALLEY STUDY AREA[1]
(acre-feet per year)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	25,680	31,516	32,208	32,900	33,592	34,890	36
2 Las Virgenes	4,120	4,120	4,360	4,600	4,840	4,840	17
3 West Basin	0	0	0	0	0	0	0
4 West Valley-LA	1,520	2,000	3,605	5,205	5,480	5,750	278
Total	**31,320**	**37,636**	**40,173**	**42,705**	**43,912**	**45,480**	**45**

Note 1: Includes groundwater and reclaimed water.

b. Local Groundwater Basins

The most significant groundwater supplies are found in a number of basins in the Calleguas MWD service area (Figure 3-1). Among these basins, four (Oxnard, Pleasant Valley, Las Posas, and Santa Rosa) provide significant quantities of water. The Simi Valley and Thousand Oaks basins provide only small amounts of potable water. Local groundwater supplies in the Las Virgenes MWD area is assumed to be zero. Local groundwater supplies in LADWP's West Valley service area are minimal.

A principal water quality problem in Calleguas MWD basins, with the exception of the North Las Posas Basin, is high concentrations of total dissolved solids and nitrates. There are no known water quality problems in the Ventura County basins.

EXISTING GROUNDWATER BASINS IN CALLEGUAS SERVICE AREA

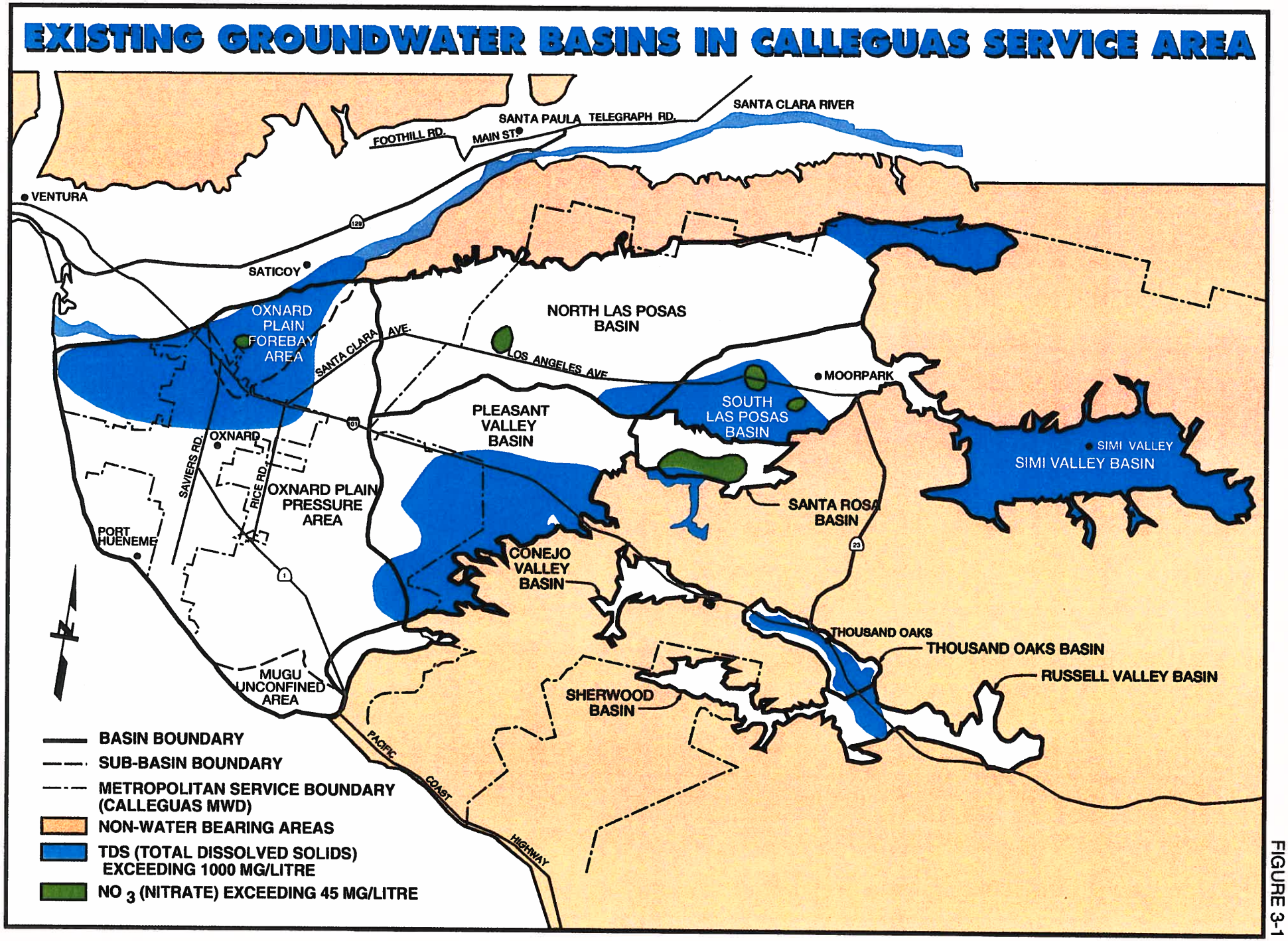


FIGURE 3-1

c. Reclaimed Water

There are several existing water reclamation projects within the study area, as described below:

- **Hill Canyon Plant:** This plant serves the City of Thousand Oaks. It is located in the northern part of the city. Effluent from this plant is used for replenishment of about 1,120 acre-feet per year in the Santa Rosa Basin. It is also used for agricultural purposes on the Oxnard Plain outside of Metropolitan's service area.
- **Moorpark Plant:** This plant replenishes about 1,600 acre-feet per year into the South Las Posas Basin.
- **Olsen Road/Sunset Hills Plant:** An additional 180 acre-feet per year is released as effluent from this plant.
- **Las Virgenes Plants:** Las Virgenes has a large master plan for a reclaimed water distribution system. This is a joint venture with Triunfo County Sanitation District (Triunfo). There are actually four projects in this system: the Las Virgenes Valley Project, the Calabasas Project, the Las Virgenes Reclamation Project, and the Calabasas Extension Project. Together, the system will provide approximately 4,100 acre-feet per year of reclaimed water, primarily for landscape irrigation use within the Las Virgenes MWD service area.

There are four potential water reclamation projects in LADWP's West Valley service area, as described below:

- **Braemar & El Caballero Country Clubs Project**: This project is located in the southeast part of Tarzana. An ultimate yield of approximately 800 acre-feet per year is proposed to be used for irrigation at the Braemar and El Caballero Country Clubs.
- **Mountaingate Golf Course Project**: This project is located in the Santa Monica Mountains west of the San Diego Freeway, south of Encino and north of Brentwood. An ultimate yield of approximately 450 acre-feet per year is proposed to be used for irrigation at the Mountaingate Golf Course.
- **West Valley Greenbelt Project**: This project is located near the Mountaingate Golf Course and the Braemer & El Caballero Country Club Projects. An ultimate yield of approximately 1,000 acre-feet per year of reclaimed water is proposed to be used for irrigation.
- **Sepulveda Basin Project**: This project is located in the Sepulveda Dam Recreation Area in the City of Los Angeles. An ultimate yield of approximately 3,500 acre-feet per year of reclaimed water is proposed to be used for irrigation of golf courses, parks, baseball fields, etc.

Two additional potential wastewater reclamation projects planned within the West Valley service area have also been identified:

- **North Ranch Reclamation Project:** This project will extend the existing Las Virgenes/Triunfo reclaimed water distribution system (described above) to the North Ranch area of the City of Thousand Oaks. Approximately 1,300 acre-feet per year of this reclaimed water is proposed to be used for golf course irrigation.
- **Simi Valley Plant:** This plant will provide reclaimed wastewater to meet some of the growing M&I demands in the Simi Valley. It is estimated that 4,800 acre-feet per year would be used for this purpose. It has also been proposed that a portion of this effluent be conveyed to the Las Posas Valley for agricultural irrigation.

d. Total Annual Imported Water Demand

Projected above-normal imported water demands for the West Valley area are summarized in Table 3-9. These projections were obtained by subtracting anticipated local water supplies (Table 3-8) from total above-normal demands (Table 3-7). The projections of imported water demand for the area include water supplied by Metropolitan and delivered to the service area from the Jensen plant and water supplied by Metropolitan and Los Angeles via the Los Angeles Aqueduct and delivered to the service area from the Los Angeles Aqueduct Filtration Plant.

Imported water demand is projected to increase 58 percent by the year 2030. An expected population increase of 64 percent, from 1995 to 2030, will drive much of this increased

Table 3-9

ABOVE NORMAL IMPORTED DEMAND IN THE WEST VALLEY STUDY AREA
(acre-feet per year)

Analysis Unit	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	122,838	126,423	133,872	145,779	172,851	205,484	67
2 Las Virgenes	17,749	19,623	21,681	23,243	23,594	24,187	36
3 West Basin	9,251	9,645	10,734	11,480	12,618	13,892	50
4 West Valley-LA	169,559	182,470	193,926	204,697	230,224	259,555	53
Total Imported Water Demand	**319,397**	**338,160**	**360,213**	**385,199**	**439,287**	**503,118**	**58**

demand. Most of the increased demand is expected in the Oxnard area because of the high rates of expected growth and future annexations and the West Valley-Los Angeles area. Increased demand on Metropolitan, however, will be mitigated by conservation efforts, reduction in agricultural water use, by increased use of local supplies by the cities of Camarillo and Oxnard, and by expanded use of reclaimed water.

8. Peak-Week Demand

Generally, all local agencies are responsible for meeting daily and hourly peak demands from their storage or production facilities. Metropolitan's practice is to plan its facilities to meet peak-week demands in all areas.

The peak-week demand factor is the ratio of peak-week demand on a given agency's supply to its average annual weekly delivery. This factor was based on a study of weekly deliveries through West Valley Feeder No. 2 from 1985 through 1989. The peak-week delivery in each year was then compared with the average weekly delivery for that year to determine the peak-week factor.

The factor used in peak-week projections, shown in Table 3-10, is a five-year average of these peak-week ratios. This factor was then applied to the above-normal demands on Metropolitan from Table 3-9 to determine above-normal, peak-week imported water demand.

Calleguas MWD is planning to develop seasonal storage in the North Las Posas Basin to take advantage of Metropolitan's seasonal pricing program. Seasonal or in-lieu deliveries in the winter would decrease the amount of water taken in the peak summer months. Calleguas is planning to develop the storage in stages. The initial stage would be capable of storing and extracting 15,000 acre-feet per year by the year 2000, increasing to 30,000 acre-feet per year by the year 2010. For the purposes of determining peak demands, it is assumed that these amounts of water are extracted on a continuous, constant flow basis during the five summer months. This flowrate is then subtracted from the above-normal peak-week imported water demand to determine the net peak-week imported water demand. New facilities are planned to meet the net peak-week imported water demand.

Table 3-10

ABOVE-NORMAL IMPORTED DEMAND IN THE WEST VALLEY STUDY AREA (cfs)

Analysis Unit (1)	Year						% Change 1995 to 2030
	1995	2000	2005	2010	2020	2030	
1 Calleguas	260	267	283	308	365	434	67
2 Las Virgenes	38	41	46	49	50	51	36
3 West Basin (2)	0	0	23	24	27	29	N/A
4 West Valley-LA	358	386	410	433	487	549	53
Sub-Total	**655**	**694**	**761**	**814**	**928**	**1,063**	**62**
Additional In-Lieu	**0**	**50**	**75**	**100**	**100**	**100**	
Net Peak Demand	**655**	**644**	**686**	**714**	**828**	**963**	**47**

(1) Peak Factor = 1.53.

