

SUMMARY MASTER WATER PLAN



Prepared for:



DRAFT

October, 2005

ALBERT A.
WEBB
ASSOCIATES
ENGINEERING CONSULTANTS



**JURUPA COMMUNITY SERVICES DISTRICT
SUMMARY
MASTER WATER PLAN**

DRAFT

**Prepared by:
ALBERT A. WEBB ASSOCIATES
Riverside, California**

October 2005

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OFFICE OF THE DISTRICT ENGINEER

October 12, 2005

Ms. Carole A. McGreevy
General Manager
Jurupa Community Services District
11201 Harrel Street
Mira Loma, California 91752

RE: Draft Summary Master Water Plan

Dear Ms. McGreevy:

We are pleased to submit this Draft Master Water Plan report entitled "Jurupa Community Services District – Summary Master Water Plan" October 2005.

This Master Water Plan is a planning tool that provides the District an updated technological base upon which the staff and ultimately the Board of Directors can make policy decisions regarding the management of their water resources.

Three alternative plans for imported water were formulated. The criteria used to plan these alternatives are as follows:

1. Provide a water supply which will meet the District's ultimate water demand based upon the County's current land use designation;
2. Provide sufficient flow to satisfy fire flow requirements;
3. Provide water which meets State and Federal health regulations for a municipal water supply;
4. Provide a quality water supply which will allow the District to meet the mineral portion of the Waste Discharge Requirements for the City of Riverside and Western Riverside County Regional Wastewater Authority's Treatment Plants, respectively.

From the three alternative water importation plans, the Directors can select the one best suited to the political, economic, financial, legal, social, and environmental conditions of the service area.

Ms. Carole A. McGreevy
General Manager
Jurupa Community Services District
October 12, 2005
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In implementing the Master Water Plan, the greatest challenge is the development of a viable and effective financial program utilizing a revised District water connection fee and other sources (i.e. private, State, and Federal), if available. The total estimate project cost ranged from \$226,000,000 to \$264,000,000 of which the water importation facilities ranged from \$101,000,000 to \$139,000,000.

Webb Associates appreciates the opportunity to work on this plan and looks forward to working with the District to implement the Master Water Plan.

Sincerely,

ALBERT A. WEBB ASSOCIATES

A handwritten signature in black ink, appearing to read "Sam I. Gershon", written over the typed name.

Sam I. Gershon, RCE
Senior Vice President

Enclosures

ACKNOWLEDGEMENTS

Albert A. Webb Associates acknowledges with thanks the information and advice by various individuals during the preparation of this report. In particular, they are:

JURUPA COMMUNITY SERVICES DISTRICT

Board of Directors

Jack Smith, President

Curtis Hummel, Vice President

James Huber, Director

Ken McLaughlin, Director

Paul Hamrick, Director

Water Problems Committee

Jack Smith

Paul Hamrick

District Staff

Carole A. McGreevy, General Manager

Charles Smith, Operations Manager

Ken Waring, Finance Manager

Denise Waldie, Operations Assistant

Albert A. Webb Associates formed a planning team consisting of its own planning and design engineers to prepare this report.

This report was prepared by:

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* Andrew Crider, P.E., Associate Engineer, resigned from Webb Associates April 1, 2005.

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GLOSSARY OF ABBREVIATIONS

ACWA	Association of California Water Agencies
AF	acre feet
AWWA	American Water Works Association
BAT	best available treatment
BMP	best management practices
CCWD	Cucamonga County Water District
CDA	Chino Basin Desalter Authority
cfs	cubic feet per second
CRP	Colorado River Project
DBPR	Disinfection Byproducts Rule
DHS	Department of Health Services, State of California
GIS	geographic information system
GP	General Plan
gpm	gallons per minutes
IEUA	Inland Empire Utilities Agency
IX	ion exchange
JCSD	Jurupa Community Services District
LMTP	Lloyd Michael Treatment Plant
MCL	maximum contaminant level
MF	Microfiltration
mgd/MGD	million gallons per day
MWD	The Metropolitan Water District of Southern California
NO₃	nitrate
O&M	Operation and Maintenance
PF	peaking factor
PRV	pressure reducing valve
RO	reverse osmosis
RTP	regional treatment plant
RWQCB	Regional Water quality Control Board
SARI	Santa Ana River Interceptor
SAWPA	Santa Ana River Watershed Project Authority

GLOSSARY OF ABBREVIATIONS

SCAG	Southern California Association of Governments
SDWA	Safe Drinking Water Act
SWP	State Water Project
SWRCB	State Water Resources Control Board
SWTR	Surface Water Treatment Rule
TDS	total dissolved solids
UBC	Uniform Building Code
UF	Ultrafiltration
VOC	volatile organic compound
WRCRWA	Western Riverside County Regional Wastewater Authority
WTP	water treatment plant

SECTION 1 – EXECUTIVE SUMMARY

Ultimate Demand

Ultimate maximum day water demand for the Jurupa Community Services District based on the County of Riverside's General Plan land use for the District's service boundary was estimated at 69,600 gpm (100 MGD). The projected total annual water demand is 41,560 acre-feet per year.

Project Cost

The total project cost of the proposed capital improvements for the ultimate system ranged from \$226,000,000 to \$264,000,000.

SECTION 2 – SCOPE OF WORK

The objective of this Master Water Plan is to update the 1982 Master Water Plan, 1991 Eastvale Master Water Plan, and the 1999 Economic Analysis of Alternative Water Supplies prepared for the District. This study incorporates the current County of Riverside projected land use designation, the District's water supply, and water demand information. As a result of the above study of water supply and demand, a list of proposed capital improvements for the ultimate water supply, transmission, and storage facilities were developed. As a result of this Master Water Plan, existing development fees will be reviewed in light of the proposed capital improvements outlined herein.

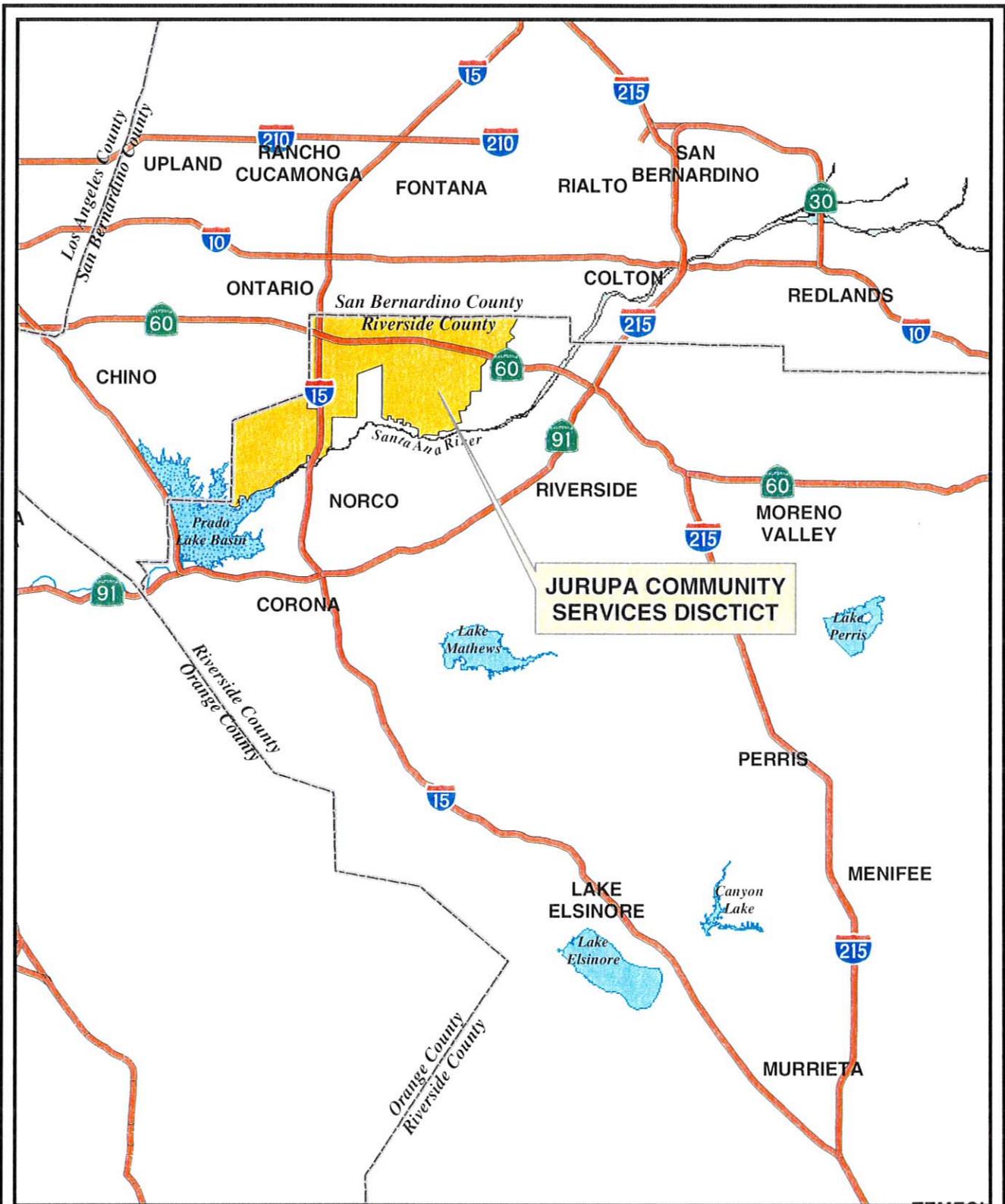
In order to accomplish the objectives of this Master Plan, the Scope of Work addresses the following:

1. Land use and water demand under ultimate development
2. Existing sources of supply
3. Existing water system
4. Alternative means of meeting future water demand
5. Water system improvements including supplemental water supply
6. Capital cost of the proposed improvements

SECTION 3 – STUDY AREA

Jurupa Community Services District is located in north-western Riverside County (Figures 3-1 and 3-2) and encompasses approximately 26,000 acres. The District is bounded by the San Bernardino / Riverside County line to the north and west, the Santa Ana River to the south, Jurupa Mountains easterly of Armstrong Road, and Pedley Hills to the east (Figure 3-2). JCSD serves the communities of Glen Avon, Mira Loma, Sunnyslope, Indian Hills, Sky County, Pedley, and Eastvale (Plate 1).

The District has a variety of topographic features associated with it, with elevations ranging from 560 feet to 2,230 feet. Within the District's service area are the Jurupa Mountains, which are located in the northern portion of the District (Figure 3-2), and the Pedley Hills, which are located in the eastern portion of the District. The balance of the service area consists of alluvial plains, which slope southwesterly to the Santa Ana River. More than 80 percent of the District is comprised of land with a natural slope of less than 12 percent; the remainder is divided between the categories of 12-25 percent and above 25 percent.



JURUPA COMMUNITY SERVICES DISTRICT

Not to Scale

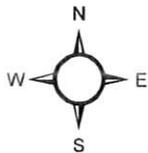
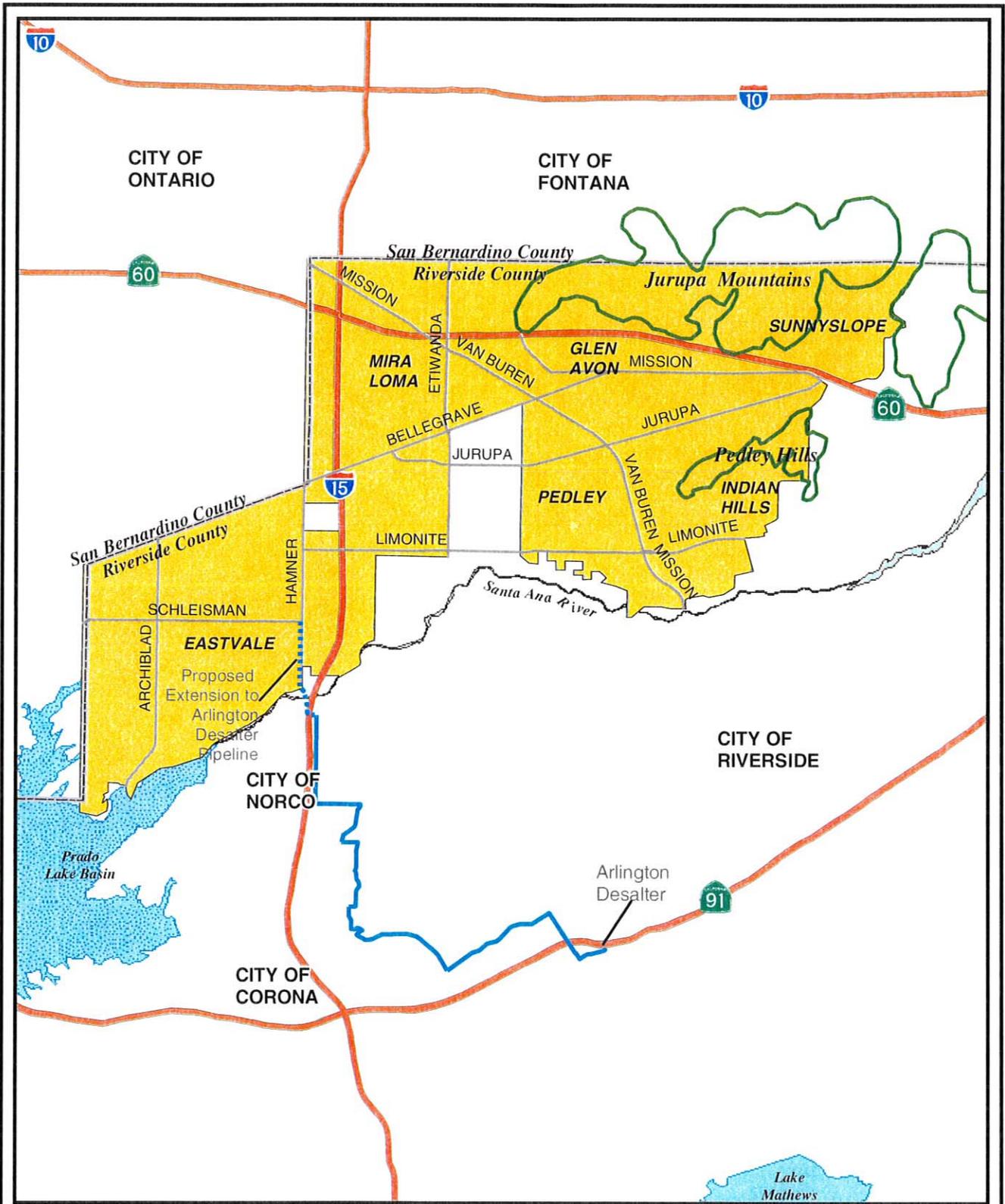


