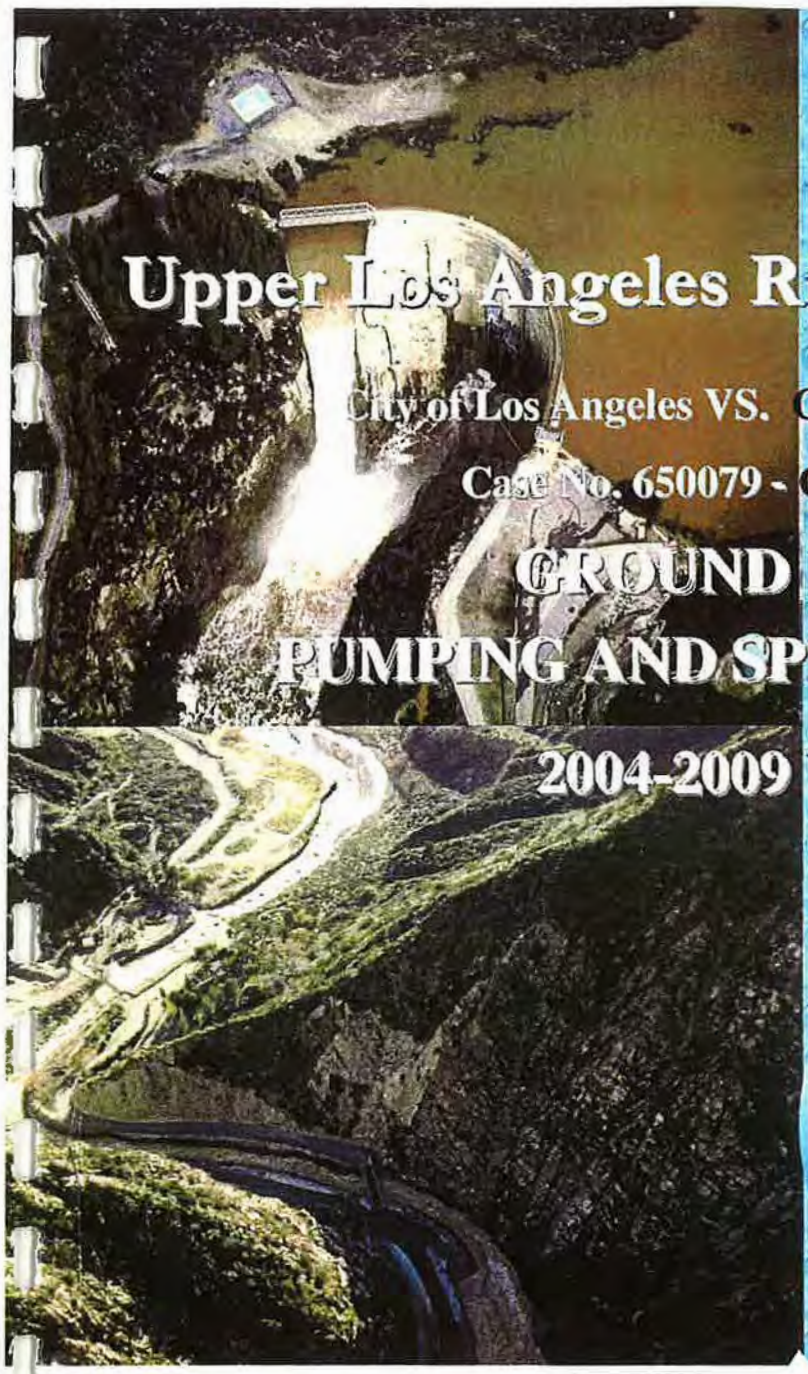


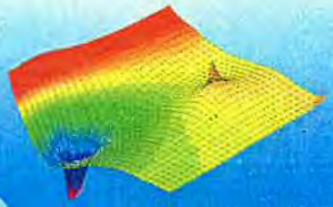
Upper Los Angeles River Area Watermaster

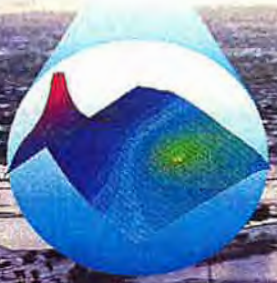
City of Los Angeles VS. City of San Fernando, ET AL

Case No. 650079 - County of Los Angeles

GROUND WATER PUMPING AND SPREADING PLAN

2004-2009 Water Years





July 2005

Upper Los Angeles River Area Watermaster

UPPER LOS ANGELES RIVER AREA WATERMASTER

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

GROUNDWATER PUMPING AND SPREADING PLAN FOR THE UPPER LOS ANGELES RIVER AREA LOS ANGELES COUNTY, CALIFORNIA

2004-2009 WATER YEARS

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JULY 2005

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I. EXECUTIVE SUMMARY

As Watermaster for the Upper Los Angeles River Area (ULARA), I am pleased to submit the 2005 ULARA Pumping and Spreading Plan. This report is prepared in compliance with Section 5.4 of the ULARA Watermaster's Policies and Procedures that established the Watermaster's responsibility for water quality management in the ULARA groundwater basins. The Pumping and Spreading Plan includes the individual plans submitted by the five major pumping parties, which incorporates changes in recharge, spreading, and pumping, or pumping patterns, especially in relation to the present and future plans for groundwater cleanup.

In the Sylmar Basin, the City of San Fernando will pump all its groundwater rights, but the City of Los Angeles plans to pump less than its full right in this Water Year. In the San Fernando Basin (SFB) Burbank will pump its full adjudication, but Los Angeles is planning to pump less than its adjudicated amount. Glendale plans to pump its full adjudicated amount in the SFB, but it has limited pumping capacity in the Verdugo Basin. Crescenta Valley Water District (CVWD) may be unable to pump all its assigned water rights from the Verdugo Basin, and is completing a study to determine the cause and possible corrective measures.

Currently, there are five groundwater cleanup plants in operation: the City of Los Angeles' North Hollywood Operable Unit (OU) and the Pollock Wells Treatment Plant, the Burbank OU, CVWD's Glenwood Nitrate Removal Plant, and the Glendale OU. The City of Burbank's Granular Activated Carbon (GAC) Treatment Plant has been temporarily removed from service due to elevated levels of hexavalent chromium.

The Watermaster will continue to address the declining water table in the SFB. Due to record rainfall, projected spreading in 2004-05 will increase to a rate double the 36-year average. The Watermaster has been working with the County and City of Los Angeles to find ways to maximize spreading in the Hansen and Tujunga Spreading Grounds and to explore spreading in new areas. A methane gas mitigation plan for the Tujunga Spreading Grounds has begun, and further testing is currently underway. Thanks to the enormous effort of the Los Angeles County Department of Public Works a significant amount of native water was captured to recharge the basin during this past historic high rainfall season.

The groundwater model this year simulates the effect on groundwater elevations of projected pumping in the SFB for the next five years. The most significant features continue to be the pumping cones of depression formed in Layer I (Upper Zone) as a result of pumping at Los

Angeles' Tujunga and Rinaldi-Toluca wells and the Burbank OU (Plate 3), and the rebound of groundwater levels due to above-normal recharge during the 2004-05 Water Year and anticipated spreading of imported supplies by Burbank.

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

MARK G. MACKOWSKI
ULARA Watermaster

II. INTRODUCTION

As a result of the groundwater contamination that was discovered in the SFB, the ULARA Watermaster and Administrative Committee, jointly with the Regional Water Quality Control Board (RWQCB), revised the ULARA Watermaster's Policies and Procedures in July 1993 to prevent further degradation of groundwater quality and to limit the spread of contamination in the ULARA basins. The Policies and Procedures were revised again in February 1998 to organize the material into a more accessible and complete document.

Section 5.4 of the Policies and Procedures assigns the responsibility for this annual Pumping and Spreading Plan to any municipal party who produces groundwater. Each municipal pumper is required to submit to the ULARA Watermaster annually (on or before May 1 of the current Water Year) a Groundwater Pumping and Spreading Plan. This plan should include five-year projected groundwater pumping and spreading amounts, recent water quality data on each well, and facility modification plans.

The ULARA Watermaster is required to evaluate and report on the impact of the combined pumping and spreading of each party as it relates to the implementation of the San Fernando Judgment (January 26, 1979) and groundwater management, and make the needed recommendations. The Watermaster's evaluation and recommendations are to be included in a Groundwater Pumping and Spreading Plan for ULARA, and the Administrative Committee is to review and approve the plan by July 1 of the current Water Year.

This is the July 2005 Groundwater Pumping and Spreading Plan for ULARA, prepared according to the Policies and Procedures. This report provides guidance to the Administrative Committee for use in protecting water quality within ULARA, improving basin management, and providing protection of each party's water right.

III. PLANS FOR THE 2004-2009 WATER YEARS

A. Projected Groundwater Pumping for 2004-05 Water Year

The total 2004-05 ULARA pumping is projected at 71,370 acre-feet (AF) (Table 3-1B), 26,942 AF below the 25-year average (1979-2004). The estimated pumping for 2005-06 is 116,599 AF, a 18,287 AF increase from the historical average (Appendices A-E).

In 2004-05, the City of Burbank plans to pump 7,800 AF (Table 3-1B) from all its groundwater sources, 3,004 AF less than its five-year average. This decrease is due to technical problems with the Burbank OU system and the declining water table in the SFB. As of October 1, 2004, Burbank had a storage credit of 22,038 AF. Burbank's annual return water credit of 20 percent is approximately 5,000 AF/yr., and its right to purchase Physical Solution water from Los Angeles is 4,200 AF/yr. The plant capacity is 9,000 gpm (14,000 AF/yr). Pumping in excess of Burbank's annual return water credit can come from its banked storage or Physical Solution purchases from Los Angeles. Burbank may also purchase and import water from the Metropolitan Water District (MWD) and store it in the SFB for later extraction, or purchase stored water credit from other water rights holders in the SFB.

CVWD plans to pump 3,150 AF, which is an increase of 378 AF compared to its average pumping since 1979, and a reduction of 8 AF from its five-year average. In past years when there was more groundwater available in the Verdugo Basin CVWD pumped a portion of Glendale's allocation of the Verdugo Basin safe yield, which Glendale was unable to pump. This additional pumping was approved by the Watermaster and the Administrative Committee. The current pumping plan does not include additional pumping beyond the CVWD's adjudicated right of 3,294 AF/yr.

The City of Glendale resumed significant pumping from the SFB when the Glendale North and South OUs began operating in September 2000. In the SFB, Glendale accumulates 20 percent return credit for water delivered to its entire service area within the SFB. In addition, Glendale has the right to purchase from Los Angeles up to 5,500 AF/yr. of Physical Solution water. Glendale had storage credit of 66,201 AF in the SFB as of October 1, 2004. Glendale plans to pump 7,625 AF in the 2004-05 Water Year, 1,062 AF more than the past five-year average. Glendale plans to extract 2,300 AF from the Verdugo Basin in 2004-05, an increase of 37 AF over its 25-year historical average, and 137 AF more than the average of the past five years.

The City of Los Angeles plans to pump 44,763 AF this year from the SFB, 36,035 AF below its 1979-2004 annual average and 29,686 AF less than the past five-year average. A total of 2,250 AF of groundwater will be pumped from the Sylmar Basin, 710 AF less than the 1979-2004 average and 362 AF less than the average of the last five years (1999-2004). As of October 1, 2004, Los Angeles had a storage credit of 286,846 AF in the SFB and 6,303 AF in the Sylmar Basin.

In 2004-05 the City of San Fernando plans to pump 3,482 AF from the Sylmar Basin, 134 AF less than its average pumping for the past five years and 404 AF more than the past 25 year average. San Fernando has storage credit of 227 AF as of October 1, 2004.

Estimated capacities of ULARA well fields are provided in Table 3-1. Actual and projected amounts of pumping and spreading by the major parties during 2004-05 are shown in Tables 3-1A, 3-1B, and 5-1A.

B. Constraints on Pumping as of 2004-05

SAN FERNANDO BASIN

City of Burbank - In January 1996, a portion of Burbank's pumping capability was restored when the Lockheed-Burbank Operable Unit (Burbank OU) was activated under Phase I of the Consent Decree with the United States Environmental Protection Agency (USEPA). The City assumed the 18-year operation of the facility on March 12, 2001 under provisions of the Second Consent Decree. Although the USEPA turned over operating control of the facility to the City of Burbank, negotiations continue with Lockheed Martin (Lockheed) over several issues including the pumping capacity of the eight supply wells.

In January 2002, USEPA approved a mode of operation using the existing wells and blending the output with MWD water to keep total chromium levels at 5 parts per billion (ppb) or less, the goal established by the Burbank City Council for the City's delivered water. Part of the pumping plan includes the voluntary shut down of the Lake Street/GAC wells, which could not be blended down to 5 ppb. The Lake Street/GAC wells continue to be temporarily off-line.

The Burbank OU will pump approximately 7,500 AF of groundwater during the 2004-05 Water Year, a reduction from its design capacity of 14,000 AF/yr. The cause of the reduced pumping is the subject of a study by Burbank. Burbank has hired Montgomery Watson Harza to perform an evaluation of the well field and appurtenant facilities in an effort to bring production up to 9,000 gpm. The first phase of the Well Field Performance Attainment Study is scheduled to be completed in June 2005. The USEPA is also evaluating whether deflating the well packers will increase production while still containing the Volatile Organic Compound (VOC) plume.

City of Glendale – The Glendale OU began operating in September 2000. Subsequently, hexavalent chromium contamination was detected in the groundwater. However, the Glendale OU was not designed to treat for chromium, so Glendale blends the treated water with imported supplies from MWD to keep hexavalent chromium levels below 6 ppb, a goal set by the Glendale City Council.

Glendale has received more than $1 million from federal appropriations and the American Water Works Association Research Foundation (AWWARF) to investigate technology capable of large-scale treatment of hexavalent chromium. Phase I and II are completed. Phase II provided vendors the opportunity to demonstrate the capabilities of their systems to treat hexavalent chromium from the technologies selected in Phase I. Glendate is now in Phase III of the chromium studies. This study will also benefit other pumpers in the SFB including the cities of Burbank and Los Angeles, as well as water purveyors from other parts of the country.

City of Los Angeles - All of the well fields within the SFB have been impacted because of groundwater contamination, primarily from VOCs such as TCE and PCE. The Pollock Well Field was partially restored when the Pollock Wells Treatment Plant was placed into service March 17, 1999. The Tujunga and Rinald-Toluca Well Fields have also experienced levels of TCE, PCE, and nitrates above the Maximum Contaminant Level (MCL) at the wellheads and are being evaluated. Low levels of perchlorates have been detected in both the Rinaldi-Toluca and Tujunga Well Fields.

LADWP is considering adding up to eight new 8-cubic feet per second (cfs) wells in the North Hollywood Well Field-West Branch to restore capacity resulting from contamination and obsolescence of some existing wells.

In 2003 LADWP began a five-year project to convert the disinfection of all water in the system from chlorine to chloramines. The conversion is necessary to meet the more stringent MCLs for total trihalomethanes (THMs) and Haloacetic Acids (HAA) that have been recently established under the Disinfection Byproduct (DBP) Rule.

SYLMAR BASIN

City of San Fernando - All of San Fernando's groundwater is pumped from the Sylmar Basin, where there are no limitations related to contamination. However, elevated nitrate levels have been observed in San Fernando's wells. Old septic systems, and possibly past agricultural practices, are the likely cause(s) of the high nitrate levels.

City of Los Angeles - The Mission Wells will not be pumping Los Angeles' full entitlement during 2004-05.

VERDUGO BASIN

Crescenta Valley Water District - All of CVWD's groundwater rights are in the Verdugo Basin. Contamination from VOCs is minimal, however, nitrate contamination is widespread. High nitrate levels are reduced in the supply by treating a portion of the groundwater by anion exchange at the Glenwood Nitrate Removal Plant, and blending untreated groundwater with treated groundwater and/or MWD supplies to meet drinking water standards.

In past years CVWD has been given permission on an annual basis by the Watermaster and Administrative Committee to pump in excess of its right until the City of Glendale is able to pump its entire right. During the past few years CVWD has not pumped its full entitlement due to a declining water table.

CVWD has received three AB303 Local Groundwater Assistance grants to study declining groundwater levels in the Verdugo Basin. The first grant funded a monitoring well study to locate new production wells. The results of the study showed that these well sites would also produce low-capacity wells. The second grant has been used to investigate the feasibility of recharging the basin. The Verdugo Basin Groundwater Recharge, Storage and Conjunctive Use Feasibility Study has demonstrated that is is possible to capture and store stormwater in the Verdugo Basin. The third grant will be

used to perform a geophysical survey of the Verdugo Basin. This study should commence in September 2005 and be completed in June 2007.

CVWD recently completed construction of a 12-inch 5-cfs connection to Glendale's system to expand its water supply capabilities. CVWD's usage of the Glendale/CVWD interconnect was used only for testing purposes in 2003-04. It was not anticipated to be used in 2004-05, however, it was used in the March 2005 to offset a major shutdown by MWD:

City of Glendale - The City of Glendale currently does not have the capability of pumping its entire adjudicated right from the Verdugo Basin. Glendale is in the process of studying and evaluating various alternatives to increase its pumping capacity. Limitations in pumping are caused by the lack of wells, rather than contamination problems, as well as the limited availability of groundwater in the basin which is highly variable and based significantly on rainfall.

Verdugo Study Area Superfund Site -- On May 20, 2004 the USEPA issued a final report for the Verdugo Study Area Superfund Site within the Verdugo Basin. The selected remedy was no remedial action and that "No action is necessary at the Site to ensure adequate protection of human health and the environment."

TABLE 3-1: ESTIMATED CAPACITIES OF ULARA WELL FIELDS

Party/Well Field	Number Standby Wells	Number Active Wells	Estimated Capacity (All Wells) (cfs)
SAN FERNANDO BASIN			
City of Los Angeles			
Aeration	---	7	2.4
Erwin	---	2	5.0
North Hollywood	---	17	74.3
Pollock	---	2	6.3
Rinaldi-Toluca	---	15	108.8
Tujunga	---	12	104.6
Verdugo	---	2	8.3
Whitnall	---	4	19.5
City of Burbank	2	8	24.5
City of Glendale	---	8	11.0
TOTAL	2	77	364.7
SYLMAR BASIN			
City of Los Angeles	---	2	6.2
City of San Fernando	---	4	8.5
TOTAL		6	14.7
VERDUGO BASIN			
CVWD	---	12	7.2
City of Glendale	---	5	15
TOTAL		17	22.2

TABLE 3-1A: 2004-05 ACTUAL AND PROJECTED GROUNDWATER EXTRACTIONS

(acre-feet)

Party/Well Field	Total	2004			2005								
		Oct.	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
							SAN FERNANDO BASIN						
City of Los Angeles													
AERATION	1,264	2	-	28	137	118	107	143	148	143	148	148	143
ERWIN	2,886	182	134	155	278	380	6	295	286	295	295	286	295
No HOLLYWOOD	10,801	3,236	397	3	109	212	-	-	308	1,607	1,661	1,661	1,608
POLLOCK	1,914	124	65	39	147	269	178	179	185	179	185	185	178
RINALDI-TOLUCA	9,803	2,473	171	5	284	685	-	-	861	1,309	1,353	1,354	1,309
TUJUNGA	10,436	1,911	-	12	346	884	-	-	1,230	1,488	1,538	1,538	1,488
VERDUGO	4,905	460	355	252	463	659	6	-	554	536	554	554	512
WHITNALL	2,754	275	198	146	260	350	6	-	308	298	308	308	298
TOTAL:	44,763	8,662	1,320	638	2,024	3,557	303	617	3,880	5,855	6,042	6,034	5,831
City of Burbank	300	12	10	4	-	-	-	-	55	55	55	55	55
Burbank OU	7,500	795	676	701	509	125	446	708	708	708	708	708	708
City of Glendale	7,625	692	661	681	635	479	667	635	635	635	635	635	635
TOTAL:	60,188	1,499	1,347	1,386	1,144	604	1,113	1,343	1,398	1,398	1,398	1,398	1,398
							SYLMAR BASIN						
City of Los Angeles	2,250	-	-	-	-	-	-	369	381	369	381	381	369
City of San Fernando	3,482	309	11	22	237	216	238	408	408	408	408	408	408
TOTAL:	5,732	309	11	22	237	216	238	777	789	777	789	789	777
							VERDUGO BASIN						
Crescenta Valley Water Dist.	3,150	230	221	235	221	212	244	275	333	350	260	260	308
City of Glendale	2,300	156	157	171	157	180	211	211	211	211	211	211	211
TOTAL:	5,450	386	378	406	379	391	455	486	544	561	471	471	519
ULARA TOTAL:	71,370	10,855	3,055	2,453	3,784	4,768	2,109	3,224	6,611	8,591	8,700	8,692	8,525

TABLE 3-1B: HISTORICAL AVERAGE PUMPING
(acre-feet)

Party/Wellfield	Historic Average Pumping		Projected Groundwater Pumping				
			SAN FERNANDO BASIN				
City of Los Angeles	1979-2004 (A)	1999-2004 (B)	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
AERATION (15 yrs)	-	1,258	1,264	1,500	1,500	1,500	1,500
ERWIN	-	1,137	2,886	2,886	2,886	2,886	2,886
No HOLLYWOOD	-	17,268	10,801	22,408	22,408	22,408	22,408
POLLOCK (17yrs.)	-	1,521	1,914	2,000	2,000	2,000	2,000
RINALDI-TOLUCA (17yrs.)	-	22,656	9,803	27,134	27,134	27,134	27,134
TUJUNGA (12 yrs)	-	24,897	10,436	23,413	23,413	23,413	23,413
VERDUGO	-	3,897	4,905	4,905	4,905	4,905	4,905
WHITNALL	-	1,815	2,754	2,754	2,754	2,754	2,754
TOTAL City of Los Angeles	**80,798**	**74,449**	**44,763**	**87,000**	**87,000**	**87,000**	**87,000**
City of Burbank (C)	4,104	814	300	300	300	300	300
BURBANK OU (11yrs)	-	9,990	7,500	10,164	10,884	10,884	10,844
City of Glendale (C)	2,336	6,563	7,625	7,625	7,625	7,625	7,625
TOTAL San Fernando Basin	**87,239**	**91,816**	**60,188**	**105,089**	**105,809**	**105,809**	**105,769**
			SYLMAR BASIN				
City of Los Angeles	2,960	2,612	2,250	3,300	3,300	3,300	3,300
City of San Fernando	3,078	3,616	3,482	3,000	3,000	3,000	3,000
TOTAL Sylmar Basin	**6,038**	**6,228**	**5,732**	**6,300**	**6,300**	**6,300**	**6,300**
			VERDUGO BASIN				
Crescenta Valley Water Dist.	2,772	3,158	3,150	2,910	2,760	2,890	3,030
City of Glendale	2,263	2,163	2,300	2,300	2,300	2,300	2,300
TOTAL Verdugo Basin	**5,035**	**5,321**	**5,450**	**5,210**	**5,060**	**5,190**	**5,330**
TOTAL ULARA	98,312	103,365	71,370	116,599	117,169	117,299	117,399

A. 25 year average of municipal well field pumping (Appendix F). 1979-2004 total pumping includes wells that are no longer in service.

B. 5-year average.

C. Includes Forest Lawn and GOU pumping for Glendale and Valhalla and BOU pumping for Burbank.

IV. GROUNDWATER PUMPING AND TREATMENT FACILITIES

A. Well Fields

There are ten production well fields located in the SFB, two in the Sylmar Basin, and two in the Verdugo Basin. The locations of the well fields are shown on Plate 3, and their estimated capacities are provided in Table 3-1.

B. Active Groundwater Pumping and Treatment Facilities

Glendale OU

The Glendale OU has been producing and treating groundwater for VOCs since September 2000. On April 23, 2001, the City of Glendale assumed operation of the Glendale Water Treatment Plant. Prior to that time the Glendale Respondents Group had operated the plant through a contract with Camp Dresser & McKee.

The Glendale OU is comprised of a treatment plant, eight groundwater extraction wells, a pumping plant, disinfection facility, and associated piping (Appendix C, Figure 4). The treatment facility is designed to treat groundwater contaminated by trichloroethylene (TCE) and perchloroethylene (PCE) at a rate of 5,000 gpm using aeration and granulated activated carbon (GAC). The treated water is blended with imported supplies to control nitrate levels. Currently, the wells are being pumped to limit hexavalent chromium to six ppb or less in the treated, blended effluent.

Burbank OU

The remediation of groundwater contamination in the SFB has been significantly enhanced by the startup of the Burbank OU on January 3, 1996. The Burbank OU, consisting of air-stripping towers followed by liquid and gaseous phase GAC, has a design capacity of 9,000 gpm (14,000 AF annually). Under the terms of the Second Consent Decree, Burbank assumed operation of the Burbank OU on March 12, 2001 as the long-term primary operator for the next 18 years. Although the USEPA has turned over operation of the facility to the City of Burbank, there have been continuing negotiations with Lockheed over several issues including the pumping capacity of the eight wells. These issues are being resolved and the design and maintenance problems are being corrected.

GAC Treatment Plant - City of Burbank

This facility was operated by the City of Burbank from 1992-2001. Two Lake Street Wells can deliver water at 2,000 gpm to the liquid-phase GAC plant for removal of VOCs. When the plant is in use the treated water supplements production from the Burbank OU and can be delivered to the Burbank distribution system. However, current plans are to keep the plant shut down due to elevated chromium levels in the groundwater.

North Hollywood OU (Aeration Facility) - City of Los Angeles

This facility is designed to treat up to 2,000 gpm of VOC-contaminated groundwater by air-stripping and deliver the treated water to Los Angeles' water distribution system. The facility operates below design capacity due to a declining water table. The USEPA is reviewing the LADWP proposal for the NHOU to increase production by deepening existing wells. The decision is complicated by the presence of hexavalent chromium upgradient of the wells.

The USEPA five-year review of the NHOU published September 2003 found that the interim remedy of the NHOU "currently protects human health and the environment because the concentration of TCE and PCE in treated groundwater is less than the Record of Decision (ROD) selected cleanup goals and no other Contaminants of Concern (COC) currently exceed health-based standards."

Pollock Wells Treatment Plant - City of Los Angeles

Pollock Wells Treatment Plant, with a capacity of 3,000 gpm, began operating in March 1999. This project is funded, owned, and operated by the City of Los Angeles. The Pollock Wells Treatment Plant reduces rising groundwater flowing out of ULARA and enhances the overall groundwater cleanup program in the Los Angeles River Narrows area of the SFB. The groundwater is processed through liquid-phase GAC vessels for VOC removal, followed by chlorination and blending of the treated groundwater to reduce nitrate levels. The treated water is then delivered to LADWP's distribution system.

Glenwood Nitrate Removal Plant - CVWD

Groundwater pumped from CVWD's wells is high in nitrates. A portion of the pumped groundwater is treated by ion-exchange and blended with untreated water and/or imported MWD water to reduce nitrate levels below the MCL. In the past year the plant was operated below design capacity because overall groundwater production was down due to basin level decline, resulting in more imported water, thereby reducing the need for treatment. However, near record

rainfall in 2004-05 have raised well production and CVWD has increased its use of the nitrate plant.

TREATED GROUNDWATER IN ULARA

TABLE 4.1 ACTUAL GROUNDWATER TREATMENT

Water Year	Burbank GAC	Lockheed Aqua Detox	Burbank OU	Glendale North/South OU	CVWD Glenwood Nitrate Removal Plant	North Hollywood OU	Pollock Wells Treatment Plant	Annual Total AF
1985-86		1						1
1986-87		1						1
1987-88		1						1
1988-89		924						924
1989-90		1,108				1,148		2,256
1990-91		747				1,438		2,185
1991-92		917			847	786		2,550
1992-93	1,205	692			337	1,279		3,513
1993-94	2,395	425	378		1,550	726		5,474
1994-95	2,590		462		1,626	1,626		6,304
1995-96	2,295		5,772		1,419	1,182		10,668
1996-97	1,620		9,280		1,562	1,448		13,910
1997-98	1,384		2,580		1,391	2,166		7,521
1998-99	1,555		9,184		1,281	1,515	1,513	15,048
1999-00	1,096		11,451	979	1,137	1,213	1,851	17,727
2000-01	995		9,133	6,345	989	1,092	1,256	19,810
2001-02	0		10,540	6,567	515	998	1,643	20,263
2002-03	0		9,170	7,508	216	1,838	1,720	20,452
2003-04	0		9,660	6,941	164	1,150	1,137	19,052
Total AF	**15,135**	**4,815**	**77,611**	**28,340**	**13,034**	**19,605**	**9,120**	**167,659**

TABLE 4.2 PROJECTED GROUNDWATER TREATMENT

	Burbank GAC	Burbank OU	Glendale North/South OUs	CVWD Glenwood Nitrate Removal Plant	North Hollywood OU	Los Angeles' Pollock Wells Treatment Plant	Annual Total AF
2004-05	0	7,500	7,200	925	1,264	1,914	18,803
2005-06	0	10,164	7,200	750	1,500	2,000	21,614
2006-07	0	10,884	7,200	750	1,500	2,000	22,334
2007-08	0	10,884	7,200	750	1,500	2,000	22,334
2008-09	0	10,884	7,200	750	1,500	2,000	22,334
Total AF	0	**50,316**	**36,000**	**3,925**	**7,264**	**9,914**	**107,419**

C. Projected Groundwater Pumping Facilities

North Hollywood Well Field Restoration Project

LADWP is evaluating the possibility of adding new North Hollywood Wells in the west branch to restore capacity lost due to contamination and age.

D. Other Groundwater Remediation Projects

Many privately owned properties in the eastern SFB have been found to have groundwater contamination, and some are under Cleanup and Abatement Orders from the Regional Water Quality Control Board (RWQCB). Each site typically has monitoring wells and some have extraction wells and treatment facilities. The RWQCB is also in the process of evaluating and closing a significant number of cases in the underground tank program.

The USEPA began including hexavalent chromium in the quarterly sampling from its monitoring wells to characterize the plume as a step in containment and cleanup of this contaminant. A Total Dissolved Chromium plume map is shown on Plate 10.

E. Dewatering Operations

Northeast Interceptor Sewer (NEIS) Project

The NEIS Project, a portion of which is located northerly of the intersection of the Los Angeles River and the Arroyo Seco, requires dewatering during construction. This project began in 2003 and is under the direction of the Los Angeles Department of Public Works Bureau of Engineering. The sewer is expected to be put into service in May 2005. Completion of the project is expected by the end of August 2005.

Eagle Rock Interceptor Sewer (ERIS) Project

The ERIS Project, located in the Eagle Rock Basin along York Boulevard and Eagle Rock Boulevard, will require dewatering during construction. This project is under the direction of the Los Angeles Department of Public Works Bureau of Engineering. Construction started early in 2004, and will last approximately two years.

Temporary Construction Dewatering

Temporary construction excavations, such as building foundations and pipelines, sometimes require dewatering in areas that have a high groundwater table. Water that is discharged is required to be accounted for by the Watermaster, and is deducted from the water right holder.

Permanent Dewatering Operations

Some facilities along the southern and western boundaries of the SFB have deep foundations in areas of high groundwater that require permanent dewatering. The amount of groundwater pumped is required to be reported to the Watermaster on a monthly basis. These activities are subject to approval by the affected Administrative Committee party, and the dewaterer is required to pay for the replacement cost of the extracted groundwater. The pumped groundwater is subtracted from the affected party's water right.