(2) West Basin is currently not expected to connect to the Calabasas Feeder before the year 2000.

Projected peak-week demands for treated imported water in the West Valley study area during periods of above-normal weather conditions area shown in Table 3-10 as a flow in cubic feet per second (cfs). The projected net peak-week imported water demands are projected to increase from approximately 655 cfs in 1995 to approximately 963 cfs in 2030.

C. GROUNDWATER STORAGE REQUIREMENTS

All water imported to Metropolitan's service area is reliant upon water importation facilities that cross the San Andreas fault system. These supplies are subject to interruption in

the event of fault movement. In addition, major fault systems within Metropolitan's service area could cause a more localized unexpected interruption in service to the member agencies. The natural occurrence of droughts or water abundant periods can also cause dramatic swings in Metropolitan's water supplies and demands over relatively short or extended time periods. For these reasons, an adequate reserve of water and water storage capacity, which is accessible to all member agencies, is required. There are no Metropolitan owned or operated storage facilities on the western end of Metropolitan's service area. The North Las Posas groundwater basin within the Calleguas MWD service area has been identified as a viable storage facility for such purposes. Development of groundwater recharge and storage could be accomplished with facilities to increase the amount of imported water which can be conveyed into the West Valley study area.

There are two general objectives for reserve water supplies that are discussed below:

- To provide water in emergencies;
- To provide carryover storage for use during dry years.

In addition, reserve water supplies provide for seasonal storage as discussed earlier.

1. Emergency Storage Requirements

Emergency storage requirements are based on the potential for a major earthquake to damage the Colorado River, California, and Los Angeles aqueducts, since they all cross the

San Andreas Fault. Moreover, damage could occur to Metropolitan's distribution system as a result of a seismic event on the Newport-Inglewood, Santa Susana Thrust, or San Jacinto faults. It is necessary that emergency water reserves be available within the Metropolitan service area to supplement local production during an emergency. These reserves need to be distributed throughout the service area in order to maximize delivery capability under emergency conditions.

Metropolitan's criteria for emergency storage is to provide sufficient reserves to meet regional needs for six months. During emergency periods, it is assumed there would be a mandatory reduction in water use of 25 percent from normal year demand levels. All interruptible service deliveries would be curtailed. Local groundwater production would be sustained.

Emergency storage requirements for the West Valley service area, incorporating these assumptions, along with population and use projections, are shown in Table 3-11. By the year 2030, the emergency storage requirement will be 336,970 acre-feet.

2. Drought Carryover and Long-Term Storage

Drought carryover storage is defined as that storage required to make up the difference between normal and above-normal demands over two successive dry years. Two years of carryover storage is considered a minimum requirement to augment imported water deliveries during dry periods, given Southern California's history of extended droughts. Carryover storage requirements are shown in Table 3-12. By the year 2030, storage requirements will be approximately 77,300 acre-feet. These estimates assume that Metropolitan

will meet the difference between normal and above-normal demands during dry years through the use of carryover supplies.

Table 3-11

EMERGENCY STORAGE REQUIREMENTS IN THE WEST VALLEY STUDY AREA
(acre-feet per year)

	Year					
	1995	2000	2005	2010	2020	2030
75% Normal Demand	244,585	262,094	279,280	298,455	337,137	382,454
Local Supplies	31,320	37,636	40,173	42,705	43,912	45,480
Emergency Storage Requirement	**213,265**	**224,458**	**239,107**	**255,750**	**293,225**	**336,974**

Table 3-12

CARRYOVER STORAGE REQUIREMENTS IN THE WEST VALLEY STUDY AREA
(acre-feet per year)

Analysis Unit	Year					
	1995	2000	2005	2010	2020	2030
1 Calleguas	24,526	26,082	27,426	29,507	34,091	39,695
2 Las Virgenes	2,669	2,898	3,179	3,399	3,471	3,543
3 West Basin	1,129	1,177	1,310	1,401	1,540	1,696
4 West Valley-LA	20,883	22,517	24,112	25,622	28,804	32,385
Carryover Total	**49,207**	**52,675**	**56,027**	**59,929**	**67,907**	**77,318**

Chapter 4

PROJECT NEEDS

A. INTRODUCTION

This chapter describes existing conveyance and treatment facilities in the West Valley service area and discusses additional facilities that may be required to meet the projected demands shown in Chapter 3. As shown in Table 3-10, net peak imported water demand in the West Valley service area is expected to increase from 655 cfs in 1995 to 963 cfs by the year 2030. Imported water includes LADWP's Owens Valley supplies as well as Metropolitan's contracted State project supplies. This chapter includes discussions on additional conveyance, treatment, and storage facilities needed to meet the projected demand.

B. EXISTING FACILITIES TO CONVEY AND TREAT IMPORTED WATER

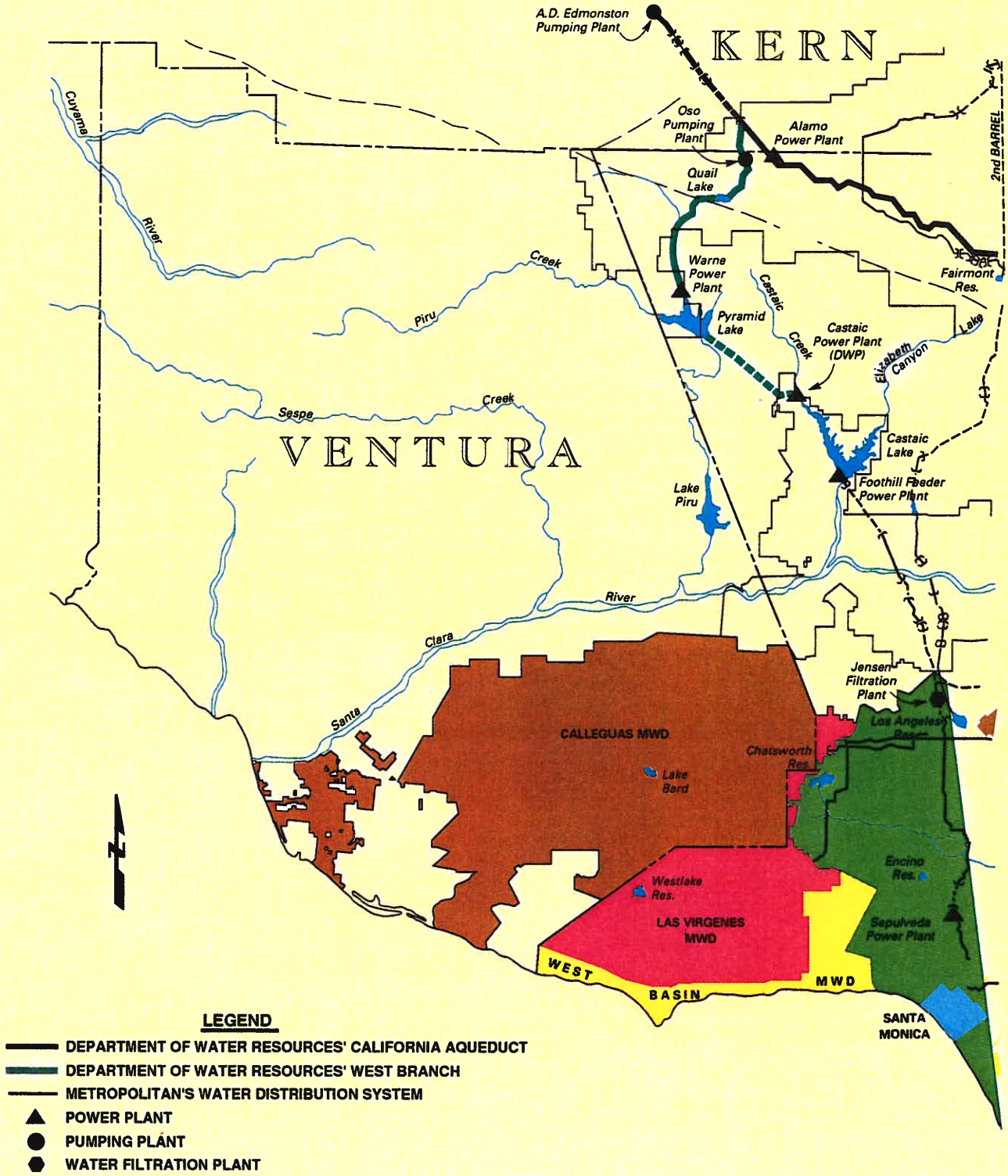
The West Valley service area has two sources of imported water. Metropolitan, through contract with the California Department of Water Resources (DWR), imports State project water from the Sacramento/San Joaquin Delta for use by its member agencies. LADWP imports supplemental water from the Owens Valley for its own use.

1. DWR Facilities

DWR owns and operates the State Water Project (SWP) which conveys water southerly through the California Aqueduct from the Sacramento/San Joaquin Delta to Southern California. The aqueduct bifurcates into the West and East branch in the Antelope Valley. The East Branch continues southeasterly through the Antelope Valley, turning south through the San Bernardino Mountains, and finally terminating at Lake Perris in Riverside. The West Branch, shown in Figure 4-1, continues southwesterly and is pumped into Quail Lake through the Oso

FIGURE 4-1

SCHEMATIC OF DWR WEST BRANCH



Pumping Plant. From Quail Lake water flows southerly through the William E. Warne Power Plant into Pyramid Lake; southeasterly through the Castaic Power Plant into Castaic Lake. The West Branch terminates at Castaic Lake in Los Angeles County north of Santa Clarita.

Castaic Lake has a storage capacity of 323,700 acre-feet at the maximum normal water surface elevation of 1,513 feet and is used as a regulatory reservoir on the State Water Project system. Historical storage levels in Castaic Lake from 1985 to mid-1992 are shown in Figure 4-2. The data indicates that, in general, the lake storage fluctuates seasonally; the lake is drawn down in the summer months and refilled in the winter months. Minimum historical lake storage was approximately 120,000 acre-feet in 1988.

Pyramid Lake has a storage capacity of 169,900 acre-feet at the maximum normal water surface elevation of 2,578 feet. Historical storage levels in Pyramid Lake from 1985 to mid-1992 are shown in Figure 4-3. The data indicates that lake storage is kept fairly constant and near capacity, averaging 156,500 acre-feet since 1985. Operation of the lake in this manner allows optimization of power production through a hydroelectric power plant operated by LADWP's power division.