Figure 3-1

Regional Location Map



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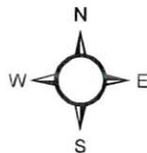


Figure 3-2

JCSD Boundary Map

SECTION 4 – PROJECTED LAND USE ANALYSIS

Plate 2, which is based on the County of Riverside's General Plan Land Use Designation developed in October 2003, depicts the present land uses planned for ultimate buildout conditions within the District's service area. It is noted that ultimate buildout conditions yield ultimate water demand, which will be discussed in Section 6 of this report. As the County's Land Use Designations change, potentially, so will the ultimate water demand.

Jurupa Community Services District's Service Area

Based upon the October 2003 General Plan Land Use Designation, the projected land use of the District's service area is summarized in Table 4-1. The land use designation was determined for each of the District's six (6) main pressure zones (Tables 4-2 through 4-7). The six (6) main pressure zones are designated 870, 980, 1100, 1110, 1200, and 1350. Plates 3, 4, and 5 show the land use designation for each of the District's water pressure zones.

Table 4-8 shows that the 870 Pressure Zone encompasses over half of the District and has the largest area, by far, of the District's six (6) pressure zones. The District has about 2000 acres of non-water service area in the Jurupa Mountains which is not included in any of the District's current pressure zones. Based on the current land use in the County General Plan, the District is not planning to service this area outside the current pressure zone boundaries in the Jurupa Mountains.

TABLE 4-1
 JURUPA COMMUNITY SERVICES DISTRICT
 LAND USE SUMMARY*

Land Use Characteristics	Total (Acres)
Residential	
Rural Res. (0 – 0.5 DU/AC)	8
Very Low Density (0.5 to 2 Du per AC)	5,581
Specific Plan (SP) 125-W (2DU per AC)	940
Low Density (2 to 5 DU per AC)	3,889
Medium Density (5 to 8 DU per AC)	482
Med. to High Density (8 to 14 DU per AC)	31
High Density (14 to 20 DU per AC)	18
Proposed Developments	2,527
Commercial	
Retail	1,230
Office	0
Community Centers	199
Industrial	
Light Industrial	3,334
Heavy Industrial	337
Business Park	1,793
Public Facilities	144
Open Space	
Conservation	75
Conservation Habitat	30
Recreation	492
Rural	110
Water	83
Mineral Resources	150
Areas Outside Water Service Area	3,791
Agricultural	10
Highway	486
TOTAL	25,740

* Based on the County of Riverside's "General Plan Land Use Designation", October 2003.

Table 4-2
 JURUPA COMMUNITY SERVICES DISTRICT
 ULTIMATE LAND USE WITHIN THE
 870 PRESSURE ZONE

2003 Land Use Designation	Land Use in Acres	Land Use Density du/ac	Projected Number of Residential Units
Residential			
Very Low Density (0.5-2 DU/AC.)	2809.05	2.0	5,618
Low Density (2-5 DU/AC.)	5214.62	4.0	20,858
Medium Density (5-8 DU/AC.)	95.23	7.0	667
Medium High Density (8-14 DU/AC)	391.34	12.0	4,696
High Density (14-20 DU/AC)	66.81	18.0	1,203
Sky Country	989.04		1,405
Subtotal	9566.09		34,447
Open Space			
Agriculture	9.87	0.0	-
Conservation Habitat	27.46	0.0	-
Public Facilities	227.24	0.0	-
Recreation	373.42	0.0	-
Subtotal	637.98		-
Other Water Uses			
Business Park	595.83	0.0	-
Community Center	44.66	0.0	-
Heavy Industrial	0.87	0.0	-
Light Industrial	442.81	0.0	-
Retail	541.35	0.0	-
Subtotal	1625.53		-
Non-water Uses			
Flood	1356.43	0.0	-
Freeway	138.95	0.0	-
WRCRWRF	62.19	0.0	-
Water	122.09	0.0	-
Subtotal	1679.66		-
TOTAL	13,509.26		34,447

Table 4-3
 JURUPA COMMUNITY SERVICES DISTRICT
 ULTIMATE LAND USE WITHIN THE
 980 PRESSURE ZONE

2003 Land Use Designation	Land Use in Acres	Land Use Density du/ac	Projected Number of Residential Units
Residential			
Rural (0-0.5 DU/AC.)	200.54	0.0	-
Very Low Density (0.5-2 DU/AC.)	734.45	2.0	1,469
Low Density (2-5 DU/AC.)	395.45	4.0	1,582
Medium Density (5-8 DU/AC.)	208.13	7.0	1,457
Medium High Density (8-14 DU/AC.)	6.27	12.0	75
Subtotal	1544.84		4,583
Open Space			
Conservation Habitat	16.81		
Recreation	7.93		
Subtotal	24.74		-
Other Water Uses			
Business Park	49.46		
Light Industrial	248.90		
Retail	266.72		
Subtotal	565.09		-
Non-water Uses			
Freeway	120.34		-
Subtotal	120.34		-
TOTAL	2,255.01		4,583

Table 4-4
 JURUPA COMMUNITY SERVICES DISTRICT
 ULTIMATE LAND USE WITHIN THE
 1100 PRESSURE ZONE

2003 Land Use Designation	Land Use in Acres	Land Use Density du/ac	Projected Number of Residential Units
Residential			
Rural (0 - 0.5 DU/AC.)	0.54	0.00	-
Rural Residential (0 - 0.5 DU/AC.)	9.66	0.20	2
Very Low Density (0.5-2 DU/AC.)	1519.07	2.00	3,038
Low Density (2-5 DU/AC.)	824.75	4.00	3,299
Medium Density (5-8 DU/AC.)	146.68	7.00	1,027
Medium High Density (8-14 DU/AC.)	35.77	12.00	429
High Density (14-20 DU/AC.)	17.73	18.00	319
Subtotal	2554.20		8,114
Open Space			
Community Center	0.55	0.00	
Conservation	26.85	0.00	
Conservation Habitat	5.36	0.00	
Mineral	61.41	0.00	
Public Facilities	5.95	0.00	
Recreation	173.55	0.00	
Subtotal	273.66		
Other Water Uses			
Business Park	128.45	0.00	
Commercial Office	0.81	0.00	
Heavy Industrial	271.86	0.00	
Light Industrial	81.15	0.00	
Retail	185.67	0.00	
Subtotal	667.94		
Non-water Uses			
Freeway	136.35	0.00	
Water	2.07	0.00	
Subtotal	138.42		
TOTAL	3,634.22		8,114

Table 4-5
 JURUPA COMMUNITY SERVICES DISTRICT
 ULTIMATE LAND USE WITHIN THE
 1110 PRESSURE ZONE

2003 Land Use Designation	Land Use in Acres	Land Use Density du/ac	Projected Number of Residential Units
Other Water Uses			
Business Park	502.31	0.0	0
Light Industrial	2601.48	0.0	0
Retail	41.20	0.0	0
Subtotal	3144.99		0
Non-water Uses			
Freeway	278.66	0.0	0
Subtotal	278.66		0
TOTAL	3,423.65		0

Table 4-6
 JURUPA COMMUNITY SERVICES DISTRICT
 ULTIMATE LAND USE WITHIN THE
 1200 PRESSURE ZONE

2003 Land Use Designation	Land Use in Acres	Land Use Density du/ac	Projected Number of Residential Units
Residential			
Very Low Density (0.5-2 DU/AC.)	269.50	2.0	539
Low Density (2-5 DU/AC.)	9.29	4.0	37
Medium Density (5-8 DU/AC.)	10.87	7.0	76
Subtotal	289.66		652
Open Space			
Mineral	159.44	0.0	-
Recreation	33.92	0.0	-
Subtotal	193.36		-
Other Water Uses			
Retail	0.16	0.0	-
Subtotal	0.16		-
TOTAL	483.18		652

Table 4-7
 JURUPA COMMUNITY SERVICES DISTRICT
 ULTIMATE LAND USE WITHIN THE
 1350 PRESSURE ZONE

2003 Land Use Designation	Land Use in Acres	Land Use Density du/ac	Projected Number of Residential Units
Residential			
Rural (0-0.5 DU/AC.)	114.54	0.0	-
Rural Residential (0-0.5 DU/AC.)	69.54	0.2	14
Very Low Density (0.5-2 DU/AC.)	279.98	2.0	560
Low Density (2-5 DU/AC.)	64.87	4.0	259
Subtotal	528.92		833
Open Space			
RECREATION	3.36	0.0	-
CONSERVATION	47.89	0.0	-
Subtotal	51.25		-
TOTAL	580.17		833

2003 Land Use Designation	Land Use in Acres	Land Use Density du/ac	Projected Number of Residential Units
SUMMARY	23,885.49 *		48,629

* Excludes non-water service area in the Jurupa Mountains.

TABLE 4-8
 JURUPA COMMUNITY SERVICES DISTRICT
 AREA OF PRESSURE ZONE

Pressure Zone	Area In Acres	Percent of Pressure Zone Areas
870	13,509	56.6
980	2,255	9.4
1100	3,634	15.2
1110	3,424	14.4
1200	483	2
1350	580	<u>2.4</u>
Total	23,885*	100%

* Excludes about 2000 acres of non-water service area in the Jurupa Mountains.

SECTION 5 – UNIT VALUES OF APPLIED WATER

Unit values of applied water were utilized to calculate average daily water demand for the study area. Webb Associates evaluated the unit values of applied water used in the District's previous Master Water Plan reports with those used in the Master Water Plans for nearby cities and a special district. After reviewing the available data and its applicability to the District, we updated the unit values of applied water that were previously used in the District's Master Water Plans. The unit values used are shown in Table 5-1.

TABLE 5-1
 JURUPA COMMUNITY SERVICES DISTRICT
 UNIT VALUES OF APPLIED WATER*

Land Use Category	Unit Values of Applied Water	
	Acre-Feet Per acre Per year	Gallons per Minute per acre (gpm)
Rural (0 to 0.5 DU/AC)	1.47	0.91
Very Low Density Residential (0.5 to 2 DU/AC)	2.00	1.24
Low Density Residential (2 to 5 DU/AC)	2.13	1.32
Medium Density Residential (5 to 8 DU/AC)	2.54	1.57
Medium High Density Residential (8 to 14 DU/AC)	3.07	1.90
High Density Residential (16 to 20 DU/AC)	5.16	3.20
Agriculture/Development Reserve	2.46	1.52
Parks/Recreation	1.68	1.04
Commercial	2.06	1.28
Industrial/Manufacturing	1.52	0.94
Industrial Park	1.52	0.94

* Modified from Table 4-2 of "City of Riverside Department of Public Utilities Water Division, Water Master Plan, Update and Hydraulic Network Analysis" August, 1979, Webb-Montgomery, a Joint Venture.

SECTION 6 – PROJECTED ULTIMATE WATER DEMAND

Land use acreage was determined using the applicable county land use designations as detailed in Section 4. To determine ultimate average water demand for each pressure zone in the District, each land use acreage was multiplied by the applicable value of unit applied water listed in Table 5-1.