F. Unauthorized Pumping in the County

Unauthorized Pumping

There are a significant number of individuals, primarily within the unincorporated hill and mountain area, who are pumping groundwater without reporting the production to the Watermaster. This groundwater has been adjudicated and is the property of the City of Los Angeles. Although the volume produced by each pumper is probably small, the cumulative effect may be significant. Working in cooperation with the County Department of Health Services and County Planning, the Watermaster and the LADWP have developed a process to identify and monitor water usage through a water license agreement. The Watermaster Office has also identified pumping by lessees on U.S. Forest Service (USFS) land within ULARA. The USFS will be conducting an evaluation of water sources for each residence in the area below the Big Tujunga Dam beginning in 2004.

V. GROUNDWATER RECHARGE FACILITIES AND PROGRAMS

A. Existing Spreading Operations

There are five active spreading facilities located in the San Fernando Basin (SFB) (Plate 1). The Los Angeles County Department of Public Works (LACDPW) operates the Branford, Hansen, Lopez, and Pacoima Spreading Grounds. The LACDPW, in cooperation with the City of Los Angeles, operates the Tujunga Spreading Grounds. The spreading facilities are used for spreading native and imported water. Plans are being considered to deepen and modernize the Hansen Spreading Grounds. An analysis is being made by the LACDPW, LADWP, and the Watermaster to identify ways to maximize spreading. Estimated capacities are shown in Table 5-2.

B. Other Spreading Operations

Headworks Spreading Grounds

The Headworks Spreading Grounds, inactive since 1982, are now being considered for a joint project among LADWP, Bureau of Sanitation, and City Department of Recreation and Parks as a multi-use site. As proposed, this 41-acre site would provide space for 28 acres of wetlands and trails, and a buried reservoir would replace the function of the Silver Lake and Ivanhoe Reservoirs. The three project partners will continue the feasibility studies.

Boulevard Pit

Vulcan Materials, CalMat Division, is currently mining sand and gravel from its Boulevard Pit, located between the existing Hansen and Tujunga Spreading Grounds. The LADWP, LACDPW, and the Watermaster are investigating the feasibility of ultimately acquiring the Boulevard Pit for conversion into a new stormwater retention and/or recharge facility.

C. Actual and Projected Spreading

Table 5-1A shows the actual and projected spread volumes for the 2004-05 Water Year. The 2004-05 Water Year will experience above-average recharge. Overall, approximately 71,573 AF of native runoff will be spread compared to the 36-year historical average of 31,513 AF of native runoff and imported water, and compared to the past five-year average of 12,220 AF. Precipitation on the valley fill is estimated at 38 inches for 2004-05 compared to the long-term average of 17.4 inches per year and the previous five-year average of 13.85 inches per year.

TABLE 5-1A SPREADING OPERATIONS

(acre-feet)

Actual and Projected Spreading in ULARA Spreading Grounds 2004-05							
Operated by:							
	LACDPW				LADWP	LACDPW and LADWP	
Month	Branford	Hansen	Lopez	Pacoima	Headworks*	Tujunga	Total
Oct-04	183	2,090	-	640		542	3,455
Nov-04	25	1,240	313	15		-	1,593
Dec-04	135	2,430	2	884		499	3,950
Jan-05	532	5,750	39	4,170		3,760	14,251
Feb-05	243	3,960	36	2,620		961	7,820
Mar-05	120	5,620	250	5,020		3,820	14,830
Apr-05	50	9,290	90	8,524		7,720	25,674
May-05							
Jun-05							
Jul-05							
Aug-05							
Sep-05							
TOTAL	1,288	30,380	730	21,873	-	17,302	71,573
1968-2004 Average	519	13,799	529	6,454	2,066	8,146 **	31,513
1999-2004 Average	573	7,275	282	2,553	-	1,537	12,220

* Out of services since 1981-82

**Includes native and imported water.

TABLE 5-1B HISTORICAL PRECIPITATION ON THE VALLEY FILL

(inches per year)

1968-04	1999-04	1999-00	2000-01	2001-02*	2002-03	2003-04	2004-05**
17.4	13.85	14.84	19.52	5.95	19.41	9.52	38.3

* Historic Low

** Estimated

TABLE 5-2 ESTIMATED CAPACITIES OF ULARA SPREADING GROUNDS

Spreading Ground	Type	Total Wetted Area (acres)	Capacity (acre-feet/year)
	Operated by the LACDPW		
Branford	Deep basin	7	1,000
Hansen	Shallow basin	105	35,000
Lopez	Shallow basin	12	2,000
Pacoima	Med. Depth basin	107	23,000
	Operated by LACDPW and LADWP		
Tujunga	Shallow basin	83	43,000
	TOTAL	314	104,000

D. Hansen and Tujunga Spreading Grounds Task Force

During the 1997-98 Water Year, precipitation in ULARA was 225 percent of normal. This resulted in an above-average volume of stormwater runoff that could be captured in upstream reservoirs and diverted into spreading grounds. In April 1998, the Watermaster Office received notice from the LACDPW that spreading at both the Hansen and Tujunga Spreading Grounds would be temporarily suspended. The basis for curtailing spreading was that the groundwater table had risen to a level that threatened to inundate the base of the Bradley-East Landfill near the Hansen Spreading Grounds, and methane gas was migrating from the Sheldon-Arleta Landfill adjacent to the Tujunga Spreading Grounds toward a high school. At that time, Los Angeles County's reservoirs were completely full, meaning that thousands of acre-feet of runoff would be spilled and lost to the ocean. The suspended spreading activities spanned over one month. The recent heavy rains during 2004-05 has caused some similar restrictions on spreading operations.

In response to this undesirable condition, the Watermaster Office in May 1998 formed the Tujunga and Hansen Spreading Grounds Task Force. The task force was comprised of representatives from the LACDPW, LADWP, Los Angeles Bureau of Sanitation and the Watermaster Office. After a series of meetings, the task force developed preliminary mitigation measures to improve the utilization of both spreading grounds, particularly during years of above-normal runoff.

- Hansen Spreading Grounds Mitigation Plan

Above-average recharge at the Hansen Spreading Grounds (HSG) affects the Bradley-East Landfill, located approximately 3,000 feet downgradient. The RWQCB and the Watermaster Office prohibit groundwater inundation of the unlined landfill. The groundwater table is allowed to rise to a designated level, and then spreading is temporarily suspended until the groundwater table recedes to a safe level. This occurs only in years when above-average runoff is available. To assure the safety of the landfill, a groundwater alert level, with a 25-foot buffer zone, was established in the late 1990s. The Hansen Spreading Grounds Mitigation Plan established an improved location to monitor the groundwater levels – 1,000 feet further downgradient from its previous location and adjacent to the existing Bradley-East Landfill. The Watermaster Office estimated that this change should improve the volume of groundwater recharge by at least 25 percent, or approximately 7,000 AF/yr., during a wet year.

Heavy spreading was possible at HSG during 2004-05 as a result of record high rainfall. In January 2005, seepage and erosion was observed in a cut slope at the northerly end of Boulevard Pit, located near the south end of HSG. Vulcan Materials Company (Vulcan) currently mines sand and gravel at Boulevard Pit. The seepage was determined by LACDPW to be directly related to the heavy spreading. LACDPW, LADWP, and the Watermaster were concerned that the seepage could further weaken the slope and cause a large landslide that might affect San Fernando Road. The City of Los Angeles Department of Building and Safety (Building and Safety) was notified, and it subsequently issued a letter requiring Vulcan to perform a slope stability analysis. In the meantime, LACDPW curtailed spreading at HSG to reduce the chance of slope failure. Although approximately 21,090 AF were spread at HSG, a significant amount of runoff could not be conserved and was wasted to the ocean. Vulcan's slope stability report was submitted to Building and Safety in April 2005 and is currently being reviewed.

- Tujunga Spreading Grounds Mitigation Plan

The Tujunga Spreading Grounds are located adjacent to the Sheldon-Arleta Landfill. Methane gas is produced by the landfill, which is a source of environmental concern.

During the spreading of surface water, water moves through the underlying soil column and displaces the air from voids within the soil matrix. The resulting lateral migration of air mass has the potential to displace methane gas out of the adjacent landfill. In recent years the methane has occasionally migrated and caused elevated levels at a nearby high school, and in at least one

instance, forced an evacuation of the school grounds. In order to avoid these episodes, a methane gas monitoring system was constructed. When methane gas is detected at specific concentrations, the spreading activities are suspended, resulting in local storm water runoff being lost to the ocean.

The Tujunga Spreading Grounds Mitigation Plan consists of continuous operation of the perimeter methane gas flare system, situated around the landfill, prior to and during spreading of surface water. This improves containment of the methane gas within the landfill, and halts its migration out of the landfill. The plan requires close coordination between the Los Angeles Bureau of Sanitation, the operators of the existing perimeter flare system, and the LACDPW. The goal is to contain methane gas within the landfill and restore the historic spreading capacity of 250 cfs. A test was conducted in May 2003 by the consultant, GeoSyntec. The results were encouraging at a spreading rate of 100 cfs. Delays in implementing plans to contain the methane gas resulted in a significant amount of runoff being wasted to the ocean during 2004-05.

E. Big Tujunga Dam/Endangered Species

Big Tujunga Dam was constructed by LACDPW in the 1930s on an easement on USFS property. In the 1970s a seismic analysis of the dam was performed, and it was found to be susceptible to damage in the event of a large earthquake. Since then, the dam has been operated at a reduced storage capacity for safety reasons. LACDPW has proposed a seismic retrofit of the dam to restore the storage capacity.

In February 2004, the United States Fish and Wildlife Service (USFWS) published in the Federal Register a rule designating the area along Big Tujunga Creek from Big Tujunga Dam to Hansen Dam a "critical habitat" for the Santa Ana Sucker (SAS), an endangered species of fish. USFWS is requiring that flow releases from the dam consider the impact on the SAS, and is concerned that large releases could jeopardize the SAS.

This native runoff belongs to the City of Los Angeles under its pueblo right, and is used to recharge the San Fernando Basin at the Hansen and Tujunga Spreading Grounds. Relatively large releases are required for the water to reach the spreading grounds. Unfortunately, the period of maximum flow during the spring occurs during the spawning season of the SAS. In addition, the USFWS is also requiring that small releases occur throughout the dry summer months to periodically refresh the pools along the creek. Depending on the final operational

requirements, Los Angeles' pueblo right could be adversely impacted by a reduction in the recharge of the SFB.

LACDPW, USFS, USFWS, LADWP, and the Watermaster are attempting to reach a compromise that provides adequate flood protection, maximizes water conservation, and is protective of the SAS. Working together this past year the agencies were successful in appealing to FEMA to reinstate dam construction funding that had been withdrawn. LACDWP expects to begin construction in the summer of 2006.

VI. BASIN MANAGEMENT ACTIVITIES AND INVESTIGATIONS

A. Groundwater Investigation Programs

Pacoima Area Groundwater Investigation

A significant groundwater VOC contaminant plume exists in the Pacoima area near the intersection of San Fernando Road and the Simi Valley Freeway (118 Freeway). This area is located approximately 2.5 miles north and upgradient of the LADWP's Tujunga Well Field. There are four primary VOCs present in the groundwater beneath the Pacoima area: PCE, TCE, 1,1-TCA and 1,1 DCE. Concentrations of TCE were found to be as high as 24,000 ppb in this area, which is the highest level found in the San Fernando Valley.

To help characterize the extent of contaminant migration, LADWP installed two monitoring wells: PA-01, approximately 0.5 mile downgradient, and PA-02, approximately 1.25 miles downgradient of the suspected source area.

The Brenntag/Holchem site is under the jurisdiction of the Department of Toxic Substances Control (DTSC). Brenntag is operating a soil vapor extraction system and has installed monitoring wells both on and off site. In May 2005 Brenntag was directed by DTSC to begin delineating the off-site groundwater plume.

The Price-Pfister site is located nearby, and is under the jurisdiction of the RWQCB. Price-Pfister has installed several monitoring wells on site and has also performed soil vapor extraction. Due to the close proximity of these sites, DTSC and RWQCB are coordinating their oversight efforts.

Chromium Investigations

The RWQCB, funded in part with a grant from the United States Environmental Protection Agency (USEPA), reviewed 4,040 sites for potential hexavalent chromium contamination and published its findings in December 2002. After this review, 255 suspected hexavalent chromium sites were identified and inspected. As a result of these inspections, the RWQCB recommended closure for 150 sites and further assessment for 105 sites. In addition, the RWQCB has issued Cleanup and Abatement orders to B.F. Goodrich (formerly Menasco Aerospace Division), PRC-Desoto (formerly Courtauld), Drilube, Honeywell (formerly Allied Signal), Lockheed (2), ITT,

and Excello Plating, and may issue several more. The Cleanup and Abatement Orders require a responsible party to assess, clean up, and abate the effects of contamination discharged to soil and groundwater.

The Chrome 6 Task Force meets on an as-needed basis to keep the various parties informed regarding hexavalent chromium issues, including regulations, health studies, and treatment technologies. A new Public Health Goal (PHG) for hexavalent chromium should be established by the Office of Environmental Health Hazard Assessment (OEHHA) in 2005. A MCL will subsequently be issued by the California Department of Health Services (DHS).

VII. ULARA WATERMASTER MODELING ACTIVITIES

A. Introduction

The purpose of the groundwater modeling study presented herein is to evaluate the effects of groundwater pumping and recharge in the SFB, as projected over a five-year period. The projected pumping values were extracted from the "Year 2004-09 Pumping and Spreading Plans" submitted by each party pursuant to the provisions established in the revised February 1998 Policies and Procedures.

The groundwater flow model used for this study is a comprehensive three-dimensional computer model that was developed originally for the USEPA during the Remedial Investigation Study of the San Fernando Valley (December 1992). The model is a tool to estimate the future response to pumping and spreading in the San Fernando Basin for the next five years. Up-to-date groundwater elevations for specific locations can be obtained by contacting the Watermaster Office at (213) 367-0921.

The model code, "Modular Three-Dimensional Finite-Difference Groundwater Flow Model," commonly called MODFLOW, was developed by the U.S. Geological Survey (McDonald-Harbaugh) and was used to develop the San Fernando Basin Goundwater Flow Model. This model consists of 64 rows, 86 columns, and up to four layers to reflect the varying geologic and hydrogeologic characteristics of the SFB in three dimensions. In the deepest portion of the SFB the model is subdivided into four layers, each layer characterizing a specific zone. The model has a variable horizontal grid that ranges from 1,000 by 1,000 feet near the southeastern SFB to 3,000 by 3,000 feet in the northwestern SFB (Figure 7-1) or where less data are available. The model is regularly updated.

B. Model Input

The input data for this model is illustrated in Table 7-1. Table 7-1A is the Basin Recharge, which consists of precipitation, delivered water, hill and mountain runoff, spreading, and sub-surface inflow. Table 7-1B is the Basin Extraction of major producers - the City of Los Angeles, City of Burbank, City of Glendale, the City of San Fernando, Crescenta Valley Water District, and other individual producers. Both tables show projected values for the five-year study, from Fall 2004 to Fall 2009, except for the first half of Water Year 2004-05 where the actual values are known.

In Table 7-1A, the percolation and spreading values were derived by using the long-term average rainfall and recharge conditions projected over the five-year study period except for the first half of Water Year 2004-05 where actual values are known. The LACDPW estimated the spreading values for the second half of the current water year. Anticipated spreading at Pacoima Spreading Grounds by the City of Burbank will help to improve the recovery of the water table in the area above the Tujunga Well Field. The values of the sub-surface inflow from the adjacent basins are assumed to be constant throughout the five-year study.

All Table 7-1B values were derived from the "Pumping and Spreading Plans" submitted by the municipal producers. Each well field's total extraction was allocated among individual wells, then each well was assigned a percentage of pumping to each model layer based on the percentage of the well's perforations contained within each layer.

The model's initial head values (groundwater elevations) were derived from the actual data from Water Year 2003-2004, during which the SFB experienced a decline in groundwater elevation as a result of low precipitation (the weighted average of both valley and mountain areas was 62 percent of the 100-year mean) combined with low artificial recharge and heavy continued pumping. The spreading recharge for the same year was only 40 percent of the long-term average.

At the close of every Water Year, the Watermaster staff updates the model input files with the actual Basin Recharge and Extraction data. This activity has been performed each year since 1981.

C: Simulated Groundwater Elevations and Flow Directions

After running the model for five stress periods (Water Years 2004-2009), each lasting 365 days, MODFLOW generated numerical data: the head (groundwater elevations), the drawdown (change in groundwater elevations), and the cell-by-cell flow (vector or flow direction data). These numerical data were used to develop the following Figures and Plates:

- The simulated groundwater (water table) contour results for Model Layer 1 are shown on Plate 1, and for Layer 2 on Plate 2.
- The change in groundwater elevation contours were generated from the drawdown data from the Fall 2004 to Fall 2009 stress period and is shown on Plate 3 for Layer 1 and Plate 4 for Layer 2.

- The horizontal groundwater flow directions are shown on Plate 5 for Layer 1 and Plate 6 for Layer 2.

- Plates 7-10 depict the most recent TCE, PCE, NO_3, and Total Dissolved Chromium contaminant plumes superimposed onto the Layer 1 horizontal groundwater flow direction.

D. Evaluation of Model Results

Plate 1: Simulated Groundwater Contour Model Layer 1 – Fall 2009

- The most noticeable feature is the cone of depression (pumping cone) that has developed around the Burbank OU. These extractions are derived primarily from Layer 1, although Layer 2 does provide some recharge to Layer 1. The Burbank OU projected pumping for the period from 2004 though 2009 is about 10,900 AF/yr. The radius of influence extends as far as 6,500 feet in the downgradient (southeasterly) direction. An upgradient radius of influence is usually larger than the downgradient radius of influence.

- In a more subtle manner, Plate 1 illustrates the pumping influence of the North Hollywood Operable Unit Aeration Wells (AE), North Hollywood West Wells, Glendale OU and Pollock Treatment Plant Wells.

Plate 2: Simulated Groundwater Contour Model Layer 2 – Fall 2009

- The most significant features are the cones of depression near the Rinaldi-Toluca (R-T), Tujunga (TJ), North Hollywood-West (NHW), and Burbank OU. Over 75 percent of the R-T, TJ, and NHW pumping is derived from Layers 2-4.

Plate 3: Change in Groundwater Elevation Model Layer 1 – Fall 2004 to Fall 2009

- As shown in Plate 3, there is an overall basinwide increase (rebound) in the groundwater elevations over the five-year study period. The largest increase occurs in areas near the Hansen, Tujunga, and Pacoima Spreading Grounds.

- The primary reason for the increase in water levels is that basin recharge is projected to exceed extractions for the five-year study period by about 83,872 AF.

- The water table within the cone of depression at the Rinaldi-Toluca Well Field rises by about 16 feet, and the groundwater level near the Burbank OU rises by about six feet.

- The water table near the Glendale North and South OU wells will rise between one to two feet. The North OU Wells will pump 5,184 AF/yr and the South OU Wells 2,016 AF/yr.

- The area upgradient of the Tujunga and Rinaldi-Toluca Well Fields will experience about 40 feet of recovery in the water table due to the projected recharge by the City of Burbank at the Pacoima Spreading Grounds and above-normal recharge during the Water Year of 2004-05. The areas near the North Hollywood, Erwin, Whitnall, and Verdugo Well Fields will experience a 6 to 14 foot increase in the water table.

Plate 4: Change in Groundwater Elevation Model Layer 2 – Fall 2004 to Fall 2009

- The area near the Rinaldi-Toluca and North Hollywood – West well fields will experience a 12 to 20 foot recovery in the water table. The area near the North Hollywood East Branch, Erwin, Whitnall and Verdugo Well Fields will experience an 6 to 14 foot rebound in the water table. The area upgradient of the Tujunga Well Field will experience about 32 feet of recovery in the water table.

Plate 5: Simulated Groundwater Flow Direction Model Layer 1 – Fall 2009

- This plate consists of superimposed groundwater flow direction arrows to illustrate the general movement of groundwater flow in Layer 1.

- The Rinaldi-Toluca, North Hollywood, Glendale OU, and Burbank OU Well Fields and the Hansen and Pacoima Spreading Grounds cause the most pronounced effect on the direction of groundwater movement. In particular, the Burbank OU creates such a significant pumping cone that groundwater flows toward the well field from all directions (radial flow).

- A groundwater divide apparently develops just north of the Verdugo Wells and south of the Whitnall, Erwin, and Burbank OU Wells. This is primarily due to the 'pumping trough' formed by the Burbank OU and North Hollywood Well Field extractions.

Plate 6: Simulated Groundwater Flow Direction Model Layer 2 – Fall 2009

- Similar to Plate 5, a groundwater divide forms between the Verdugo Wells and the Burbank OU, Erwin and Whitnall Wells. The effect of the Rinaldi-Toluca, North Hollywood, and Burbank OU pumping creates the most significant impact to the natural direction of groundwater movement.

Plates 7 – 10: Simulated Groundwater Flow Direction and TCE, PCE and NO_3, and Chromium Contamination Model Layer 1 – Fall 2009

- Plates 7-10 depict the most recent TCE, PCE, NO_3 and Cr contaminant plumes that are superimposed onto the horizontal direction of groundwater movement for Layer 1, Fall 2009. The Burbank OU appears to contain the 1,000 to 5,000 µg/L TCE and PCE plumes and a large portion of the 500 – 1,000 µg/L TCE and PCE plumes. The uncaptured portion of these plumes will migrate southeasterly in the direction of the Los Angeles River Narrows area and toward the Glendale OU.

- The Burbank OU pumping (10,900 AF/yr.) tends to flatten the horizontal gradient in a southeasterly direction and slows the natural movement of groundwater southeasterly of the Burbank OU area plume.

- The Glendale North and South OU Wells capture a portion of the plumes uncaptured by Burbank OU Wells.

- The Pollock Wells (2,000 AF/yr.) have a less pronounced effect on Layer 1 because 75 percent of the Pollock pumping originates from Layer 2.

- Plate 9 (NO_3 contamination) indicates that Layer 1 extractions by the Burbank and Glendale OU facilities may be impacted by NO_3.

- Plate 10 (Total Dissolved Chromium) indicates that Layer 1 extractions by North Hollywood OU, Burbank OU, and Glendale OU facilities may be impacted by chromium contamination.

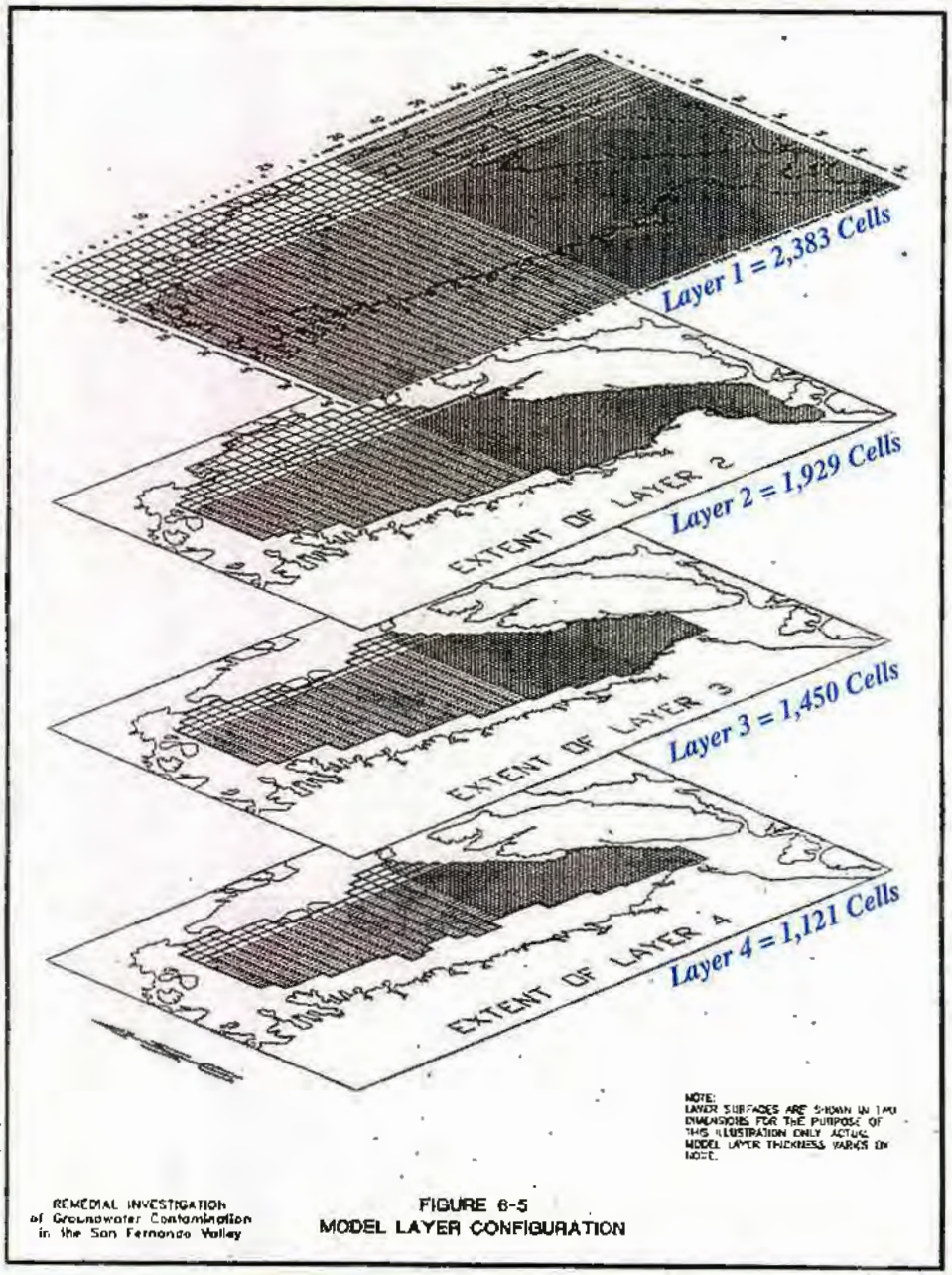
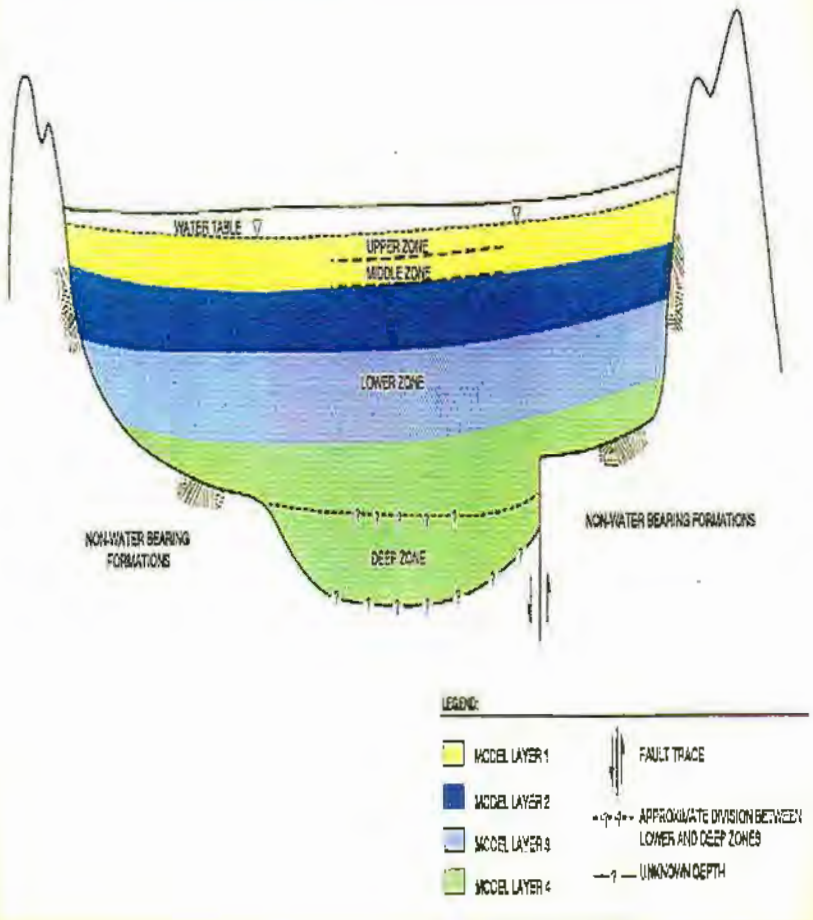


Figure 7.1
Model Layers and Cell Configurations



Source: Remedial Investigation Report of Groundwater Contamination in the San Fernando Valley, December 1992

TABLE 7-1
MODEL INPUT
Pumping and Spreading Scenario
Water Years 2004 - 2009

Table 7-1A

	BASIN RECHARGE (AF/Y)																	
	RAINFALL (IN/Y)		PERCOLATION (A)			H&M (B)	SPREADING GROUNDS (B)							SUB-SURFACE INFLOW (B)				
WATER YEAR	VALLEY	HILL & MTN	VALLEY FILL	RETURN WATER	SUB TOTAL	HILL & MTN	BRANFORD	HANSEN	HW	LOPEZ	PACOIMA	TUJUNGA	SUB-TOTAL	PACOIMA	SYLMAR	VERDUGO	SUB-TOTAL	TOTAL RECHARGE
2004-05	38.50	49.40	26,746	49,368	76,114	8,437	1,288	30,380	-	730	21,873	17,302	71,573	350	400	70	820	156,944
2005-06	18.57	23.06	12,874	55,085	67,959	3,939	438	12,973	-	579	9,977	6,696	30,663	350	400	70	820	103,381
2006-07	18.57	23.06	12,874	55,085	67,959	3,939	438	12,973	-	579	11,177	6,696	31,863	350	400	70	820	104,581
2007-08	18.57	23.06	12,874	55,085	67,959	3,939	438	12,973	-	579	12,127	6,696	32,813	350	400	70	820	105,531
2008-09	18.57	23.06	12,874	55,085	67,959	3,939	438	12,973	-	579	12,327	6,696	33,013	350	400	70	820	105,731

Table 7-1B

	BASIN EXTRACTION (AF/Y)																		
	LADWP (C)										BURBANK (C)			GLENDALE (C)			OTHERS (C)		
WATER YEAR	AE	EW	HW	NH	PO	RT	TJ	VD	WH	TOTAL LADWP	GAC	BQU	NON-BURBANK (VMP)	CITY OF GLENDALE	GU-NORTH	GU-SOUTH	TOTAL NON-LADWP	TOTAL NON-GLENDALE (F. LAWN)	TOTAL EXTRACTION
2004-05	-1,264	-2,886	0	-10,801	-1,914	-9,803	-10,436	-4,905	-2,754	**-44,763**		-7,500	-300	-25	-5,184	-2,016	-1,918	-400	**-62,106**
2005-06	-1,500	-2,886	0	-22,408	-2,000	-27,134	-23,413	-4,905	-2,754	**-87,000**	0	-10,164	-300	-25	-5,184	-2,016	-1,918	-400	**-107,007**
2006-07	-1,500	-2,886	0	-22,408	-2,000	-27,134	-23,413	-4,905	-2,754	**-87,000**	0	-10,884	-300	-25	-5,184	-2,016	-1,918	-400	-107,727
2007-08	-1,500	-2,886	0	-22,408	-2,000	-27,134	-23,413	-4,905	-2,754	**-87,000**	0	-10,884	-300	-25	-5,184	-2,016	-1,918	-400	**-107,727**
2008-09	-1,500	-2,886	0	-22,408	-2,000	-27,134	-23,413	-4,905	-2,754	**-87,000**	0	-10,884	-300	-25	-5,184	-2,016	-1,918	-400	-107,727

NOTES: (A) Model Recharge Package (Aerial)
(B) Model Well Package (Source)
(C) Model Well Package (Sink)

PROJECT: *WATERMASTER*
PROJECT NO.: *PS04-09*
DATE: 6/13/2005

VIII. WATERMASTER'S EVALUATION AND RECOMMENDATIONS

The Watermaster is encouraged by the five year projected pumping and spreading plan because of the progress of the groundwater cleanup program which has restored Burbank's and Glendale's groundwater pumping capability in the San Fernando Basin. Unfortunately, during the past several years hexavalent chromium contamination has become an issue that may adversely affect existing treatment facilities. The Watermaster is concerned that chromium contamination near the Glendale OU, Burbank OU, and the North Hollywood OU could eventually overwhelm the cities' abilities to blend the treated groundwater to acceptable levels. If that happens, the cities may be forced to reduce the treatment rate or shut down the facilities, which could be violations of the Consent Decrees established for VOC cleanup.