2. Metropolitan Facilities

Metropolitan takes delivery of state project water from Castaic Lake. Metropolitan's facilities are shown in Figure 4-4. Flow from the lake is regulated at the Foothill Feeder Control Structure located at the base of the dam. From the control structure, water flows through a series of tunnels and pipelines, approximately 15 miles, to Magazine Canyon shaft. From Magazine Canyon water can flow southeasterly through the San Fernando Tunnel and be

CASTAIC LAKE HISTORICAL STORAGE LEVELS

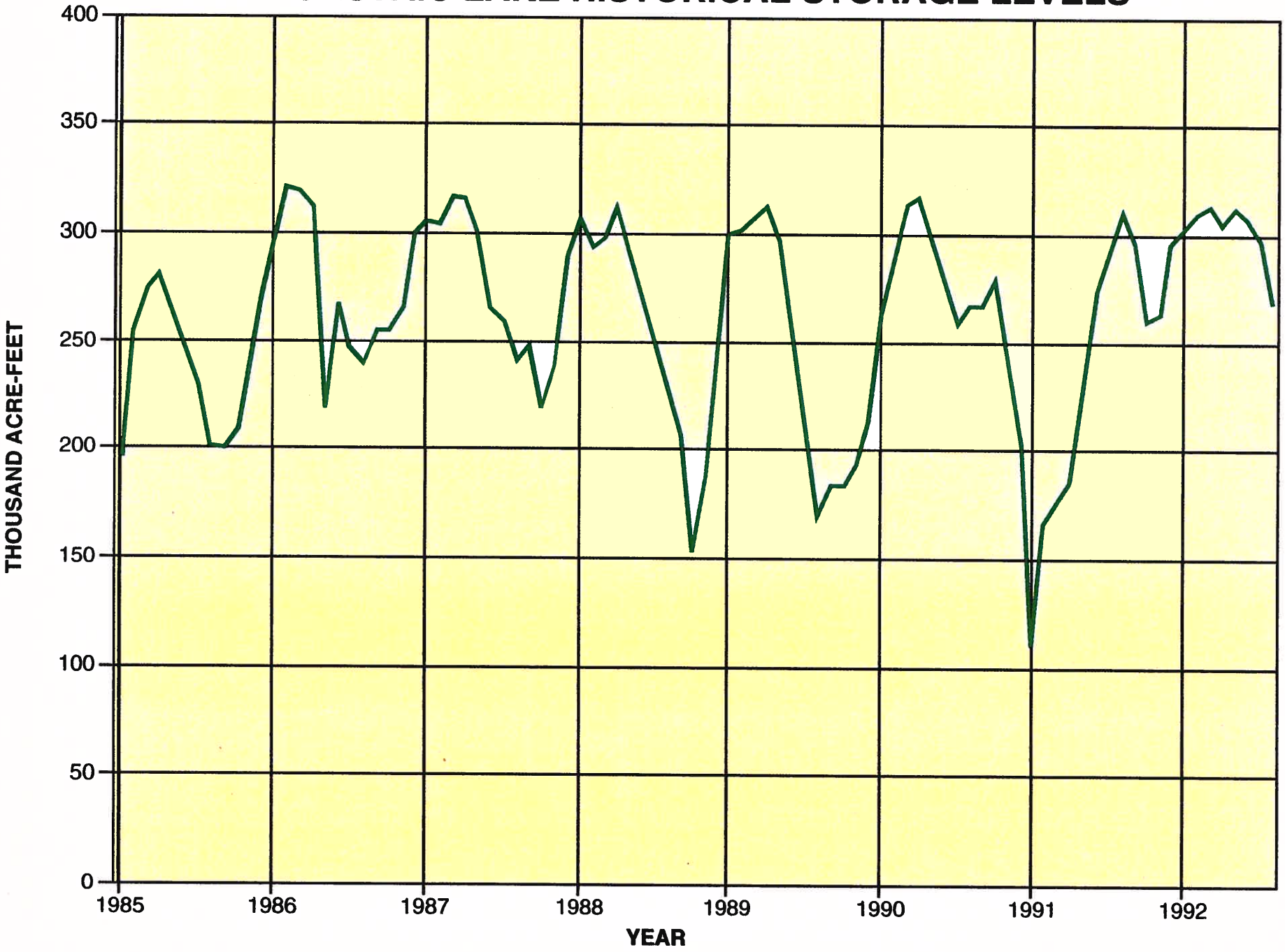
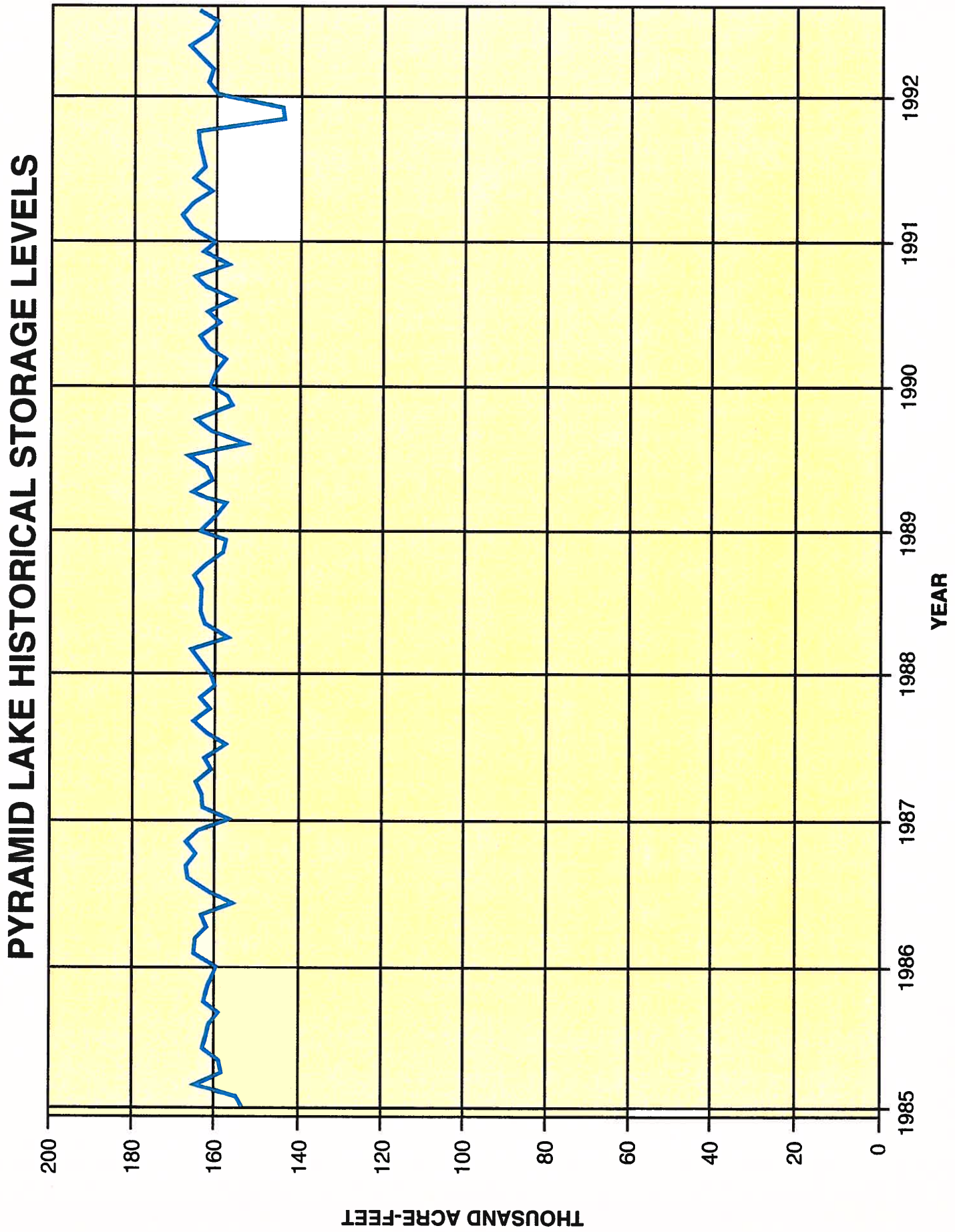


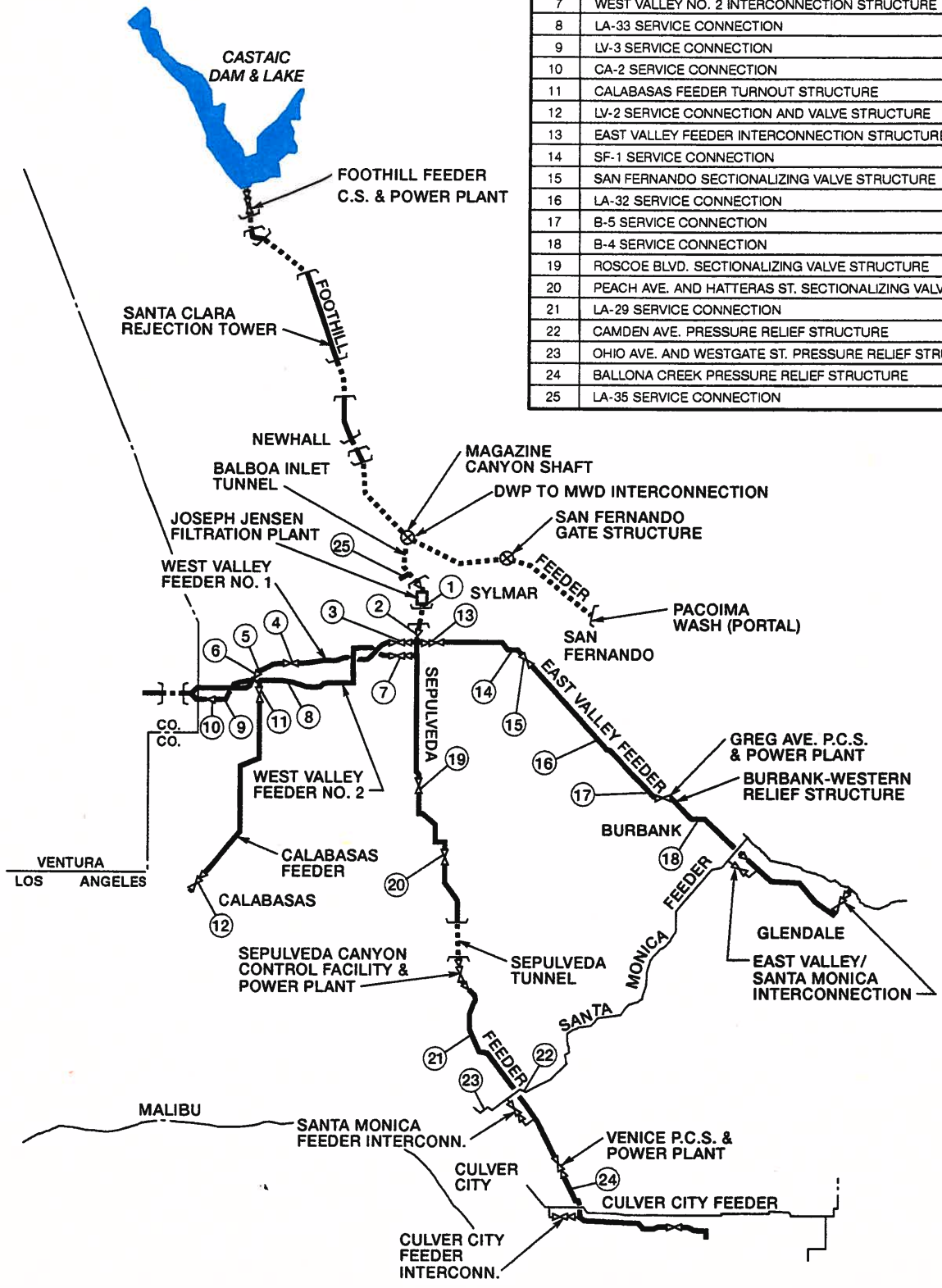
FIGURE 4-2

FIGURE 4-3


PYRAMID LAKE HISTORICAL STORAGE LEVELS
THOUSAND ACRE-FEET
200
180
160
140
120
100
80
60
40
20
0
1985
1986
1987
1988
1989
1990
1991
1992
YEAR