Table 6-1 contains a summary of land use acreage, annual water demand, average day demand, average day peak month demand, and maximum day peak month water demand. The annual water demand is projected to be 41,560 acre-feet per year excluding the demand put upon the District by Santa Ana River Water Company (1,200 acre-feet per year) and Swan Lake Mobile Home Park (263 acre-feet per year). Tables 6-2 through 6-7 show the ultimate water demand for each of the District's pressure zones. Plate 6 shows the maximum day water demand for current land use conditions (recorded in the year 2000) and under ultimate land development for each of the District's pressure zones at ultimate buildout.

TABLE 6-1
 JURUPA COMMUNITY SERVICES DISTRICT
 WATER MASTER PLAN
 SUMMARY BY PRESSURE ZONE

2003 Landuse Designation	Acres	Total (Ac-Ft per yr)	Average Day Demand (gpm)	Average Day¹ Peak Month Demand (gpm)	Maximum Day² Peak Month Demand (gpm)
870 Pressure Zone	13,509.26	24,282	15,053	27,095	40,643
980 Pressure Zone	2,255.01	3,875	2,402	4,324	6,487
1100 Pressure Zone	3,634.22	6,999	4,339	7,810	11,715
1110 Pressure Zone	3,423.65	5,044	3,127	5,628	8,442
1200 Pressure Zone	483.18	644	399	718	1,077
1350 Pressure Zone	580.17	806	500	899	1,349
TOTAL	23,885.49	41,650	25,820	46,474	69,713

¹ Average Day of Peak Month Demand is 1.8 times Average Day Demand.

² Maximum Day Peak Month Demand is 1.5 times Average Day Peak Month Demand.

TABLE 6-2
 JURUPA COMMUNITY SERVICES DISTRICT
 WATER MASTER PLAN
 870 PRESSURE ZONE

2003 Landuse Designation	Acres	Unit Values of Applied Water Ac-Ft per Ac per Yr	Total (Ac-Ft per yr)	Annual Ave Day (gpm)	Ave Day Pk Month (gpm)	Max Day Pk Month (gpm)
Residential						
Very Low Density (0.5-2 DU/AC.)	2809.05	2.00	5,618	3,483	6,269	9,403
Low Density (2-5 DU/AC.)	5214.62	2.13	11,107	6,886	12,394	18,591
Medium Density (5-8 DU/AC.)	95.23	2.54	242	150	270	405
Medium High Density (8-14 DU/AC)	391.34	3.07	1,201	745	1,341	2,011
High Density (14-20 DU/AC)	66.81	3.36	224	139	250	376
SKY COUNTRY	989.04	2.13	2,107	1,306	2,351	3,526
Subtotal	9566.09		20,500	12,708	22,875	34,312
Open Space						
AGRICULTURE	9.87	0.00	-	-	-	-
CONSERVATION HABITAT	27.46	0.00	-	-	-	-
PUBLIC FACILITIES	227.24	2.00	454	282	507	761
RECREATION	152.71	1.68	257	159	286	429
RECREATION	220.71	0.00	-	-	-	-
Subtotal	637.98		711	441	793	1,190
Other Water Uses						
BUSINESS PARK	595.83	2.00	1,192	739	1,330	1,995
COMMUNITY CENTER	44.66	2.00	89	55	100	150
HEAVY INDUSTRIAL	0.87	2.24	2	1	2	3
LIGHT INDUSTRIAL	442.81	1.52	673	417	751	1,127
RETAIL	541.35	2.06	1,115	691	1,244	1,867
Subtotal	1625.53		3,071	1,904	3,427	5,141
Non-water Uses						
FLOOD	1356.43	0.00	-	-	-	-
FREEWAY	138.95	0.00	-	-	-	-
WRCRWRF	62.19	0.00	-	-	-	-
WATER	122.09	0.00	-	-	-	-
Subtotal	1679.66		-	-	-	-
TOTAL	13,509.26		24,282	15,053	27,095	40,643

TABLE 6-3
 JURUPA COMMUNITY SERVICES DISTRICT
 WATER MASTER PLAN
 980 PRESSURE ZONE

2003 Landuse Designation	Acres	Unit Values of Applied Water Ac-Ft per Ac per Yr	Total (Ac-Ft per yr)	Annual Ave Day (gpm)	Ave Day Pk Month (gpm)	Max Day Pk Month (gpm)
Residential						
Rural (0-0.5 DU/AC.)	200.54	0.00	-	-	-	-
Very Low Density (0.5-2 DU/AC.)	734.45	2.00	1,469	911	1,639	2,459
Low Density (2-5 DU/AC.)	395.45	2.13	842	522	940	1,410
Medium Density (5-8 DU/AC.)	208.13	2.54	529	328	590	885
Medium High Density (8-14 DU/AC.)	6.27	3.07	19	12	21	32
Subtotal	1544.84		2,859	1,772	3,190	4,786
Open Space						
CONSERVATION HABITAT	16.81	0.00	-	-	-	-
RECREATION	7.93	1.68	13	8	15	22
Subtotal	24.74		13	8	15	22
Other Water Uses						
BUSINESS PARK	49.46	1.52	75	47	84	126
LIGHT INDUSTRIAL	248.90	1.52	378	235	422	633
RETAIL	266.72	2.06	549	341	613	920
Subtotal	565.09		1,003	622	1,119	1,679
Non-water Uses						
FREEWAY	120.34	0.00	-	-	-	-
Subtotal	120.34		-	-	-	-
TOTAL	2,255.01		3,875	2,402	4,324	6,487

TABLE 6-4
 JURUPA COMMUNITY SERVICES DISTRICT
 WATER MASTER PLAN
 1100 PRESSURE ZONE

2003 Landuse Designation	Acres	Unit Values of Applied Water Ac-Ft per Ac per Yr	Total (Ac-Ft per yr)	Annual Ave Day (gpm)	Ave Day Pk Month (gpm)	Max Day Pk Month (gpm)
Residential						
Rural	0.54	0.00	-	-	-	-
Rural Residential (0-0.5 DU/AC.)	9.66	1.47	14	9	16	24
Very Low Density (0.5-2 DU/AC.)	1519.07	2.00	3,038	1,883	3,390	5,085
Low Density (2-5 DU/AC.)	824.75	2.13	1,757	1,089	1,960	2,940
Medium Density (5-8 DU/AC.)	146.68	2.54	373	231	416	624
Medium High Density (8-14 DU/AC.)	35.77	3.07	110	68	123	184
High Density (14-20 DU/AC.)	17.73	5.16	91	57	102	153
Subtotal	2554.20		5,383	3,337	6,007	9,010
Open Space						
COMMUNITY CENTER	0.55	2.00	1	1	1	2
CONSERVATION	26.85	0.00	-	-	-	-
CONSERVATION HABITAT	5.36	0.00	-	-	-	-
MINERAL	61.41	0.00	-	-	-	-
PUBLIC FACILITIES	5.95	2.00	12	7	13	20
RECREATION	173.55	1.68	292	181	325	488
Subtotal	273.66		305	189	340	510
Other Water Uses						
BUSINESS PARK	128.45	1.52	195	121	218	327
COMMERCIAL OFFICE	0.81	2.00	2	1	2	3
HEAVY INDUSTRIAL	271.86	2.24	609	378	680	1,019
LIGHT INDUSTRIAL	81.15	1.52	123	76	138	206
RETAIL	185.67	2.06	382	237	427	640
Subtotal	667.94		1,312	813	1,464	2,195
Non-water Uses						
FREEWAY	136.35	0.00	-	-	-	-
WATER	2.07	0.00	-	-	-	-
Subtotal	138.42		-	-	-	-
TOTAL	3,634.22		6,999	4,339	7,810	11,715

TABLE 6-5
 JURUPA COMMUNITY SERVICES DISTRICT
 WATER MASTER PLAN
 1110 PRESSURE ZONE

2003 Landuse Designation	Acres	Unit Values of Applied Water Ac-Ft per Ac per Yr	Total (Ac-Ft per yr)	Annual Ave Day (gpm)	Ave Day Pk Month (gpm)	Max Day Pk Month (gpm)
Other Water Uses						
BUSINESS PARK	502.31	2.00	1,005	623	1,121	1,682
LIGHT INDUSTRIAL	2601.48	1.52	3,954	2,451	4,412	6,619
RETAIL	41.20	2.06	85	53	95	142
Subtotal	3144.99		5,044	3,127	5,628	8,442
Non-water Uses						
FREEWAY	278.66	0.00	-	-	-	-
Subtotal	278.66		-	-	-	-
TOTAL	3,423.65		5,044	3,127	5,628	8,442

TABLE 6-6
 JURUPA COMMUNITY SERVICES DISTRICT
 WATER MASTER PLAN
 1200 PRESSURE ZONE

2003 Landuse Designation	Acres	Unit Values of Applied Water Ac-Ft per Ac per Yr	Total (Ac-Ft per yr)	Annual Ave Day (gpm)	Ave Day Pk Month (gpm)	Max Day Pk Month (gpm)
Residential						
Very Low Density (0.5-2 DU/AC.)	269.50	2.00	539	334	601	902
Low Density (2-5 DU/AC.)	9.29	2.13	20	12	22	33
Medium Density (5-8 DU/AC.)	10.87	2.54	28	17	31	46
Subtotal	289.66		586	364	654	981
Open Space						
MINERAL	159.44	0.00	-	-	-	-
RECREATION	33.92	1.68	57	35	64	95
Subtotal	193.36		57	35	64	95
Other Water Uses						
RETAIL	0.16	2.06	0	0	0	1
Subtotal	0.16		0	0	0	1
TOTAL	483.18		644	399	718	1,077

TABLE 6-7
 JURUPA COMMUNITY SERVICES DISTRICT
 WATER MASTER PLAN
 1350 PRESSURE ZONE

2003 Landuse Designation	Acres	Unit Values of Applied Water Ac-Ft per Ac per Yr	Total (Ac-Ft per yr)	Annual Ave Day (gpm)	Ave Day Pk Month (gpm)	Max Day Pk Month (gpm)
Residential						
Rural (0-0.5 DU/AC.)	114.54	-	-	-	-	-
Rural Residential (0.5-2 DU/AC.)	69.54	1.47	102	63	114	171
Very Low Density (0.5-2 DU/AC.)	279.98	2.00	560	347	625	937
Low Density (2-5 DU/AC.)	64.87	2.13	138	86	154	231
Subtotal	528.92		800	496	893	1,340
Open Space						
RECREATION	3.36	1.68	6	3	6	9
CONSERVATION	47.89	-	-	-	-	-
Subtotal	51.25		6	3	6	9
TOTAL	580.17		806	500	899	1,349

SECTION 7 – WATER SUPPLY

The primary source of water supply for Jurupa Community Services District is from the Chino Groundwater Basin. The District is a member of the Chino Basin Desalter Authority (CDA) which currently has one operating reverse osmosis and ion exchange plant (CDA I) which removes TDS and nitrates from the Chino Basin groundwater and supplies it to some of its current member agencies. The District has a current (2005) right to 1984 gpm (3200 acre-feet per year) from this source. The District is also currently (July 2005) obtaining water (550 gpm) from Rubidoux Community Services District (from the Riverside South Groundwater Basin) and from the City of Norco (Arlington Desalter) (2000 gpm). The latter two sources are of a temporary nature (Summer 2005) until the Chino II Desalter (CDA II) is completed (estimated January 2006) and the startup of the District's Roger D. Teagarden Ion Exchange Plant, which became operational on September 14, 2005.

In 2006, after the CDA I and II are fully operational, JCSD's allotment from these two sources will be 1674 gpm (2700 acre-feet per year) and 3410 gpm (5500 acre-feet per year), respectively.

Existing Water Supply

Table 7-1 shows the District's well production capacity in gpm and the quality of the supply with regard to Total Dissolved Solids (TDS) and Nitrates. The weighted average water quality, pertaining to TDS and nitrate as NO_3 , is shown on Table 7-1. The water supply produced (8,638 gpm) in the 870 Pressure Zone has weighted average TDS and nitrate values of 426 mg/l and 69 mg/l, respectively. The Maximum Contaminant Level (MCL) for nitrate is 45 mg/l per EPA and DHS Standards. As a result of the high nitrate levels in the 870 Pressure Zone wells, the District constructed the Roger D. Teagarden Ion Exchange Plant to reduce the nitrate level to a maximum of 35 mg/l. The production capacity of the 980 Pressure Zone wells is 13,113 gpm. The TDS and nitrate levels of the 980 Pressure Zone sources are 409 mg/l and 34 mg/l, respectively. The 1110 Pressure Zone wells have a production capacity of 3,592 gpm, and TDS and nitrate levels of 244 mg/l and 15 mg/l, respectively.

Table 7-2 shows that the actual operational water supply in August 2005 was 21,189 gpm. In early July 2005, Well Nos. 17 and 23 went out of operation; hence, the District's effective water supply in early July was down to about 12,700 gpm¹ including their CDA I Plant supply (1984 gpm). On a temporary basis, the District was allowed to use the City of Chino and the City of Norco's CDA I Plant water supply. Also on a temporary

¹ In early July 2005, the District's existing supply consisted of its existing potable water well supply of 16,705 gpm and CDA I supply of 1984 gpm, totaling 18,689 gpm. With Wells 17 and 23 going out of service, the District's effective production was reduced to 12,700 gpm for a few days.

basis, water connections were made to the Cities of Ontario, Norco, and Rubidoux Community Services District to supplement the District's existing supply. In a matter of days, Well No. 23 was repaired and put into operation. However, it took several weeks to get Well No. 17 back into operation.