In order to avoid this potential conflict, the Watermaster continues to recommend an assertive approach by the USEPA to add chromium to the list of contaminants that must be cleaned up by the Responsible Parties, and by the RWQCB to issue and enforce Cleanup and Abatement Orders.

The Watermaster continues to be concerned about a general long-term decline in San Fernando Basin groundwater levels during the past several years. Probable causes include continued heavy pumping and reduced recharge of the groundwater aquifer. However, basin recharge is projected to exceed extractions by 84,000 AF over the next five years. The Watermaster will continue to monitor the situation closely and will seek the advice and guidance of the Parties to the Judgment in reversing this decline.

City of Los Angeles

Los Angeles' projected average annual pumping from the SFB will be approximately 78,553 AF/yr. for Water Years 2004-05 to 2008-09. This is approximately 2,245 AF/yr. less than the 1979-2004 average but 4,104 AF/yr. more than the average over the last five years (1999-2004). As of October 1, 2004 Los Angeles' accumulated stored water credit was 286,846 AF in the SFB.

The loss in the 1980s of Los Angeles' Headworks, Crystal Springs, and Pollock Well Fields due to VOC contamination caused increased rising groundwater levels in the Los Angeles River Narrows area. The Watermaster is pleased by the partial restoration of pumping in this area by the Pollock Wells Treatment Plant, and encourages Los Angeles to operate this facility at least

2,000 AF/yr. to minimize the loss of water from ULARA due to underflow and excess rising groundwater.

In the Sylmar Basin, Los Angeles plans to pump an average of 3,090 AF/yr. for Water Years 2004-05 through 2008-09. This represents an increase of 130 AF/yr. over the long-term average (1979-2004), and is also higher than the average of 2,612 AF/yr. during the past five years (1999-2004). As of October 1, 2004 Los Angeles' stored water credits were 6,303 AF in the Sylmar Basin.

City of Burbank

Burbank plans to pump an average of 10,363 AF/yr. over the next five years. The Watermaster is pleased that Burbank's pumping capability has been restored through the construction of the Burbank OU. However, Burbank's stored water credit is showing the impact of this pumping, dropping from 50,771 AF on October 1, 1999 to 22,038 AF on October 1, 2004. At current pumping rates Burbank's stored water will be depleted in a few years, eventually requiring arrangements to purchase or replace extractions that are in excess of Burbank's return flow credits and physical solution purchase rights. The Watermaster strongly supports Burbank's proposed plan to import approximately 6,000 AF/yr. through MWD's Foothill Feeder Tunnel and spread it at Pacoima Spreading Grounds.

City of Glendale

Glendale plans to pump 7,625 AF/yr. from the SFB. Since its start-up on September 26, 2000, the Glendale OU has pumped and treated approximately 32,783 AF from the SFB as of May 1, 2005. Glendale's stored water credits are 66,201 AF as of October 1, 2004.

In the Verdugo Basin, Glendale expects to pump an average of 2,300 AF/yr. for the next five years. The long-term average (1979-2004) is 2,263 AF/yr., and the five-year average (1999-2004) is 2,163 AF/yr.

City of San Fernando

San Fernando expects to pump an average of 3,096 AF/yr. over the next five years from the Sylmar Basin. The long-term average (1979-2004) is 3,078 AF/yr., and the five year average (1999-2004) is 3,616 AF/yr. As of October 1, 2004 San Fernando's stored water credit was 227 AF in the Sylmar Basin.

Crescenta Valley Water District (CVWD)

CVWD expects to pump an average of 2,948 AF/yr. during the next five years. The long-term average (1979-2004) is 2,772 AF/yr., and the five-year average (1999-2004) is 3,158 AF/yr. Declining groundwater levels in the Verdugo Basin have limited CVWD's pumping in recent years. However, groundwater levels have started to rebound due to above-normal rainfall and recharge during the 2004-05 Water Year. CVWD will be investigating areas within the basin for stormwater recharge over the next few years.

Model Simulation

The model simulations indicate that a significant portion of the TCE and PCE contamination plumes in the Burbank area will be captured by the Burbank OU wells. The remaining uncaptured portion will migrate toward the Los Angeles River Narrows area, where the Glendale OU and the Pollock Wells Treatment Plant will capture much of this remaining contamination.

The model predicts an overall rebound in SFB water table levels over the next five years. Specifically, in Model Layer 1, the water table rises approximately 40 feet upgradient of the Tujunga and Rinaldi-Toluca Wells; six to 14 feet near the North Hollywood, Erwin, Whitnall, and Verdugo Wells; and one to two feet near the Glendale North and South OU Wells. West of the San Diego (405) Freeway groundwater levels rise up to 20 feet, even though there are no artificial recharge facilities located there. The projected basinwide rebound is based on the assumptions that overall pumping decreases from the long-term average, precipitation remains average, but artificial recharge of imported supplies increases substantially by Burbank's Foothill Feeder Project. In addition, basin recharge during the 2004-05 Water Year is double the long-term average.

Pacoima Area Contamination

The Pacoima area groundwater contamination concerns the Watermaster because it is only 2.5 miles upgradient of the Tujunga Well Field. The Watermaster continues to urge the DTSC and RWQCB to expedite the investigation and cleanup of these VOC plumes.

Tujunga Spreading Grounds

The Watermaster continues to recommend implementing without further delay the program to control methane gas migration from the Sheldon-Arleta Landfill. The goal of this project is to restore Tujunga Spreading Grounds to its historic capacity of 250 cfs. Until this project is

completed stormwater runoff will continue to be wasted unnecessarily, especially during normal to above-normal rainfall years.

Boulevard Pit

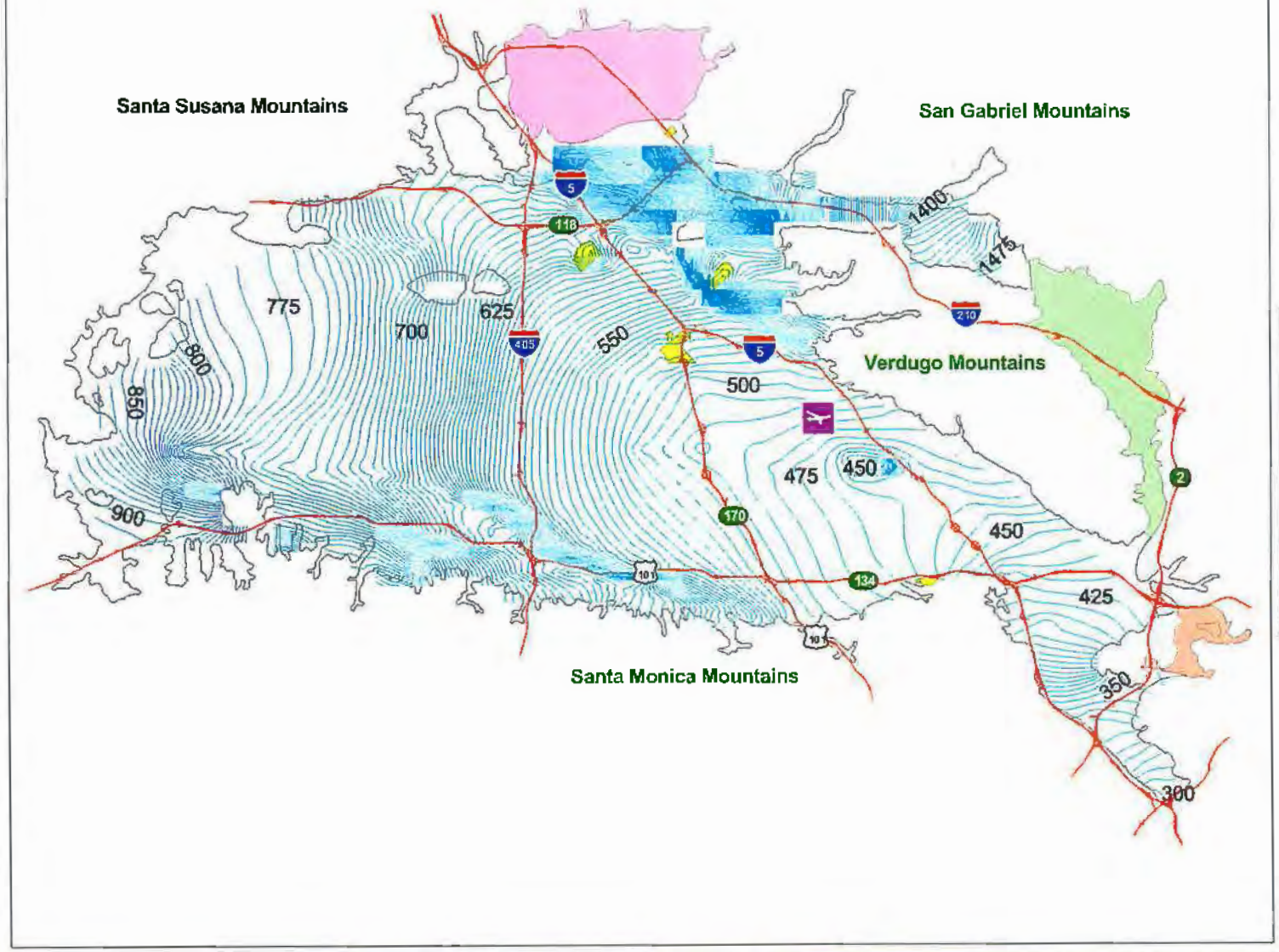
The Boulevard Pit is owned by Vulcan Materials and is currently being mined for sand and gravel. The Watermaster encourages LADWP and LACDPW to continue investigating the potential for obtaining this property and converting it to a stormwater spreading and/or storage facility. This facility could provide a significant new opportunity to enhance basin recharge for the City of Los Angeles and provide additional flood protection for the County, especially during above-normal rainfall events.

The slope stability investigation will determine whether continuous heavy spreading at HSG poses a hazard to the steep cut slope within Boulevard Pit. This issue must be resolved before the next rainfall season so that the County can capture and conserve as much runoff as possible.

PLATES

PLATE 1

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year



LEGEND

- Groundwater Contour
- Spreading Grounds
- Burbank Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

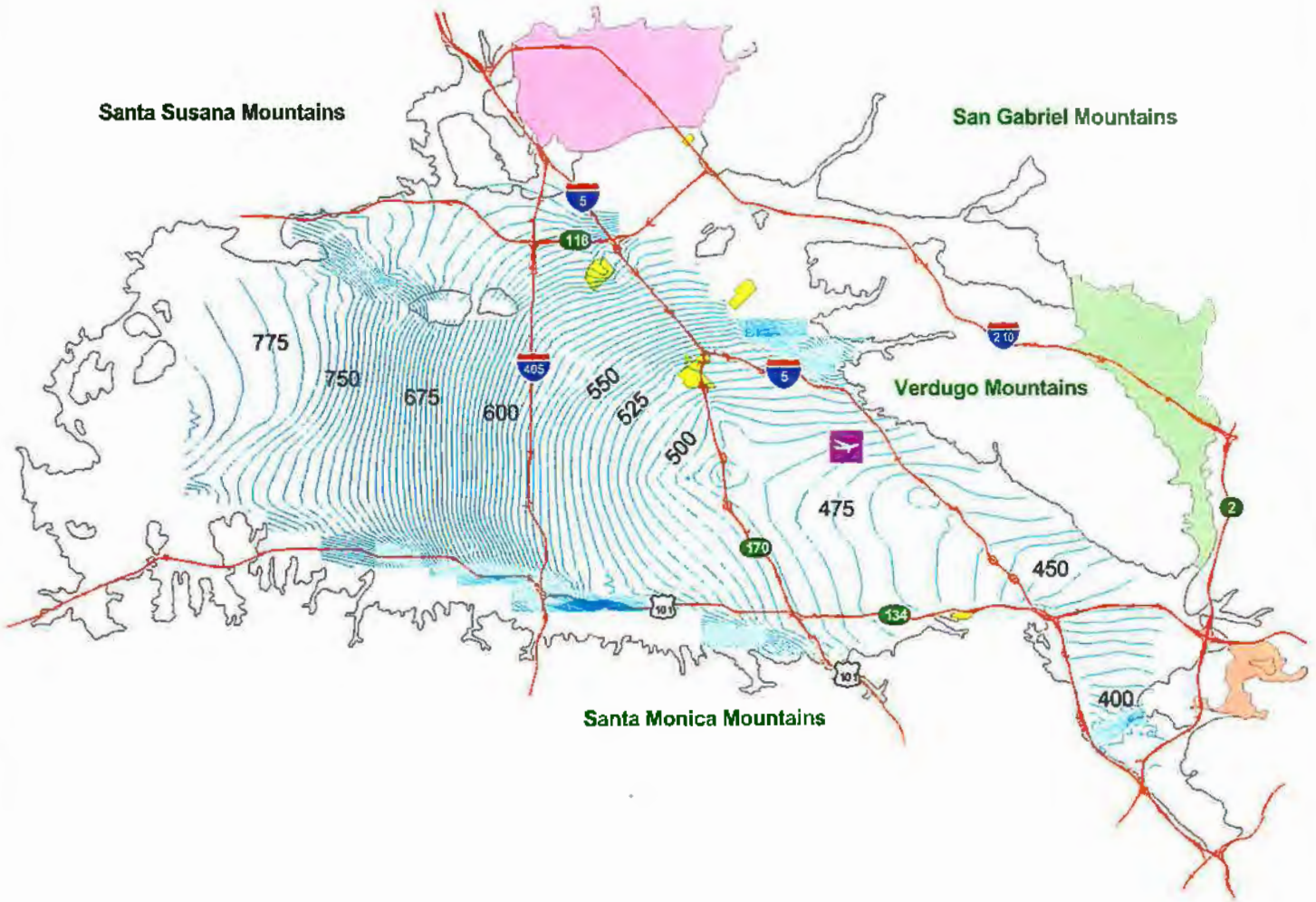
N

2 0 2 Miles

Simulated Groundwater Contours - Model Layer 1
FALL 2009

PLATE 2

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year



LEGEND

- Groundwater Contour
- Spreading Grounds
- Burbank Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

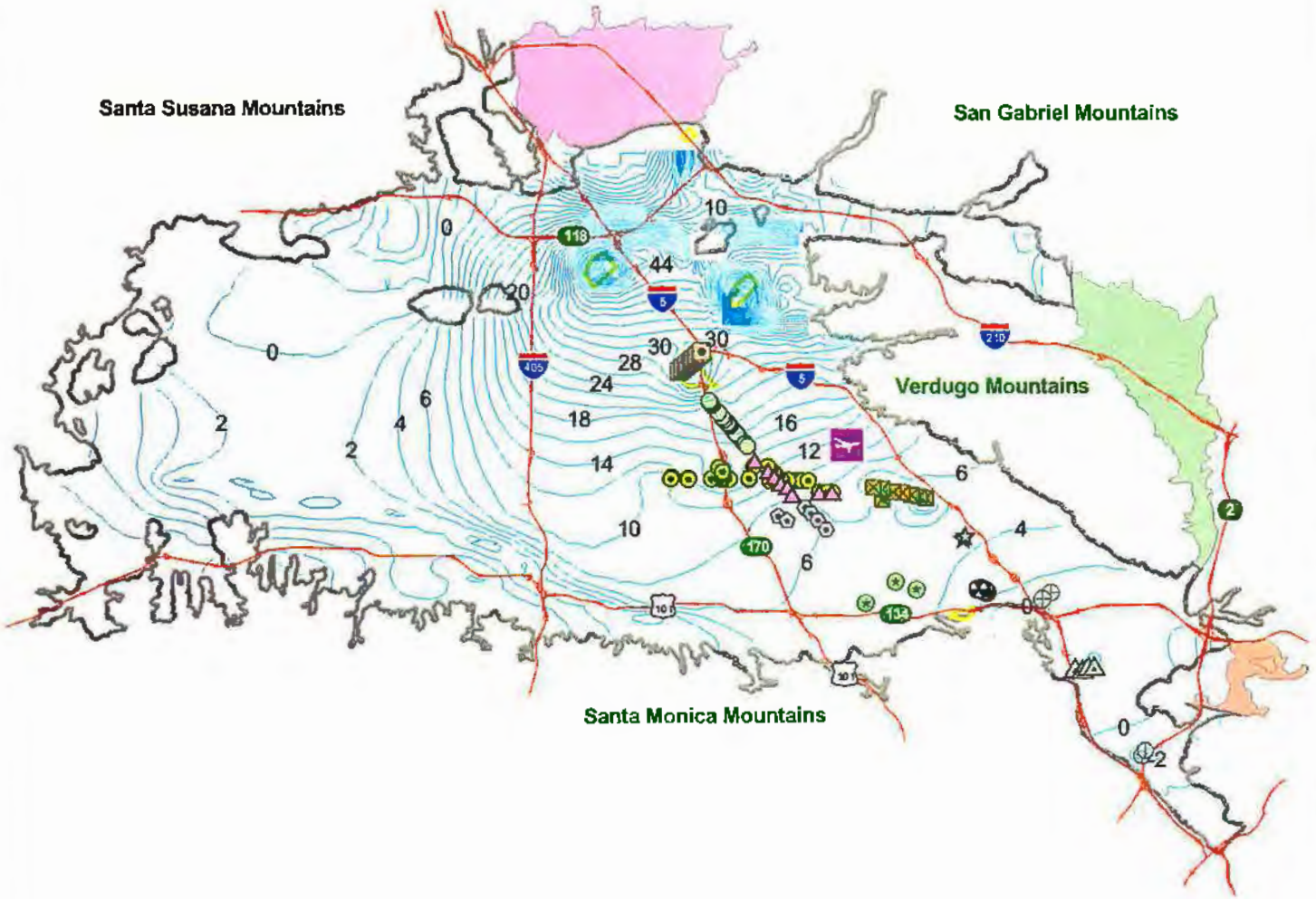
N

2 0 2 Miles

Simulated Groundwater Contours - Model Layer 2
FALL 2009

PLATE 3

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year



LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- Headworks
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

Change in GW Elev.
Spreading Grounds
Burbank Airport

Groundwater Basins
- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

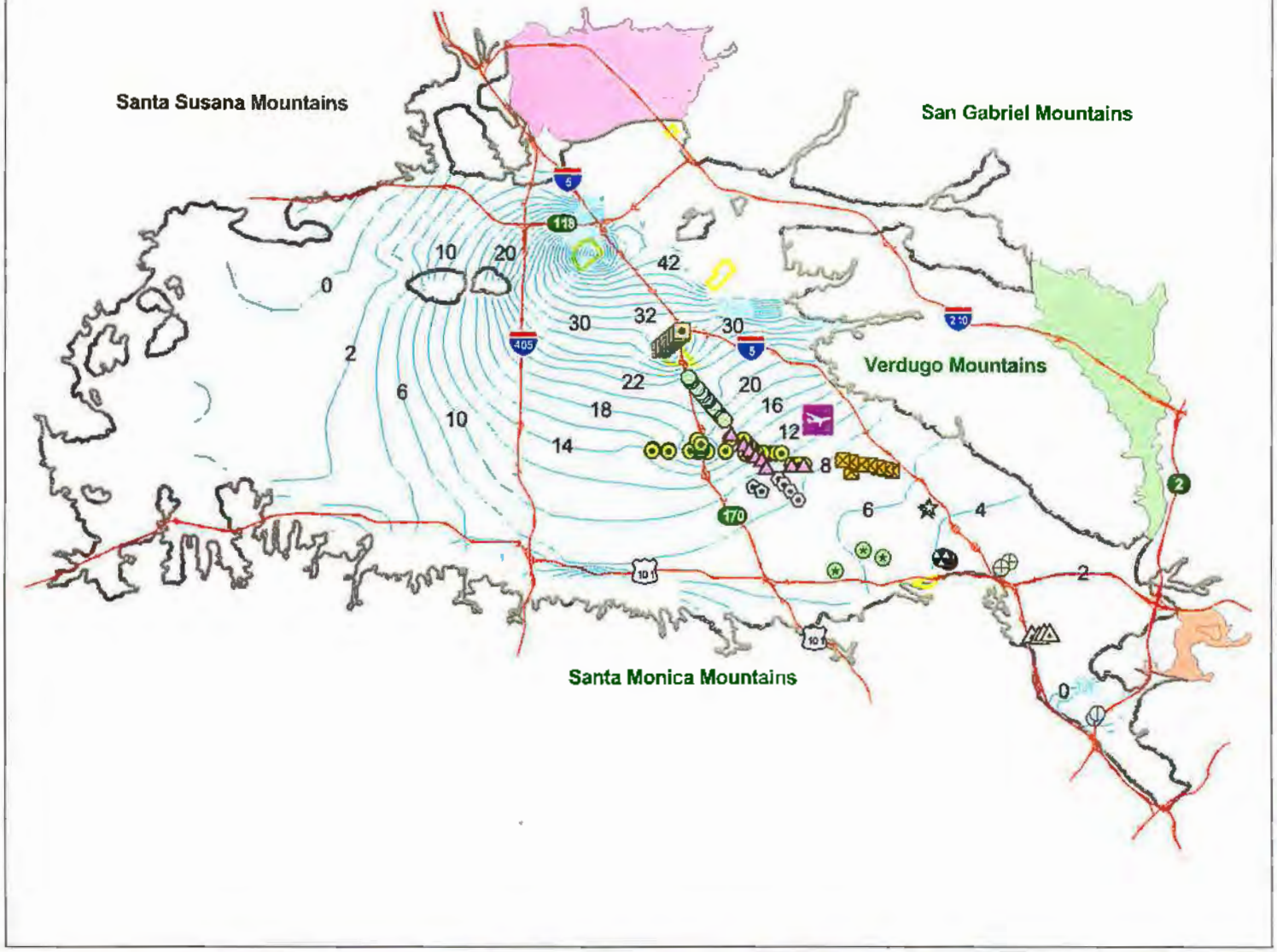
N

2 0 2 Miles

Change in Groundwater Elevation - Model Layer 1
Fall 2004 - Fall 2009

PLATE 4

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year



LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- Headworks
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

Change in GW Elev.

Freeway

Spreading Grounds

Burbank Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

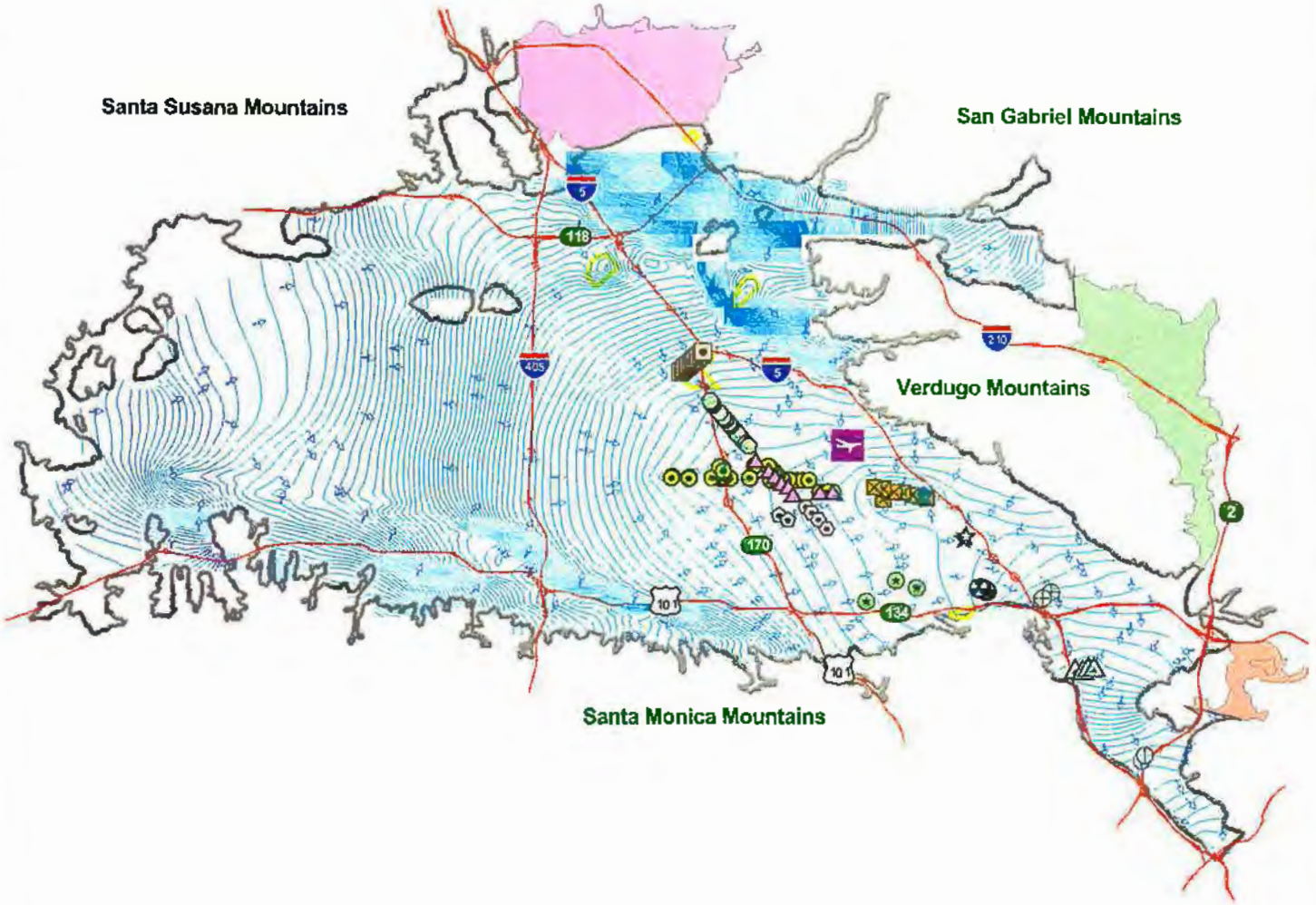
N

2 0 2 Miles

Change in Groundwater Elevation - Model Layer 2
Fall 2004 - Fall 2009

PLATE 5

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year



LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- Headworks
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

- Freeway
- Spreading Grounds
- Groundwater Contour
- Groundwater Flow Direction
- Burbank Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

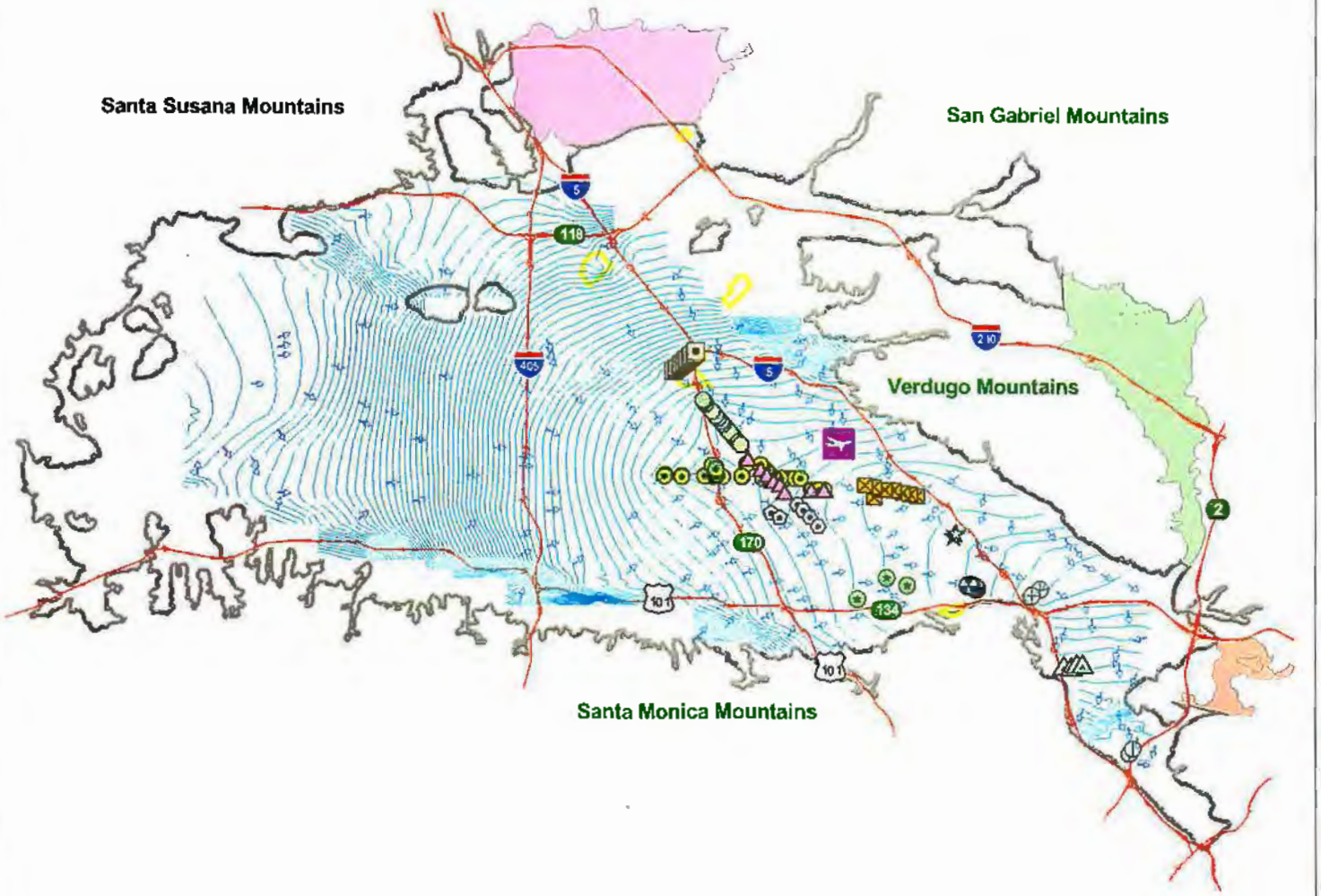
N

2 0 2 Miles

Simulated Groundwater Flow Direction - Model Layer 1
FALL 2009

PLATE 6

Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year



LEGEND

Well Fields

- Burbank OU
- Glendale North OU
- Glendale South OU
- Burbank GAC
- Headworks
- North Hollywood OU
- Pollock
- Tujunga
- Rinaldi - Toluca
- North Hollywood
- Whitnall
- Erwin
- Verdugo

- Freeway
- Spreading Grounds
- Groundwater Contour
- Groundwater Flow Direction
- Burbank Airport