SCHEMATIC OF METROPOLITAN FACILITIES WEST VALLEY SERVICE AREA

ITEM	DESCRIPTION
1	LA-25 SERVICE CONNECTION
2	SF-O MASTER METER STRUCTURE
3	WEST VALLEY NO. 1 INTERCONNECTION STRUCTURE, LA-34A, LA-34B
4	DESOTO ST. SECTIONALIZING VALVE STRUCTURE AND CA-01S
5	LV-1 SERVICE CONNECTION
6	CA-1 SERVICE CONNECTION
7	WEST VALLEY NO. 2 INTERCONNECTION STRUCTURE
8	LA-33 SERVICE CONNECTION
9	LV-3 SERVICE CONNECTION
10	CA-2 SERVICE CONNECTION
11	CALABASAS FEEDER TURNOUT STRUCTURE
12	LV-2 SERVICE CONNECTION AND VALVE STRUCTURE
13	EAST VALLEY FEEDER INTERCONNECTION STRUCTURE AND EVF-O METER
14	SF-1 SERVICE CONNECTION
15	SAN FERNANDO SECTIONALIZING VALVE STRUCTURE
16	LA-32 SERVICE CONNECTION
17	B-5 SERVICE CONNECTION
18	B-4 SERVICE CONNECTION
19	ROSCOE BLVD. SECTIONALIZING VALVE STRUCTURE
20	PEACH AVE. AND HATTERAS ST. SECTIONALIZING VALVE STRUCTURE
21	LA-29 SERVICE CONNECTION
22	CAMDEN AVE. PRESSURE RELIEF STRUCTURE
23	OHIO AVE. AND WESTGATE ST. PRESSURE RELIEF STRUCTURE
24	BALLONA CREEK PRESSURE RELIEF STRUCTURE
25	LA-35 SERVICE CONNECTION



released through the proposed LA-36 service connection into Pacoima Wash or continue southerly through the Balboa tunnel to the Jensen plant. LADWP can also take delivery of state project water through LA-35 which is located just upstream of the Jensen plant. These deliveries are treated by LADWP along with its own imported supplies through the LA Aqueduct Filtration Plant.

Water processed at the Jensen plant is used to satisfy treated water demands in the West Valley service area as well as other portions of Los Angeles and Orange Counties. The Jensen plant is currently being expanded from 620 cfs to 1,160 cfs. The expansion is expected to be completed in 1994. Nominal getaway capacity from Jensen in the Sepulveda Feeder, according to hydraulic profile 4-1-A, is 1,200 cfs. However, nominal capacity of the take-outs downstream of the Jensen plant is approximately 1,160 cfs (including West Valley Feeder No. 1). There is also potential for an additional 400 cfs demand on the Jensen plant through LA-25 service connection at the plant's clearwell for a total connected getaway capacity of 1,560 cfs.

The Sepulveda Feeder has a diameter of 12-foot-6-inches from the Jensen Plant clearwell to West Valley Feeder No. 1 and East Valley Feeder connections (about two miles downstream of the clearwell). The Sepulveda Feeder reduces to 10-foot diameter between West Valley Feeders No. 1 and 2 and has a capacity of about 1,000 cfs. The Sepulveda Feeder continues past the West Valley Feeder No. 2 connection to deliver treated water to other portions of Los Angeles and Orange counties.

Treated water is delivered to West Valley member agencies via West Valley Feeder No. 2. West Valley Feeder No. 1, although connected to the Sepulveda Feeder, is currently leased to LADWP and is being used to convey water from LADWP's Los Angeles Aqueduct Filtration Plant. LADWP has installed two major interconnections to its system along the feeder and is using the feeder as a major east-west trunk line.

West Valley Feeder No. 2 has a capacity of 310 cfs from the Sepulveda Feeder to the Calabasas Feeder connection. LADWP has a 75 cfs emergency connection (LA-33) on West Valley Feeder No. 2 upstream of the Calabasas Feeder. Downstream of the Calabasas Feeder connection West Valley Feeder No. 2 has a capacity of 260 cfs to its terminus at the Santa Susana Tunnel and service connection CA-2. CA-2 is Calleguas' primary source of imported water.

Las Virgenes receives water from service connection LV-2 at the end of the Calabasas Feeder. The Calabasas Feeder has a capacity of 50 cfs. Las Virgenes also receives water from service connection LV-1. LV-1 is located on West Valley Feeder No. 1. However, since the upstream portion of West Valley Feeder No. 1 is currently being leased to LADWP, LV-1 is normally fed from West Valley Feeder No. 2 through an interconnection between the two feeders at the Santa Susana Tunnel.

3. LADWP Facilities

LADWP's facilities serving the West Valley area are shown in Figure 4-5. LADWP imports water from the Owens Valley through the Los Angeles Aqueduct as well as

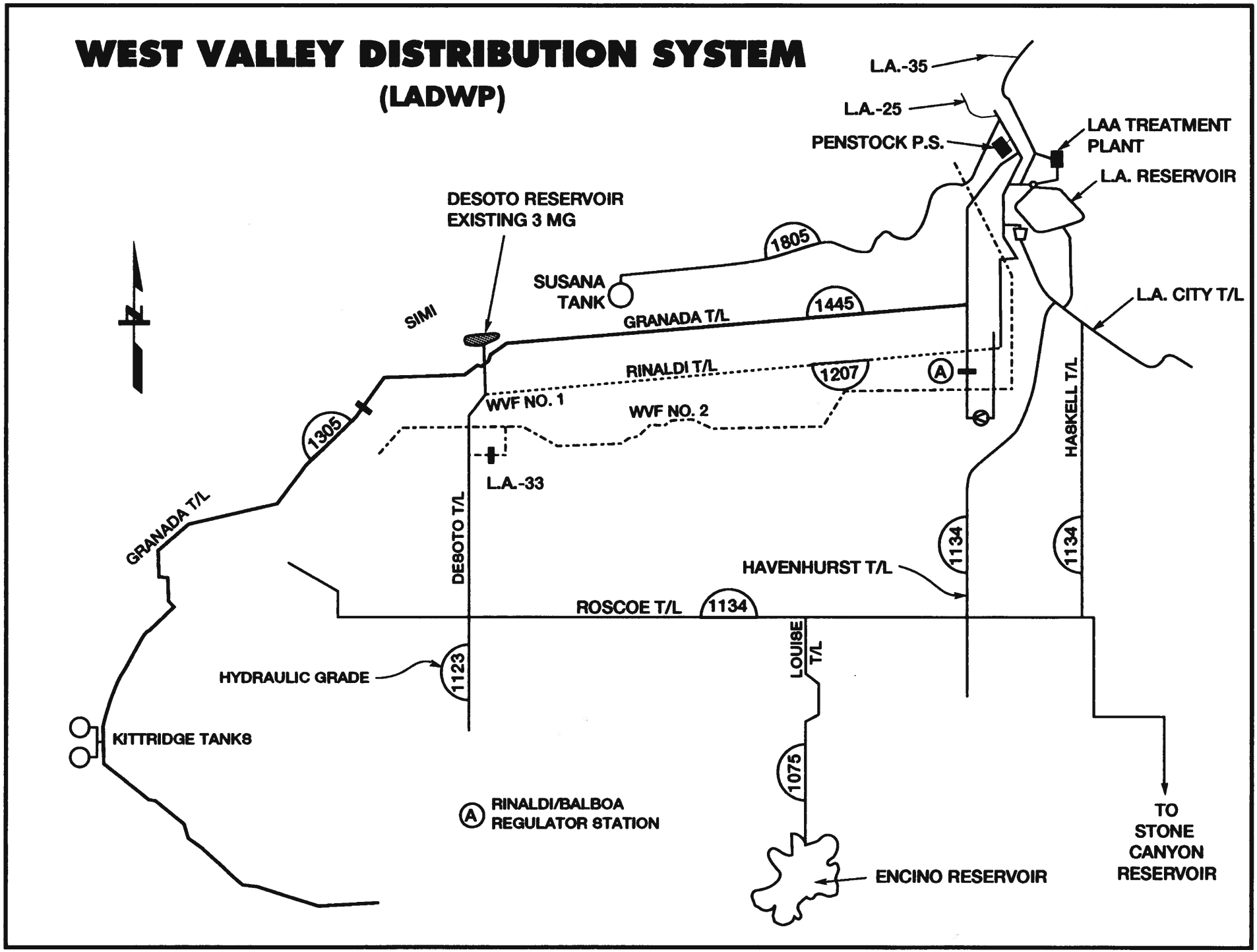

WEST VALLEY DISTRIBUTION SYSTEM
(LADWP)
L.A.-35
L.A.-25
PENSTOCK P.S.
LAA TREATMENT PLANT
L.A. RESERVOIR
DESOTO RESERVOIR
EXISTING 3 MG
1805
SUSANA TANK
SIMI
GRANADA T/L
1445
L.A. CITY T/L
RINALDI T/L
1207
A
WVF NO. 1
WVF NO. 2
1305
L.A.-33
HASKELL T/L
GRANADA T/L
DESOTO T/L
1134
1134
HAVENHURST T/L
ROSCOE T/L
1134
LOUISE T/L
HYDRAULIC GRADE
1123
KITTRIDGE TANKS
1075
A RINALDI/BALBOA REGULATOR STATION
TO STONE CANYON RESERVOIR
ENCINO RESERVOIR

FIGURE 4-5

taking state project water deliveries through LA-35. The water is treated at the Los Angeles Aqueduct (LAA) Filtration Plant in Granada Hills. From the plant, water can be distributed to most of LADWP's service area. The major trunk lines conveying water into LADWP's West Valley service area include the Susana Trunk Line, the Granada Trunk Line, the Rinaldi Trunk Line (West Valley Feeder No. 1), and the Roscoe Trunk Line. Total design capacity of these lines is approximately 390 cfs which, in combination with reservoir storage, provide peak day capability for LADWP's system. It should be noted that LADWP utilizes a different residual disinfectant scheme from Metropolitan in their conveyance facilities, including the leased West Valley Feeder No. 1. Because of the numerous open reservoirs in LADWP's system, a free chlorine residual is maintained throughout LADWP's conveyance facilities in the West Valley in order to ensure adequate disinfection. Metropolitan, on the other hand, normally provides a residual disinfection of chloramines, which is a combination of chlorine and ammonia. Consequently, LADWP's distribution system, including West Valley Feeder No. 1, is currently operated separately from Metropolitan's facilities to prevent the mixing of chlorinated and chloraminated waters.

C. CONVEYANCE FACILITY NEEDS

Projected peak imported water demand in the West Valley service area is projected to increase from 655 cfs in 1995 to 963 cfs in 2030. Imported water is conveyed into the service area by major pipelines owned by Metropolitan and LADWP. These pipelines, discussed in Section B of this chapter, include Metropolitan's West Valley Feeders and

LADWP's main trunk lines. The combined capacity of these pipelines to meet peak week demands is approximately 640 cfs; 310 cfs in West Valley No. 2 and an estimated 330 cfs peak week capacity in LADWP's main trunk lines. Figure 4-6 shows projected imported water demands versus existing conveyance capacity in the West Valley service area. As shown in Figure 4-6, peak demands are expected to exceed pipeline capacities around 2000. An additional 323 cfs will be required by 2030. It is noted that peak demands shown in Figure 3-6 do not include the West Basin service area until after the year 2000. West Basin is currently not taking water from the Calabasas Feeder and is not expected to connect to the Calabasas Feeder before the year 2000.