TABLE 7-1
 JURUPA COMMUNITY SERVICES DISTRICT
 WATER WELL CAPACITY AND QUALITY

Description	Pressure Zone	Flow (GPM)	Total Filtrable Residue ¹ (In mg/l)	Nitrate ¹ (In mg/l)
Well No. 8	870	1348	420	71
Well No. 11	870	1236	550	76
Well No. 12	870	1000	670	80
Well No. 14	870	2081	290	39
Well No. 15	870	735	380	38
Well No. 16	870	2238	392	96 ²
Subtotal	870	8638	426³	69³
Well No. 6	980	1500	310	32
Well No. 13	980	2663	440	26
Well No. 17	980	3500	400	38
Well No. 18	980	1656	370	44
Well No. 20	980	922	270	23
Well No. 22	980	2500	510	39
Well No. 24 (Glen Avon Well No. 6)	980	372	520	25
Subtotal	980	13,113	409³	34³
Well No. 19	1110	1092	230	13
Well No. 23 ⁴	1110	2500	250	16
Subtotal	1110	3592	244³	15³
TOTAL		25,343		

¹ Data from Jurupa Community Services District's 2005 table titled, "General Mineral Inorganic Chemicals 2005".

² Data from water quality sample taken on July 27, 2005.

³ Weighted average water quality based on well production.

⁴ This well will be converted to pump into the 870 Pressure Zone in early 2006.

TABLE 7-2
 JURUPA COMMUNITY SERVICES DISTRICT
 EXISTING (AUGUST 2005) WATER SUPPLY
 (IN GALLONS PER MINUTE)

Source of Supply	Available Water Supply For 2005
Existing Potable Well Supply	16,705
Existing 870 Well Supply that needs Nitrate Removal ¹ (Not Operational as of August 2005) ²	8,638
Subtotal	25,343
CDA #1	1,984
Norco Connection (Temporary)	2,000
Rubidoux Connection (Temporary)	500
TOTAL	29,827
Actual Operational Water Supply August 2005	21,189

¹ To utilize this source, the Roger D. Teagarden Ion Exchange Plant needs to be operational and expanded from 4 to 10 nitrate vessels. A contract is in place to expand the plant from 4 to 6 vessels. The final phase to expand the plant to 10 vessels is scheduled to be completed by June 2006.

² The Ion Exchange Plant's four nitrate vessels became operational on September 14, 2005.

Table 7-3 shows the District's projected 2006 water supply (36,700 gpm) from their wells, CDA treatment plants, and connections to the City of Norco Facilities and Rubidoux Community Services District. This assumes that the Roger D. Teagarden Ion Exchange Plant and the CDA II Desalter Facilities are fully operational in 2006.

Supplemental Water Supply

The Ultimate Maximum Day Water Demand of the District, including its obligations to the Santa Ana River Water Company and Swan Lake Mobile Home Park, is 71,560 gpm. Table 7-3 shows that the District's projected 2006 water supply is about 36,700 gpm. Hence, the District needs to develop about 35,000 gpm supply and additionally, to have in reserve the ability to replace its largest single source of supply. In the District's case, this would be the Roger D. Teagarden Ion Exchange Plant which will have a treatment capacity of 12,800 gpm. Therefore, the District needs to develop a supplemental water supply in addition to their projected supply noted in Table 7-3 of 47,800 gpm (68.8 MGD) alternative sources of water supply.

TABLE 7-3
 JURUPA COMMUNITY SERVICES DISTRICT
 2006 WATER SUPPLY
 (IN GALLONS PER MINUTE)

Source of Supply	Projected Water Supply For 2006
Existing Well Supply	25,343
<u>Increase in Well Capacity For:</u>	
Well No. 23 (Installation of final pumps and motors.) ¹	1,000
CDA #1	1,674
CDA #2	3,410
Norco Connection	4,000
Rubidoux Connection	500
CDA #2 Santa Ana River Water Co. Supply	744
TOTAL	36,671 ≈ 36,700

⁽¹⁾ The existing (August 2005) capacity of Well No. 23 is 2500 gpm (Table 7-1). With the installation of the final well equipment, the capacity of this well will be increased to 3500 gpm. With the construction of the 30" diameter Harrel Street pipeline from Well No. 23 to the Etiwanda 24" diameter 870 Pressure Zone pipeline, Well No. 23 will pump directly into the 870 Pressure Zone. The 30" diameter water pipeline will allow a portion of the CDA II water supply to be pumped directly into the 870 Pressure Zone.

Well No. 22's capacity will increase by 1000 gpm upon completion of the Etiwanda Avenue pipeline to convey water from Well Nos. 17, 18, 22, and future Well No. 25 into the 870 Pressure Zone. This pipeline will be constructed after 2006.

Alternative Water Supply Sources

As previously discussed, the District's water supply is currently from groundwater. In order to meet the maximum day water demand under ultimate development, approximately 46,800 gpm² of additional water supply will be required. In order to provide this additional supplemental water supply, the following four stage program of water supply development is proposed. Each stage of water development represents a larger financial commitment by the District. The timing of the additional sources of supply are dependent on:

1. Reliability of the District's existing sources of ground water;
2. Growth in water demand;
3. Capital and operation and maintenance cost of additional sources of supply; and
4. Financial feasibility.

This four stage program begins with the most cost effective (maximize existing resources) method of providing water to the District and progresses to each following stage until ultimately, the highest cost water supply source (imported water) is developed. The four stage program is as follows:

1. Develop potable Chino Basin groundwater supply within JCSD's service area (See area of potential well sites in Plate 7). 16,000gpm
2. Purchase demineralized water from the Chino II Desalter when it is rated to 15 MGD; 2.5 MGD
1736gpm
3. Construct a second ion exchange plant at the Roger D. Teagarden Ion Exchange Plant site to treat groundwater, assuming nitrate is greater than 45 mg/l from wells in Sky Country and from future wells along Cantu-Galleano Road; and
4. Construct an importation facility from one of the following sources: 10,500 gpm
 - a. Alternative 1 - Imported Colorado River water from The Metropolitan Water District of Southern California's Upper Feeder (30 MGD) (Plate 8); or
 - b. Alternative 2 - Imported State Water Project water from The Metropolitan Water District of Southern California's Etiwanda Feeder (30 MGD) (Plates 9 and 10); or

² Not included in this total is the increase in well supply from Well No. 22 when it pumps into the 870 Pressure Zone.

- c. Alternative 3 - Imported water from the Cucamonga County Water District (26 MGD) (Plates 11 and 12).

Develop Potable Groundwater Supply

The first stage of the water supply development program is to initiate a program to develop potable ground water sources within the District's service area (Chino Basin within Riverside County). This stage is the most cost effective method of providing additional water supply to the system for two reasons: (1) the groundwater is local and relatively inexpensive to develop; and (2) the higher quality groundwater eliminates the need for treatment (other than chlorination). The capital, operation, and maintenance cost of local well water is estimated at about \$160 to \$180 per acre-foot assuming an annual use factor of 37 percent. The cost does not include any payment to the Chino Basin Water Master for ground water replenishment which is currently about \$233 per acre-foot.

The District has several potential locations it should develop as soon as possible. They include the following:

1. Northwest corner of the District (Plate 7); and
2. Intersection of San Sevaine Way and San Sevaine Flood Control Channel.

Drill Wells in the Northwest Portion of the District. The first stage of groundwater development should be in the northwest portion of the District. The District has already drilled two wells in the area (Water Well Nos. 22 and 23). The proposed well development in this area of the District (Plate 7) is based on Geoscience Support Services, Inc. report "Jurupa Community Services District, Evaluation of Groundwater Production Potential" September 2003. These proposed wells will pump directly into the 870 Pressure Zone (See Plates 8, 10, and 12).

The District should retain a hydrogeologist to determine the number of wells that can be drilled in this portion of the District without having long time adverse consequence on the District's and CDA's wells that currently exist in the area. The hydrogeologist should look at the feasibility of using these proposed wells for peaking purposes in order to lessen the annual impact on the groundwater basin.

San Sevaine Well. GSi/Water investigated potential well sites for the former Mutual Water Company of Glen Avon Heights within Sections 9 and 10 Township, 2 south, Range 6 west in 1994 (Plates 8, 10, and 12). They found suitable sites along San Sevaine Way that could produce 1500 to 2000 gallons per minute. Test hole drilling would be required along with the acquisition of a potential well site. There is a very suitable site at the southeast intersection of San Sevaine Way and San Sevaine Flood Control Channel. If a test hole proves that a production well is cost effective at this

location, the District should consider the drilling of a well in this location. This well could pump directly into the 980 Pressure Zone with minimal piping improvements. The project cost of this proposed well is not included in our future cost of improvements, since success of this site is problematic, at this time.

Chino Basin Desalter Authority

The District is a member of the Chino Basin Desalter Authority which has one operating plant, CDA I³ and one plant under construction, CDA II⁴. CDA II should be operational in the early part of 2006.

RBF Consulting Engineers have informed⁵ CDA that CDA II Treatment Plant, which was designed for 10 MGD, may have the ability to treat up to about 15 MGD as a result of the present source water quality being better than the design water quality criteria assumed for the plant. The District may want to consider purchasing 2.5 MGD (2800 acre-feet) of this additional capacity of 5 MGD.

Roger D. Teagarden Ion Exchange Proposed Plant II

Geoscience Support Services, Inc. identified areas with various ranges of water quality in their September 10, 2003 report "Jurupa Community Services District, Evaluation of Groundwater Production Potential" with various ranges of water quality. As discussed previously, we recommend drilling in areas that have good water quality with total dissolved solids ranging from 250-500 mg/l. Geoscience also identified areas of poorer water quality (TDS concentration of 500-750 mg/l and a nitrate concentration of 45-100 mg/l) that can be used if treated.

We recommend that the District utilize their existing unused well sites in Sky Country (Nos. 1, 2, and 3), and acquire four (4) additional well sites along Cantu-Galleano Road. We envision that these wells will have a production capacity of about 1500 gpm each. Water from these wells will have to be treated in a new ion exchange plant that will be constructed on the existing Roger D. Teagarden Plant site. The proposed new ion exchange plant will require eight (8) ion exchange vessels plus auxiliary equipment.

Importation Facilities

The District has four potential options to import water from other public agencies. The first two are from The Metropolitan Water District of Southern California (Plates 8 and 9). The other two options are from Cucamonga County Water District (Plate 11), and San Bernardino Valley Municipal Water District's Baseline Feeder.

³ Located at the southwest corner of the intersection of Euclid Avenue and Kimball Avenue.

⁴ Located behind JCSD's office building on Harrel Street (Plate 1).

⁵ E-mail (September 7, 2005) from Cameron Hipwell (RBF) to Craig Parker (IEUA).

The Metropolitan Water District of Southern California. Webb Associates, on behalf of the District, has previously evaluated alternative means of importing water from Metropolitan's facilities. We evaluated obtaining Colorado River water off of the Upper Feeder (Plate 8) and State Water Project water off of the Etiwanda Feeder (Plate 9).

Upper Feeder. Metropolitan's Upper Feeder, which conveys untreated Colorado River water, crosses the District generally in a south to north direction along Camino Real and exits the District through Pyrite Canyon into the City of Fontana (Plate 8). A connection to the Upper Feeder would preclude the need for a long transmission line to the District (compared to the other two imported water alternatives); since, a proposed connection would be in the vicinity of Granite Hills Drive and Pyrite Road (Plate 8) which is within the District's service area boundaries.

Metropolitan's recommended hydraulic grade on the Upper Feeder, for the District's study purposes, is 1163 feet. For fiscal year 2004-2005, the average total dissolved solids (TDS) of this source of supply at Lake Mathews was 625 mg/l. Nitrate concentration was 0.8 mg/l. However, since the Colorado River water has a high TDS concentration, it would preclude the District from discharging the wastewater generated from this source into the District's sewerage system.

The California Regional Water Quality Control Board – Santa Ana Region has established waste discharge requirements at the City of Riverside and the Western Riverside County Regional Wastewater Authority's (WRCRWA) Treatment Plant. The City of Riverside's Waste Discharge Requirement Order No. 01-3 has a twelve (12) month average TDS requirement for wastewater of 650 mg/l. In addition, the total dissolved solids concentration shall not exceed the TDS of the water supply by 250 mg/l. The WRCRWA Waste Discharge Requirements Order No. R8-2002-0024 has a twelve (12) month average TDS requirement for wastewater of 625 mg/l. In addition, the total dissolved solids concentration shall not exceed the TDS of the water supply by 250 mg/l. As a result, the District's water supply needs to be in the order of 375 to 400 mg/l to meet the waste discharge requirements at either wastewater treatment plant.