Groundwater Basins

- San Fernando
- Sylmar
- Verdugo
- Eagle Rock

N

2 0 2 Miles

Simulated Groundwater Flow Direction - Model Layer 2
FALL 2009

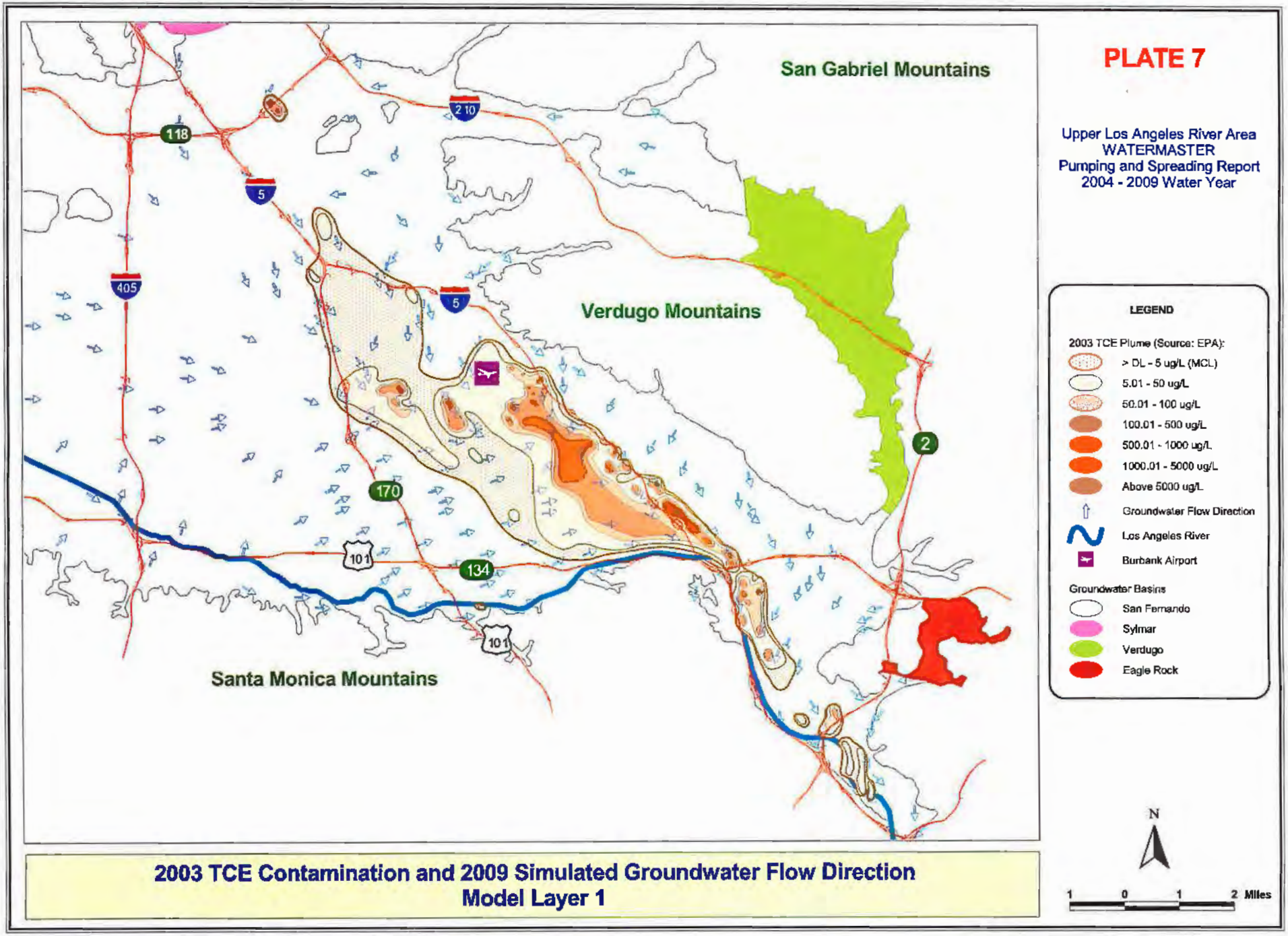


PLATE 7
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year
San Gabriel Mountains
Verdugo Mountains
Santa Monica Mountains
118
210
5
405
170
101
134
2
LEGEND
2003 TCE Plume (Source: EPA):
> DL - 5 ug/L (MCL)
5.01 - 50 ug/L
50.01 - 100 ug/L
100.01 - 500 ug/L
500.01 - 1000 ug/L
1000.01 - 5000 ug/L
Above 5000 ug/L
Groundwater Flow Direction
Los Angeles River
Burbank Airport
Groundwater Basins
San Fernando
Sylmar
Verdugo
Eagle Rock
N
1 0 1 2 Miles
2003 TCE Contamination and 2009 Simulated Groundwater Flow Direction
Model Layer 1

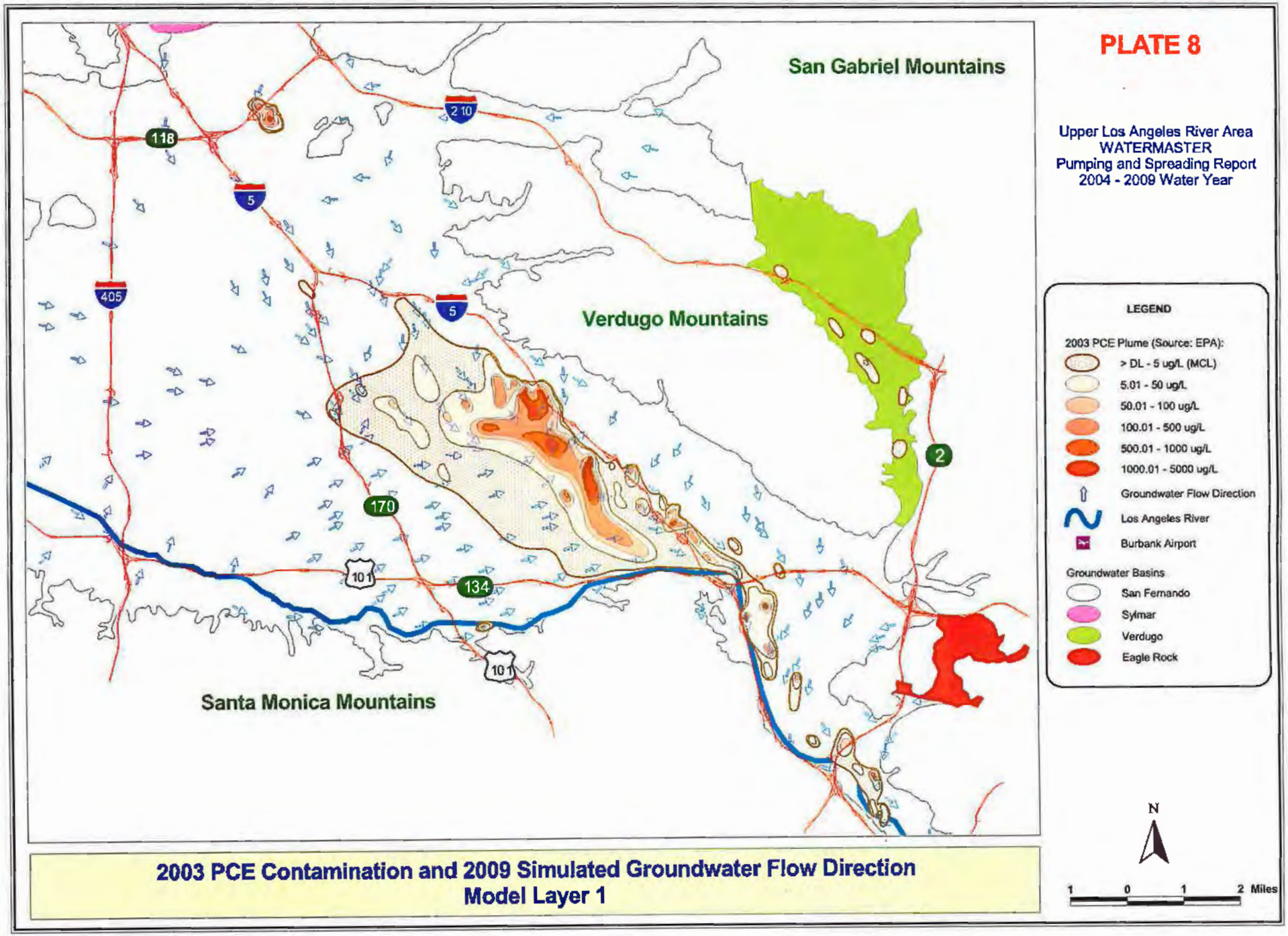


PLATE 8
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year
San Gabriel Mountains
Verdugo Mountains
Santa Monica Mountains
118
210
5
405
5
170
101
134
101
2
LEGEND
2003 PCE Plume (Source: EPA):
> DL - 5 ug/L (MCL)
5.01 - 50 ug/L
50.01 - 100 ug/L
100.01 - 500 ug/L
500.01 - 1000 ug/L
1000.01 - 5000 ug/L
Groundwater Flow Direction
Los Angeles River
Burbank Airport
Groundwater Basins
San Fernando
Sylmar
Verdugo
Eagle Rock
N
1 0 1 2 Miles
2003 PCE Contamination and 2009 Simulated Groundwater Flow Direction
Model Layer 1

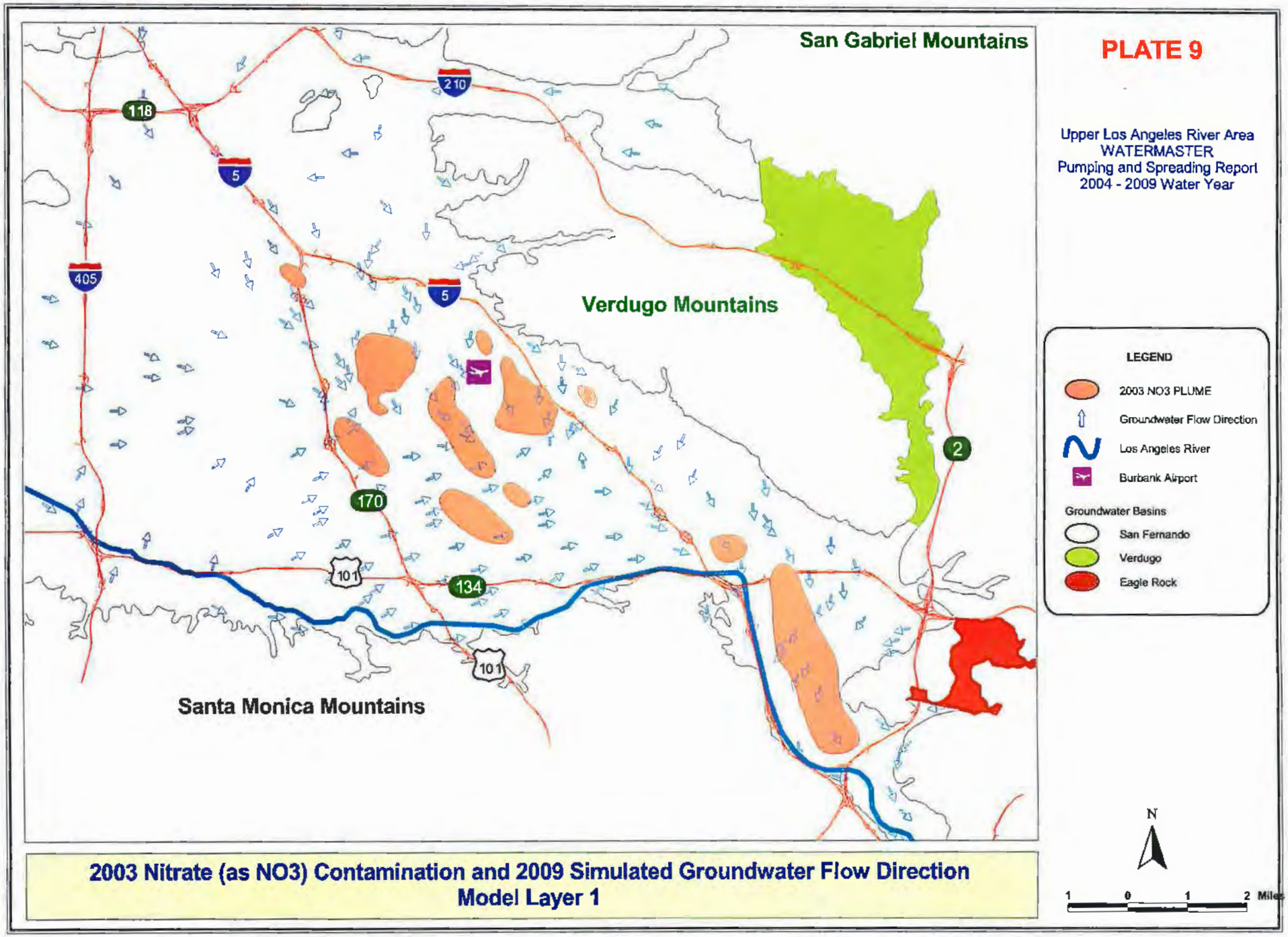


PLATE 9
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year
San Gabriel Mountains
Verdugo Mountains
Santa Monica Mountains
118
210
5
405
5
170
101
134
101
2
LEGEND
2003 NO3 PLUME
Groundwater Flow Direction
Los Angeles River
Burbank Airport
Groundwater Basins
San Fernando
Verdugo
Eagle Rock
N
1 0 1 2 Miles
2003 Nitrate (as NO3) Contamination and 2009 Simulated Groundwater Flow Direction
Model Layer 1

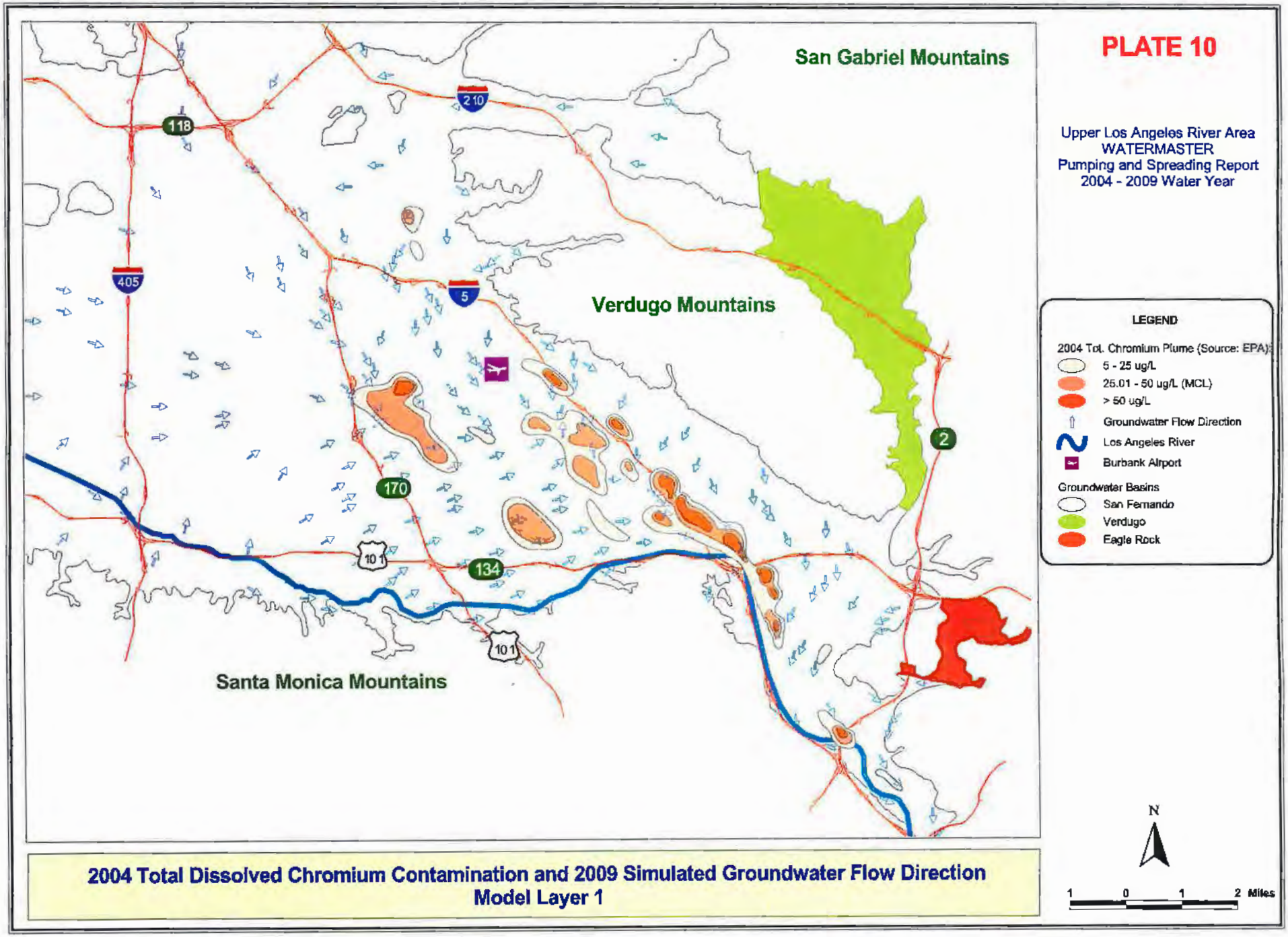


PLATE 10
Upper Los Angeles River Area
WATERMASTER
Pumping and Spreading Report
2004 - 2009 Water Year
San Gabriel Mountains
Verdugo Mountains
Santa Monica Mountains
118
210
405
5
170
101
134
2
LEGEND
2004 Tot. Chromium Plume (Source: EPA):
5 - 25 ug/L
25.01 - 50 ug/L (MCL)
> 50 ug/L
Groundwater Flow Direction
Los Angeles River
Burbank Airport
Groundwater Basins
San Fernando
Verdugo
Eagle Rock
N
1 0 1 2 Miles
2004 Total Dissolved Chromium Contamination and 2009 Simulated Groundwater Flow Direction
Model Layer 1

APPENDIX A

CITY OF LOS ANGELES

PUMPING AND SPREADING PLAN

2004-2009 Water Years

CITY OF LOS ANGELES
GROUNDWATER PUMPING AND SPREADING PLAN
IN THE UPPER LOS ANGELES RIVER AREA
FOR THE 2004-2009 WATER YEARS

APRIL 2005

Prepared by:
Groundwater Group
WATER RESOURCES BUSINESS UNIT
Los Angeles Department of Water and Power

TABLE OF CONTENTS

Introduction

The water rights in the Upper Los Angeles River Area (ULARA) were set forth in a Final Judgment, entered on January 26, 1979, ending litigation that lasted over 20 years. The ULARA Watermaster's Policies and Procedures give a summary of the decreed extraction rights within ULARA, together with a detailed statement describing the ULARA Administrative Committee operations, reports to and by the Watermaster and necessary measuring tests and inspection programs. The ULARA Policies and Procedures have been revised several times since the original issuance, to reflect current groundwater management thinking.

In Section 5.4 of the ULARA Policies and Procedures as amended in February 1998, it is stated that:

> *"...all parties or non-parties who pump groundwater are required to submit annual reports by May 1 to the Watermaster that include the following:*
>
> - *A 5-year projection of annual groundwater pumping rates and volumes.*
> - *A 5-year projection of annual spreading rates and volumes.*
> - *The most recent water quality data for each well."*

This report constitutes Los Angeles' 2005 Groundwater Pumping and Spreading Plan for the Water Years 2004 - 2009.

Section 1: Facilities Description

This section describes facilities that influence groundwater conditions in ULARA and relate to Los Angeles.

a.) Spreading Grounds: There are six spreading ground facilities that can be used for groundwater recharge of native water in ULARA. The Los Angeles County Department of Public Works (LACDPW) operates the Branford, Hansen, Lopez, and Pacoima spreading grounds; the City of Los Angeles Department of Water and Power (LADWP) operates the Headworks Spreading Grounds. LACDPW and LADWP operate the Tujunga Spreading Grounds cooperatively. Estimated capacities for these are shown in Table 1-1 and their locations are shown in Figure 1-1.

Table 1-1

Estimates Capacities of ULARA Spreading Grounds			
Spreading Ground	Type	Total wetted area [ac]	Capacity [ac-ft/yr.]
Operated by LACDPW			
Branford	Deep basin	7	1,000
Hansen	Shallow basins	105	35,000
Lopez	Shallow basins	12	2,000
Pacoima	Med. depth basins	107	23,000
Operated by LADWP			
Headworks*	Shallow basins	28	11,000
Operated by LACDPW and LADWP			
Tujunga	Shallow basins	83	43,000
TOTAL:			115,000

*Out of service since 1981-82.

b.) Extraction Wells: The LADWP has nine well fields in the San Fernando Basin, and one in the Sylmar Basin. The well fields are shown in Figure 1-1, and their rated capacities are shown in Table 1-2. The rated capacities are approximate as operating capacities vary depending on the water levels. Actual groundwater pumping is dependent on maintenance schedules and water quality for each well.

Table 1-2

Rated Capacities of LADWP Well Fields in ULARA				
Well Field	Number of Wells			Rated Capacity (cfs)
San Fernando Basin	Active	Stand-by	Total	cfs
Aeration	7	---	7	2.4
Crystal Springs (A)	---	---	---	---
Erwin	2	0	2	5
Headworks			---	---
North Hollywood	17	0	17	74.3
Pollock	2	0	2	6.3
Rinaldi-Toluca	15	---	15	108.8
Tujunga	12	---	12	104.6
Verdugo	2	---	2	8.3
Whitnall	4	---	4	19.5
Sylmar Basin				
Mission	2	---	2	6.2
TOTAL	63	0	63	335.4

(A) Wellfield has been abandoned pursuant to sale of property to DreamWorks, Inc.

c.) Groundwater Treatment Facilities: The LADWP operates two groundwater treatment facilities. Water treated at these facilities is delivered to the water distribution system for consumption.

North Hollywood Groundwater Treatment Facility: This plant was placed into service in December 1989 to treat up to 2,000 gpm of groundwater to remove VOCs by using aeration with granular activated carbon (GAC) for off-gas treatment. This facility is a part of the North Hollywood Operable Unit (NHOU) that also includes a system of shallow wells. The NHOU is financed, in part, by the U.S. Environmental Protection Agency.

Pollock Wells Treatment Plant: This plant was placed into service in March 1999 to remove VOCs from the groundwater at a rate up to 3,000 gpm from the Pollock Well Field. The facility features the use of liquid-phase GAC, restores the use of Pollock Wells, and addresses the excessive rising groundwater discharges from the San Fernando Basin into the Los Angeles River.

Section 2: Annual Pumping And Spreading Projections

a.) Pumping Projections for the Water Years 2004-2009: The City of Los Angeles has the following three sources of water supply: 1.) Los Angeles Aqueduct supply imported from the Owens Valley/Mono Basin area, 2.) Local groundwater supply from the Central, San Fernando, and Sylmar Basins, 3.) Purchased water from the Metropolitan Water District of Southern California (MWD). The MWD sources of supply are the State Water Project and the Colorado River Aqueduct. Use of San Fernando Basin groundwater can fluctuate annually depending on the availability of imported water which varies due to climatic and operational constraints.

The San Fernando Basin and Sylmar Basin provide most of the City's local groundwater supply. The City of Los Angeles has the following average annual water rights which comprise approximately 15% of the City's supply:

San Fernando Basin	87,000 AF
Sylmar Basin	3,255 AF

Table 2-1 shows the amount of groundwater extractions that are expected during the 2004-05 Water Year from the San Fernando and Sylmar Basins. Appendix B provides groundwater extraction projections from 2004 to 2009. These projections are based upon assumed demand and Los Angeles Aqueduct flows, and are subject to yearly adjustments.

Table 2-1

CITY OF LOS ANGELES
ACTUAL AND PROJECTED PUMPING FOR WY 04-05

San Fernando Basin		Actual Extraction (Acre-Feet)						Projected Extraction (Acre-Feet)					
	TOTAL	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05
AERATION	1,265	2	0	28	137	118	107	143	148	143	148	148	143
ERWIN	2,686	182	134	155	278	380	6	295	286	295	295	286	295
HEADWORKS	0	0	0	0	0	0	0	0	0	0	0	0	0
NORTH HOLLYWOOD	10,800	3,236	397	3	109	212	0	0	308	1,607	1,661	1,661	1,607
POLLOCK	1,914	124	65	39	147	269	178	179	185	179	185	185	179
RINALDI-TOLUCA	9,802	2,473	171	5	284	685	0	0	861	1,309	1,353	1,353	1,309
TUJUNGA	10,436	1,912	0	12	346	884	0	0	1,230	1,488	1,538	1,538	1,488
VERDUGO	4,904	460	355	252	463	659	6	0	554	536	554	554	512
WHITNALL	2,754	275	198	146	260	350	6	0	308	298	308	308	298
SAN FERNANDO BASIN TOTAL:	44,762	8,662	1,320	638	2,024	3,557	303	617	3,880	5,855	6,042	6,033	5,831
Sylmar Basin													
MISSION	2,250	0	0	0	0	0	0	369	381	369	381	381	369
ULARA TOTAL:	47,012	8,662	1,320	638	2,024	3,557	303	986	4,261	6,224	6,423	6,414	6,200

b.) Spreading Projections for the 2004-05 Water Year: Native groundwater recharge from captured storm runoff occurs primarily as a result of the use of man-made spreading grounds. Spreading grounds operations are primarily controlled by the LACDPW. Table 2-2 represents the anticipated spreading volumes for 2004-05.

Table 2-2

Actual and Projected Spreading in ULARA Spreading Grounds in 2004-05 (in acre-feet)							
	Operated by:						
	LACDPW				LADWP	LACDPW and LADWP	Monthly Total
Month	Branford	Hansen	Lopez	Pacoima	Headworks (A)	Tujunga	
Oct-04	183	2090	0	640		542	3455
Nov-04	25	1240	313	15		0	1593
Dec-04	135	2430	2	884		499	3950
Jan-05	532	5750	39	4170		3760	14251
Feb-05	243	3960	36	2620		961	7820
Mar-05	120	5620	250	5020		3820	14830
Projected							
Apr-05	50	9290	90	8524		7720	25674
May-05							0
Jun-05							0
Jul-05							0
Aug-05							0
Sep-05							0
Total	1288	30380	730	21873	0	17302	71573

Section 3: Water Quality Monitoring Program Description

All of LADWP's 63 active wells in ULARA are monitored in conformance with the requirements set forth in Title 22, California Code of Regulations. For all active wells, monitoring is required whether the well is in production or not. State regulations require the following types of monitoring regimens:

1. Inorganic compounds
2. Organic compounds
3. Phase II and V Initial monitoring
4. Radiological compounds
5. Quarterly organics compounds

Each well, whether on active or standby status, is monitored every three years for a full range of inorganic and organic compounds. Phase II and V Initial monitoring involves analysis for newly regulated organic compounds at all wells. Each well must be sampled for four consecutive quarters within a three-year period. Quarterly organic compounds analysis monitoring are performed four times a year for each well where organic compounds have been detected. A complete list of the parameters that must be tested for is contained in Title 22 of the California Code of Regulations. Appendix A provides a recent report for TCE, PCE, and nitrates in Los Angeles' San Fernando and Sylmar Basins wells.

Section 4: Groundwater Treatment Facilities Operations Summary

North Hollywood Operable Unit (NHOU): In November 2004 the Aeration Facility was shut down to install and test the new Power Control unit and to calibrate the new Relative Humidity (RH) temperature probe. Throughout the year there were problems with reduced water table impacting suction at the wells particulary Well No. 4.

	Aeration Well No.							Average Flow to Facility	Influent to Facility TCE/PCE	Effluent from Facility TCE/PCE
Mon/Yr	2	3	4	5	6	7	8	(gpm)	(ug/L)	(ug/L)
4/04	88	125	53	15	234	154	267	664	45.0/13.0	ND/ND
5/04	99	125	74	21	233	174	306	764	61.2/9.8	ND/ND
6/04	113	---	116	30	234	168	239	931	65.0/10.3	ND/ND
7/04	113	125	79	31	233	155	244	1120	55.0/10.5	ND/ND
8/04	95	110	37	36	233	156	244	815	72.3/11.2	ND/ND
9/04	107	110	40	30	200	140	245	668	NS	NS
10/04	96	118	54	21	---	202	---	---	NS	NS
11/04	---	---	---	---	---	---	---	---	NS	NS
12/04	118	99	32	26	228	167	---	927	61.5/8.07	<0.5/<0.5
1/05	112	99	---	23	223	140	257	1013	66.0/9.24	ND/ND
2/05	122	95	105	25	221	141	254	759	57.5/8.74	ND/ND
3/05	124	79	74	32	218	159	249	1136	57.4/9.7	ND/ND

Section 5: Plans For Facilities Modifications

This section describes any plans for modifications to existing facilities, or plans to construct new facilities in the 2004-2005 Water Year, as of the printing of this report (April 2005).

a.) Spreading Grounds:. LADWP plans to restore the full groundwater recharge capacity of the Tujunga Spreading Grounds by developing and implementing a mitigation action plan to control the methane gas migration from Sheldon-Arleta Landfill to the local neighborhood as a result of recharge. The Headworks Spreading Grounds is the site of multi-objective projects to improve water quality and storage, and to provide the community with an opportunity for passive recreation. The project includes a buried 110-million gallon reservoir for potable water storage. Construction is planned to commence in January 2007. The other Headworks component is the proposed wetlands project that is a joint effort between LADWP and the Army Corps of Engineers.

b.) Extraction Wells: LADWP is planning to add up to eight new North Hollywood Wells in the west branch to restore diminished capacity resulting from contamination and obsolescence of some existing wells.

c.) Groundwater Treatment Facilities:

North Hollywood Operable Unit. A feasibility study to improve the sustained production capacity of the NHOU well system to 2,000 gpm, to enhance the NHOU capture zone, and to improve the reliability of the NHOU to remain in operation is being reviewed by the USEPA. This plan includes the development of two or three new wells northwesterly of the NHOU. The discovery of hexavalent chromium above 5,000 ppb upgradient of the proposed well locations has created a need for a more extensive review of the consequences of implementing the plan. The USEPA, the City of Los Angeles, and the RWQCB are investigating the source of the hexavalent chromium contamination.

Reclamation Projects in the San Fernando Valley. The LADWP has plans to connect large recycled water customers over the next three years including the Hansen Dam Recreation Area, Valley Generating Station and Angeles National Golf Course in the eastern portion of the

Valley, and the Sepulveda Basin and Pierce College in the southern portion of the Valley. The present goal is to be able to fully utilize the 10,000 acre feet per year (AF/Y) originally intended for groundwater recharge as part of the East Valley Water Recycling Project. Tertiary treated recycled water from the Donald C. Tillman Water Reclamation Plant will be used, but only for non-potable projects. The Hansen Area Water Recycling Project Phase I, scheduled to be on line by early 2006.