D. TREATMENT PLANT NEEDS

As previously noted, treated imported water is provided in the West Valley area by Metropolitan's Jensen plant and LADWP's Los Angeles Aqueduct plant. Both of these plants service a wide area and also provide supplemental supplies to the East Valley and Common Pool service areas.

The Jensen plant is currently being expanded from 620 cfs to 1,160 cfs. The expansion will be completed in 1994 to meet increasing demands in the Jensen and Common Pool load areas. The Jensen load area is the service area in which Metropolitan treated water is provided exclusively by the Jensen plant. This area includes the West Valley, East Valley, and the City of San Fernando. The Common Pool area consists of Metropolitan's member agencies who receive supplemental treated water provided by the Jensen plant in combination

WEST VALLEY DEMANDS

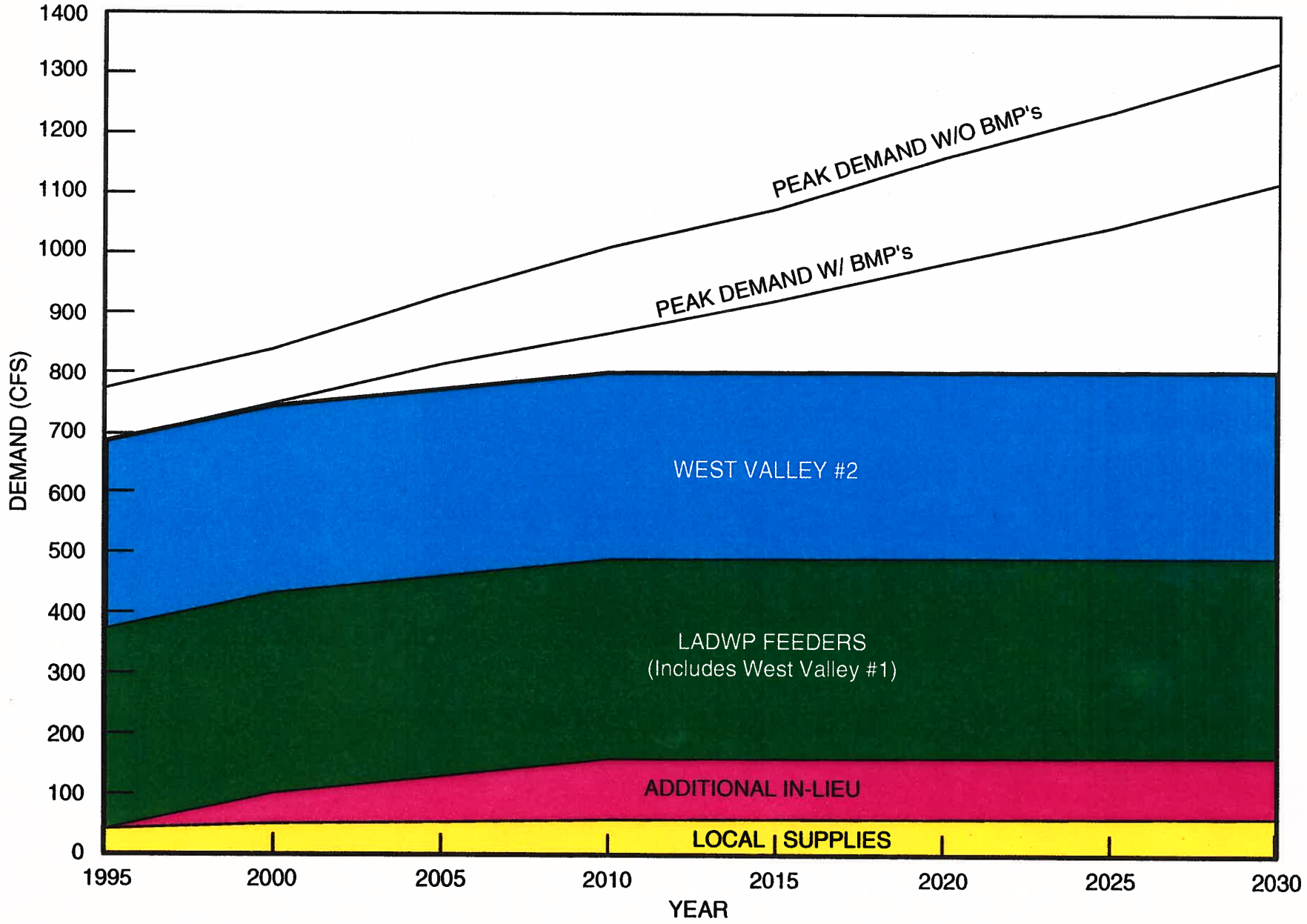


FIGURE 4-6

with Metropolitan's Weymouth plant in La Verne and Diemer plant in Yorba Linda. The Common Pool area consists of the central Los Angeles basin and the north coastal areas of Orange County. With the expansion of the Jensen plant, there will be sufficient capacity in the Jensen load area until about 2010. Due to conveyance limitations from the Jensen plant into the Common Pool load area, additional treatment plant capacity to the Common Pool is projected to be needed by the year 2000.

The Central Pool Augmentation and Water Quality Project (CPA Project) is being planned to provide additional treatment plant capacity to the Common Pool by the year 2000 to augment treated water deliveries currently provided by the Jensen, Weymouth, and Diemer plants. The CPA Project, in combination with existing plants, is intended to meet demands in the Common Pool, Jensen, Weymouth, and Diemer load areas through the year 2010. Beyond 2010, additional treatment capacity will be required which could be provided by expanding the CPA Project water treatment plant, by expanding Jensen, or by building a new facility.

The Los Angeles Aqueduct Filtration Plant, located immediately east of the Jensen plant, provides the majority of the treated water supplies to LADWP's service area in the West Valley. The Los Angeles Aqueduct Filtration Plant has a capacity of 930 cfs and can treat both import supplies from the Los Angeles Aqueduct as well as the state project water provided through the LA-35 service connection. The plant has sufficient capacity to meet LADWP's demands in the West Valley well into the future.

E. STORAGE NEEDS

The Eastside Reservoir Final Environmental Impact Report, October 1991, identified the need for an additional 800,000 acre-feet of storage, as a minimum, to meet emergency, carryover, and seasonal storage needs of Metropolitan to the year 2030. The 800,000 acre-feet need was based on full utilization of existing surface reservoirs and coordinated operations of surface reservoirs and groundwater basins. Coordinated operations of surface reservoirs and groundwater basins maximize storage in groundwater basins and reduce the need for additional surface storage. Without coordinated operations it was estimated that 1,200,000 acre-feet of storage would be required by the year 2030. This indicates that coordinated operations could increase groundwater storage by 600,000 acre-feet.

Current plans for the Eastside Reservoir are to construct a reservoir with a capacity of 800,000 acre-feet. This will be adequate to meet the storage needs of Metropolitan to the year 2030 if groundwater storage is also maximized.

A 1989 report prepared jointly by Metropolitan and Calleguas, *North Las Posas Basin Hydrogeologic Investigation*, identified the North Las Posas Basin (NLPB) as an aquifer in which a potential of 300,000 acre-feet of water could be stored. The aquifer is located in the Calleguas service area near Moorpark. Existing ordinances are in effect with Fox Canyon GMA for seasonal and long-term storage of water in the basin.

For the purposes of this report, it is assumed that Pyramid and Castaic lakes will provide emergency and seasonal storage for the service area leaving carryover storage to be met possibly in the North Las Posas Basin. As shown in Table 3-12, 77,300 acre-feet of carryover

storage will be required in the West Valley service area by the year 2030. Of this total approximately 32,400 is needed by LADWP, 39,700 by Calleguas, 3,500 by Las Virgenes, and 1,700 by West Basin. Calleguas and potentially Las Virgenes have access to water stored in the North Las Posas Basin. Up to 43,200 acre-feet of water could be needed and stored in the North Las Posas Basin for use by Calleguas and possibly Las Virgenes in times when supplies are low or in the event of an emergency.

F. RELIABILITY ISSUES

Calleguas and Las Virgenes are served supplemental water via a single pipeline, West Valley Feeder No. 2. Calleguas takes water from the feeder and conveys it into their service area through the Santa Susana tunnel. Las Virgenes takes most of its water from the Calabasas Feeder which is connected to West Valley Feeder No. 2.

A second pipeline to serve the West Valley area would increase operating reliability and flexibility. With a second pipeline, one of the conveyance lines could be taken out of service for maintenance while still delivering water in the other pipeline to the member agencies.

Additionally, West Valley Feeder Nos. 1 and 2 are near the Santa Susana and Northridge Hills thrust faults which are classified as potentially active. The existing feeders actually cross the Northridge Hills Fault Zone near Chatsworth. There are over 500,000 people in Calleguas' and Las Virgenes' service areas dependent upon West Valley Feeder No. 2. The agencies serving these people have expressed their concern over the vulnerability of this single

source of supplemental water especially if a rupture along the Santa Susana or Northridge Hills faults were to occur. To the extent that new facilities are constructed to provide additional conveyance capacity, it may be preferable to provide it from an alternate delivery point; one that does not cross fault zones or crosses the fault zones at a point to minimize the potential for simultaneous failure of the existing and the new pipeline.

Chapter 5

PROJECT CONCEPTS

A. INTRODUCTION

Additional water conveyance capacity into the West Valley service area is needed by about the year 2000 to meet projected demands. These demands are based on 1989 SCAG population estimates and indicate the need for about 300 cfs of additional conveyance capacity by the year 2030. There are two general conceptual routes for an additional conveyance facility to meet the needs of the West Valley member agencies (Figure 5-1). The first route would travel through the west end of the San Fernando Valley from Metropolitan's Sepulveda Feeder, westerly to the Santa Susana Mountains. The second route would travel through the Santa Clara River Valley from Metropolitan's Foothill Feeder, westerly along the Santa Clara River and turn south to Calleguas MWD's boundary. Based on preliminary reconnaissance level data, both of the routes appear feasible at this time. Each concept is discussed in more detail below.

B. SAN FERNANDO VALLEY CONCEPT

The San Fernando Valley concept would convey treated water from Metropolitan's Sepulveda Feeder, westerly through the San Fernando Valley to the Santa Susana Mountains. These pipeline routes would generally parallel the existing West Valley Feeders and be routed through busy urban streets. It is expected that these routes would have considerable impact on traffic, businesses, and homes along these streets. A second tunnel through the Santa Susana Mountains would be required to transport water to Calleguas MWD.