If Colorado River water is used by the District, at least 50 percent will have to be demineralized to achieve an average TDS water supply of about 350 to 375 mg/l. In addition, the District would have to acquire Santa Ana Regional Interceptor (SARI) capacity and treatment capacity at Orange County's Treatment Plant to dispose of the brine waste from the R.O. Treatment Plant. At this time, the District does not have a treatment plant site for this alternative.

Etiwanda Feeder. In evaluating Metropolitan's facilities, where the District could obtain State Water Project water from their facilities, the most feasible location was off of the Etiwanda Feeder at Etiwanda Avenue and Foothill Boulevard (Plate 9). The proposed connection site was the closest MWD facility (with treated or, in this case, untreated State Water Project water) to the District's service area. For fiscal year 2004-2005, State Water Project water has a TDS of 247 mg/l and a nitrate level of 3-

7 mg/l. The Etiwanda Feeder also has a second advantage in that the design hydraulic grade (1658 feet) is sufficient to allow water to flow by gravity to a proposed treatment facility (1150 feet^{+/-}) in the Jurupa Mountains. The length of the pipeline from between the connection to the Etiwanda Feeder and the District's proposed treatment plant is 34,000 feet. One of the significant problems with this alternative is to find a suitable site at the 1080 foot elevation or higher in the Jurupa Mountains that could be developed into a treatment plant water site (15 acres). Preliminary grading studies show that one site would require about 1,500,000 cubic yards of export. At this time, the District does not have any land for a proposed treatment plant. Other treatment plant locations, at a lower elevation, will require a major pump station in addition to the treatment facility.

Cucamonga County Water District. Cucamonga County Water District's Michaels Treatment Plant is located at 24th Street and Etiwanda Avenue (Plate 11). The plant has a current capacity of 66 MGD but can be expanded to 90 MGD. The Cucamonga County Water District is a member agency of the Inland Empire Utilities Agency which in turn is a member agency of Metropolitan Water District. Cucamonga County Water District obtains untreated State Water Project water from the Rialto Feeder. Cucamonga County Water District is currently undertaking an aggressive groundwater development program so that it appears that they may have excess capacity in their existing 66 MGD plant. Jurupa Community Services District's supplemental demand for water is about 26.5 MGD after assuming additional groundwater development. It appears that based on preliminary discussion that it may be possible for the District to expand the Michael Treatment Plant to its full capacity of 90 MGD. The institutional feasibility and financial terms are unknown at this time but should be explored to determine if this is a viable option for the District.

Baseline Feeder. San Bernardino Valley Municipal Water District has indicated that they have about 10,000 acre-feet per year capacity in their Baseline Feeder which currently terminates at Cactus Avenue in the City of Rialto (Plate 13). This project would require agreements with Western Municipal Water District (WMWD) and San Bernardino Valley Municipal Water District (SBVMWD) and participation in the cleanup of the Bunker Hill Groundwater Basin. It is doubtful that the District, working by itself, could develop a source off of the Baseline Feeder. Inland Empire Utilities Agency (IEUA) has been discussing the feasibility of extending the Baseline Feeder west into its service area (Plate 13). There may be an opportunity, working with IEUA, WMWD, and SBVMWD, to develop a source of supply in the future. However, at this time, other sources of supply seem to be more feasible.

SECTION 8 – STORAGE REQUIREMENTS FOR THE ULTIMATE SYSTEM

Existing System

The District has 38.7 million gallons of storage within its existing facilities as shown in Table 8-1.

Storage Design Criteria

Storage facilities are required to meet the peak hour demand, fire flow, and other emergency conditions (which are equivalent to one hundred percent of maximum day demand plus worst case fire flow storage requirements). The following criteria were used to determine storage volume:

Equalizing Storage

Pumping facilities have been sized to meet maximum day demand flows. Any peak demands, e.g. peak hour, greater than maximum day must be supplied from storage. Equalizing storage provides the storage to meet these short term peak water demands. Twenty-five percent of the estimated maximum day demand is used as the criteria needed to meet the daily demand fluctuations within each pressure zone.

Fire Flow Storage

Fire flow requirements for each pressure zone must be met through storage and have been estimated based on the fire flow criteria given in Table 8-1. Fire flows and durations used in the analysis are given in Table 8-1. In each case, worst case conditions were used for each pressure zone.

Emergency Storage

Emergency storage capacity will be needed to sustain the water needs during periods of total or partial shutdown of the water supply facilities. Three quarters of the estimated maximum day demand is used to calculate emergency storage by pressure zone.

Ultimate Storage Requirements

The projected ultimate storage requirements for each pressure zone were calculated to meet peak hour, fire flow, and emergency conditions per the listed criteria. No storage was included to wheel water through a pressure zone to a higher pressure zone. These ultimate requirements were then compared to existing storage capacity to determine additional storage required to meet ultimate water demand conditions. Table 8-1 shows the existing and required storage by zone.

870 Pressure Zone

The 870 Pressure Zone contains 17 MG of storage. Currently (2005), there is a slight deficit of 0.8 MG. However, under ultimate development, this zone will require about 45 MG of additional storage. Webb Associates is currently preparing a preliminary design report to evaluate the optimum placement of 40 to 50 MG of storage on the District's Lindsay Reservoir Site (Plates 8, 10, and 12).

**TABLE 8-1
JURUPA COMMUNITY SERVICES DISTRICT
CURRENT AND ULTIMATE STORAGE REQUIREMENTS**

Pressure Zone	Max. Day Demand (gpm)	Year 2005 Storage Requirements					ULT Max. Day Demand (gpm)	Ultimate Storage Requirements								
		Component Storage Requirements				Total Storage Required (MG)		Present Storage (MG)	Additional Storage Required (MG)	Component Requirements			Total Storage Required (MG)	Present Storage (MG)	Additional Storage Required (MG)	
		Equalizing Storage ² (MG)	Fire Storage ³ (MG)	Emergency Storage ⁴ (MG)	Fire Storage ³ (MG)					Emergency Storage ⁴ (MG)	Equalizing Storage ² (MG)	Fire Storage ³ (MG)				Emergency Storage ⁴ (MG)
870	11,530 ¹	4.15	1.2	12.45	17.8	17.8	17	0.8	870	42,000 ¹	15.1	1.2	45.4	61.7	17	44.7
980	2,830	1.0	0.6	3.1	4.7	8	8	---	980	6,500	2.3	0.6	7.0	9.9	8	1.9
1100	7,290	2.6	0.6	7.9	11.1	5	5	6.1	1,100	12,000	4.3	0.6	13.0	17.9	5	12.9
1110	3,262	1.2	1.44	3.5	6.1	6	6	0.1	1,110	10,000	3.6	1.44	10.8	15.8	6	9.8
1200	730	0.3	0.18	0.8	1.3	1.21	1.21	0.1	1,200	1,100	0.4	0.18	1.2	1.8	1.21	0.6
1350	510	0.2	0.18	0.6	1.0	1.5	1.5	---	1,350	1,400	0.5	0.18	1.5	2.2	1.5	0.7
TOTAL	26,152				42.0	38.71				73,000				109.3	38.71	70.6

¹ Includes water demand for Swan Lake Mobile Home Park (440 gpm) and Santa Ana River Water Co. (1560 gpm).

² Twenty-five percent of maximum day demand.

³ Based on the following five demands:

- 5000 gpm for 4 hours in the 870 Pressure Zone
- 5000 gpm for 2 hours in the 980 Pressure Zone
- 6000 gpm for 4 hours in the 1110 Pressure Zone
- 1500 gpm for 2 hours in the 1200 and 1350 Pressure Zones

⁴ Seventy-five percent of maximum day demand. Prior to this study, the District's storage requirement for maximum day demand was 50 percent.

980 Pressure Zone

The 980 Pressure Zone currently has 8 MG of water in storage and currently has a surplus of storage capacity. The ultimate storage required for this zone is 9.9 MG, based on the proposed design criteria. The District will ultimately require an additional 2 MG of storage for this pressure zone. Due to the small amount of additional storage required and the lack of plausible sites, this additional storage could be excluded or placed in a higher pressure zone.

1100 Pressure Zone

The 1100 Pressure Zone has 5 MG of storage; however, it should have 11.1 MG. This zone has the greatest existing storage deficit (6.1 MG) of all the District's zones. This zone will require the construction of an additional 13 MG of storage for a total of 18 MG.

1110 Pressure Zone

The 1110 Pressure Zone currently has 6 MG in storage. No additional storage is required at this time. Under ultimate development, this zone will require about 15.8 MG or an increase of about 9.8 MG in storage. The District is currently soliciting bids for the construction of a 6 MG storage tank adjacent to their existing 6 MG storage facility. No additional land will need to be acquired for this facility. However, if additional storage is required in this zone, land will need to be acquired. The 1110 Pressure Zone may not need an additional 3.8 MGD because this pressure zone's actual water demand appears to be less than the projected values.

If a pipeline is placed in Granite Hill Drive to connect the 1100 and 1110 Pressure Zones, then the storage may be added to the 1100 Pressure Zone site to compensate for any apparent deficit in the 1110 Pressure Zone.

1200 Pressure Zone

The 1200 Pressure Zone has 1.21 MG of storage while the currently required storage is 1.3 MG. Under ultimate development, it is projected that this zone will require 1.8 MG; hence, an additional 0.6 MG may need to be added in this zone. Due to limited reservoir sites in the area and the minimal increase in storage, it may be more economical to provide a standby generator that will provide auxiliary power to provide for a supplemental emergency supply of water to this zone.

1350 Pressure Zone

The 1350 Pressure Zone has 1.5 MG of storage while the current required storage capacity is 1.0 MG. Ultimately, this zone may need 2.2 MG of water storage facilities resulting in a deficit of 0.7 MG. This zone, like the 1200 Pressure Zone, may be better served to have an auxiliary power supply to pump emergency water into this zone if there are inadequate storage facilities in the future.

SECTION 9 – PIPELINE REQUIREMENTS FOR ULTIMATE SYSTEM

The design criteria used to size the transmission pipeline network is consistent with criteria used in previous Master Plans for the District. The following is a summary of the design criteria used:

1. Maximum velocity of 6-ft/sec in transmission pipelines under replenishment conditions.
2. Maximum friction loss of 3.5-ft/1000-ft of transmission line under replenishment conditions.
3. Maximum velocity of 7.5-ft/sec in any water pipelines during peak hour or maximum day demand plus emergency fire flow conditions.
4. Transmission pipeline shall be no smaller than 12-inch diameter.

As part of the Master Plan, a computer model was developed to simulate the existing and ultimate water system. The computer model used is H2ONET® Version 3.1 developed by MW Soft, Inc. Conditions analyzed include the current conditions, ultimate system at peak hour, ultimate system at maximum day demand plus fire flow and ultimate system at replenishment conditions.

The proposed transmission pipelines for the ultimate system, assuming supplemental supply from MWD's Upper Feeder, are shown in Plate 8. The proposed system requires approximately 22 miles of new pipeline which is broken down as follows:

Pipeline System for Alternative No. 1

Water Supply Facilities Pipelines

870 Pressure Zone Potable Water Well Pipeline System

24" Ø	17,600'
30" Ø	4,420'

1110 Pressure Zone Potable Water Well Pipeline System

16" Ø	640'
-------	------

870 Pressure Zone Ion Exchange Raw Water Well Pipeline System⁶

8" Ø	8080'
12" Ø	5180'
16" Ø	6510'
24" Ø	3480'

980 Pressure Zone Ion Exchange Raw Water Well Pipeline System

16" Ø	1800'
24" Ø	3220'
30" Ø	3540'

1100 Pressure Zone MWD Connection to Upper Feeder System

24" Ø	6580'
-------	-------

870 Pressure Zone MWD Connection to Upper Feeder System

42" Ø	9920'
-------	-------

Transmission Facilities

870 Pressure Zone

16" Ø	10,600'
36" Ø	5450'
36" Ø	4290'
42" Ø	16,580'

1100 Pressure Zone

18" Ø	3580'
-------	-------

1110 Pressure Zone

16" Ø	3,260'
-------	--------

⁶ Existing 870 Pressure Zone pipelines may be converted to raw water to minimize new pipeline construction.

The vast majority of the pipeline system improvements deal with construction pipelines to existing and proposed wells for either treatment or directly into the District's distribution system. The balance of the improvements deal with improving the existing distribution system and constructing the proposed transmission pipeline from the proposed Lindsay Reservoir, directly into the 870 Pressure Zone.

Pipeline System for Alternative No. 2

The water supply facilities pipeline and transmission facilities are the same as for Alternative No. 1. In addition, this alternative has a 34,000 foot transmission pipeline to the Etiwanda Feeder. This proposed alternative will require about 28 miles of new pipelines.

Pipeline System for Alternative No. 3

The water supply facilities pipeline and transmission facilities are the same as for Alternative No. 1. In addition, this alternative requires the construction of 57,000 feet of 36" diameter pipeline to the Cucamonga County Water District's Michaels Treatment Plant. This alternative will require the construction of 32.5 miles of pipeline.