APPENDIX A:
2004-2005 Water Quality Sampling Results

ULARA WELLS

	Owner Name	Well Name	Well	Date	PCE 5 ppb	TCE 5 ppb	NO3 45 ppm
1	NHE-1	3800E	NH AERATION WELL-001	6/17/98	3.66	240.00	
2	NHE-2	3810U	NH AERATION WELL-002	2/2/05	5.63	0.90	42.60
3	NHE-3	3810V	NH AERATION WELL-003	2/16/05	5.87	19.70	41.80
4	NHE-4	3810W	NH AERATION WELL-004	8/25/04	17.80	46.80	45.20
5	NHE-5	3820H	NH AERATION WELL-005	2/16/05	36.80	39.80	50.90
6	NHE-6	3821J	NH AERATION WELL-006	2/16/05	9.26	14.10	26.50
7	NHE-7	3830P	NH AERATION WELL-007	2/2/05	7.51	155.00	26.50
8	NHE-8	3831K	NH AERATION WELL-008	2/16/05	9.29	48.20	36.60
9	EW-1	3831H	ERWIN-001	10/22/97	0.72	-99.00	
10	EW-2	3821G	ERWIN-002	5/4/95	4.30	13.20	
11	EW-3	3831G	ERWIN-003	7/30/96	1.40	24.00	14.66
12	EW-4	3821F	ERWIN-004	4/7/97	0.60	8.10	4.43
13	EW-6	3821H	ERWIN-006	2/2/05	0.80	2.29	25.50
14	EW-10	3811F	ERWIN-010	2/2/05	-99.00	-99.00	9.30
15	M-5	4840J	MISSION-005	6/20/03	-99.00	5.15	27.60
16	M-6	4840K	MISSION-006	2/24/05	-99.00	-99.00	9.30
17	M-7	4840S	MISSION-007	2/24/05	-99.00	1.35	25.70
18	NH-02	3800	NORTH HOLLYWOOD-002	9/28/99	5.06	36.50	32.40
19	NH-04	3780A	NORTH HOLLYWOOD-004	2/26/05	-99.00	-99.00	8.37
20	NH-07	3770	NORTH HOLLYWOOD-007	2/9/05	-99.00	-99.00	10.60
21	NH-11	3810	NORTH HOLLYWOOD-011	5/4/04	17.70	16.80	25.50
22	NH-15	3790B	NORTH HOLLYWOOD-015				
23	NH-16	3820D	NORTH HOLLYWOOD-016	5/23/96	12.50	2.70	16.30
24	NH-17	3820C	NORTH HOLLYWOOD-017	12/9/97	6.16	1.65	11.92
25	NH-18	3820B	NORTH HOLLYWOOD-018	11/10/99	8.18	83.70	36.90
26	NH-20	3830C	NORTH HOLLYWOOD-020	7/21/99	3.00	9.58	39.50
27	NH-21	3830B	NORTH HOLLYWOOD-021	3/23/01			10.94
28	NH-22	3790C	NORTH HOLLYWOOD-022	2/9/05	-99.00	-99.00	12.90
29	NH-23	3790D	NORTH HOLLYWOOD-023	2/26/05	-99.00	-99.00	11.60
30	NH-25	3790F	NORTH HOLLYWOOD-025	1/29/04	-99.00	-99.00	14.20
31	NH-26	3790E	NORTH HOLLYWOOD-026	2/17/05	-99.00	-99.00	11.20
32	NH-27	3820F	NORTH HOLLYWOOD-027	4/23/02	-99.00	-99.00	10.40
33	NH-28	3810K	NORTH HOLLYWOOD-028	5/4/04	18.00	17.00	25.70
34	NH-30	3800D	NORTH HOLLYWOOD-030	6/18/03	1.12	8.08	25.00
35	NH-32	3770C	NORTH HOLLYWOOD-032	11/19/04	-99.00	-99.00	1.43
36	NH-33	3780C	NORTH HOLLYWOOD-033	2/26/05	-99.00	-99.00	8.11
37	NH-34	3790G	NORTH HOLLYWOOD-034	2/17/05	-99.00	-99.00	8.82
38	NH-35	3830N	NORTH HOLLYWOOD-035	11/15/01	2.81	1.22	10.40
39	NH-36	3790H	NORTH HOLLYWOOD-036	2/17/05	-99.00	-99.00	8.42
40	NH-37	3790J	NORTH HOLLYWOOD-037	2/17/05	-99.00	-99.00	10.00
41	NH-38	3810M	NORTH HOLLYWOOD-038				
42	NH-39	3810N	NORTH HOLLYWOOD-039				
43	NH-40	3810P	NORTH HOLLYWOOD-040	5/4/04	1.85	1.63	9.30
44	NH-41	3810Q	NORTH HOLLYWOOD-041	5/8/01	5.63	47.20	14.13
45	NH-42	3810R	NORTH HOLLYWOOD-042	5/12/99	5.73	88.50	24.50
46	NH-43A	3790K	NORTH HOLLYWOOD-043A	2/17/05	-99.00	-99.00	8.90
47	NH-44	3790L	NORTH HOLLYWOOD-044	2/17/05	-99.00	-99.00	3.56
48	NH-45	3790M	NORTH HOLLYWOOD-045	2/17/05	-99.00	-99.00	8.24
49	P-4	3959E	POLLOCK-004	4/8/04	3.81	4.86	31.40
50	P-6	3958H	POLLOCK-006	2/17/05	9.66	8.47	40.40

NOTE: -99 = non-detect

- - - = not tested (refer to p.8)

= above MCL

ULARA WELLS

	Owner Name	Well Name	Well	Date	PCE 5 ppb	TCE 5 ppb	NO3 45 ppm
51	P-7	3958J	POLLOCK-007	6/2/03	-99.00	-99.00	13.50
52	RT-1	4909E	RINALDI-TOLUCA-001	1/21/05	-99.00	-99.00	8.59
53	RT-2	4898A	RINALDI-TOLUCA-002	2/18/05	-99.00	-99.00	12.90
54	RT-3	4898B	RINALDI-TOLUCA-003	2/25/05	-99.00	1.33	16.50
55	RT-4	4898C	RINALDI-TOLUCA-004	2/25/05	-99.00	-99.00	16.50
56	RT-5	4898D	RINALDI-TOLUCA-005	11/30/04	-99.00	-99.00	15.50
57	RT-6	4898E	RINALDI-TOLUCA-006	2/25/05	-99.00	-99.00	16.60
58	RT-7	4898F	RINALDI-TOLUCA-007	2/25/05	-99.00	0.69	17.50
59	RT-8	4898G	RINALDI-TOLUCA-008	2/25/05	-99.00	-99.00	17.70
60	RT-9	4898H	RINALDI-TOLUCA-009	10/6/04	-99.00	-99.00	17.90
61	RT-10	4909G	RINALDI-TOLUCA-010	2/18/05	-99.00	-99.00	9.66
62	RT-11	4909K	RINALDI-TOLUCA-011	2/18/05	-99.00	0.83	11.00
63	RT-12	4909H	RINALDI-TOLUCA-012	2/18/05	-99.00	-99.00	9.57
64	RT-13	4909J	RINALDI-TOLUCA-013	2/18/05	-99.00	0.69	10.00
65	RT-14	4909L	RINALDI-TOLUCA-014	2/18/05	-99.00	-99.00	9.97
66	RT-15	4909M	RINALDI-TOLUCA-015	2/18/05	-99.00	-99.00	8.46
67	TJ-01	4887C	TUJUNGA-001	2/11/05	-99.00	-99.00	17.60
68	TJ-02	4887D	TUJUNGA-002	2/11/05	-99.00	-99.00	15.80
69	TJ-03	4887E	TUJUNGA-003	1/5/05	-99.00	-99.00	18.80
70	TJ-04	4887F	TUJUNGA-004	2/11/05	0.90	2.87	24.70
71	TJ-05	4887G	TUJUNGA-005	2/11/05	3.17	10.40	38.10
72	TJ-06	4887H	TUJUNGA-006	2/11/05	2.32	9.48	34.60
73	TJ-07	4887J	TUJUNGA-007	1/12/05	3.28	15.90	45.60
74	TJ-08	4887K	TUJUNGA-008	2/11/05	2.59	12.20	51.80
75	TJ-09	4886B	TUJUNGA-009	2/11/05	4.03	13.70	44.30
76	TJ-10	4886C	TUJUNGA-010	2/11/05	1.26	7.89	45.60
77	TJ-11	4886D	TUJUNGA-011	1/12/05	1.38	14.60	43.10
78	TJ-12	4886E	TUJUNGA-012	2/11/05	1.38	8.74	21.40
79	V-1	3863H	VERDUGO-001	8/7/03	0.76	6.46	32.90
80	V-2	3863P	VERDUGO-002	2/26/03	0.78	18.30	38.70
80	V-2	3853F	VERDUGO-002	3/21/03	-99.00	3.60	36.10
81	V-4	3863J	VERDUGO-004	1/13/98	6.47	17.90	1.92
82	V-11	3863L	VERDUGO-011	2/2/05	-99.00	2.76	15.80
83	V-13	3853G	VERDUGO-013				
84	V-24	3844R	VERDUGO-024	2/2/05	-99.00	-99.00	8.64
85	WH-4	3821D	WHITNALL-004	2/1/05	1.95	4.09	14.10
86	WH-5	3821E	WHITNALL-005	2/1/05	4.58	11.00	31.00
87	WH-6A	3831J	WHITNALL-006A	2/1/05	1.02	2.72	10.20
88	WH-7	3832K	WHITNALL-007	2/1/05	3.71	6.95	25.00
89	WH-8	3832L	WHITNALL-008	10/22/96	4.60	10.20	
90	WH-9	3832M	WHITNALL-009				

NOTE: -99 = non-detect

- - - = not tested (refer to p.8)

= above MCL

APPENDIX B:
Groundwater Extraction Projections 2004-2009

PROJECTED PUMPING BY THE CITY OF LOS ANGELES FROM THE SAN FERNANDO AND SYLMAR BASINS FOR THE NEXT 5 YEARS (IN ACRE-FEET)

SAN FERNANDO BASIN (SFB) WELL FIELDS	WATER YEAR				
	2004-05	2005-06	2006-07	2007-08	2008-09
AERATION	1,264	1,500	1,500	1,500	1,500
ERWIN	2,886	2,886	2,886	2,886	2,886
HEADWORKS	0	0	0	0	0
NO HOLLYWOOD	10,801	22,408	22,408	22,408	22,408
POLLOCK	1,914	2,000	2,000	2,000	2,000
RINALDI-TOLUCA	9,803	27,134	27,134	27,134	27,134
TUJUNGA	10,436	23,413	23,413	23,413	23,413
VERDUGO	4,905	4,905	4,905	4,905	4,905
WHITNALL	2,754	2,754	2,754	2,754	2,754
TOTAL SFB ACRE-FEET	44,763	87,000	87,000	87,000	87,000

Sylmar Basin	2,250	3,300	3,300	3,300	3,300

APPENDIX B

CITY OF BURBANK

PUMPING AND SPREADING PLAN

2004-2009 Water Years

GROUNDWATER PUMPING
AND
SPREADING PLAN

FIVE WATER YEARS
OCTOBER 1, 2004 TO SEPTEMBER 30, 2009

Prepared by

BURBANK WATER AND POWER
WATER DIVISION

May 2005

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FIGURES

APPENDICES

I. INTRODUCTION

The groundwater rights of the City of Burbank are defined by the JUDGMENT in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et. al., Defendants". The Final Judgment was signed on January 26, 1979.

In 1993, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Section 2.9, Groundwater Quality Management. This addition has been made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup and limiting the spread of contamination in the San Fernando Valley. This report is in response to Section 2.9.4, Groundwater Pumping and Spreading Plan.

The Groundwater Pumping and Spreading Plan is based on the water year, October 1 to September 30. The Draft Plan for Burbank will be submitted in May to the Watermaster for the current water year.

II. WATER DEMAND

The annual total water demand for the last ten years and the projected annual water demand for the next five years are shown in Table 2.1.

Water demand during 1990 to 1993 was affected by drought conditions in California. The City of Burbank imposed mandatory conservation from April 1991 to April 1992. Voluntary conservation was in effect prior to, and since, this period. Significant "hard conservation" in the form of retrofit showerheads and ultra-low flush toilet installations has been made.

Projected water demands for the next five years are expected to increase only slightly from the 1989-90 base year. The increase is not from residential growth, but as a rebound from the drought conditions and re-establishment of commercial-industrial demand. The projected water demand may vary significantly due to weather and/or economic conditions in the Burbank area. A variance of ±5% may be expected.

III. WATER SUPPLY

The water supply for the City of Burbank is composed of purchased water from the Metropolitan Water District of Southern California (MWD), locally produced and treated groundwater, and reclaimed water from the Burbank Water Reclamation Plant.

A. MWD

The amount of treated water purchased from the MWD has been reduced as the result of bringing several water resource projects on-line. Burbank may purchase additional quantities of untreated water for basin replenishment. See Section IV. Historic and projected use of MWD water is shown in Table 3.1.

B. GAC TREATMENT PLANT

The City placed a granular activated carbon (GAC) Treatment Plant in service in November 1992. Historic and projected production from this plant is shown in Table 3.2. The GAC Treatment Plant would normally be operated during the summer season from May to October. However, current plans are to keep the plant shut down, except for emergencies, because of hexavalent chromium in the well water. The GAC treatment process does not remove chromium, and blending facilities are not available. Total chromium in the plant effluent would exceed the limit of five parts per billion (ppb) set by Burbank City Council policy for water delivered to the distribution system. New chromium regulations due in 2005-06 will lead to decisions on the future use of the water. When the plant is operated, shutdowns for carbon change-out can be expected every two months. Mechanical maintenance will be performed when the plant is out of service during the winter season. The GAC Treatment Plant uses the groundwater produced from Well No. 7 and Well No. 15 (Figure 3.1). The plant capacity is 2,000 gpm.

Additionally, Lockheed Martin has arranged to utilize the capacity of the GAC Treatment Plant to augment the production of the Burbank Operable Unit (BOU) to reach the required annual average of 9,000 gpm. Lockheed Martin will pay a share of the operation and maintenance cost of the GAC in proportion with the volume of water which is credited toward the 9,000 gpm.

C. EPA CONSENT DECREE

The EPA Consent Decree Project became operational January 3, 1996. The source of water is wells VO-1 through VO-8 (Figure 3.1). The Second Consent Decree was entered on June 22, 1998. The plant was out of service from December 15, 1997 to December 13, 1998. The plant capacity is 9,000 gpm. Historic and projected water production from the Burbank Operable Unit (BOU) is shown in Table 3.3.

D. RECLAIMED WATER

The City has used reclaimed water for its power plant cooling since 1967. An expansion of the reclaimed water system to DeBell Golf Course was completed in 1996. Incremental expansion of the reclaimed water system has been ongoing since 2001 and is projected to continue for the next 20 years. Historic and proposed use of reclaimed water is shown in Table 3.4.

E. PRODUCTION WELLS

The City has five wells that are mechanically and electrically operable, plus the eight wells of the BOU. Two wells are on "Active" status and three are on "Inactive" status with the Department of Health Services (DHS). Three others have had equipment pulled. We do not plan to operate the inactive wells unless an emergency develops in the 2003-2004 water year.

Active Wells	Inactive Wells	Well Casings
No. 7 No. 15	No. 6A No. 13A No. 18*	No. 11A No. 12 No. 17

*No transformer; cannot be operated.

IV. JUDGMENT CONSIDERATIONS

A. PHYSICAL SOLUTION

The City has a physical solution right of 4,200 acre-feet per year in addition to its import return water extraction rights and use of stored water credits. The City will charge the following physical solution right holders for water used and claim the extractions against the City's rights:

Physical Solution Producers	
Valhalla	300 acre-feet
Lockheed Martin	25 acre-feet

Table 3.3 lists the extractions by Lockheed Martin. Table 4.1 lists the extractions by Valhalla.

B. STORED WATER CREDIT

The City has a stored water credit of 22,038 acre-feet as of October 1, 2004.

C. ALLOWANCE FOR PUMPING

The import return water extraction right (20 percent of water delivered the prior year) for the 2004-2005 water year is 4,847 acre-feet. This amount is exclusive of additional extractions allowed due to the City's stored water credits, physical solution right or pumping for groundwater clean-up.

Estimated allowable future pumping, based on 23,000 acre-feet of delivered water, will be 4,600 acre-feet per year.

D. SPREADING OPERATIONS

The City has purchased water for basin replenishment since 1989. The water has been typically spread at the Pacoima Spreading Grounds by L.A. County Public Works Department with the assistance of the Los Angeles Department of Water and Power (LADWP). The LADWP water pipelines to the Pacoima Spreading Ground were damaged during the 1994 Northridge earthquake. Replenishment water, beginning in water year 1994-95, has been taken "in lieu" through MWD service connection LA-35 at the L.A. Treatment Plant. The historic and projected spreading water is shown in Table 4.2.

Burbank is currently preparing to construct an MWD connection at the end of the Foothill Feeder Tunnel. (See Figure 4.1.) The connection will be capable of delivering 50 cubic feet per second (cfs). This will allow spreading of 6,000 to 8,000 acre-feet per year of purchased water at the Pacoima Spreading Grounds as soon as it can be completed, perhaps by summer of 2006.

V. CAPITAL IMPROVEMENTS

A. WELLS

Burbank: Burbank has retained the services of a consultant to conduct an efficiency study of the BOU wells and well water transmission system. Proposed capital improvements may result from the Well Field Performance Attainment Study now underway.

We plan to continue the use of Wells No. 7 and No. 15 for the GAC Treatment Plant when it is operated.

Maintenance Activity- Wells 14A, 17 and 18: These wells are planned to be destroyed in accordance with County standards. Well 14A was destroyed in July 2003. Wells 17 and 18 will be destroyed during Fiscal Year 2005-06.

B. GROUNDWATER TREATMENT FACILITIES

EPA Project: The EPA Consent Decree Project became fully operational on January 3, 1996. Production and treatment of 3,000 gpm to 8,000 gpm was performed through mid-September 1996.

The EPA Consent Decree Project was removed from production on December 15, 1997 for plant modifications required under the Second Consent Decree.

Due to problems in obtaining a new operating permit from DHS, the treatment plant did not resume operations until December 12, 1998. During the outage, water was pumped and treated only for production testing. Production from December 1998 through September 1999 increased from 5,000 gpm to 9,000 gpm as the plant came fully on-line.

In late June 2000, the treatment plant went off-line due to a breakthrough of 1,2,3- trichloropropane (TCP) in the plant effluent. The plant did not return to service until DHS had approved an operation and sampling plan and the carbon was changed out in the wet phase contactors. Well VO-6 was removed from service at that time because it had high concentrations of 1,2,3-TCP. The overall production of the BOU was also reduced at this time due to general mechanical problems in the BOU, including the vapor phase GAC screens, the wearing of well pumps/motors and the failure of well level sensors. While these problems were being analyzed, Lockheed Martin invoked a "*force majeure*" provision of the Second Consent Decree in October 2001. EPA has ruled against the *force majeure* claim. The results of the Well Field Performance

Attainment Study will guide the next step in optimizing the BOU facilities to reliably produce 9,000 gpm.

The City has had responsibility, through its contractor, United Water Services, for full operation of the BOU since March 12, 2001.

The distribution headers and underdrains in the liquid phase carbon contactors were being replaced during the summer of 2003. The work was completed in December of 2003. Design of replacement screens for the vapor phase carbon contactors is in progress. Construction is projected for late 2005.

GAC Treatment Plant: Burbank does not plan to use the production and treatment facilities of the GAC Treatment Plant during the 2004-2005 water year. The plant will remain on an active status, but will not be operated except for emergencies.

TABLE 2.1
ACTUAL AND PROJECTED WATER DEMAND

Water Year	Acre – Feet
94-95	23,003
95-96	23,188
96-97	24,845
97-98	22,447
98-99	22,672
99-00	26,313
00-01	25,619
01-02	24,937
02-03	23,129
03-04	24,357
04-05*	22,900
05-06*	25,382
06-07*	25,610
07-08*	25,839
08-09*	26,071

* Projected

NOTES:

(1) Water demand equals the total delivered water. [Extractions (GAC & EPA), MWD, Reclaimed, Valhalla].

(2) The last five year average water demand was 24,871 acre-feet.

TABLE 3.1
ACTUAL AND PROJECTED MWD TREATED WATER DELIVERIES

Water Year	Acre-Feet
94-95	17,173
95-96	12,937
96-97	10,525
97-98	16,972
98-99	10,536
99-00	10,471
00-01	12,447
01-02	12,086
02-03	13,158
03-04	13,751
04-05*	14,000
05-06*	12,568
06-07*	12,076
07-08*	12,305
08-09*	12,537

*Projected

NOTES:

(1) All values shown above are for treated water.

TABLE 3.2
ACTUAL AND PROJECTED LAKE STREET GAC TREATMENT PLANT PRODUCTION

Water Year	Acre-Feet
94-95	2,590
95-96	2,295
96-97	1,620
97-98	1,348
98-99	1,542
99-00	1,086
00-01	987
01-02	0
02-03	0
03-04	0
04-05*	0
05-06*	0
06-07*	0
07-08*	0
08-09*	0

*Projected

NOTES:

(1) The Lake Street GAC Treatment Plant has a treatment capacity of 2,000 gpm.

(2) Wells No. 7 and No. 15 supply water for the GAC Treatment Plant. Proposed production rates (if the plant is used) are as follows:

Well No. 7	1,050 gpm
Well No. 15	850 gpm

(3) GAC Treatment Plant production was reduced beginning in water year 1996-97 to accept the required flows from the EPA Consent Decree Project.

(4) The GAC Treatment Plant has been shut down since March 2001 because of chromium 6 concerns.

TABLE 3.3
ACTUAL AND PROJECTED VALLEY/ BOU TREATED GROUNDWATER PRODUCTION

Water Year	Acre-Feet
94-95	0 (3)
95-96	5,737 (3)
96-97	9,280
97-98	2,102
98-99	9,042
99-00	11,345
00-01	9,046
01-02	10,402
02-03	9,100
03-04	9,660
04-05*	7,500
05-06*	10,164
06-07*	10,884
07-08*	10,884
08-09*	10,884

*Projected

NOTES:

(1) Burbank includes BOU extractions in its pumping rights.
(2) Lockheed Martin has a physical solution right of 25 AF/year.
(3) Table 3.3 shows extractions charged to Burbank. During the water years 1993-94, 1994-95 and 1995-96, Lockheed-Martin produced water for testing of the EPA Consent Decree Project. The Watermaster did not charge Burbank for these amounts shown below. Production for municipal use began in January 1996. GAC flushing and treatment bypass were accounted for separately and charged to a 'basin account' (following table), but beginning June 2003, most such losses are charged to Burbank as "non-municipal use" and included above. Non-municipal use is not included in deliveries used to calculate the 20% return water credit.

Water Year	AF	Water Year	AF	Water Year	AF	Water Year	AF
1994-95	462	1997-98	478	2000-01	88	2003-04	0
1995-96	34	1998-99	142	2001-02	138		
1996-97	320	1999-2000	107	2002-03	70		

(4) The City of Burbank is currently using water from the BOU under an Operation Permit, issued in October 2000, from the California Department of Health Services.

TABLE 3.4
ACTUAL AND PROJECTED RECLAIMED WATER DELIVERIES

Water Year	Acre-Feet
94-95	2,480
95-96	1,880
96-97	3,120
97-98	1,744
98-99	1,210
99-00	2,979
00-01	2,732
01-02	2,087
02-03	488
03-04	549
04-05*	1,100
05-06*	2,350
06-07*	2,350
07-08*	2,350
08-09*	2,350

*Projected

NOTES:

1) The source of reclaimed water is the Burbank Water Reclamation Plant.
2) The Magnolia Power Project will begin using reclaimed water in the second half of WY 2004-05

TABLE 4.1
ACTUAL AND PROJECTED EXTRACTIONS OF GROUNDWATER BY VALHALLA

Water Year	Acre- Feet
94-95	298
95-96	339
96-97	300
97-98	281
98-99	342
99-00	432
00-01	407
01-02	362
02-03	383
03-04	397
04-05*	300
05-06*	300
06-07*	300
07-08*	300
08-09*	300

*Projected

NOTES:

(1) Burbank includes extractions by Valhalla in its pumping rights.

(2) Valhalla has physical solution right of 300 AF/year.

TABLE 4.2
ACTUAL AND PROJECTED BURBANK SPREADING OPERATIONS

WATER YEAR	ACRE-FEET
94-95	5,380 (2)(3)
95-96	2,000 (3)
96-97	1,500 (3)
97-98	0
98-99	2,000 (3)
99-00	0
00-01	0
01-02	0
02-03	300 (3)
03-04	44 (4)
04-05*	1,000 (5)
05-06*	3,850 (6)
06-07*	5,050
07-08*	6,000
08-09*	6,200

*Projected

NOTES:

1) The Maclay pipeline was damaged in the 1994 Northridge earthquake. Deliveries to the Pacoima Spreading Grounds are precluded until repaired by the LADWP.
2) Total for 95-96 includes 2,000 AF in-lieu transfer through LA, 2,200 AF Physical Solution purchase 3/96, and 802 and 378 AF Watermaster account credits.
3) The City exercised its physical solution right in water years 1994-95, 1995-96, 1996-97, 1998-99, and 2002-03 for basin replenishment.
4) In WY 2003-04, 44 AF of stored water credit was transferred from Glendale to Burbank to compensate for April 2004 water transfer via system interconnection.
5) In WY 2004-05, Burbank is arranging to spread LA Aqueduct water at Pacoima and to deliver an equal amount of State Project water to LADWP.
6) A new connection to MWD is planned to allow the necessary spreading at Pacoima Spreading Grounds starting in summer 2006. (Figure 4.1)

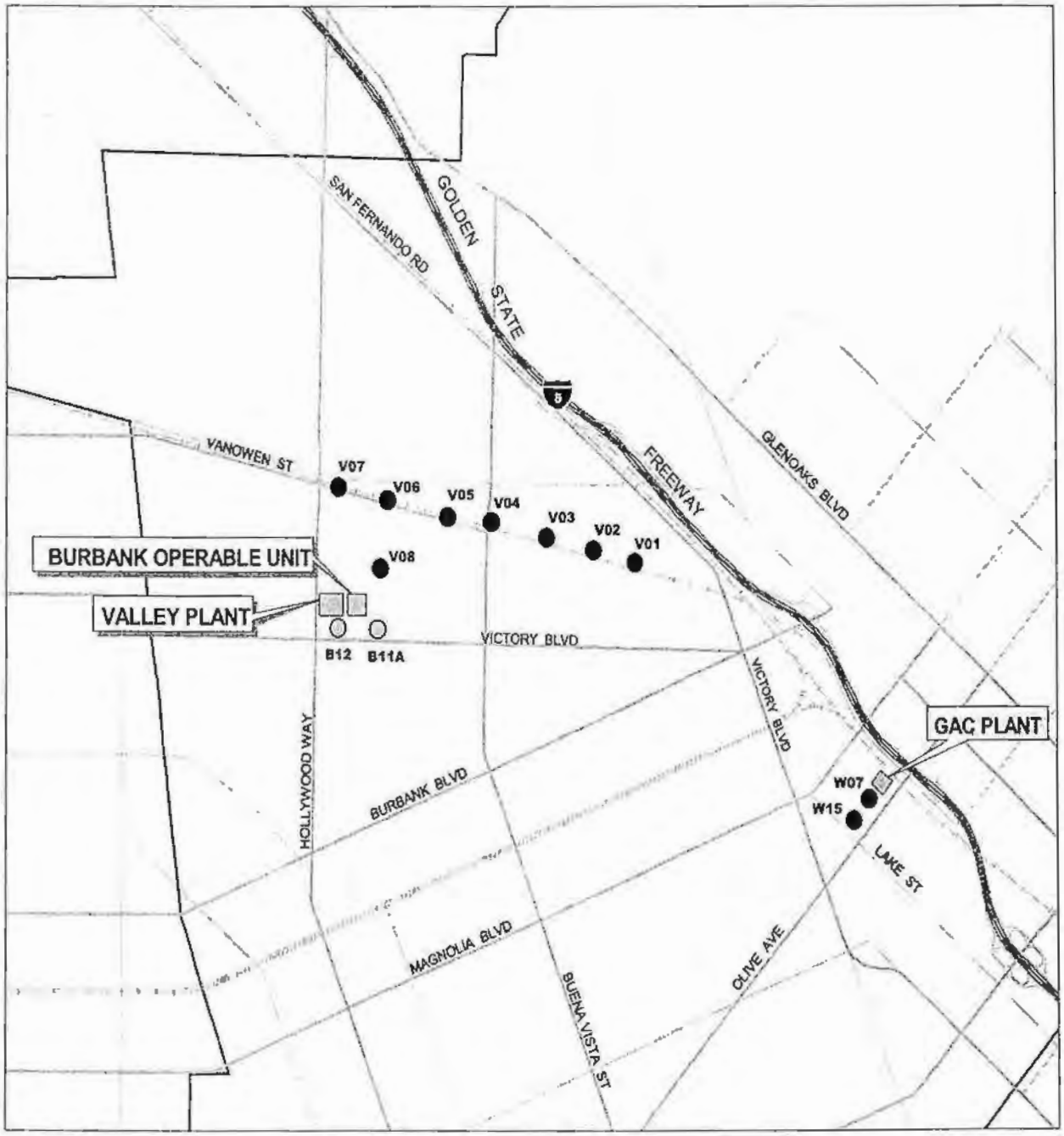


FIGURE 3.1
WELLS AND GROUNDWATER TREATMENT PLANTS

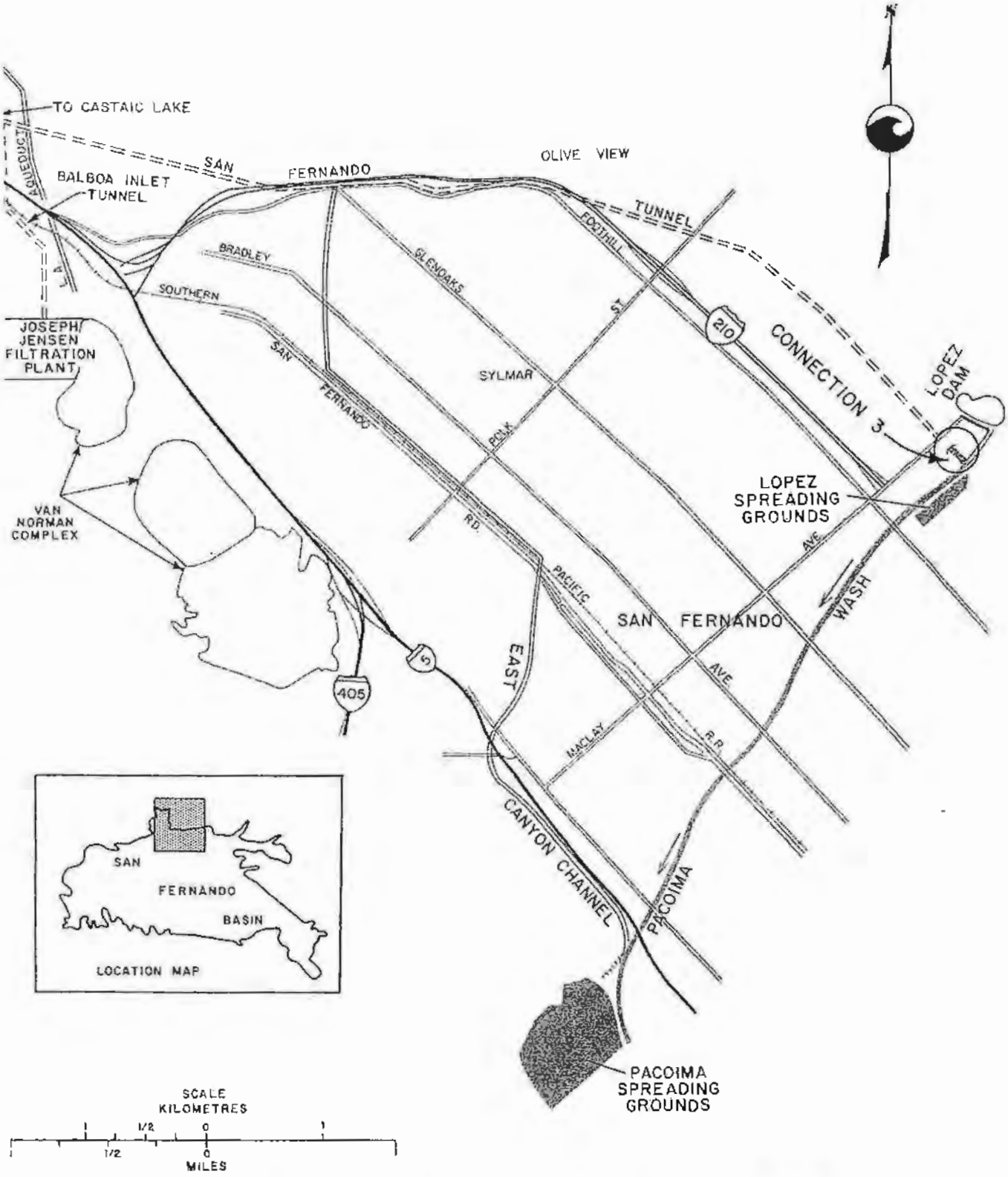


FIGURE 4.1
LOCATION OF PROPOSED MWD UNTREATED WATER CONNECTION

APPENDIX A

WATER QUALITY DATA

The 2004 Annual Water Quality Report is not yet available. Water Quality monitoring and testing of supply sources is not included with this report.