The San Fernando Valley alignments may not add greatly to the reliability of supplies to the West Valley member agencies from a seismic standpoint. This is because the

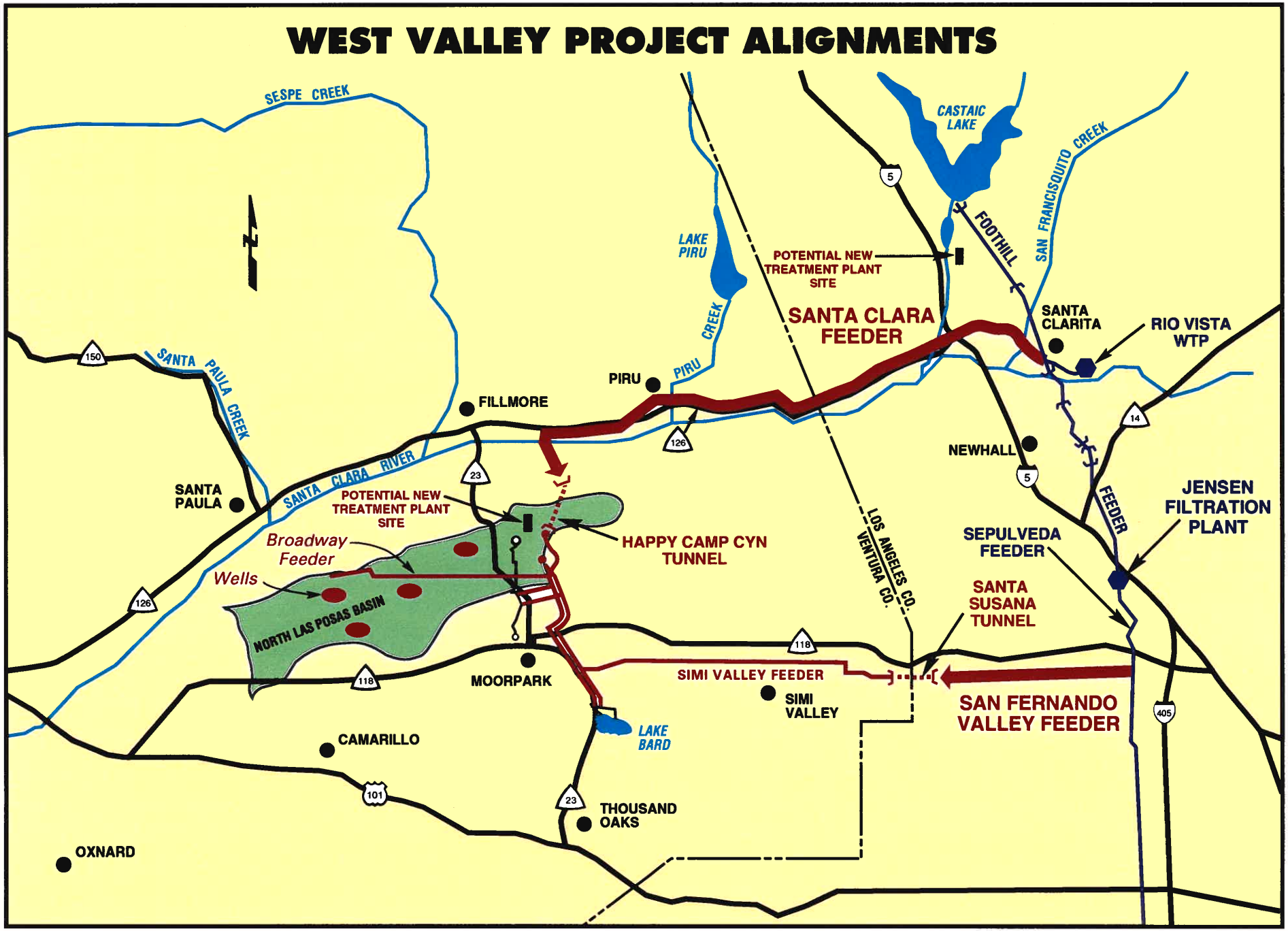

WEST VALLEY PROJECT ALIGNMENTS
SESPE CREEK
SANTA PAULA CREEK
SANTA CLARA RIVER
SANTA PAULA
FILLMORE
PIRU
PIRU CREEK
LAKE PIRU
CASTAIC LAKE
SAN FRANCISQUITO CREEK
FOOTHILL
POTENTIAL NEW TREATMENT PLANT SITE
SANTA CLARA FEEDER
SANTA CLARITA
RIO VISTA WTP
NEWHALL
JENSEN FILTRATION PLANT
FEEDER
SEPULVEDA FEEDER
SANTA SUSANA TUNNEL
SAN FERNANDO VALLEY FEEDER
LOS ANGELES CO. VENTURA CO.
HAPPY CAMP CYN TUNNEL
POTENTIAL NEW TREATMENT PLANT SITE
Broadway Feeder
Wells
NORTH LAS POSAS BASIN
SIMI VALLEY FEEDER
SIMI VALLEY
MOORPARK
LAKE BARD
CAMARILLO
THOUSAND OAKS
OXNARD
150
126
23
118
101
5
14
405

FIGURE 5-1

alignments would probably be in the same general vicinity of faults as the existing West Valley Feeders and Santa Susana Tunnel. Should a slip along a fault in the vicinity of the existing West Valley Feeders occur, the existing feeders as well as a new San Fernando Feeder may be subject to the same impact because of the pipelines' proximity to each other.

Under this concept, water would be treated at Metropolitan's Jensen pant. The Jensen plant is one of three existing filtration plants providing treated water to the Central Pool service area. Assuming that the planned Central Pool Augmentation (CPA) Filtration Plant is on-line by the year 2000, there will be sufficient treatment capacity in the Central Pool to the year 2010 and the Jensen plant would not require a second expansion. Beyond 2010, additional treatment capacity will be needed in the Central Pool which could be provided by expanding the Jensen plant, by expanding the CPA plant, or by providing additional treatment capacity somewhere else in the Central Pool service area.

C. SANTA CLARA RIVER VALLEY CONCEPT

The Santa Clara River Valley concept would convey water from Metropolitan's Foothill Feeder, westerly along the Santa Clara River, and then turn south to Calleguas MWD's boundary. This concept would "transfer" Calleguas MWD demands on West Valley Feeder No. 2 to the new Santa Clara Feeder and allow more of West Valley Feeder No. 2 to be used by LADWP and Las Virgenes MWD. Las Virgenes could also receive additional supplies through a planned connection to Calleguas' distribution system. The pipeline would be routed mostly through undeveloped lands making construction generally easier and less costly on a per

foot basis. However, it is expected these routes will be longer than the San Fernando Valley routes making total project costs higher than for the San Fernando Valley routes.

A Santa Clara Feeder would provide a second route for water supplies into the West Valley service area and add to the areas' supply reliability. Depending on the route, the Santa Clara Feeder may not cross the Santa Susana fault or would cross it miles from the existing crossing in the Santa Susana tunnel.

Under this concept, additional treatment plant capacity would be required. Conceptually water could be treated at the beginning of the pipeline near Castaic Lake or at the end of the pipeline in Moorpark. There are potential feasible sites for a new filtration plant near Castaic Lake, including a 200-acre plateau southeast of Castaic Lake at an elevation of approximately 1350 feet, or land adjacent to Castaic Lake Water Agency's Rio Vista Treatment Plant near Santa Clarita. A potential site for a filtration plant in Moorpark is in Happy Camp Canyon or near Lake Bard. However, a promising alternative for additional treatment capacity would be to expand and utilize the existing Rio Vista Treatment Plant.

D. NORTH LAS POSAS GROUNDWATER BASIN

To address storage needs in the West Valley service area, each of the concepts discussed above would involve storage of water in the North Las Posas groundwater basin. The North Las Posas Basin is non-adjudicated and is currently being over drafted on the order of 40,000 acre-feet per year. Calleguas MWD and Metropolitan recently completed a joint injection/extraction demonstration project showing the feasibility of storing water in the North

Las Posas Basin. Water would have to be injected into the basin because of very limited natural recharge areas. Studies indicate there is up to 300,000 acre-feet of storage available in the basin.

Calleguas MWD is planning to construct injection/extraction wells in the basin as well as facilities needed to convey water into their own distribution system. The basin may provide Metropolitan with an opportunity for a cyclic storage agreement, where water can be stored in North Las Posas in times when it is available and used when there may be a shortage of supplies.

Chapter 6

COORDINATED OPERATIONS AND INSTITUTIONAL AND POLICY ISSUES

A. COORDINATED OPERATIONS

Coordinated operations refers to cooperative planning and operation of Metropolitan and local facilities for better regional utilization of imported and local resources and reduced total system costs. New West Valley conveyance and conjunctive-use facilities would satisfy future water needs, and provide supply optimization and system reliability for LADWP, Calleguas MWD, Las Virgenes MWD, West Basin MWD, and any other agency indirectly tied into the West Valley system.

1. Member Agency Task Force

In order to address technical and operational issues, a West Valley member agency task force was formed. The purpose of the task force is to study the conveyance alternatives and to provide comment and guidance where needed. The task force will remain in effect until certification of an Environmental Impact Report (EIR). Incorporation of new facilities into member agency operations is discussed in the following section.

2. LADWP

Construction of a new West Valley feeder would allow LADWP continued use of West Valley Feeder No. 1, and provide for additional needed capacity. LADWP's west side distribution system is shown in Figure 4-5. Note that West Valley Feeder No. 1 is known as the Rinaldi Trunk Line to LADWP staff. As noted earlier, this feeder has been operating at peak capacity for several years. LADWP is considering an expansion of its De Soto Reservoir or installing additional storage tanks at its Kittridge facility to help meet peak demands. If

Metropolitan constructed the new feeder in the San Fernando Valley, LADWP would coordinate their facility expansion in a manner consistent with the new alignment which would optimize west side deliveries. It may also request a service connection from the new feeder. Construction of either West Valley feeder alternative would not affect where LADWP will locate their new storage facilities.

The development of groundwater storage on the west side of the system is attractive to LADWP. Every acre-foot of water stored in the North Las Posas Basin would be equivalent to an acre-foot of water that would remain in Castaic Lake for potential use by the LADWP in a drought or emergency condition.

3. Calleguas MWD

A new West Valley feeder would have a significant impact on Calleguas MWD and the construction of new facilities. The potential alternatives have been incorporated into the Calleguas Master Plan (October 1991). If the conveyance pipeline was constructed in the San Fernando Valley, Calleguas MWD would need to construct an additional tunnel parallel to the existing Santa Susana tunnel. A new 96-inch feeder, approximately 15 miles in length, would then be constructed through Simi Valley toward Moorpark. At that point, a new 78-inch feeder would convey water into the Calleguas distribution system and Lake Bard, or to groundwater conjunctive use facilities.

If Metropolitan constructed the Santa Clara River alternative, Calleguas MWD would need to construct facilities to connect to the new feeder. A new 96-inch feeder would convey

water to groundwater conjunctive-use facilities or into the Calleguas MWD distribution system. A new 96-inch Lake Bard Feeder would also be constructed to convey new supplies to the lake. The future new facilities are shown in Figure 6-1. Of the two feasible sources of supplemental water supply, Calleguas MWD has determined that the Santa Clara River alternative will offer the greatest operational flexibility, particularly during emergency periods.

4. Las Virgenes MWD

Las Virgenes MWD receives its imported water deliveries from the eastern portion of its service area. During system peak and high demand periods, particularly on the western end of the service area, flows are met to a large extent with the districts' local facility at Westlake Reservoir. The lack of surplus conveyance capacity limits the districts' ability to refill the reservoir with imported Metropolitan supplies. These supplies need to be conveyed across the entire district service area.

If Metropolitan constructed the San Fernando Valley alignment, Las Virgenes MWD would need to construct additional facilities across its entire service area to enhance the refill capability of Westlake Reservoir and to meet ultimate demands. Again, all imported supplies would be conveyed from the district's eastside. A 42-inch-diameter pipeline has been planned for this purpose.