SECTION 10 – CONSTRUCTION AND PROJECT COST ESTIMATES

Cost estimates have been developed for the facilities proposed to serve the District at ultimate development. The cost estimates are based on unit costs for water pipelines and water treatment facilities, and lump sum estimates for reservoirs, PRV stations, and pump stations.

The construction and project cost shown were obtained from manufacturers, construction firms and recorded data from bid results for similar water facilities. The estimated project costs shown are based on August 2005 ENR – Los Angeles Construction Cost Index of 8277.95. Estimated project costs include construction cost and project overhead. Project overhead is estimated at forty percent of construction costs and is itemized as follows:

1. Contingencies – 15% of construction cost.
2. Technical Services – 15% of construction cost which includes preparation of a non-controversial environmental assessment, processing of necessary approvals and permits, engineering survey and photogrammetry, design and specifications.
3. Field Engineering – 10% of construction costs which include contract administration, coordination with other agencies, administrations of geotechnical and other necessary outside services, construction surveying, construction inspection and preparation of as-built drawings.
4. Escalation, financing, interest during construction, District contract administration, legal, EIR/EIS, land acquisition and right-of-way agent costs are not included.

The capital improvement program carries through the projected ultimate development of the District. Actual costs will be determined by market conditions and detailed design.

The improvements described herein are Master Plan capital improvements to the Jurupa Community Services District's water system. Routine system maintenance, which is not included herein, encompasses the following:

- Pipeline replacement.
- Pipeline repair and maintenance.
- Meter repair or replacement.
- Change-out of fire hydrants or detector checks.

- Repair and replacement of system line valves.
- Valve exercise program.
- Well repairs.

Construction costs are based on conditions as of August 2005. The following unit construction costs were used:

1. New Pipelines:

8-inch pipeline	\$110/foot
12-inch pipeline	\$135/foot
16-inch pipeline	\$165/foot
18-inch pipeline	\$180/foot
24-inch pipeline	\$220/foot
30-inch pipeline	\$265/foot
36-inch pipeline	\$300/foot
42-inch pipeline	\$350/foot

2. Reservoirs were assumed to be prestressed reservoirs, except as noted.

6 MG tank	\$2.0 million (welded steel tank)
15 MG tank	\$8.0 million
20 MG tank	\$10.0 million

3. New well construction costs (per well) are detailed as follows:

Property	\$200,000
Well Construction	\$500,000
Wellhead Facilities/Equipping	<u>\$750,000</u>
Estimated Construction Cost	\$1,450,000

4. Engine Generator unit: \$300,000
(Stationary unit, in a building, with ATS and ventilation)
5. Ion Exchange Plant: \$0.50/gallon per day
6. Membrane Filtration Plant: \$1.50/gallon per day
7. Conventional Treatment Plant: \$2.00/gallon per day

8. Reverse Osmosis: \$2.00/gallon per day
(Reduction of TDS from 700 mg/l)
9. Brine Disposal: \$10/gallon per day
(into the SARI Line)

The following tables present the project cost for the Master Water Plan facilities to meet the ultimate water demand of the District. Tables 10-1 through 10-9 show the construction and project cost of the water facilities required by the District excluding importation facilities of MWD water. Table 10-10 shows that the project cost of the District facilities (excluding importation facilities is about \$125,000,000). Tables 10-11 through 10-13 show the projected cost of importing Colorado River water or State Water Project water to the District.

Table 10-11 shows that the cost of obtaining water from MWD's Upper Feeder which crosses the District near Pyrite Canyon (Plate 8). The project cost of this alternative, including conveyance facilities, is about \$139,000,000.

Table 10-12 shows the estimated cost of importing water from the Metropolitan Etiwanda Feeder (Plates 9 and 10); the project cost of this alternative, including conveyance facilities is about \$101,000,000.

Table 10-13 (Plates 11 and 12) shows the estimated cost of obtaining treated State Water Project water from Cucamonga County Water District's Michaels Treatment Plant. We have estimated that the project cost of this alternative, including conveyance facilities, is about \$106,000,000.

In summary, the projected capital improvement costs to implement the Master Water Plan ranges from \$226,000,000 to \$264,000,000 (Table 10-14).

Alternatives 1 and 2 include construction costs of a 30 MGD Treatment Plant. Alternative 3 includes the cost of construction of a 24 MGD Treatment Plant. Cucamonga County Water District's existing facility only allows for an expansion of a 24 MGD facility. The first two alternatives provide for 6 MGD of additional emergency supply.

Please note that the project costs excludes certain cost items such as for land and site improvements.

TABLE 10-1
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 870 PRESSURE ZONE
 POTABLE WATER WELLS AND PIPELINE SYSTEM

Description	Quantity	Unit	Unit Cost	Construction Cost
PIPELINES				
24" Ø Waterline	17,600	L.F.	\$220	\$3,872,000
30" Ø Waterline	4,420	L.F.	\$265	\$1,171,300
CONSTRUCTION COST				\$5,043,000
PROJECT COST ⁽¹⁾				\$7,060,000
WATER WELLS				
Water Wells	6	Per Well	\$1,750,000	\$10,500,000
CONSTRUCTION COST				\$10,500,000
PROJECT COST ⁽¹⁾				\$14,700,000
TOTAL CONSTRUCTION COST				\$15,543,000
TOTAL PROJECT COST⁽¹⁾				\$21,760,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

TABLE 10-2
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 1110 PRESSURE ZONE
 POTABLE WATER WELL AND PIPELINE SYSTEM

Description	Quantity	Unit	Unit Cost	Construction Cost
PIPELINES				
16" Ø Waterline	640	L.F.	\$165	\$105,600
CONSTRUCTION COST				\$105,600
PROJECT COST ⁽¹⁾				\$148,000
WATER WELL				
Water Well (Proposed Well No. 26)	1	Per well	\$1,750,000	\$1,750,000
CONSTRUCTION COST				\$1,750,000
PROJECT COST ⁽¹⁾				\$2,450,000
TOTAL CONSTRUCTION COST				\$1,855,000
TOTAL PROJECT COST⁽¹⁾				\$2,600,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

TABLE 10-3
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 980 PRESSURE ZONE
 WATER WELL PIPELINE SYSTEM
 TO THE ION EXCHANGE PLANT

Description	Quantity	Unit	Unit Cost	Construction Cost
PIPELINES				
16" Ø Waterline	1,800	L.F.	\$165	\$297,000
24" Ø Waterline	3,220	L.F.	\$220	\$708,400
30" Ø Waterline	3,540	L.F.	\$265	\$938,100
CONSTRUCTION COST				\$1,943,500
PROJECT COST ⁽¹⁾				\$2,720,000
WATER WELL				
Water Well (Proposed Well No. 25)	1		\$1,750,000	\$1,750,000
CONSTRUCTION COST				\$1,750,000
PROJECT COST ⁽¹⁾				\$2,450,000
TOTAL CONSTRUCTION COST				\$3,693,500
TOTAL PROJECT COST⁽¹⁾				\$5,170,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

TABLE 10-4
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 870 PRESSURE ZONE
 HIGH NITRATE WATER WELLS, PIPELINES, AND
 ION EXCHANGE TREATMENT PLANT

Description	Quantity	Unit	Unit Cost	Construction Cost
PIPELINES				
8" Ø Waterline	8,080	L.F.	\$110	\$888,800
12" Ø Waterline	5,180	L.F.	\$135	\$699,300
16" Ø Waterline	6,510	L.F.	\$165	\$1,074,150
24" Ø Waterline	3,480	L.F.	\$220	\$765,600
CONSTRUCTION COST				\$3,427,850
PROJECT COST ⁽¹⁾				\$4,800,000
WATER WELLS				
Water Wells (Sky Country Well Sites)	3	Per Well	\$1,250,000	\$3,750,000
Water Wells (Cantu-Galleano Road)	4	Per Well	\$1,450,000	\$5,800,000
CONSTRUCTION COST				\$9,550,000
PROJECT COST ⁽¹⁾				\$13,400,000
TREATMENT PLANT				
Ion Exchange Treatment Plant at the Roger D. Teagarden Site	15 MGD	Gallons	\$0.50	\$7,500,000
CONSTRUCTION COST				\$7,500,000
PROJECT COST ⁽¹⁾				\$10,500,000
TOTAL CONSTRUCTION COST				\$20,477,850
TOTAL PROJECT COST⁽¹⁾				\$28,700,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

TABLE 10-5
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 EXPANSION OF 56TH STREET BOOSTER STATION
 AND 1100 PRESSURE ZONE PIPELINE

Description	Quantity	Unit	Unit Cost	Construction Cost
PUMP STATION ADDITION				
Addition of 2000 gpm Pump	1	L.S.	\$100,000	\$100,000
CONSTRUCTION COST				\$100,000
PROJECT COST ⁽¹⁾				\$140,000
PIPELINE				
18" Ø Pipeline	3580	L.F.	\$180	\$644,400
CONSTRUCTION COST				\$644,400
PROJECT COST ⁽¹⁾				\$900,000
TOTAL CONSTRUCTION COST				\$744,400
TOTAL PROJECT COST⁽¹⁾				\$1,040,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

TABLE 10-6
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 870 AND 1110 PRESSURE ZONE
 TRANSMISSION FACILITIES

Description	Quantity	Unit	Unit Cost	Construction Cost
PIPELINE SYSTEM				
16" Ø Pipeline (870 Pressure Zone)	10,600	L.F.	\$165	\$1,749,000
16" Ø Pipeline (1110 Pressure Zone)	3,260	L.F.	\$165	\$537,900
TOTAL CONSTRUCTION COST				\$2,286,900
TOTAL PROJECT COST⁽¹⁾				\$3,200,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

TABLE 10-7
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 LINDSAY RESERVOIR AND PIPELINE SYSTEM

Description	Quantity	Unit	Unit Cost	Construction Cost
RESERVOIRS				
Grading	L.S.	L.S.	\$600,000	\$600,000
Site Piping	L.S.	L.S.	\$500,000	\$500,000
Offsite Drainage Pipeline	L.S.	L.S.	\$500,000	\$500,000
15 MG Reservoir (Initial)	1	Per Reservoir	\$8,000,000	\$8,000,000
15 MG Reservoirs	2	Per Reservoir	\$8,000,000	\$16,000,000
CONSTRUCTION COST				\$25,600,000
PROJECT COST ⁽¹⁾				\$35,840,000
PIPELINE SYSTEM 870 Pressure Zone				
36" Ø Pipeline	5450	L.F.	\$300	\$1,635,000
42" Ø Pipeline	16,580	L.F.	\$350	\$5,803,000
CONSTRUCTION COST				\$7,438,000
PROJECT COST ⁽¹⁾				\$10,410,000
TOTAL CONSTRUCTION COST				\$33,038,000
TOTAL PROJECT COST⁽¹⁾				\$46,250,000

The District owns the Lindsay Reservoir site.

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

TABLE 10-8
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 MIRA LOMA RESERVOIR

Description	Quantity	Unit	Unit Cost	Construction Cost
6 MG RESERVOIR				
6 MG Reservoir (Steel)	1	Per Reservoir	\$2,000,000	\$2,000,000
TOTAL CONSTRUCTION COST				\$2,000,000
TOTAL PROJECT COST*				\$2,500,000

* The Reservoir will be constructed on a District's existing reservoir pad. Webb's usual multiplier to calculate project cost in this case doesn't apply because bids have been received, the contract has been awarded, and the reservoir pad has been previously constructed.

TABLE 10-9
 JURUPA COMMUNITY SERVICES DISTRICT
 CONSTRUCTION AND PROJECT COST
 1100 PRESSURE ZONE
 SUNNYSLOPE RESERVOIR

Description	Quantity	Unit	Unit Cost	Construction Cost
SUNNYSLOPE RESERVOIR 1100 Pressure Zone				
Grading	L.S.	L.S.	\$500,000	\$500,000
Site Piping	L.S.	L.S.	\$500,000	\$500,000
Offsite Drainage Pipeline	L.S.	L.S.	\$1,000,000	\$1,000,000
15 MG Reservoir	L.S.	L.S.	\$8,000,000	\$8,000,000
TOTAL CONSTRUCTION COST				\$10,000,000
TOTAL PROJECT COST				\$14,000,000

The District owns the Sunnyslope Tank site.