APPENDIX B

WATER TREATMENT FACILITIES

LAKE STREET GAC TREATMENT PLANT

320 North Lake Street
Burbank CA 91502

OPERATOR:

City of Burbank
Burbank Water and Power, Water Division

Albert Lopez, Water Production/ Operations Superintendent

QUANTITY TREATED (10/1/03 through 10/1/04):

None—plant remained on standby

WATER QUALITY:

Contaminant VOC'S: TCE, PCE, 1,2-DCE, 1,2-DCA

DISPOSITION:

Burbank Water System
Potable Water

EPA CONSENT DECREE PROJECT – BURBANK OPERABLE UNIT

2030 North Hollywood Way
Burbank CA 91505

OPERATOR:

City of Burbank
Burbank Water and Power, Water Division

Albert Lopez, Water Production/ Operations Superintendent

QUANTITY TREATED (10/1/03 through 10/1/04):

9,539 Acre-Feet for domestic use

WATER QUALITY:

Contaminants: VOCs, Nitrate, Chromium, 1,2,3-TCP

DISPOSITION:

(1) Test Water- Waste

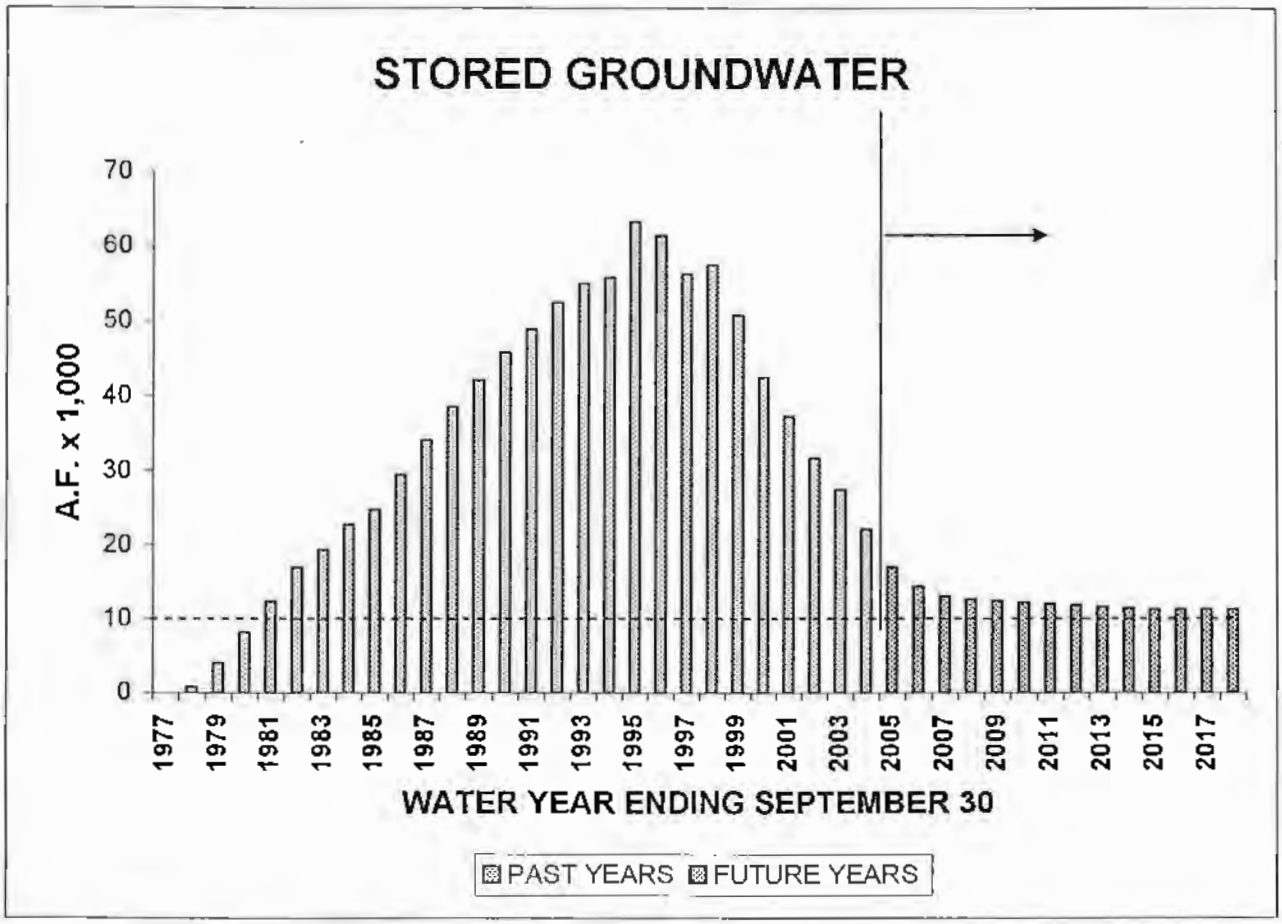
(2) Operation Water (backwash, etc.) - Waste

(3) Burbank Water System-
Potable water after blending

APPENDIX C

STORED GROUNDWATER

BURBANK WATER AND POWER
WATER DIVISION
FY 2004/05



NOTES:

- 10,000 AF RECOMMENDED AS BASIN BALANCE. THIS EQUATES TO ABOUT ONE YEAR OF DOMESTIC SYSTEM PRODUCTION IF REPLENISHMENT NOT AVAILABLE FROM MWD.
- DRAW DOWN STORED WATER BY PRODUCTION EXCEEDING THE RETURN FLOW CREDIT (~4,600 AF) PLUS SPREAD WATER OR PHYSICAL SOLUTION CREDITS.
- GROUNDWATER PRODUCTION EQUALS EPA (10,700 AF) AND VALHALLA (300 AF).
- RAMP UP SPREADING WATER PURCHASES BEGINNING WATER YEAR 2004-05 TO MAINTAIN BASIN BALANCE.

CITY OF BURBANK WATER AND POWER
WATER DIVISION

BURBANK'S STORED GROUNDWATER

70% EPA - With Ramp

WATER YEAR	DELIVERED WATER AF	RETURN FLOW CREDIT AF	SPREAD WATER AF	PUMPED GROUNDWATER AF	STORED WATER CREDIT AF
1976-77	22,743	4,549			
1977-78	22,513	4,503		3,767	(1) 782
1978-79	24,234	4,847		1,358	(2) 3,947
1979-80	24,184	4,837		677	8,117
1980-81	25,202	5,040		595	12,359
1981-82	22,120	4,424		523	16,676
1982-83	22,118	4,424		2,002	19,298
1983-84	24,927	4,985		1,063	22,659
1984-85	23,641	4,728		2,863	24,781
1985-86	23,180	4,636		123	29,386
1986-87	23,649	4,730		0	34,022
1987-88	23,712	4,742		253	38,498
1988-89	23,863	4,773		1,213	42,027
1989-90	23,053	4,611	378	1,401	45,777
1990-91	20,270	4,054	504	2,032	48,860
1991-92	20,930	4,186	503	938	52,479
1992-93	21,839	4,368	500	(3) 2,184	54,981
1993-94	24,566	4,913	0	(3) 3,539	55,810
1994-95	22,541	4,508	5,380	2,888	63,215
1995-96	23,124	4,625	2,000	8,308	61,415
1996-97	24,888	4,977	1,500	11,243	56,297
1997-98	22,447	4,489	0	3,731	57,543
1998-99	22,671	4,534	2,000	13,262	50,770
1999-2000	26,312	5,262	0	12,862	42,442
2000-01	25,619	5,124	0	10,440	37,264
2001-02	24,937	4,987	0	10,764	31,624
2002-03	23,108	4,622	300	9,483	27,428
2003-04	24,235	4,847	44	10,057	22,037
2004-05	23,000	4,600	1,000	11,000	16,884
2005-06	23,000	4,600	3,850	11,000	14,334
2006-07	23,000	4,600	5,050	11,000	12,984
2007-08	23,000	4,600	6,000	11,000	12,584
2008-09	23,000	4,600	6,200	11,000	12,384
2009-10	23,000	4,600	6,200	11,000	12,184
2010-11	23,000	4,600	6,200	11,000	11,984
2011-12	23,000	4,600	6,200	11,000	11,784
2012-13	23,000	4,600	6,200	11,000	11,584
2013-14	23,000	4,600	6,200	11,000	11,384
2014-15	23,000	4,600	6,200	11,000	11,184
2015-16	23,000	4,600	6,400	11,000	11,184
2016-17	23,000	4,600	6,400	11,000	11,184
2017-18	23,000	4,600	6,400	11,000	11,184

NOTES:
(1) STORED WATER AS OF OCTOBER 1, 1978
(2) STORED WATER AS OF OCTOBER 1, 1979
(3) EXCLUDES 150 A.F. OF PUMPING FOR TESTING.
SPREAD WATER INCLUDES PHYSICAL SOLUTION PURCHASES, IN-LIEU STORAGE, AND OTHER TRANSFERS
COLUMNS (1) THROUGH (5) - FROM ULARA WATERMASTER REPORTS
COLUMN (2) = 20% OF COL. (1)
COLUMN (5) = COL.(2) PREV. YR. - COL.(4) CUR. YR. + COL.(5) PREV. YR. + COL.(3) CUR. YR.
PUMPED GROUNDWATER INCLUDES CITY, VALHALLA, LOCKHEED, & DISNEY.
SHADED AREAS OF TABLE ARE PROJECTED VALUES .

APPENDIX C

CITY OF GLENDALE

PUMPING AND SPREADING PLAN

2004-2009 Water Years

CITY OF GLENDALE

GROUNDWATER PUMPING AND SPREADING PLAN

WATER YEARS 2004-2009

Prepared By

GLENDALE WATER & POWER

MAY 2005

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INTRODUCTION

This report discusses historic water supplies to Glendale, future water demands, and new sources of local water available to meet demands and reduce dependency on imported water. This information is needed by a wide group of individuals and organizations including Glendale's City Manager and Council Members, regulatory agencies, others interested in Glendale's water resource future and, more recently, to demonstrate adequate water supplies for the future development in the City.

EXISTING WATER SOURCES AND SUPPLIES

The City has four sources of water available to meet its long-term water demands, the San Fernando Basin, the Verdugo Basin, Metropolitan Water District of Southern California (MWD), and recycled water from the Los Angeles – Glendale Water Reclamation Plant. Location of these sources is shown in Figure 1.

SAN FERNANDO BASIN

Water Rights and Supplies - The City's right to San Fernando Basin groundwater supplies is defined in The City of Los Angeles, Plaintiff, vs. The City of San Fernando, ET. al., Defendants, (Judgment). The Final Judgment of 1979 concluded litigation over San Fernando Basin water rights that began in 1955. Location of the San Fernando Basin is shown in Figure 2. The California Supreme Court found that under "Pueblo" Water Rights, Los Angeles owns all San Fernando surface and groundwater supplies, and that the cities of Burbank and Glendale are entitled to only an annual Return Flow credit. There is also a Physical Solution Water Right that allows for additional but limited extractions for payment. Various categories of San Fernando Basin water supplies are:

Return Flow Credits - Glendale has a right to extract 20 percent of all water, including recycled water, it delivered in the San Fernando Basin. This does not apply to waters delivered to the Verdugo Basin. This return flow credit is about 5,500 acre-feet per year (AFY).

Accumulated Groundwater Rights -- Glendale has the right to store groundwater credits and extract an equivalent amount. Because Glendale was not been able to fully utilize its right to Return Flow Credits from 1979 to 2000 due to the presence of volatile organics in the groundwater, the stored water credits accumulated to a peak of almost 80,000 AF in 2000. With the completion of the Glendale Water Treatment Plant, extraction of water from the basin started in July 2001

Physical Solution Water Rights - Glendale has a secondary right to produce additional water called Physical Solution Water. Glendale has a 5,500 AFY physical solution allowance. This would be charged to the City of Los Angeles' extraction rights in exchange for payment roughly equivalent to MWD's water costs less the energy cost for extraction.

Pumping for Groundwater Cleanup - Section 2.5 of the Upper Los Angeles River Area's Policies and Procedures, dated July, 1993, provides for the unlimited extraction of basin water for SUPERFUND activities, subject to payment of specified charges similar to physical solution water.

Carry-Over Extractions - In addition to current extractions of return flow water and stored water (discussed later), Glendale may, in any one year, extract from the San Fernando Basin an amount not to exceed ten percent (10%) of its last annual credit for import return water, subject to an obligation to replace such over-extraction by reduced extraction during the next water year. This provides an important year-to-year flexibility in meeting water demands.

Water Quality - San Fernando Basin production was greatly reduced between 1980 and 2000 because of the volatile organic compounds in the groundwater. The U. S. Environmental Protection Agency (EPA) established Operable Units in North Hollywood, Burbank, and Glendale to extract and treat the contaminated groundwater.

The Glendale Operable Unit consists of eight extraction wells, a 5,000 gpm water treatment plan and pipelines between the facilities. The Grandview Pumping Plant, a chloramination station, and a blend line from the MWD G-3 connection were needed to put the treated water into the distribution system. A general layout of these facilities is

shown on Figure 4. This source will provide over 7,200 AFY to the City and will meet about 23 percent of projected near-term water demands.

There is additional groundwater production of 400 AFY by Forest Lawn Memorial Park for irrigation purposes, and 25 AFY for use of the cooling towers at the Glendale Power Plant for a total of 7,625 AFY from the San Fernando Basin.

Summary – Glendale has extraction rights to about 5,500 AFY plus an additional 5,500 AFY of physical solution allowance. Because of the Glendale Water Treatment Plant, the City can use 7,200 AFY from the Operable Unit wells, plus 400 AFY produced by Forest Lawn Memorial Park used for irrigation purposes, and 25 AFY for use of the cooling towers at the Glendale Power Plant. The annual production from the San Fernando Basin totals 7,625 AFY. This represents about 20 percent of the year 2025 water demands as shown in Table 6.

VERDUGO BASIN

Water Rights and Supplies – The Judgment gave Glendale the right to extract 3,856 AFY from the Verdugo Basin, shown on Figure 2. Glendale has a long history of pumping water from this basin. It was the primary source of water during the formation of the City in the early 1900s. The production of water varies year to year depending on rainfall. The City operates three extraction wells constructed prior to 1950. To increase production from this basin, Glendale constructed the Verdugo Park Water Treatment Plant (VPWTP). It consists of two new shallow wells and the underground water infiltration pick-up system, and a diatomaceous earth filtration plant. The plant has a capacity of 1,150 gpm. This water is delivered to the potable water supply system.

Even with the VPWTP, the City has not been able to fully utilize their Verdugo Basin extraction rights. The reduced yield from this basin is attributed to low rainfall and the replacement of septic tanks with wastewater lines in the La Cresenta area. It is anticipated that the City can produce about 2,300 AFY from this basin.

Water Quality – Historically, the only water quantity parameter of concern in the Verdugo Basin is the high nitrates from past septic tanks in the La Crescenta area. Since the areas have been sewered, the nitrate levels have decreased in recent years

and are below the MCL of 10 ppm. Even so, the groundwater is blended with MWD supplies and monitored weekly.

Summary – If the City were able to fully utilize its rights to these supplies, about ten percent of demands could be met from this supply. Realistically, based on historical pumping records, only 2,300 AFY will be available from this source on a reliable basis, and will provide about 7 percent of the City's water needs. Location of the VPWTP and wells are shown on Figure 3.

METROPOLITAN WATER DISTRICT

The Metropolitan Water District of Southern California (MWD) provides supplemental water from Northern California via the State Water Project and the Colorado River via the Colorado River Aqueduct. The location of these aqueducts is shown on Figure 5. Within its service area, it has 26 member agencies that provide water to 16 million people. Glendale is one of the member agencies.

Glendale has three service connections to MWD. Service connection number and capacity are summarized in Table 1. The City and MWD is currently in the works to increase the capacity of the G-3 to 20* cfs to meet the new blending demands from the GWTP.

TABLE 1
METROPOLITAN CONNECTIONS AND CAPACITY

Service Connection Number	Capacity (cfs)
G-1	48
G-2	10
G-3	12*

RECYCLED WATER

Since the late 1970's, the City of Glendale has been delivering recycled water from the Los Angeles/Glendale Water Reclamation Plant (LAGWRP). This is a 20 million gallon-per-day (MGD) facility that is owned by the Cities of Los Angeles and Glendale. Each City is entitled to one-half of the treated flows from the plant for recycled water deliveries. Effluent not used in the recycled water systems for Los Angeles and Glendale is discharged to the Los Angeles River. The City of Glendale has four major recycled water projects reviewed below.

Power Plant Project - Recycled water deliveries were first made to the Glendale Power Plant for use in the cooling towers and to Caltrans for irrigation along the 134 Freeway near the 5 Freeway in the late 1970's. A pipeline was constructed from the LAGWRP to the Glendale Power Plant.

Forest Lawn Project – This project, completed in 1992, was a joint project with the City of Los Angeles. This facility, a 30-inch diameter pipeline project, was constructed to deliver recycled water for irrigation to Forest Lawn Memorial Park in south Glendale. It was later expanded to irrigate the median on Brand Boulevard south of Colorado Boulevard.

Los Angeles proposes to extend the system from its south Glendale terminus into Elysian Park and into the downtown Los Angeles area.

Verdugo – Scholl Project was designed to deliver recycled water to Oakmont Country Club, Scholl Canyon Golf Course, and Scholl Canyon Landfill. Another major user is Cal Trans for irrigation along the 134 and 2 Freeways. Additional users include Glendale Community College, Glendale High School, Sport Complex, and the Central Library. Due to the request of the Home Owners Association of Polygon Homes, the City is studying the possibility of extending the RW service to irrigate the hills and landscape area they maintain.

The portion of the project up to Scholl Canyon was a joint effort with the City of Pasadena. Pasadena provided funds for Glendale to the size the facilities to accommodate future deliveries to Pasadena for their projects.

Brand Park Project consists of a pumping plant, storage tanks, and pipeline from the Glendale Power Plant to a tank above Brand Park. This section delivers recycled water for irrigation to Brand Park, Grandview Cemetery and along the street medians on Glenoaks Boulevard.

Delivery System - Recycled water delivery system is now comprised of 20 miles of mains, 5 storage tanks, pumping plants and 43 customers currently using about 1,400 AFY. Specific features of the recycled water program are shown in more detail on Figure 6 including location of various recycled water projects. Schematic diagram of the recycled water system is shown on Figure 7. Recycled water use has increased from 770 AF in 1992-93 to 1,698 AF in 2003-04. Expected deliveries from the various projects are shown on Table 2. The objective is to increase the use of recycled water to meet 6 percent of demands. This will require a significant increase in users and expansion of the system. The list of recycled water users is shown in detail on Figure 8.

TABLE 2

RECYCLED WATER USE (AFY)

PROJECTS	2000	2005	2010	2020
Brand Park	111	170	170	170
Forest Lawn Pipeline	242	350	350	350
Power Plant Pipeline	472	450	450	450
Verdugo-Scholl Pipeline	839	1,020	1,040	1,080
TOTAL	**1,664**	**1,990**	**2,010**	**2,050**

High-Rise Office Building - The City requires dual plumbing system in new high-rise office buildings so when recycled water becomes available, it can be used for sanitary flushing purposes in the buildings without retrofitting. A list of office buildings that have been dual plumbed is provided on Table 3.

Glendale Community College has recently completed on-site plumbing changes to utilize recycled water on two of their dual plumbed buildings. They started delivery of recycled water for toilet flushing in April 2004. We are currently working with the college on the installation of swivel-el connection for use during any RW service interruption.

The City started a chlorination program for the recycled water storage facilities a few years ago in anticipation of the higher quality expected for dual plumbing purposes. Substantial improvement in odor and bio-growth in the system was noted.

TABLE 3

Office Buildings Dual Plumbed to Use Recycled Water for Sanitary Programs

Location	Stories
655 N Central Avenue	24
400 N Brand Boulevard	15
450 N Brand Boulevard	15
Glendale Community College Classroom and Library	4
Glendale Police Building	4

Summary of Supplies

A general summary of the City's rights to local water resources compared to the amount currently being used is shown on Table 4.

TABLE 4

LOCAL WATER USE (AFY)

Potential Source	Right	Current Use	Future Use
San Fernando Basin[1]	About 5,400	7,870 AFY	7,625
Verdugo Basin	3,856	2,170 AFY	2,300
Recycled Water	10,000	1,500 AFY	2,050

PAST WATER USE, CURRENT AND TRENDS

Historically, the City used ground water to meet a varying portion of its water demand. In the 1940's and 1950's essentially all of the City's water needs were obtained from the San Fernando and the Verdugo Basins with limited supplies from Metropolitan. In the 1960's, production from the San Fernando Basin reached a peak of about 18,000 acre-feet per year (AFY). The Grandview wells in the San Fernando Basin had a peak capacity of about 24,000 gpm.

In the mid-1970's, the City limited production from the San Fernando Basin to about 12,000 AFY as part of a court decree arising from a lawsuit by the City of Los Angeles.

Other limitations to ground water use occurred in the late 1970's, when production from the Verdugo Pick-up System in the Verdugo Basin was discontinued because of possible water quality problems.

---

(1) Return flow credit only.

In late 1979, Assembly Bill 1803 required that all water agencies using ground water must conduct tests for the presence of certain industrial solvents. The tests indicated that volatile organic compounds (VOCs), in particular, trichloroethylene (TCE) and perchloroethylene (PCE) were present in the San Fernando Basin. Both chemicals were used extensively in the past by the aerospace, metal plating, and dry cleaning industries. As the VOC plume spread across the basin, Glendale and other water agencies in the San Fernando Basin began shutting down wells as the VOC concentrations approached the State Department of Health Service maximum contaminant levels (MCL). As a result, the City production from the basin declined to about 400 ac-ft per year. This use was limited to the Glendale Power Plant for cooling tower make-up water and irrigation at Forest Lawn Memorial Park.

In the 1980's, the U. S. Environmental Protection Agency designated the San Fernando Basin as a Superfund site. After a decade of studies, and facility design and construction, a water treatment plant, eight extraction wells and collection lines to the treatment plant, a delivery line to the Grandview Pumping Station, a blend line from the MWD G-3 connection to reduce nitrate levels, and a chloramination facility, were completed in the summer of 2000 to begin the use of San Fernando Basin water supplies. This plant is called the Glendale Water Treatment Plant (GWTP). A general layout of the plant facilities is shown on Figure 4. GWTP has produced 6,890 AF in 2002-03 WY and 7,280 AF in 2003-04 WY.

The City also completed construction of the Goodwin Treatment facility in December 2002. This GAC facility can remove VOCs from one of the higher chromium wells before delivering the effluent to the Recycled Water system. This was constructed as a contingency to meet upcoming regulations on hexavalent chromium.

Ten of the old Grandview Wells in the San Fernando Basin were decommissioned in December 2002. Figure 9 shows the historic and projected water use from the various sources. The annual water use in Glendale for water year 2003-04 was 35,611 AFY. In 1991-92, the use was about 25,782 AFY because of mandatory conservation.

Water use in WY 1997-98 was below normal because of the very heavy rain (El Nino) during the first half of 1998. However, with the below normal rainfall in WY 1998-99, water use was up significantly as shown on Table 5. In the water year 2003-04, the use was 35,610 AFY and is equivalent to an average daily use of 31.5 million gallons per day (MGD).

TABLE 5

TOTAL ANNUAL WATER DEMAND

Water Year	Demand	Comments
1992-93	28,010 AF	
1997-98	29,660 AF	Heavy Rainfall (El Nino)
1998-99	31,530 AF	Below Normal Rainfall
1999-00	34,740 AF	
2000-01	33,810 AF	
2001-02	33,720 AF	
2002-03	34,180 AF	
2003-04	35,610 AF	
2005	*32,554 AF*	*Projected*
2010	*33,824 AF*	
2020	*36,821 AF*	
2025	*38,600 AF*	

PROJECTED WATER DEMANDS AND SOURCES

Projection Methodology - MWD uses the U.S. Army Corps of Engineers IWR-MAIN (Municipal and Industrial Needs) water demand forecasting system modified for 51 of the larger cities in MWD's service area including Glendale. The model (MWD-MAIN) is

used to project water demands incorporating a wide range of economic, demographic, and climatic factors. Specific data includes projected population, housing mix, household occupancy, housing values, weather conditions, and conservation measures. The forecasts generate expected demands during a year of normal weather conditions. This modeling is considered the state-of-the-art approach in projecting demands and is being used by an increasing number of major cities in the country for water demand forecasting.

Projected Water Use - The projected water demand using MWD-MAIN calibrated for Glendale shows the overall water demand for year 2005 of 32,554 AFY, for year 2020 a demand of 36,821 AFY and 38,600 for the year 2025. These figures were based on incorporating projected population, housing, and employment data into the MWD-MAIN water demand forecasting model for Glendale along with a weather variable. The year 2020 demand reflects a modest increase over current use even though Glendale is essentially "built-out". These projections incorporate the 1981 and 1992 California plumbing codes changes requiring ultra-low flush toilets beginning in 1992, along with a continuation of current drought oriented public education and information programs. As additional conservation measures are carried out, there could be still more reductions in projected use.

Future Water Sources - The basic objective of the City's Water Resource Plan has been to develop more local supplies. Currently, about 66% of the water used in the City comes from MWD. This compares to 90% just a few years ago before building new facilities and the use of the San Fernando Basin water supplies. Because there is no increase in future groundwater supplies, the projected growth in the City's water demand will be met by MWD and Recycled Water. The change in source of water to be used in the City between now and year 2025 is presented on Figure 10.

TABLE 6
HISTORIC AND PROJECTED WATER USE IN GLENDALE (AF)

Fiscal Year	San Fernando Basin	Verdugo Basin	Recycled Water	MWD Water	Total
Historic					
1980-81	761	3,488	300	22,647	27,196
1985-86	6,089	2,733	300	22,080	31,202
1990-91	2,440	1,132	396	24,925	28,893
1991-92	1,476	732	551	23,023	25,782
1992-93	426	909	770	25,905	28,010
1993-94	550	1,225	620	27,044	29,439
1994-95	441	1,662	914	26,213	29,230
1995-96	496	2,059	886	27,905	31,346
1996-97	467	2,569	1,112	28,150	32,298
1997-98	267	2,696	1,087	25,626	29,678
1998-99	409	2,720	1,458	26,642	31,229
1999-00	515	2,451	1,738	28,731	33,435
2000-01	673	2,105	1,664	29,033	33,475
2001-02	4,013	2,120	1,500	26,264	33,897
2002-03	8,524	1,495	1,376	21,924	33,318
2003-04	7,872	2,174	1,517	23,774	35,337
Projected					
2005	7,625	2,300	1,990	20,639	32,554
2010	7,625	2,300	2,010	21,889	33,824
2015	7,625	2,300	2,030	23,136	35,091
2020	7,625	2,300	2,050	24,846	36,821
2025	7,625	2,300	2,050	26,625	38,600

A:\RAYNOTARIO\ZIPC\GWPSPLANWY2004-09 FWD
MAY 2005

FIGURES

FIGURE 1

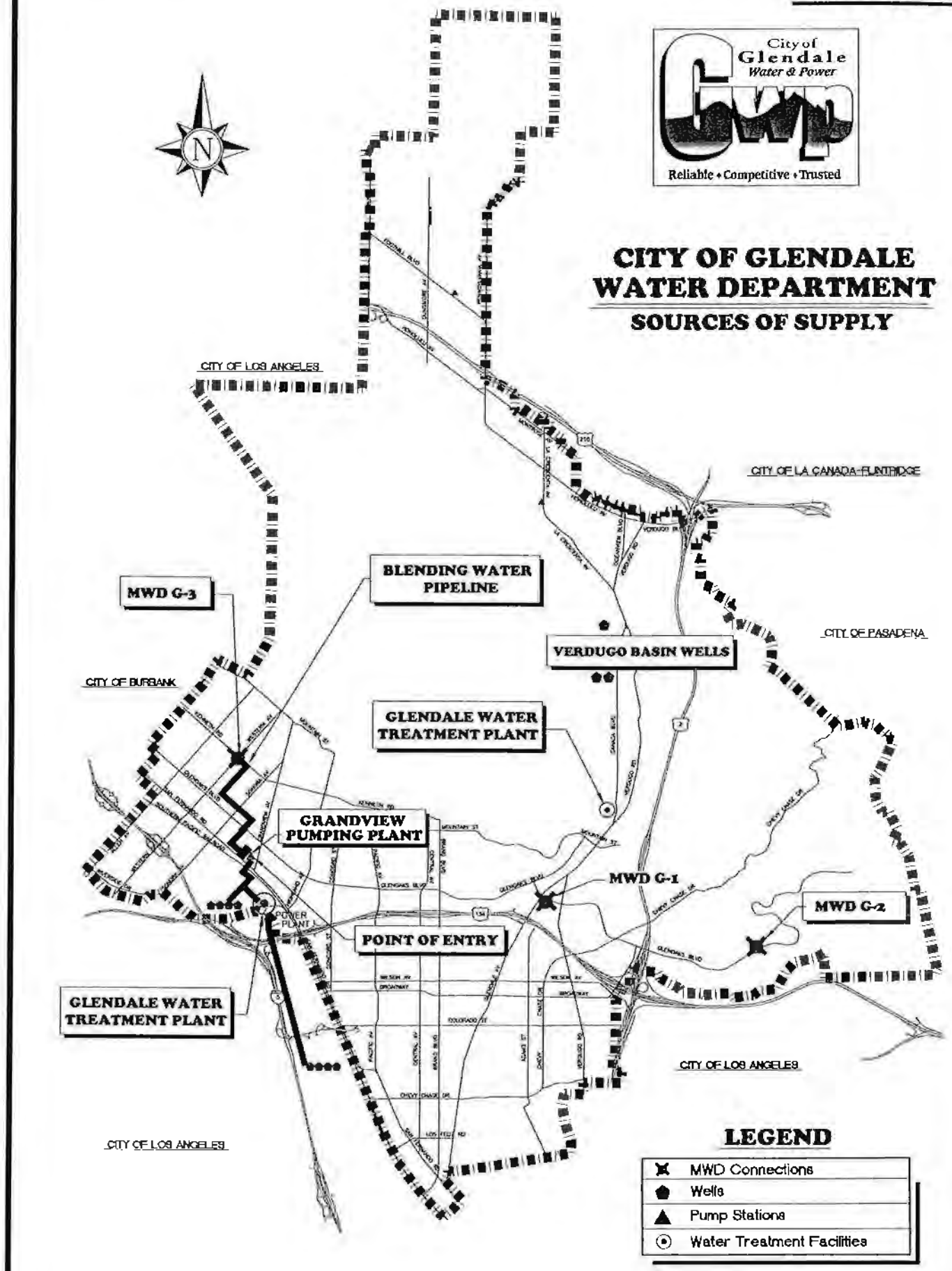
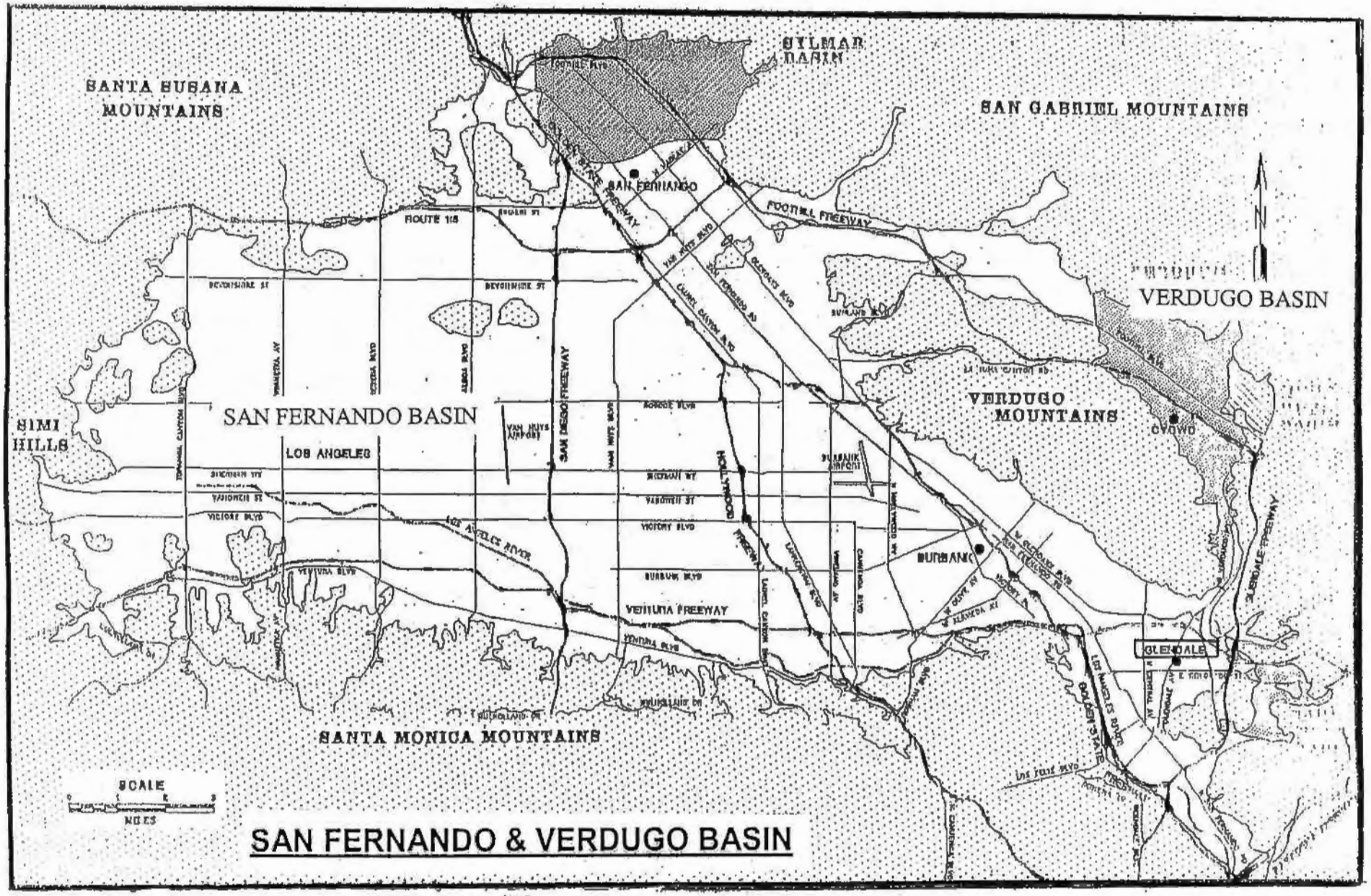