However, Calleguas MWD has indicated to Las Virgenes MWD that available capacity will exist in its Lindero Feeder if Metropolitan constructs the Santa Clara River alternative. This would provide a second source of supply for the district, increasing its system

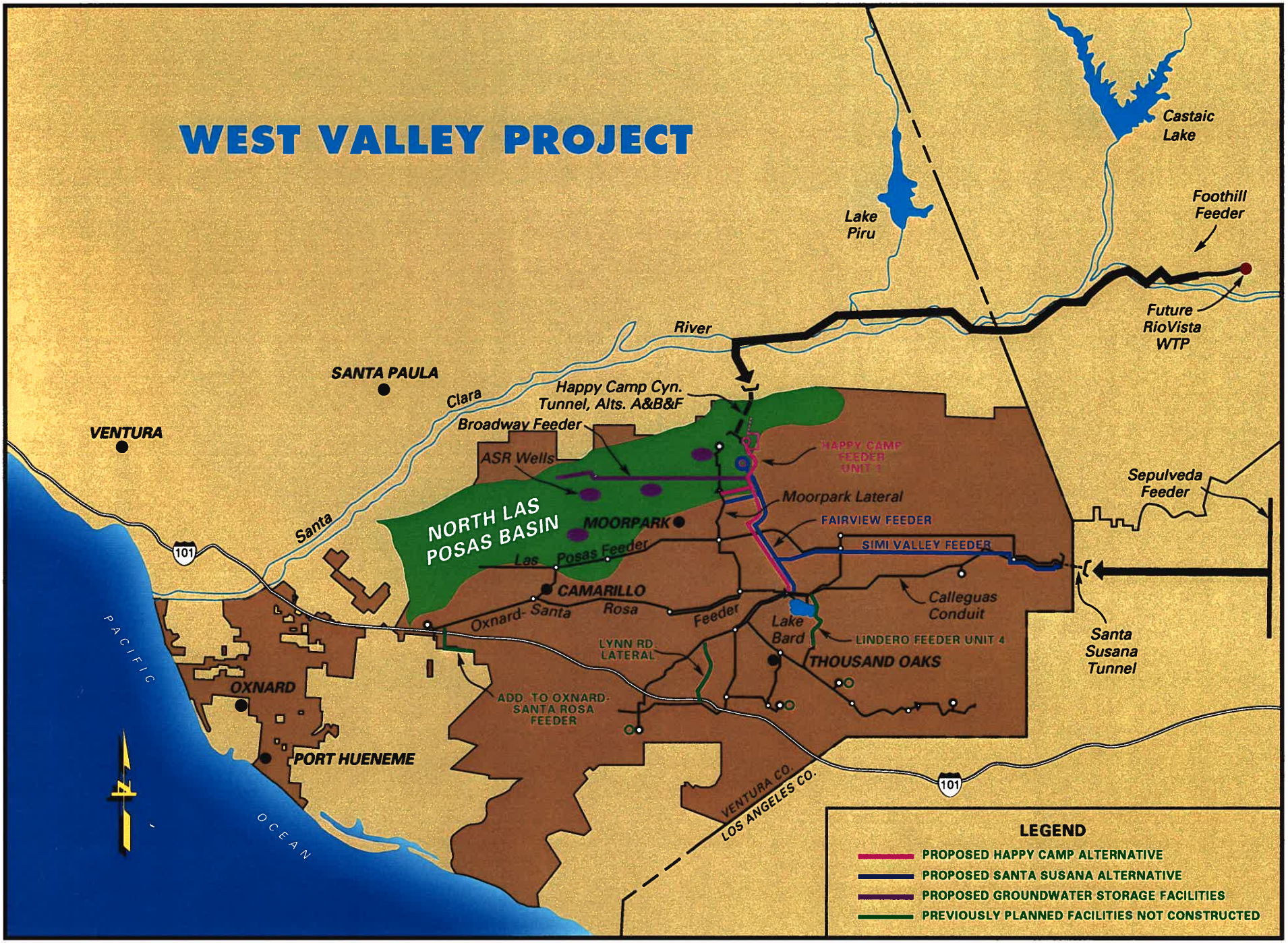

WEST VALLEY PROJECT
Castaic Lake
Lake Piru
Foothill Feeder
Future RioVista WTP
River
Clara
SANTA PAULA
VENTURA
Happy Camp Cyn. Tunnel, Alts. A&B&F
Broadway Feeder
ASR Wells
HAPPY CAMP FEEDER UNIT 1
Moorpark Lateral
FAIRVIEW FEEDER
SIMI VALLEY FEEDER
Sepulveda Feeder
NORTH LAS POSAS BASIN
MOORPARK
Las Posas Feeder
Santa
101
CAMARILLO
Oxnard-Santa Rosa Feeder
Calleguas Conduit
Lake Bard
LINDERO FEEDER UNIT 4
LYNN RD. LATERAL
THOUSAND OAKS
Santa Susana Tunnel
PACIFIC
OCEAN
OXNARD
ADD. TO OXNARD-SANTA ROSA FEEDER
PORT HUENEME
VENTURA CO.
LOS ANGELES CO.
101
LEGEND
PROPOSED HAPPY CAMP ALTERNATIVE
PROPOSED SANTA SUSANA ALTERNATIVE
PROPOSED GROUNDWATER STORAGE FACILITIES
PREVIOUSLY PLANNED FACILITIES NOT CONSTRUCTED

FIGURE 6-1

reliability and providing it with a more direct route to meet its western service area demands, and refilling its Westlake Reservoir. Las Virgenes MWD has looked at several facility alternatives which are shown in Figure 6-2. From a technical feasibility perspective, the Westlake Boulevard route appears to be the most feasible, although further study is needed.

5. West Basin MWD

West Basin could connect to Metropolitan's Calabasas Feeder to meet additional future demands to the Malibu portion of its serve area. Demands to the western end of the district's service area are made from Metropolitan's Culver City Feeder Interconnection. West Basin MWD is planning a peak-week delivery capability of 8 to 10 cfs from the Calabasas Feeder service connection. Construction of either West Valley alternative would provide for the district's requirements to the extent that deliveries from the Calabasas Feeder were not exclusive.

B. INSTITUTIONAL AND POLICY ISSUES

The West Valley conveyance system will involve institutional and policy issues to be addressed between Metropolitan, West Valley member agencies, Fox Canyon Groundwater Management Agency (GMA), and possibly CLWA. It is likely that agreements between some or all of these agencies will need to be in place in order to develop a project that meets the needs of the West Valley member agencies and is economically and operationally sound with minimal adverse environmental impact.

1. West Valley Feeder No. 1

LADWP has exclusively leased West Valley Feeder No. 1 since 1979. That lease

LAS VIRGENES SUPPLY PIPELINES FROM CALLEGUAS MWD

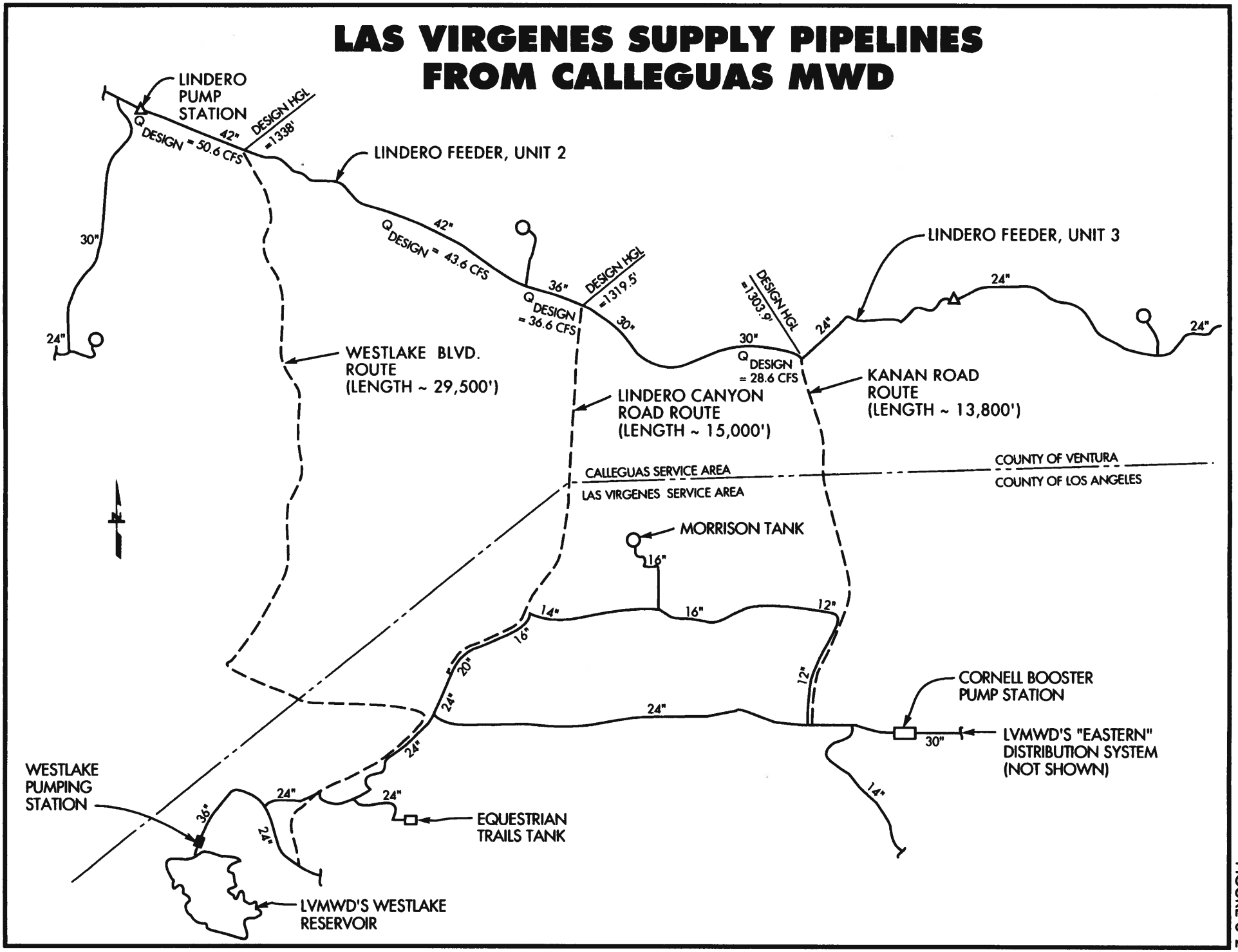


FIGURE 6-2

is due to expire on July 1, 1999. According to the terms of the lease, Metropolitan must give LADWP five years notice if the lease is to be terminated.

LADWP has expressed a desire to continue to use West Valley Feeder No. 1 to convey its own water supplies. West Valley No. 1 has been integrated into LADWP's distribution system and is currently being used as a major east-west trunk line within LADWP's distribution system. West Valley Feeder No. 1 is known as the Rinaldi Trunk Line in LADWP's system. West Valley Feeder No. 1 conveys treated imported water from LADWP's Los Angeles Aqueduct Filtration Plant westerly to the 1,207-foot pressure zone.