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

TABLE 10-10
 JURUPA COMMUNITY SERVICES DISTRICT
 MASTER WATER PLAN
 PROJECT COST OF CAPITAL IMPROVEMENT PROGRAMS
 (EXCLUDING WATER IMPORTATION PROJECTS)

Project Description	Project Cost
1. 870 Pressure Zone Potable Water Wells and Pipeline System	\$21,760,000
2. 1110 Pressure Zone Potable Water Well and Pipeline	\$2,600,000
3. 980 Pressure Zone Water Well (No. 25) and Pipeline System	\$5,170,000
4. 870 Pressure Zone Ion Exchange Water Wells, Pipeline System and Ion Exchange Plant No. 2	\$28,700,000
5. Expansion of 56 th Street Booster and 1100 Pressure Zone Pipeline	\$1,040,000
6. 870 and 1110 Pressure Zone Transmission Pipelines	\$3,200,000
7. 870 Pressure Zone Lindsay Reservoir and Pipeline System	\$46,250,000
8. 1110 Pressure Zone 6 MG Welded Steel Reservoir	\$2,500,000
9. 1100 Pressure Zone 15 MG Sunnyslope Reservoir	\$14,000,000
TOTAL PROJECT COST	\$125,220,000

TABLE 10-11
 JURUPA COMMUNITY SERVICES DISTRICT
 ALTERNATIVE NO. 1
 PRELIMINARY PROJECT COST ESTIMATE
 TO TREAT AND CONVEY MWD WATER FROM THE UPPER FEEDER

Description	Quantity	Unit	Unit Cost	Construction Cost
TREATMENT PLANT				
50 cts Connection to MWD's Upper Feeder	1	L.S.	\$1,500,000	\$1,500,000
Micro-Filtration Plant	30	MGD	\$1.50/gal/day	\$45,000,000
Reverse Osmosis Plant	15	MGD	\$2.00/gal/day	\$30,000,000
SARI Connection Capacity	1.5	MGD	\$10.00/gal/day	\$15,000,000
Brine Line to SARI Line including Connection to SARI Line	1	L.S.	\$1,000,000	\$1,000,000
CONSTRUCTION COST				\$92,500,000
PROJECT COST ⁽¹⁾⁽²⁾				\$129,500,000
PIPELINE				
1100 PRESSURE ZONE				
24" Ø Waterline	6,580	L.F.	\$220	\$1,447,600
870 PRESSURE ZONE				
42" Ø Waterline	9,920	L.F.	\$350	\$3,472,000
36" Ø Waterline	4,290	L.F.	\$300	\$1,287,000
CONSTRUCTION COST				\$6,206,600
PROJECT COST ⁽¹⁾				\$8,690,000
PRESSURE REDUCING STATION				
980 Pressure Zone to 870 P.Z.	1	L.S.	\$300,000	\$300,000
1110 Pressure Zone to 870 P.Z.	1	L.S.	\$300,000	\$300,000
CONSTRUCTION COST				\$600,000
PROJECT COST ⁽¹⁾				\$840,000
TOTAL CONSTRUCTION COST				\$99,306,600
TOTAL PROJECT COST⁽¹⁾				\$139,030,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

⁽²⁾ The cost of a proposed treatment site is not included herein.

TABLE 10-12
 JURUPA COMMUNITY SERVICES DISTRICT
 ALTERNATIVE NO. 2
 PRELIMINARY PROJECT COST ESTIMATE
 TO TREAT AND CONVEY MWD WATER FROM THE ETIWANDA FEEDER

Description	Quantity	Unit	Unit Cost	Construction Cost
TREATMENT PLANT				
50 cts Connection to MWD's Etiwanda Feeder	1	1	\$1,500,000	\$1,500,000
Micro-Filtration Plant	30	MGD	\$1.50/gal/day	\$45,000,000
CONSTRUCTION COST				\$46,500,000
PROJECT COST ⁽¹⁾⁽²⁾				\$65,100,000
PIPELINE				
36" Ø Etiwanda Feeder to Proposed Treatment Plant	34,000	L.F.	\$450/ft	\$15,300,000
WATERLINE				
36" Ø Treatment Plant to Lindsay Reservoir	4,000	L.F.	\$400/ft	\$1,600,000
30" Ø Treatment Plant to 1110 Reservoir	4,000	L.F.	\$350/ft	\$1,400,000
36" Ø (1110 Pressure Zone)	4,290	L.F.	\$300/ft	\$1,287,000
24" Ø (1100 Pressure Zone)	16,500	L.F.	\$220/ft	\$3,630,000
CONSTRUCTION COST				\$23,217,000
PROJECT COST ⁽¹⁾				\$32,500,000
PRESSURE REDUCING STATION				
	1	L.S.	\$300,000	\$300,000
CONSTRUCTION COST				\$300,000
PROJECT COST ⁽¹⁾				\$420,000
PUMP STATION				
7000 gpm (300 HP)	1	L.S.	\$2,000,000	\$2,000,000
CONSTRUCTION COST				\$2,000,000
PROJECT COST ⁽¹⁾				\$2,800,000
TOTAL CONSTRUCTION COST				\$72,017,000
TOTAL PROJECT COST⁽¹⁾				\$100,820,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

⁽²⁾ The cost of a proposed treatment plant site is not included herein.

TABLE 10-13
 JURUPA COMMUNITY SERVICES DISTRICT
 ALTERNATIVE NO. 3
 PRELIMINARY PROJECT COST ESTIMATE
 TO TREAT AND CONVEY
 CUCAMONGA COUNTY WATER DISTRICT WATER

Description	Quantity	Unit	Unit Cost	Construction Cost
TREATMENT PLANT	24	MGD	\$2.00/gal/day	\$48,000,000
CONSTRUCTION COST				\$48,000,000
PROJECT COST ⁽¹⁾⁽²⁾				\$67,200,000
PIPELINES (CCWD to JCSD)				
36" Ø (200 psi)	18,000	L.F.	\$300/ft	\$5,400,000
36" Ø (300 psi)	16,500	L.F.	\$450/ft	\$7,425,000
36" Ø (300 psi)	22,500	L.F.	\$450/ft	\$10,125,000
CONSTRUCTION COST				\$22,950,000
PROJECT COST ⁽¹⁾				\$32,130,000
PRESSURE REDUCING STATION				
1350 PRESSURE ZONE TO 1110 P.Z.	1	L.S.	\$300,000	\$300,000
1350 PRESSURE ZONE TO 980 P.Z.	1	L.S.	\$300,000	\$300,000
1350 PRESSURE ZONE TO 1100 P.Z.	1	L.S.	\$300,000	\$300,000
1350 PRESSURE ZONE TO 870 P.Z.	1	L.S.	\$300,000	\$300,000
CONSTRUCTION COST				\$1,200,000
PROJECT COST ⁽¹⁾				\$1,680,000
PIPELINE				
24" Ø (1100 PRESSURE ZONE)	16,500	L.F.	\$220/ft	\$3,630,000
CONSTRUCTION COST				\$3,630,000
PROJECT COST ⁽¹⁾				\$5,082,000
TOTAL CONSTRUCTION COST				\$75,780,000
TOTAL PROJECT COST⁽¹⁾				\$106,092,000

⁽¹⁾ Project cost is 1.4 times construction cost. Project cost includes construction costs, construction contingencies, design engineering, including plans and specifications, design and construction surveying and mapping, geotechnical evaluation and report, engineering contract administration, and field inspection. Costs are based on Engineering News Record (ENR) Construction Cost Index Los Angeles, August 2005 (ENR = 8277.95). Escalation, financing, interest during construction, District Contract Administration, legal, EIR/EIS, land acquisition, and R.O.W. agent costs are not included.

⁽²⁾ The cost of participating with Cucamonga County Water District is unknown at this time. It is presumed for this study that the cost of participation in the treatment plant is reflected in our estimated cost of expanding the treatment plant from 66 MGD to 90 MGD.

TABLE 10-14
 JURUPA COMMUNITY SERVICES DISTRICT
 PROJECT COST OF CAPITAL WATER FACILITIES
 FOR ULTIMATE DEVELOPMENT INCLUDING
 IMPORTED WATER PROJECTS

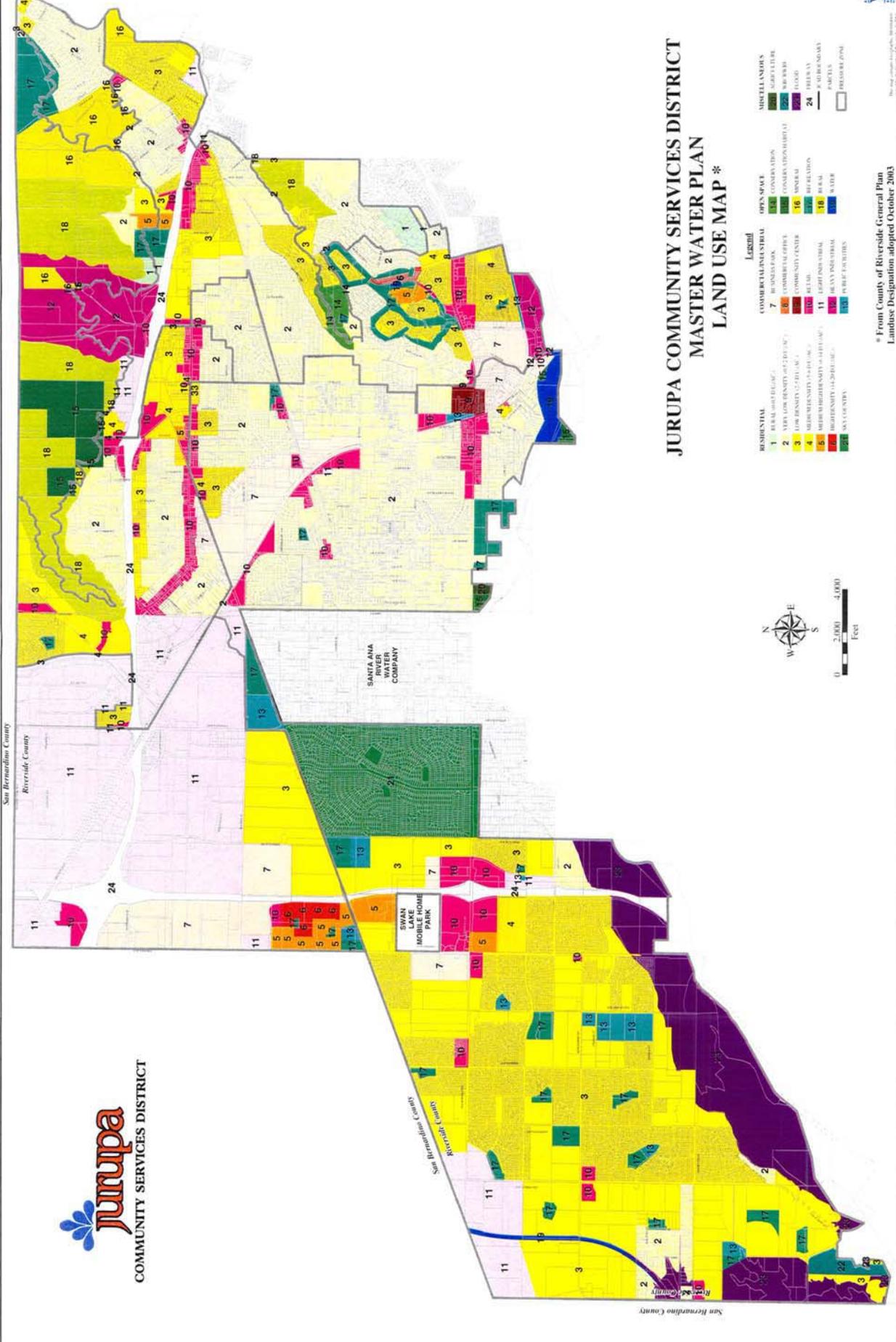
Project Description	Project Cost
OPTION 1	
1. Project Cost of Capital Improvements (Excluding Importation Project Cost)	\$125,220,000
2. MWD Upper Feeder Project	\$139,030,000
TOTAL	\$264,250,000
OPTION 2	
1. Project Cost of Capital Improvements (Excluding Importation Project Cost)	\$125,220,000
2. MWD Etiwanda Feeder	\$100,820,000
TOTAL	\$226,040,000
OPTION 3	
1. Project Cost of Capital Improvements (Excluding Importation Project Cost)	\$125,220,000
2. Cucamonga County Water District (State Water Project Water)	\$106,092,000
TOTAL	\$231,312,000