City of Glendale
Water & Power
GWP
Reliable • Competitive • Trusted
CITY OF GLENDALE
WATER DEPARTMENT
SOURCES OF SUPPLY
CITY OF LOS ANGELES
CITY OF LA CANADA-FLINTRIDGE
CITY OF PASADENA
CITY OF BURBANK
MWD G-3
BLENDING WATER PIPELINE
VERDUGO BASIN WELLS
GLENDALE WATER TREATMENT PLANT
GRANDVIEW PUMPING PLANT
MWD G-1
MWD G-2
POWER PLANT
POINT OF ENTRY
GLENDALE WATER TREATMENT PLANT
CITY OF LOS ANGELES
CITY OF LOS ANGELES
LEGEND
MWD Connections
Wells
Pump Stations
Water Treatment Facilities

FIGURE 2



SAN FERNANDO & VERDUGO BASIN

FIGURE 3

CITY OF GLENDALE

VERDUGO PARK WATER TREATMENT PLANT PICK-UP AND WELL SYSTEM

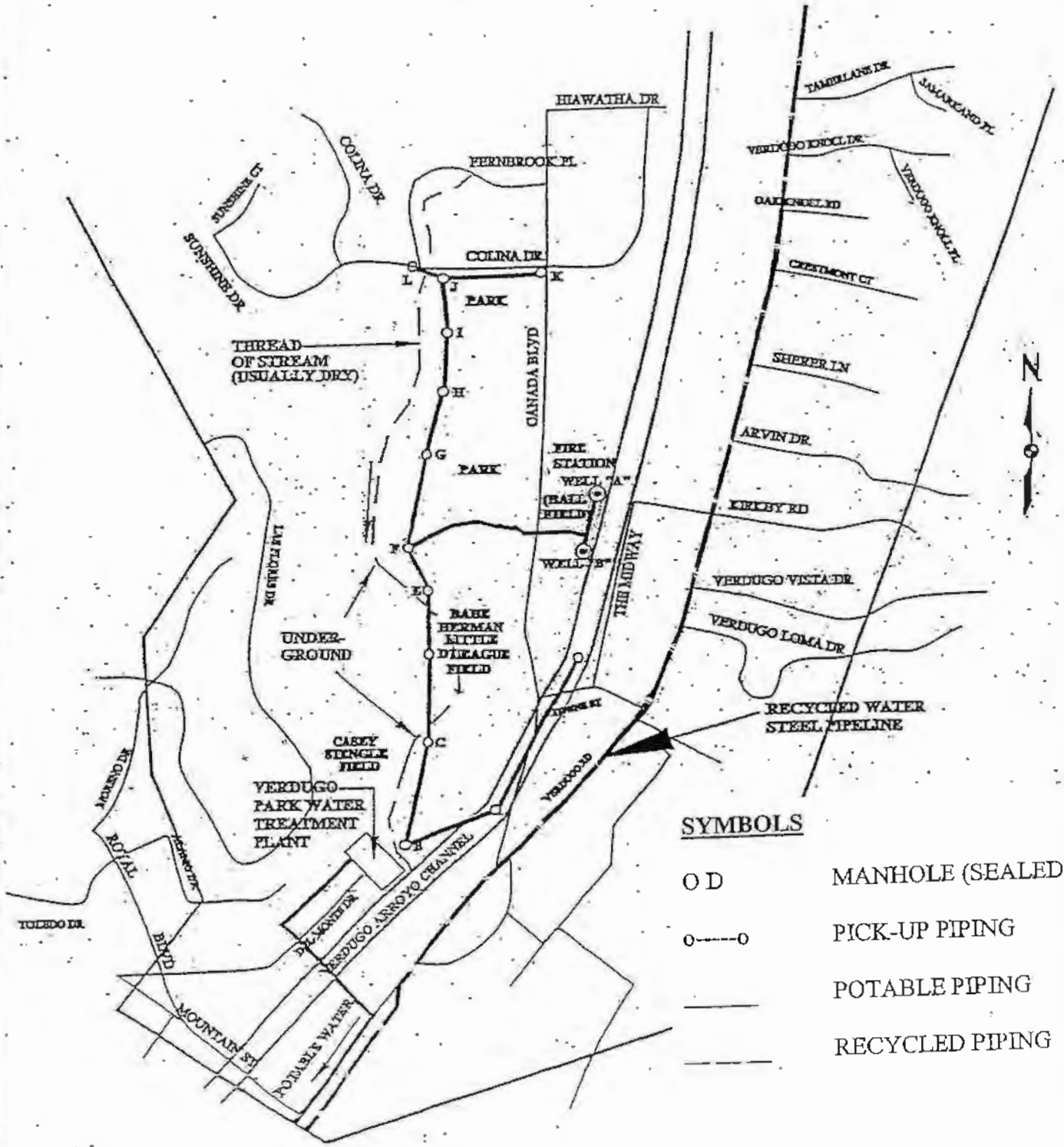
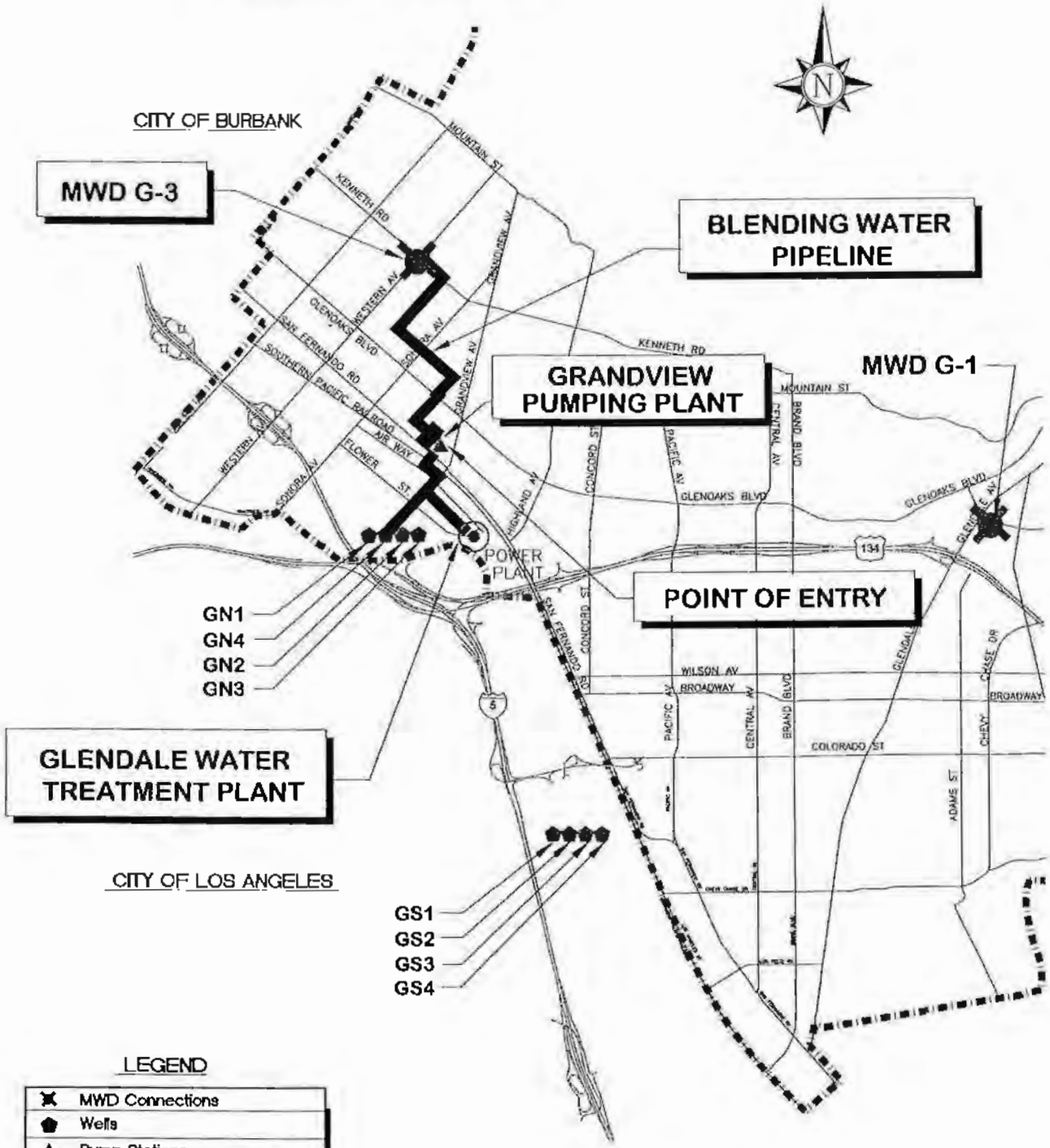


FIGURE 4

CITY OF GLENDALE

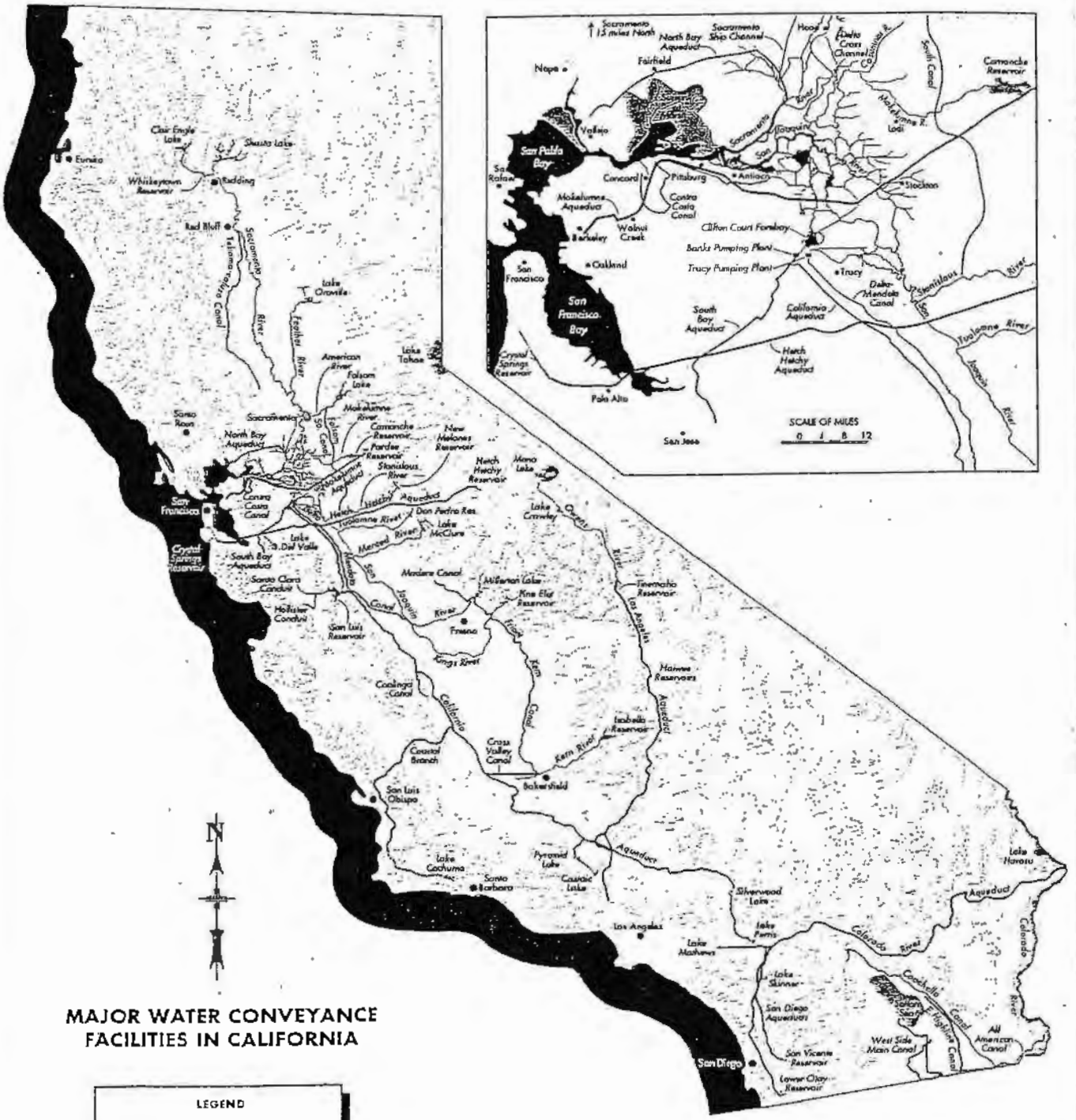
GLENDALE WATER TREATMENT PLANT & WELL LOCATIONS



CITY OF GLENDALE

STATE WATER PROJECT and COLORADO RIVER AQUEDUCT

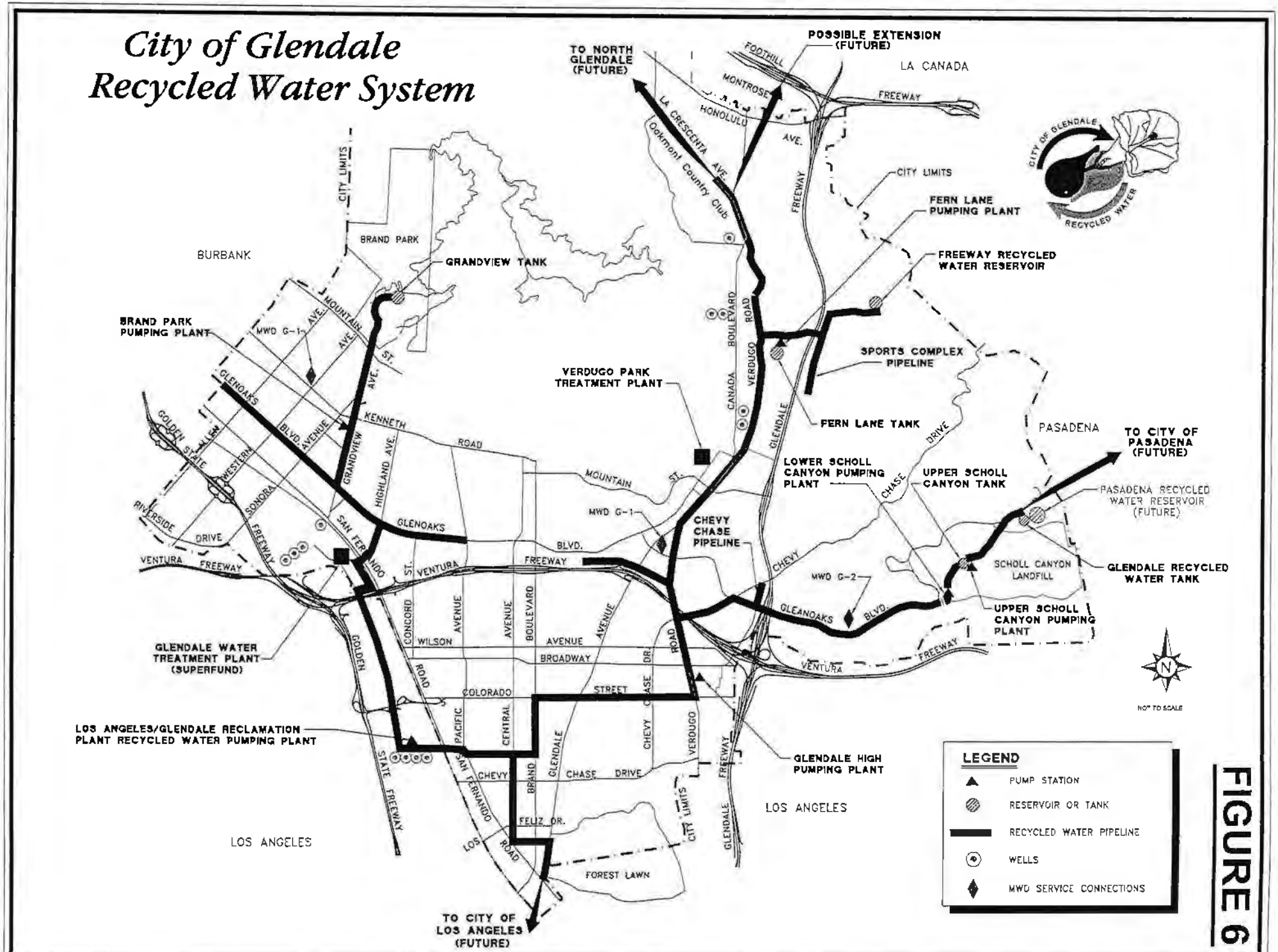
FIGURE 5



MAJOR WATER CONVEYANCE FACILITIES IN CALIFORNIA

LEGEND

- FEDERAL AQUEDUCT
- STATE AQUEDUCT
- LOCAL AQUEDUCT


City of Glendale
Recycled Water System
TO NORTH GLENDALE (FUTURE)
POSSIBLE EXTENSION (FUTURE)
LA CANADA
FOOTHILL
MONTROSE
HONOLULU
AVE.
FREEWAY
LA CRESCENTA AVE.
Oakmont Country Club
CITY LIMITS
FERN LANE PUMPING PLANT
CITY OF GLENDALE
RECYCLED WATER
FREEWAY RECYCLED WATER RESERVOIR
BURBANK
BRAND PARK
GRANDVIEW TANK
CITY LIMITS
BRAND PARK PUMPING PLANT
MWD G-1
MOUNTAIN AVE.
GLENOAKS BLVD.
GOLDEN STATE FREEWAY
WESTERN AVENUE
SONORA AVENUE
RIVERSIDE DRIVE
VENTURA FREEWAY
SAN FER
GRANDVIEW AVE.
HIGHLAND AVE.
KENNETH ROAD
MOUNTAIN ST.
GLENOAKS BLVD.
WOO ST.
VENTURA FREEWAY
VERDUGO PARK TREATMENT PLANT
CANADA BOULEVARD
VERDUGO ROAD
GLENDALE
SPORTS COMPLEX PIPELINE
FERN LANE TANK
PASADENA
TO CITY OF PASADENA (FUTURE)
LOWER SCHOLL CANYON PUMPING PLANT
CHASE DRIVE
UPPER SCHOLL CANYON TANK
PASADENA RECYCLED WATER RESERVOIR (FUTURE)
CHEVY CHASE PIPELINE
MWD G-1
MWD G-2
SCHOLL CANYON LANDFILL
GLENDALE RECYCLED WATER TANK
CHEVY CHASE DR.
GLENOAKS BLVD.
UPPER SCHOLL CANYON PUMPING PLANT
FREEWAY
VENTURA
GLENDALE WATER TREATMENT PLANT (SUPERFUND)
GOLDEN STATE FREEWAY
CONCORD AVENUE
WILSON AVENUE
BROADWAY
COLORADO STREET
PACIFIC AVENUE
CENTRAL AVENUE
BRAND BOULEVARD
GLENDALE AVENUE
CHEVY CHASE DR.
VERDUGO ROAD
LOS ANGELES/GLENDALE RECLAMATION PLANT RECYCLED WATER PUMPING PLANT
SAN FERNANDO ROAD
CHEVY CHASE DRIVE
FELIZ DR.
CITY LIMITS
GLENDALE FREEWAY
GLENDALE HIGH PUMPING PLANT
LOS ANGELES
LOS ANGELES
FOREST LAWN
TO CITY OF LOS ANGELES (FUTURE)
NOT TO SCALE
LEGEND
PUMP STATION
RESERVOIR OR TANK
RECYCLED WATER PIPELINE
WELLS
MWD SERVICE CONNECTIONS
FIGURE 6

SCHEMATIC DIAGRAM OF RECYCLED WATER SUPPLY SYSTEM

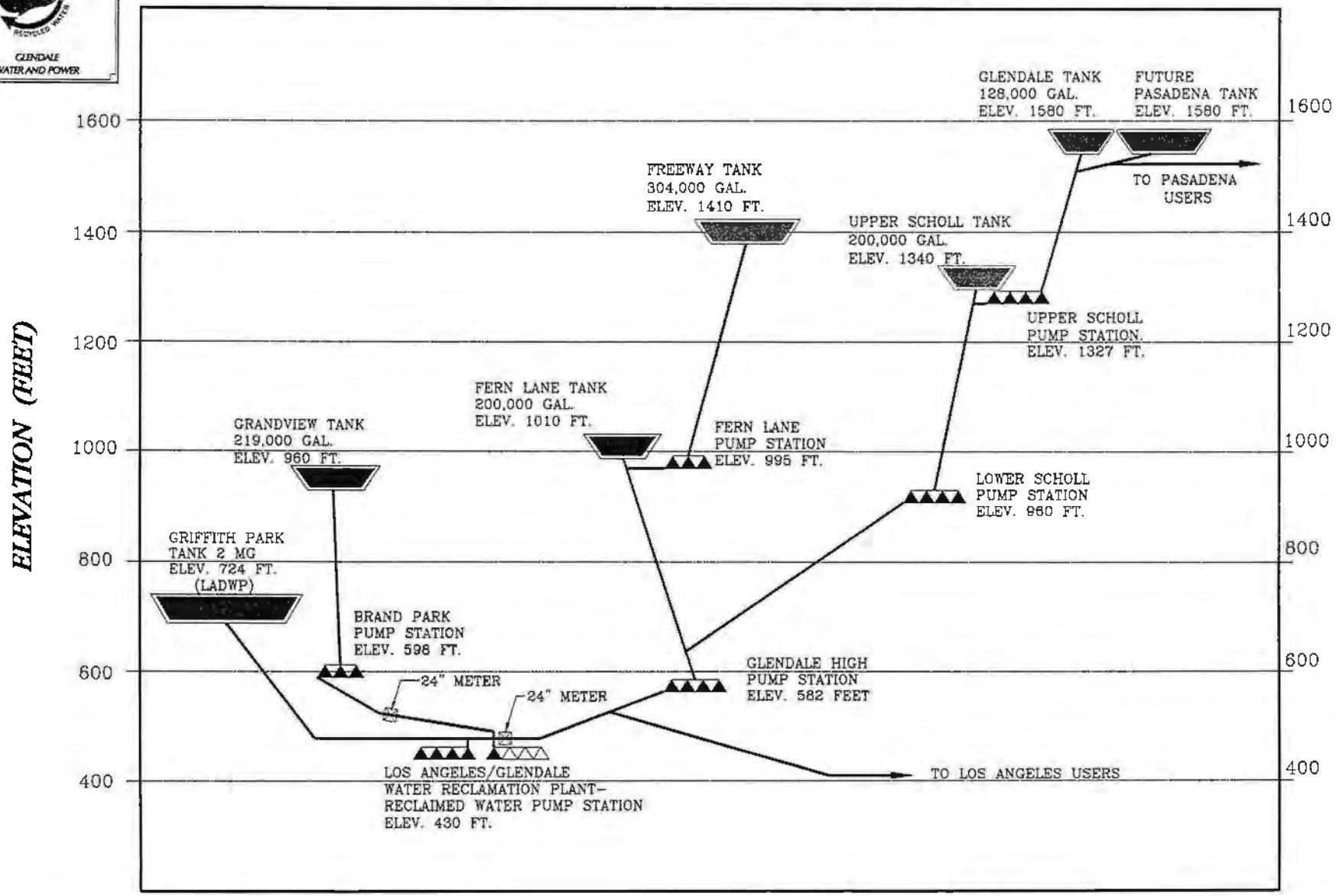


FIGURE 7

CITY OF GLENDALE
RECYCLED WATER USERS - SN 1990008
As of SEPTEMBER 2004

FIGURE 8

LOC. NO.	RECYCLED WATER USER PROJECT	Actual/Anticipated Delivery Date	User	Quantity AF/year	Type of Use
	FOREST LAWN PROJECT				
1	Forest Lawn Memorial Park	1992	YES	200-400	*Irrigation*
2	1600 South Brand Median	1995	YES	6	*Irrigation*
4	323 W Garfield Avenue	2000	YES	2	*Irrigation*
	POWER PLANT PROJECT				
5	Caltrans - 943 West Doran Street	1978	YES	40-60	*Irrigation*
6	Glendale Grayson Power Plant	1978	YES	400-600	*Cooling Towers*
	VERDUGO SCHOLL PROJECT				
	PARKS and RECREATION - City of Glendale				
22	Adult Recreation Center	1995	YES	10	*Irrigation*
24	Armory	1996	YES	4	*Irrigation*
30	Central Library	1995	YES	4	*Irrigation*
31	City of Glendale - Fern Lane	1997	YES	60	*Irrigation*
32	Civic Auditorium	1996	YES	15	*Irrigation*
48	Colorado Boulevard - Parkway Irrigation	1997	YES	5	*Irrigation*
47	North Verdugo Road Median/La Cresenta Avenue	1996	YES	10	*Irrigation*
37	Glenoaks Park	1995	YES	5	*Irrigation*
40	Montecito Park	1995	YES	1	*Irrigation*
44	701 North Glendale Avenue - Median @ Monterey Road	1995	YES	6	*Irrigation*
43	741 S Brand Median	1995	YES	4	*Irrigation*
49	Parque Vaquero	1998	YES	2	*Irrigation*
51	Scholl Canyon Ballfield	1997	YES	20	*Irrigation*
50	Scholl Canyon Park	1996	YES	12	*Irrigation*
53	Sports Complex (Completed)	1998	YES	99	*Irrigation*
46	Verdugo Rd/Canada (South) Overpass	1995	YES	0.5	*Irrigation*
45	Verdugo Rd/Canada (North Median)	1996	YES	1.5	*Irrigation*
43	Fern Lane Medians-Irrigation	2003	YES		*Irrigation*
	CALTRANS (5 Meters):				
25	1970 E Glenoaks Boulevard (E/S)	1995	YES	15	*Irrigation*
25	1970 E Glenoaks Boulevard (W/S I2)	1995	YES	10	*Irrigetion*
26	406 N Verdugo Road @ Chevy Chase	1995	YES	35	*Irrigation*
27	709 Howard Street @ Monterey Road	1995	YES	12	*Irrigetion*
28	2000 E Chevy Chase Drive @ Harvey	1995	YES	4	*Irrigation*
	GLENDALE UNIFIED SCHOOL DISTRICT:				
35	Glendale High School	1995	YES	30	*Irrigation*
36	Glenoaks Elementary School	1998	YES	2	*Irrigation*
55	Wilson Junior High School	1995	YES	15	*Irrigation*
	OTHERS:				
33	Glendale Adventist Memorial Hospital	1997	YES(Partially)	20	*Irrigation*
42	Oakmont Country Club	1996	YES	250-350	*Irrigation*
23	Scholl Canyon Golf Course	1998	YES	150-250	*Irrigation*
39	Scholl Canyon Landfill (LACSD)	1997	YES	120	*Dust Control/Soil Compaction*
52	Scholl Canyon Landfill (PW)	1996	YES	25	*Irrigation/Soil Compaction*
54	Upper Scholl Pump Station	1996	YES	10	*Irrigation*
	Dual Plumbing:				
34	Glendale Community College	1996*** 2002****	YES(Partially)	25-35	*Irrigation***/Flushing Toilets****
3	*PUBLIC WORKS - City of Glendale*	1978	YES	1.5	*Street Cleaning*
	BRAND PARK PROJECT				
7	Brand Park	1997	YES	55-65	*Irrigation*
8-16	Glenoaks Median (9 Meters)	1996	YES	30	*Irrigation*
17	Grand View Memorial Park	2001	YES(Partially)	50	*Irrigation*
20	Pelanconi Park	1996	YES	8	*Irrigation*
	Sub-TOTAL ***CURRENT METERS***	43		***1,775 - 2,415***	