If Metropolitan were to terminate the lease, LADWP would have two main options. The first option would be to build its own feeder in the San Fernando Valley and continue to serve Los Angeles Aqueduct water to the 1207 zone through this new feeder. Because of fiscal concerns, this pipeline is currently not-budgeted.

The second option would be to request Metropolitan service from the West Valley feeders and serve Metropolitan's treated water to the 1,207 zone. This would increase treated water demands on Metropolitan in general and on the Jensen plant in particular. At present, LADWP would prefer not to mix Metropolitan's treated water with its own because of the different disinfectants used in each system (chloramines in Metropolitan's system versus free chlorine in LADWP's system). However, LADWP is studying the feasibility of using chloramines. A switch to chloramines would allow the two waters to mix.

Additional conveyance to the West Valley Service would still be required sometime in the future even if the lease was terminated. The timing of the new facility would depend on the quantity of water LADWP requests.

2. Joint Agency Participation

The potential for joint sharing of conveyance and treatment facilities exists between Metropolitan, Calleguas MWD, and the Castaic Lake WA. This opportunity arose from a request by Castaic Lake WA to utilize Metropolitan's Foothill Feeder to deliver untreated water from Castaic Lake to its proposed Rio Vista Water Treatment Plant. In return for this consideration, Castaic Lake WA offered to jointly participate in treatment and conveyance facilities within its service area which would be of mutual benefit to all agencies. Castaic Lake WA has unused capacity at its Earl Schmidt Treatment Plant, and owns 580 acres at the Rio Vista site in the Santa Clarita Valley. There is enough room at this location to accommodate additional incremental facility expansion for Metropolitan and/or Calleguas MWD should the Santa Clara River alignment be determined the preferred alternative. All three agencies recognize the advantages of jointly using their facilities in a project of this scale inasmuch as the environmental impacts and costs associated with construction, operation, and maintenance of a single facility would be lower than if the agencies provided their own separate facilities.

An MOU exists between Metropolitan, Castaic Lake WA, and Calleguas MWD, which outlines the general terms of participation. Specific details of the level of participation are being addressed in a separate wheeling agreement between Metropolitan and Castaic Lake

Water Agency, and a separate water transport agreement between all three parties. While the terms of the wheeling agreement are relatively straightforward, there are a number of options that may be addressed in the future water transport agreement. For example, ownership of potential new treatment facilities could be handled several ways.

The MOU indicates a desire by Castaic Lake WA to be the responsible agency for financing, designing, constructing, and operating all water treatment facilities constructed on its property. The proportional capacity required by and provided to Metropolitan and/or Calleguas MWD in the conveyance facilities would determine the maximum water treatment capacity to be provided by Castaic Lake WA. Metropolitan's decision not to participate in joint treatment facilities would not preclude Castaic Lake WA and Calleguas MWD from participating, should Metropolitan decide to construct the Santa Clara River alternative.

Castaic Lake WA is also willing to participate in joint conveyance facilities within its service area from the Santa Clarita Valley to its western boundary at the Ventura County line. A future water transport agreement will need to address specific levels of participation in terms of proportional conveyance capacity, right-of-way acquisitions, and other pipeline construction considerations.

3. Groundwater Storage

Fox Canyon GMA was enacted in 1982 by the California State Legislature. It has broad powers to manage groundwater in Ventura County, which includes the Calleguas MWD

service area. Fox Canyon GMA's powers are not intended to supersede traditional powers of other existing water agencies within its boundaries. The North Las Posas Basin lies within its jurisdiction.

It is governed by a five-member board of directors, having the power to plan, manage, control, preserve, and regulate the extraction and use of groundwater within its territory. Additionally, the agency may adopt ordinances, fine for violations, petition for equitable relief; and commence, maintain, intervene in, defend, compromise, and assume costs for legal actions and proceedings which include groundwater. Fox Canyon GMA adopted an ordinance in 1990 prohibiting construction of new production wells and has implemented a management plan. This would eliminate groundwater overdraft by reducing pump extractions 5 percent until safe yield is achieved in the year 2010. Aquifer injection/extraction wells are exempt from this ordinance.

There is legislation in place which provides for seasonal and long-term storage of foreign waters. Fox Canyon GMA demonstrated this commitment when it adopted Ordinance No. 5 in September 1990. The ordinance provides for storage credits that may be accrued year to year for carryover purposes. The storage credits could also be accrued on a seasonal basis. Calleguas MWD, the City of Oxnard, and Camrosa Water District (a Calleguas Purveyor) have practiced seasonal storage within Fox Canyon GMA boundaries since 1990. Fox Canyon GMA has openly encouraged the storage of State project water since it serves to improve water quality in the basin and raise groundwater levels which lower purveyor

pumping costs.

The North Las Posas Basin is unadjudicated, and in fact, there are no groundwater adjudications within Fox Canyon GMA's boundaries. Since groundwater storage is an integral component of the West Valley conveyance system, storage agreements through Ordinance 5 will need to be secured with Fox Canyon GMA. To a large extent, this has been accomplished by Calleguas MWD who applied for and was approved permission to construct the first of five aquifer injection-storage extraction facilities for seasonal and long-term purposes.

A storage account in the basin would help satisfy a sizable portion of the West Valley storage requirement. An agreement between Calleguas MWD and Metropolitan would serve to establish the mechanism by which storage is achieved. Calleguas MWD would be the lead agency to interface with Fox Canyon GMA. Metropolitan and Calleguas MWD would then enter into a separate agreement which defined levels of storage and conjunctive-use management options that would benefit all West Valley member agencies, as well as Metropolitan's entire service area. Funding, construction, and ownership of groundwater facilities will need to be addressed between Metropolitan and the local member agencies.

C. VENTURA JOINT AGENCIES

The Ventura Joint Agencies (VJA) include United Water Conservation District, Casitas MWD, and the City of Ventura. These three agencies have been assigned State project water entitlement by the Ventura County Food Control District, a State water contractor. The VJA prepared a final program EIR to discuss alternatives to increase supplemental water supplies

in southeastern Ventura County. Some of the proposed alternatives are very similar to Metropolitan's Santa Clara River alternatives and would convey VJA's State project water entitlement from Castaic Lake to the joint agencies. Close coordination between Metropolitan and the VJA will be required if Santa Clara River alternative is preferred.

WEST VALLEY PROJECT SCHEDULE

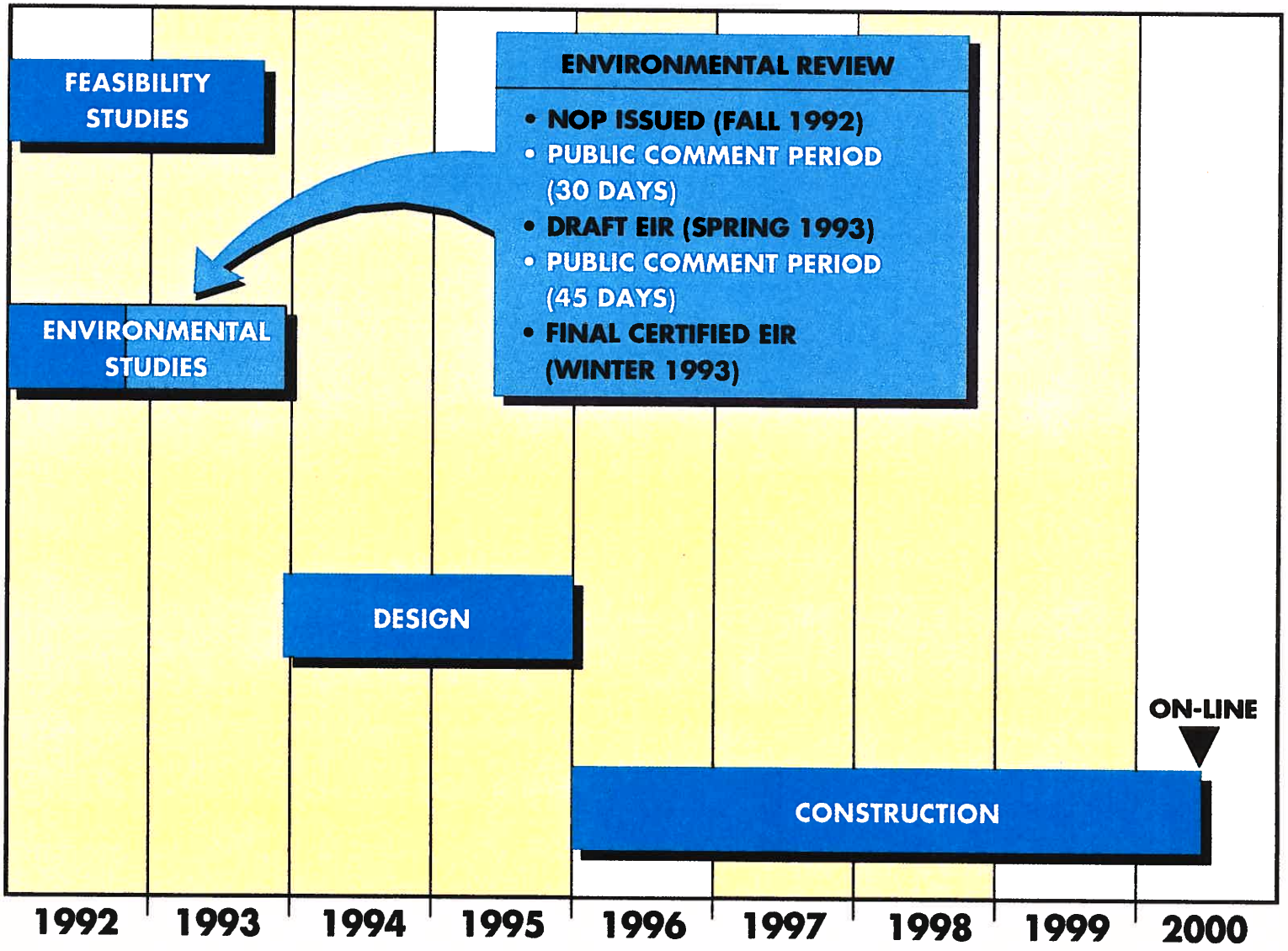


FIGURE 7-1

pump. Adding a 30 percent contingency, total project costs for this alternative would be on the order of $420 million.

2. Santa Clara River Alternative

Construction of the Santa Clara alignment would involve approximately 120,000 feet (23 miles) of 96-inch-diameter pipeline. Using a preliminary construction cost estimate in open spaces of $10 per inside diameter inch per foot, costs for Metropolitan would be approximately $115 million. A new treatment plant under this alternative would exclusively serve the West Valley service area. A new treatment plant would probably be phased such that 100 cfs would be constructed in the year 2000, with the additional 200 cfs following in the year 2015. The estimated cost of treatment facilities is $120 million in today's dollars.

The Calleguas Master Plan estimates that capital costs for this alternative would cost the district $68 million. Groundwater facilities would be an additional $40 million. Adding a 30 percent contingency, total project costs for this alternative would be approximately $450 million. These costs are essentially the same order of magnitude as the costs for the San Fernando Valley alternative. Additional benefits may be realized through joint agency participation with Castaic Lake WA on the Santa Clara alternative.

B. PROJECT SCHEDULE

The project schedule is shown in Figure 7-1. A Notice of Preparation was released in November 1993. The Final EIR is expected to be certified in late 1993. Detailed facility design will begin in 1994, with the initiation of construction in late 1995. The project is scheduled to be on-line in 2000.