CITY OF GLENDALE
RECYCLED WATER USERS - SN 1990008
As of SEPTEMBER 2004

FIGURE 8

LOC. NO.	RECYCLED WATER USER / PROJECT	Actual/Anticipated Delivery Date	User	Quantity AF/year	Type of Use
	FUTURE USERS				
	FOREST LAWN PROJECT				
	LOS ANGELES		NO		
61	S Central Avenue*	Completed	NO	5	*Irrigation*
62	Edison School*	Completed	NO	15	*Irrigation*
63	Cerritos School*	Completed	NO	10	*Irrigation*
	*Dual Plumbing:**				
56	Glendale Plaza - 655 N Central Avenue	Completed	NO		*Flushing Toilets*
57	Building - 400 N Brand	Completed	NO		*Flushing Toilets*
58	Building - 450 N Brand	Completed	NO		*Flushing Toilets*
59	Police Building - Isabel Street	Completed	NO		*Flushing Toilets*
60	Building - 611 N Brand	Planning Stage	NO		*Flushing Toilets*
73	Glendale Town Center	Construction Stage	NO		*Irrigation*
	VERDUGO SCHOLL PROJECT				
	PASADENA		NO		
64	John Marshall School*	Completed	NO	15	*Irrigation*
65	Fire Station No. 21*	Completed	NO	10	*Irrigation*
66	Mayor's Park (Proposed)	Unknown	NO	6	*Irrigation*
67	Park Site C (Proposed)	Unknown	NO	54	*Irrigation*
68	Park Site A (Proposed)	Unknown	NO	69	*Irrigation*
29	Carr Park	Planning Stage	NO	5	*Irrigation*
38	Glorietta Pump Station	2002	NO	5	*Irrigation*
41	Monterey Road Median - WJH	2002	NO	1	*Irrigation*
	PARKS and RECREATION - City of Glendale				
74	Deukmejian Wilderness Park	*Under Construction*	NO		*Irrigation*
	BRAND PARK PROJECT				
69	W Glenoaks Boulevard*	Completed	NO	5	*Irrigation*
70	Toll Jr High		NO	10	*Irrigation*
71	Hoover High School		NO	20	*Irrigation*
72	Keppel High School		NO	10	*Irrigation*
	PARKS and RECREATION - City of Glendale				
75	Pacific Park	Completed	NO		*Irrigation*
	Sub-TOTAL			***100***	
	TOTAL			** ***2,015 - 2,655***	

** RW main service not yet available.*

*** Pasadena and Los Angeles Demand not included*

GLENDALE WATER SUPPLY AND DEMAND (AF/YR)

(Use MWD Direct Deliveries for Blending)

FIGURE 9

	Fiscal Year	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2010	2015	2020	2025
(1)	**Water Demands (a)**	28,010	29,439	29,230	31,346	32,298	29,678	31,229	33,435	33,475	33,897	33,318	35,337	32,554	32,824	33,074	33,824	35,091	36,821	38,600
(2)	San Fernando Basin-Water Rights	4,805	5,090	4,979	5,535	5,555	5,575	5,588	5,601	5,626	5,651	5,676	5,701	5,725	5,843	5,843	5,843	5,843	5,843	5,843
	Water Supplies:																			
	San Fernando Basin																			
(3)	Grandview Wells																			
(4)	Power Plant	78	140	65	35	25	24	32	24	381	337	918	397	25	25	25	25	25	25	25
(5)	Glendale Water Treat. Plant (b)										3,223	7,238	6,941	7,200	7,200	7,200	7,200	7,200	7,200	7,200
(6)	Forest Lawn/Physical Solution	348	410	376	461	442	243	377	491	292	453	368	534	400	400	400	400	400	400	400
(7)	**Total:**	426	550	441	496	467	267	409	515	673	4,013	8,524	7,872	7,625	7,625	7,625	7,625	7,625	7,625	7,625
	Verdugo Basin																			
(8)	Wells 3,4, & 6	909	1,225	1,662	2,059	2,116	1,981	2,080	1,960	1,635	1,663	835	1,527	1,800	1,800	1,800	1,800	1,800	1,800	1,800
(9)	VPWTP				0	453	715	640	491	470	457	660	647	500	500	500	500	500	500	500
(10)	Other Production								0	0	0	0	0	0	0	0	0	0	0	0
(11)	**Total:**	909	1,225	1,662	2,059	2,569	2,696	2,720	2,451	2,105	2,120	1,495	2,174	2,300	2,300	2,300	2,300	2,300	2,300	2,300
	Recycled Water																			
	Brand Park Project					32	63	73	106	111	95	104	134	170	170	170	170	170	170	170
	Forest Lawn Project	348	295	290	292	344	239	191	200	242	252	187	215	350	350	350	350	350	350	350
	Power Plant Project	422	325	284	377	264	306	698	453	472	318	232	287	450	450	450	450	450	450	450
	Verdugo-Scholl Project			340	217	472	479	496	979	838.5	835	853	881	1020	1040	1040	1,040	1,060	1,080	1,080
(12)	**Total:**	770	620	914	886	1,112	1,087	1,458	1,738	1,664	1,500	1,376	1,517	1,990	2,010	2,010	2,010	2,030	2,050	2,050
	Metropolitan Water																			
(13)	Direct Deliveries (G1, G2, & G3)	25,905	27,044	26,213	27,905	28,150	25,628	26,642	28,731	29,033	26,264	21,923	23,774	20,639	20,889	21,139	21,889	23,136	24,846	26,625
(14)	**Total:**	25,905	27,044	26,213	27,905	28,150	25,628	26,642	28,731	29,033	26,264	21,923	23,774	20,639	20,889	21,139	21,889	23,136	24,846	26,625
(15)	**Total Water Supplies**	28,010	29,439	29,230	31,346	32,298	29,678	31,229	33,435	33,475	33,897	33,318	35,337	32,554	32,824	33,074	33,824	35,091	36,821	38,600

2) [(1) - 4,000 AF] * 20% return flow

5) 5,000 gpm @ 90%

6) Forest Lawn, et.al.

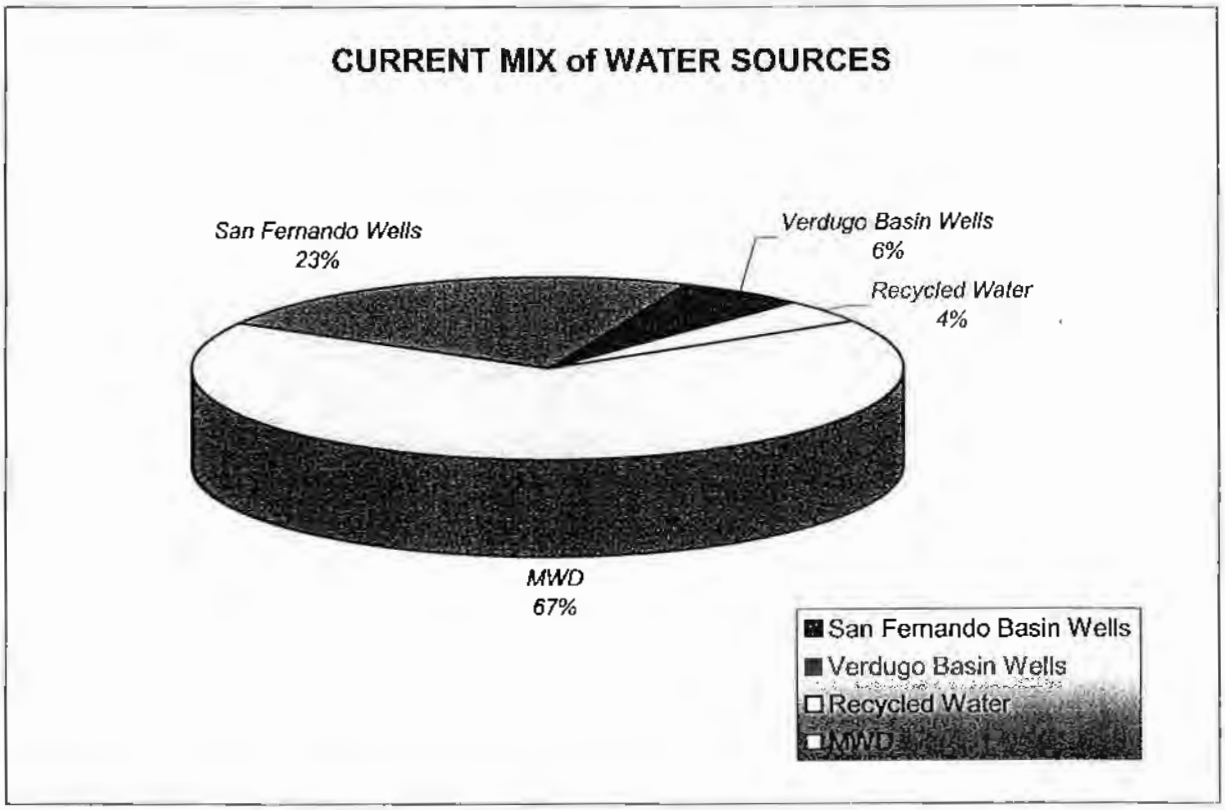
13) (1) - (7) - (11) - (12)

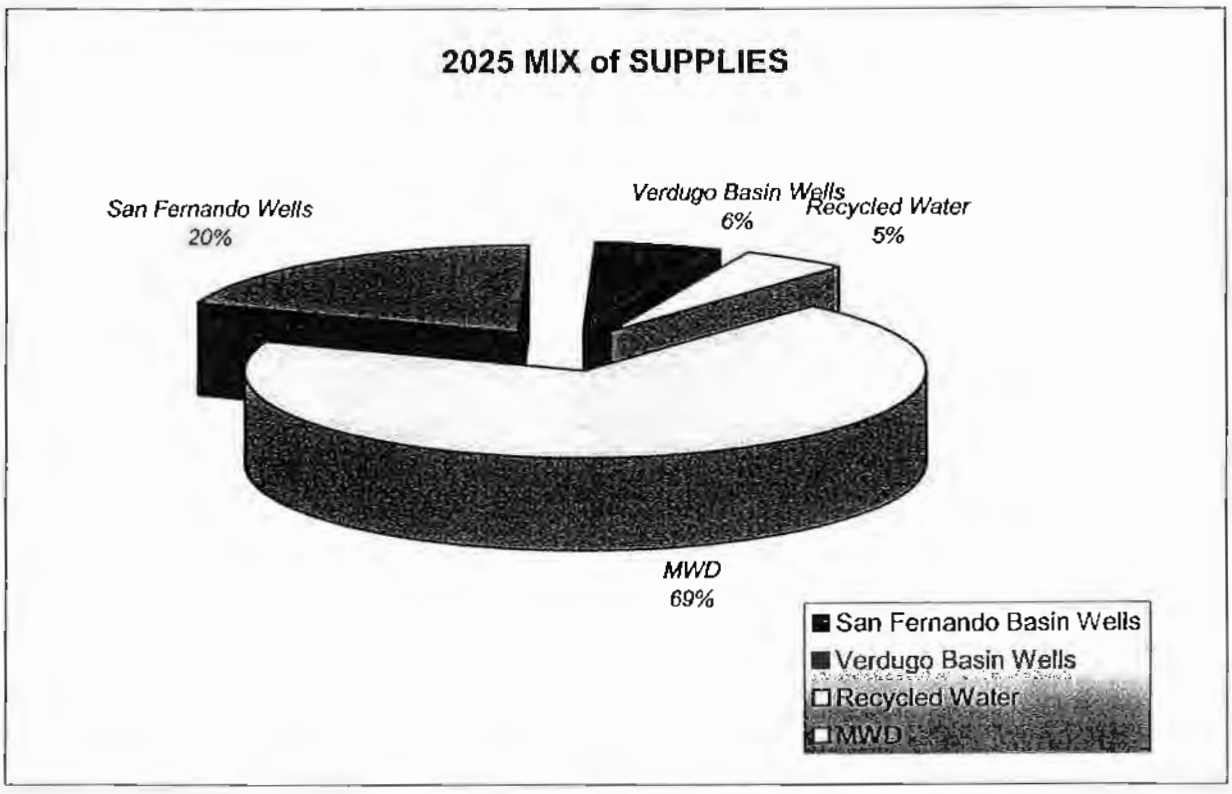
(a) Projected demands from MWD

(b) Started operation Dec. 2000, not used by the system
Started delivering water to the system July 2001. 24-hr operation, January 6, 2002

FIGURE 10

CURRENT PROJECTED SOURCES OF WATER





APPENDIX D

CITY OF SAN FERNANDO

PUMPING AND SPREADING PLAN

2004-2009 Water Years

CITY OF SAN FERNANDO

GROUNDWATER PUMPING AND SPREADING PLAN

OCTOBER 1, 2004 TO SEPTEMBER 30, 2009

2004-2005 Water Year

Prepared by:

Public Works Department

Engineering Division

117 Macneil Street

San Fernando, California 91340

APRIL 2005

TABLE OF CONTENTS

I. INTRODUCTION

The ground water rights of the City of San Fernando were defined by the JUDGMENT in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et. al., Defendants." The Final Judgment was signed on January 26, 1979.

On August 26, 1983, the Watermaster reported to the court pursuant to Section 10.2 of the Judgment that the Sylmar Basin was in condition of overdraft. On October 1, 1984, San Fernando and Los Angeles were assigned equal rights to pump the safe yield of the Basin (6,210 acre-feet) thus, San Fernando and Los Angeles were each allowed to pump approximately 3,105 acre-feet per year. Thereafter, on October 1, 1996, the safe yield of the Basin was determined to be 6,510 acre-feet per year. Therefore, San Fernando and Los Angeles are now allowed to each pump approximately 3,255 acre-feet per year.

In 1993, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Section 2.9, Groundwater Quality Management. This addition has been made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup and limiting the spread of contamination in the San Fernando Valley. This report is in response to Section 2.9.4, Groundwater Pumping and Spreading Plan.

The Groundwater Pumping and Spreading Plan is based on the water year, October 1 to September 30. The Draft Plan for San Fernando will be submitted in April to the Watermaster for the current water year.

II. WATER DEMAND

The annual total water demand for the last five years and the projected annual water demand for the next five years are shown on Table 2.1.

Water demand during the early 1990's was affected by drought conditions in the Southern California region. However, the City of San Fernando did impose voluntary conservation since 1977.

Projected water demands for the next five years is expected to slightly increase from the 1992-93 base year since public opinion is that drought conditions no longer exist and conservation habits will undoubtedly regress. The increase is therefore not from residential growth, but from a rebound of drought conditions and a re-establishment of commercial and industrial demand.

The projected water demand may vary significantly due to weather conditions, economic conditions and/or social conditions in the San Fernando area. A variance of $\pm$ 10 percent can be expected.

III. WATER SUPPLY

The water supply for the City of San Fernando is composed of locally produced and treated groundwater. Supplemental water is purchased from the Metropolitan Water District of Southern California (MWD). In case of emergency, there is an existing 6-inch water connection to the City of Los Angeles (DWP) water system at 12900 Dronfield Avenue, in Sylmar.

A. MWD: The amount of treated water purchased from the MWD has been changed beginning in 1997-98 through 2001 as reflected in the Historic and projected use of MWD water as shown in Table 2.1.

B. Production Wells: The City of San Fernando owns and operates four (4) wells that are on "active status" with the Department of Health Services as indicated below:

1. ***Well 2A***
   Location: 14060 Sayre Street, Sylmar
   Capacity: 2100 GPM

2. ***Well 3***
   Location: 13003 Borden Avenue, Sylmar
   Capacity: 1100 GPM

3. ***Well 4A***
   Location: 12900 Dronfield Avenue, Sylmar
   Capacity: 400 GPM

4. ***Well 7A***
   Location: 13180 Dronfield Avenue, Sylmar
   Capacity: 800 GPM

C. Quantity (Acre-Feet) of Water Pumped From Each Well (2003-2004)

1.	Well 2A	1,668.72
2.	Well 3	948.42
3.	Well 4A	202.72
4.	Well 7A	634.24
	Total	3454.10

D. Wells Groundwater Level Data

1.	Well 2A	1080.5	Taken 06/04
2.	Well 3	1071.2	Taken 06/04
3.	Well 4A	1076.1	Taken 06/04
4.	Well 7A	1054.3	Taken 06/04

E. Well Locations
See next page

IV JUDGMENT CONSIDERATIONS

A. Native and Imported Return Water

The safe yield of the Sylmar Basin is 6,510 acre-feet and the cities of San Fernando and Los Angeles have equal rights to pump from this basin. After subtracting the overlaying pumping rights of two private parties, San Fernando and Los Angeles are each allowed to pump approximately 3,255 acre-feet per year.

B. Stored Water Credit

San Fernando and Los Angeles each have the right to store water in the Sylmar Basin and the right to extract equivalent amounts.

As of September 30, 2004 the City of San Fernando has a stored water credit of 227.00 acre-feet accumulated during previous years through the 03-04 water year.

TABLE 2.1
FIVE-YEAR HISTORIC AND PROJECTED WATER DEMAND
PUMPED AND IMPORTED WATER
CITY OF SAN FERNANDO

(Acre – Feet)

FY	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
DEMAND										
WELLS	3,766.19	3,686.60	3,765.72	3357.50	3454	3,500	3,000	3,000	3,000	3,000
MWD	0	0		382	508	500	1000	1000	1000	1000
TOTAL	3,766.19	3,686.60	3765.72	3739.50	3,954	4,000	4,000	4,000	4,000	4,000
ACTUAL						PROJECTED				

APPENDIX A

WATER QUALITY DATA

SEE ATTACHED WATER QUALITY REPORT, 2004

CITY OF SAN FERNANDO

- WELL NO. 3
- WELL NO. 4A
- WELL NO. 2A
- WELL NO. 7A

(In Progress)

APPENDIX B

POLICIES AND PROCEDURES

(By ULARA)

WATERMASTER SERVICE

UPPER LOS ANGELES RIVER AREA

POLICIES AND PROCEDURES

February 1998

APPENDIX E

CRESCENTA VALLEY WATER DISTRICT

PUMPING AND SPREADING PLAN

2004-2009 Water Years

CRESCENTA VALLEY WATER DISTRICT

GROUNDWATER PUMPING & SPREADING PLAN

FOR

WATER YEARS

OCTOBER 1, 2004 TO SEPTEMBER 30, 2009

Prepared by:
David S. Gould, P.E.,
District Engineer

Prepared for:
ULARA Watermaster's Office

APRIL 2005

I. INTRODUCTION

The ground water rights of the Crescenta Valley Water District (CVWD) were defined by the JUDGEMENT in Superior Court Case No. 650079, entitled "The City of Los Angeles, a Municipal Corporation, Plaintiff, vs. City of San Fernando, et. al., Defendants". The Final Judgment was signed on January 26, 1979.

In 1993 and in February 1998, significant revisions were made to the Upper Los Angeles River Area (ULARA) Policies and Procedures with the addition of Sections or Groundwater Quality Management and various new reports and appendices. This addition has been made by the Watermaster and the Administrative Committee to affirm its commitments to participate in the cleanup and limiting the spread of contamination in the San Fernando Valley. This report as prepared by CVWD is in response to Section 5.4, Groundwater Pumping and Spreading Plan. Since no groundwater spreading has been performed by the CVWD at this time, only plans/projections for groundwater pumping and treatment are discussed in this report. However, CVWD's Verdugo Basin Groundwater Recharge, Storage and Conjunctive Use Feasibility Study, which is near completion has recommended methods of stormwater recharge and storage within the basin and this issue will be investigated more in the future.

The Groundwater Pumping Plan is based on the water year, October 1 to September 30. The Draft Plan for CVWD will be submitted in March or April to the Watermaster for the current water year.

II. WATER DEMAND

The annual total water demand for the last five years and the projected annual water demand for the next five years are shown in Table 2.1.

Water demand during the last five years has been affected by the fact that there have been less than normal amounts of rainfall in the Crescenta Valley since 1997-98. The 2003-04 water year concluded six (6) consecutive years of below average rainfall in the Crescenta Valley, which was an average of 16.4 inches over this period. However, starting in later 2004 and through April 2005, the Southern California area has seen near record rainfall and the Crescenta Valley rainfall total has reached over 50 inches. We believe the recent rainfall will lower water demand in the region for 2004/05. However, this rain season may be a chance occurrence and rainfall amounts may go back to normal or below normal.

In response to the declining groundwater levels in 2004, CVWD's Board of Director continued the voluntary water conservation program and implemented a water conservation alert system and public education for summer of 2004. CVWD saw a marginal decrease water usage (3%-4%), which was probably attributed to the mild summer and public awareness.

Water conservation incentives in the form of rebates for turf replacement, ultra-low flush toilets, and high efficiency clothes washers were being provided along with continuous water conservation information that was posted on CVWD's website.

Furthermore, CVWD attempted to put into action a tiered water rate system in January 2005. However, it was not received well by the community and the Board of Directors decided not implement tier rates this year. This issue will again be discussed in January 2006.

The 2003-04 base year had significantly less production compared to last year and the peak year. CVWD's wells produced only 78% of its total adjudicated rights of 3,294 AFY. It appears that water demand has stabilized in the 5600-5900 AFY range, hopefully due to our water conservation and public education efforts. The ongoing drought has serious implications for the Verdugo Basin groundwater supply and CVWD has been looking at additional ways to augment its supply. The District, while working Foothill Municipal Water District (FMWD) has completed a pump station expansion for additional imported water, constructed a wholesale water supply interconnection with the City of Glendale, but this may still not be enough supply to meet all future peak demands. CVWD is also working with the City of Los Angeles, Department of Water and Power (LADWP) on a new water supply interconnection and has requested grant funding under Proposition 50 with DHS for construction of the new facility.

Regardless of water conservation programs, the water demand seems to vary significantly due to weather conditions in the CVWD service area. This can be attributed to the residential character of the District and the large percentage of water consumption for outdoor landscaping. An increase in water demand of approximately 10% can be expected over the next five (5) years.

III. WATER SUPPLY

The water supply for the CVWD is composed of locally produced and treated groundwater, water from the Metropolitan Water District of Southern California (MWD) purchased on a wholesale basis from FMWD and a water supply interconnection with the City of Glendale.

A. PRODUCTION WELLS

The CVWD has eleven active wells that are currently in operation. Historic and projected production from these wells is shown in Table 3.1. The CVWD wells produce water which typically contains nitrate concentrations above the 45 mg/L maximum contaminant level (MCL) set by the EPA and DHS. As a result, an ion exchange process, the Glenwood Nitrate Removal Plant, is used to treat a portion of the produced water. Untreated water and water treated at the Glenwood Plant are blended to produce water with less than the nitrate MCL.

The blended water is distributed by the CVWD system. In the 2003-04 base year, minimal amounts of water were treated for nitrate removal since the straight blending accommodates nitrate reduction in the distribution system during low groundwater production. However, with the recent rainfall season, starting in November 2004, well levels and well production have increased and the ion-exchange plant has been in operation.

The District's active wells range in age from 3 to 75 years and are mostly beyond their useful life. The District's well replacement program, starting in 2000 had set a goal of replacing existing groundwater production capacity with new, modern wells over the next 10 years. However, Well 15 has a very low capacity and a second recently drilled (Well 17) did not produce enough during development of the well for us to be put into production. As the capacity of the new wells appears to be far less than we originally anticipated, CVWD received an AB303 local groundwater assistance grant for the Verdugo Basin monitoring well study to locate new production wells. The results of the study showed that these well sites would also produce low-capacity well. The District then received another AB303 local groundwater assistance grant to perform a groundwater model and look at the feasibility of recharging the basin. This feasibility study is nearly complete and the recommendations are that it is possible to store stormwater in the basin to increase groundwater levels and water production. To continue with CVWD's work in the basin, CVWD was awarded a third AB303 local groundwater assistance grant to perform a geophysical survey of the Verdugo Basin. This study should commence in September 2005 and be completed in June 2007.

CVWD has seen a dramatic increase in water levels and water production in its groundwater wells due to the record rainfall received in the Crescenta Valley since November 2004. Water production has increased from a maximum capacity of 3.0 MGD to 4.5 MGD. While we believe that this year (04/05), we should increase our overall groundwater production, this situation may not be long-term if the dry rainfall cycle continues in future years.

B. GLENWOOD NITRATE REMOVAL PLANT

The Glenwood ion exchange nitrate removal plant began operation in January 1990. The plant has been out of operation for extended periods in 1992–93 and in 1997 when repairs were necessary. In the past year, the plant was only in marginal operation because overall groundwater production was down due to basin level decline, resulting in more imported water, thereby reducing the need for treatment. This trend continued in 2003/04; however the near record rainfall in 04/05 has allowed CWVD to increase usage of the plant. The historic and projected production from the Glenwood Plant is shown in Table 3.2.

C. PICKENS GRAVITY TUNNEL PRODUCTION

A small portion of the total CVWD demand is supplied by the Pickens Gravity Tunnel. Historic and projected production from Pickens Tunnel is shown in Table 3.3.

D. MWD

In 2003/04, the amount of treated water purchased from MWD via FMWD remains high to make up the difference between decreased groundwater production capacity and customer demand. In 2004/05, the recent rains have allowed CVWD to decrease the amount of import water it receives from FMWD, however, this maybe a short-term situation that could increase in future years. Historic and projected use of FMWD water is shown in Table 3.4.

E. City of Glendale Interconnection

In 2003/04, CVWD completed the installation of a new water supply interconnection with the City of Glendale. This connection allowed CVWD to increase its water supply capacity by 5.0 cfs or 1.1 mgd. An agreement between City of Glendale, FMWD and CVWD was signed in 2004, where CVWD will pay FMWD for the water and Glendale for the maintenance and operation of bring the water to CVWD. CVWD's usages of the Glendale/CVWD interconnect (GCI) was used only for testing purposed in 2003/04. It is not anticipated to be used in 2004/05 unless demand or weather conditions change.

IV. JUDGEMENT CONSIDERATIONS

The allowable pumping for CVWD's share of the Verdugo Basin is 3,294 acre-feet annually. Basin production has been declining and 2001-02 was the first in over ten years to be less than the full adjudication. Estimated future pumping is expected to stay slightly below this adjudicated quantity on an annual basis. The unusually higher than normal rainfall condition this year has increased the groundwater levels and production capacity in the Verdugo Basin, but this may not be a long-term trend and well levels and production may decrease in future years. A more conservative approach is taken in the estimates provided here. In prior years, the Watermaster, with approval from the ULARA Administrative Committee, has allowed CVWD to over-pump their rights in the Basin. This will probably not be an issue in the near future. In any case, future consideration for excess pumping in the Verdugo Basin is now addressed in the February 1998 "Policies and Procedures", Section 2.3.4. Either party, Glendale or CVWD, may pump in excess of their adjudication as long as total production does not exceed 7150 AF/year, as reviewed on an annual basis by the Watermaster.

TABLE 2.1
HISTORIC AND PROJECTED WATER DEMAND
(Acre-Feet)

99-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
5884	5614	5823	5711	5874	5515	5750	5840	5960	6080
ACTUAL					PROJECTED				

TABLE 3.1
HISTORIC AND PROJECTED COMBINED WELL AND TUNNEL GROUNDWATER PRODUCTION
(Acre-Feet)

99-2000	2000 2001	2001 2002	2002-2003	2003-2004	2004 2005	2005-2006	2006-2007	2007-2008	2008-2009
3698	3412	3266	2842	2575	2930	2910	2760	2890	3030
ACTUAL					PROJECTED				

TABLE 3.2
HISTORIC AND PROJECTED GLENWOOD NITRATE REMOVAL PLANT PRODUCTION BEFORE BLENDING
(Acre-Feet)

99-2000	2000-2001	2001 2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007 2008	2008 2009
1137	989	515	206	164	500	350	350	350	350
ACTUAL					PROJECTED				

NOTES:

(1) The Glenwood Treatment Plant has a capacity of 2.7 MGD of blended water.

(2) The Glenwood Treatment Plant began operation January 1990.

TABLE 3.3
HISTORIC AND PROJECTED PICKENS TUNNEL WATER PRODUCTION
(Acre-Feet)

99-2000	2000 2001	2001 2002	2002-2003	2003-2004	2004-2005	2005 2006	2006 2007	2007-2008	2008-2009
54	61	59	56	51	58	58	58	58	58
ACTUAL					PROJECTED				

TABLE 3.4
HISTORIC AND PROJECTED USE OF MWD TREATED WATER
(Acre-Feet)

99-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
2186	2202	2556	2868	3299	2590	2840	3080	3070	3050
ACTUAL					PROJECTED				

NOTES:

(1) All values shown above are for treated water.

APPENDIX F

ANNUAL MUNICIPAL EXTRACTIONS IN ULARA

1979 - 2004

ANNUAL MUNICIPAL EXTRACTIONS IN ULARA
1979-80 through 2003-04
(acre-feet)

Water Year	San Fernando Basin*				Sylmar Basin			Verdugo Basin			ULARA TOTAL
	Burbank	Glendale	Los Angeles	TOTAL	Los Angeles	San Fernando	TOTAL	CVWD	Glendale	TOTAL	
2003-04	9,660	7,282	68,626	85,568	3,033	3,454	6,487	2,568	2,117	4,685	96,740
2002-03	9,170	8,587	73,676	91,353	3,549	3,357	6,906	2,836	1,613	4,449	102,708
2001-02	10,540	6,838	66,823	84,201	1,240	3,766	5,005	3,266	2,129	5,396	94,602
2000-01	12,547	6,886	65,409	84,843	2,606	3,696	6,301	3,422	2,227	5,649	96,793
1999-00	12,547	1,023	98,016	111,586	2,634	3,807	6,441	3,699	2,727	6,426	124,453
1998-99	10,729	31	123,207	133,966	4,536	3,528	8,064	3,797	2,627	6,424	148,455
1997-98	3,964	28	85,292	89,284	3,642	3,308	6,950	3,747	2,820	6,567	102,802
1996-97	11,171	20	89,935	101,126	2,482	3,259	5,741	3,672	2,674	6,346	113,213
1995-96	8,067	26	72,286	80,379	2,766	2,985	5,752	3,705	2,133	5,838	91,969
1994-95	3,052	53	55,478	58,583	2,311	3,421	5,732	3,708	1,633	5,341	69,656
1993-94	2,773	115	60,480	63,368	2,052	3,398	5,451	3,634	1,402	5,037	73,855
1992-93	1,354	91	34,973	36,419	1,369	2,145	3,514	2,557	990	3,547	43,480
1991-92	39	489	75,684	76,213	3,292	2,826	6,118	2,631	633	3,264	85,596
1990-91	1,278	2,755	67,032	71,065	3,281	2,266	5,546	2,615	1,230	3,845	80,456
1989-90	16	1,500	79,949	81,465	2,626	2,763	5,389	2,903	1,329	4,232	91,086
1988-89	29	1,315	126,630	127,974	3,259	2,199	5,459	2,285	2,064	4,349	137,781
1987-88	30	1,020	104,419	105,470	3,133	777	3,911	2,268	2,096	4,364	113,745
1986-87	29	5,758	85,845	91,632	3,113	3,026	6,139	2,255	2,619	4,874	102,645
1985-86	123	5,819	80,963	86,904	3,075	3,166	6,241	2,075	3,418	5,493	98,639
1984-85	2,863	3,086	95,641	101,591	3,130	3,102	6,232	1,997	3,837	5,834	113,657
1983-84	1,063	1,708	112,840	115,611	3,106	3,907	7,013	2,009	3,551	5,560	128,184
1982-83	2,187	1,028	65,178	68,394	3,048	3,133	6,181	1,759	3,427	5,187	79,761
1981-82	523	952	83,207	84,682	3,486	3,290	6,775	1,876	3,732	5,607	97,065
1980-81	595	1,129	91,067	92,791	4,117	3,380	7,497	2,140	2,122	4,262	104,550
1979-80	677	934	57,304	58,915	3,111	2,991	6,102	1,873	1,434	3,307	68,325
Average	4,201	2,336	80,798	87,335	2,960	3,078	6,038	2,772	2,263	5,035	98,409

*Includes municipal pumping only. Does not include any physical solution pumping in the cities of Burbank, Glendale, or Los Angeles.