JURUPA COMMUNITY SERVICES DISTRICT MASTER WATER PLAN AERIAL MAP

Legend
 JCSO BOUNDARY

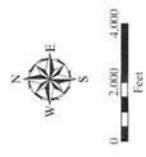




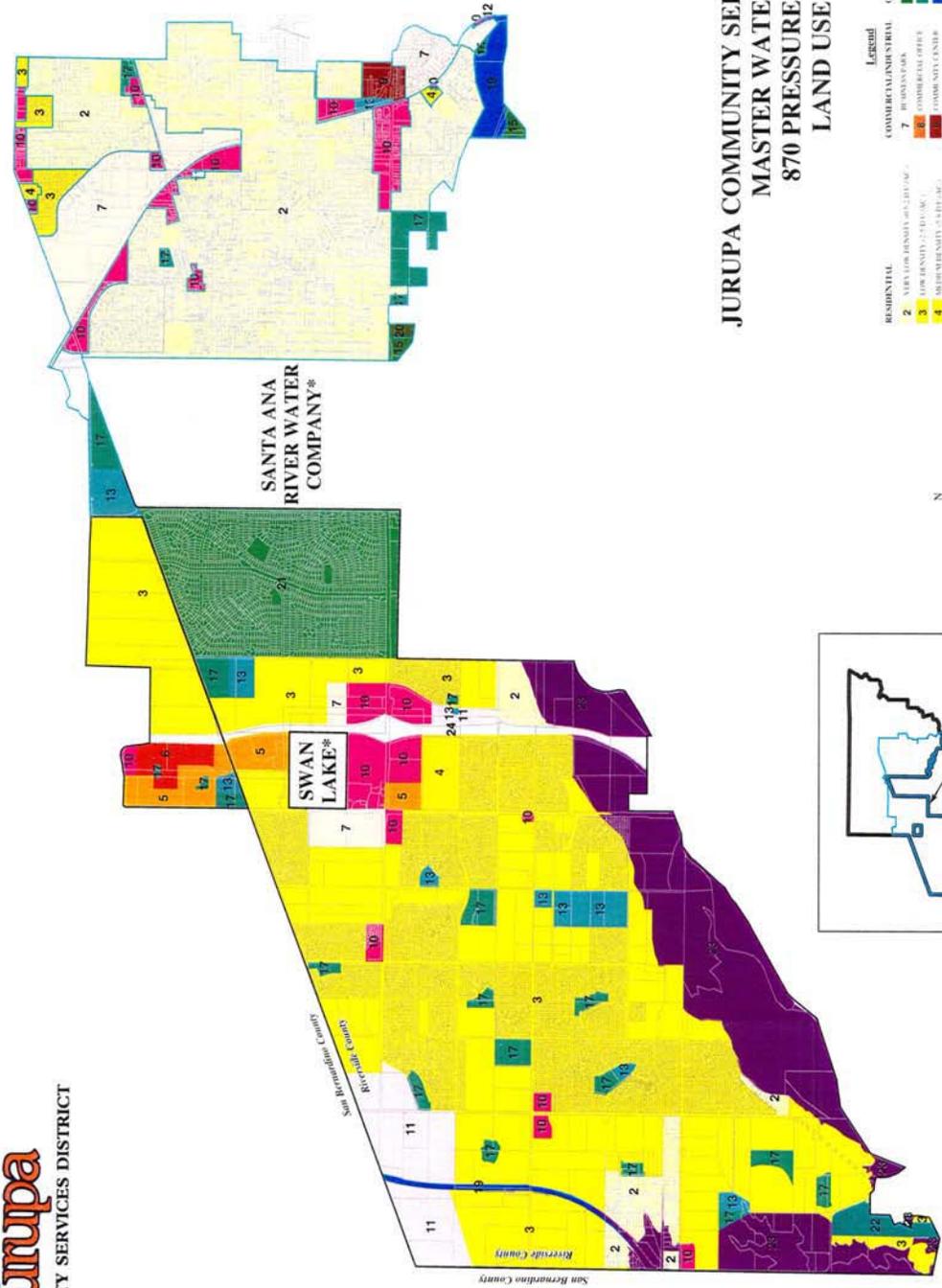
JURUPA COMMUNITY SERVICES DISTRICT MASTER WATER PLAN LAND USE MAP *

Legend

RESIDENTIAL	COMMERCIAL/INDUSTRIAL	OPEN SPACE	MISCELLANEOUS
1. RURAL (R1, R2, R3)	7. BUSINESS PARK	13. CONSERVATION	13. GOLF COURSE
2. VERY LOW DENSITY (VLD, VLD-2)	8. COMMERCIAL OFFICE	14. CONSERVATION (HABITAT)	14. RECREATION
3. LOW DENSITY (LD, LD-2, LD-3)	9. COMMUNITY CENTER	15. WOODLAND	15. FLOOD
4. MEDIUM DENSITY (MD, MD-2)	10. RETAIL	16. RURAL	16. HIGHWAY
5. HIGH DENSITY (HD, HD-2)	11. LIGHT INDUSTRIAL	17. RURAL	17. AIRBORNE MARKS
6. HIGH DENSITY (HDI, HDI-2)	12. HEAVY INDUSTRIAL	18. RURAL	18. PARCELS
	13. INDUSTRIAL	19. WATER	19. FRESH WATERS



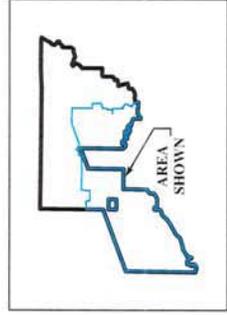
* From County of Riverside General Plan
Landuse Designation adopted October 2003



**JURUPA COMMUNITY SERVICES DISTRICT
MASTER WATER PLAN
870 PRESSURE ZONE
LAND USE ****

Legend

RESIDENTIAL	COMMERCIAL/INDUSTRIAL	OPEN SPACE	MISCELLANEOUS
2. VERY LOW DENSITY (R-10)	7. BUSINESS PARK	1. CONSERVATION/AMBIENT	1. AGRICULTURE
3. LOW DENSITY (R-20)	8. COMMERCIAL OFFICE	2. RECREATION	2. SHOPPING
4. MEDIUM DENSITY (R-35)	9. COMMUNITY CENTER	3. WATER	3. HOUSING
5. MEDIUM DENSITY (R-40)	10. RETAIL	4. WASTE	4. PUBLIC
10. HIGH DENSITY (R-100)	11. LIGHT INDUSTRIAL	5. HEAVY INDUSTRIAL	5. PUBLIC
11. HIGH DENSITY (R-200)	12. HEAVY INDUSTRIAL	6. PUBLIC UTILITIES	6. PRESSURE ZONE
13. WATERWAYS			



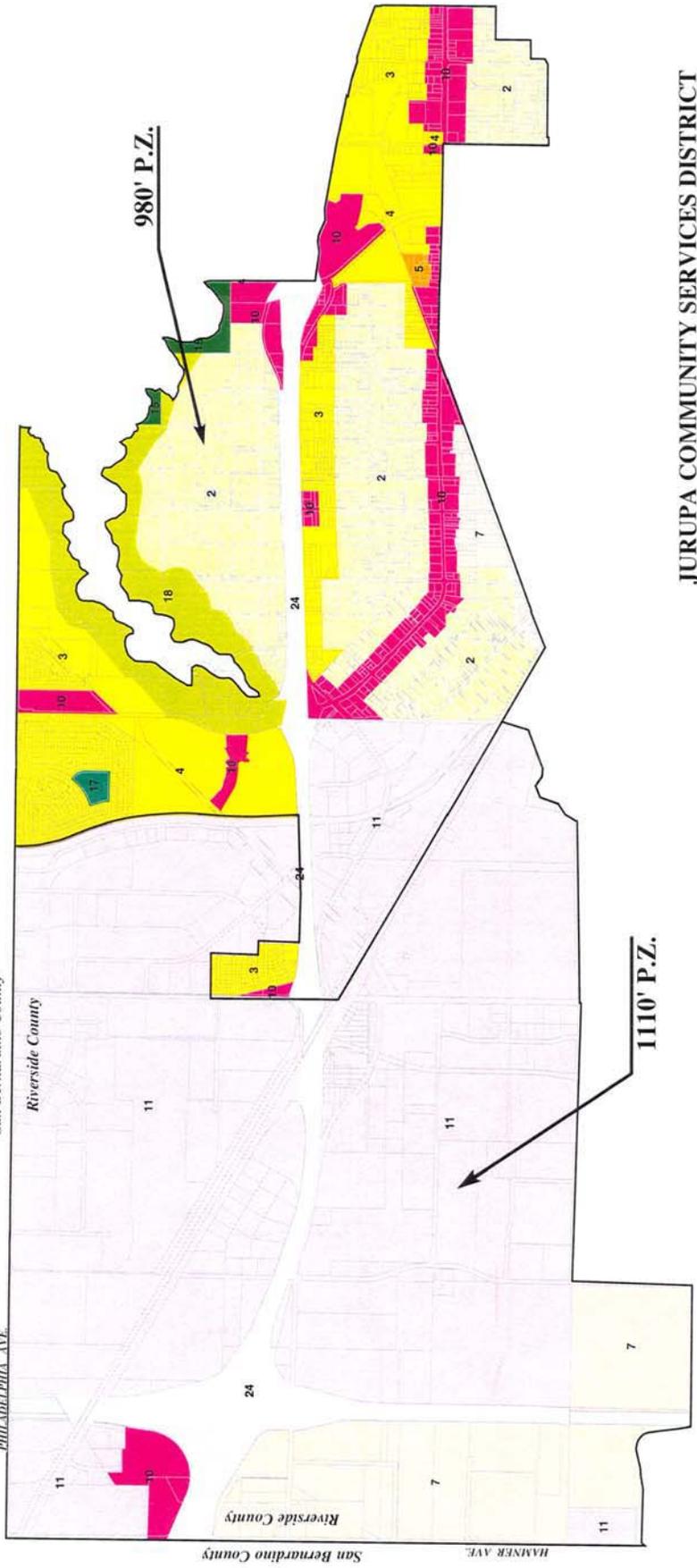
** From County of Riverside General Plan Landuse Designation adopted October 2003

** SERVED BUT AREA ARE NOT WITHIN DISTRICT



San Bernardino County
Riverside County

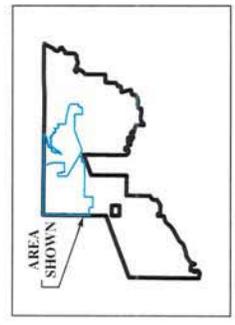
PHILADELPHIA AVE.



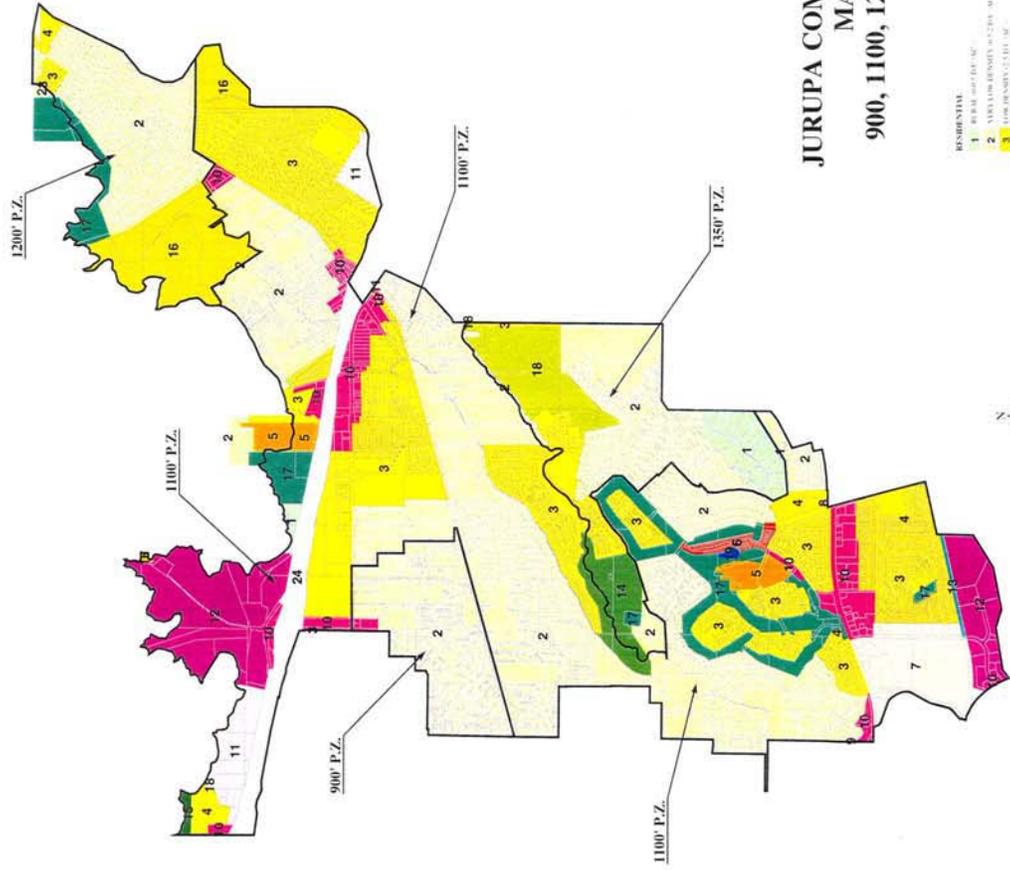
**JURUPA COMMUNITY SERVICES DISTRICT
MASTER WATER PLAN
980 & 1110 PRESSURE ZONES
LAND USE ***

Legend

RESIDENTIAL	COMMERCIAL/INDUSTRIAL	OPEN SPACE	MISCELLANEOUS
2 - VERY LOW DENSITY (10-20 U/L)	7 - BUSINESS PARK	18 - CONSERVATION/RECREATION	24 - FIELDS
3 - LOW DENSITY (25-40 U/L)	10 - RETAIL	19 - RECREATION	1 - OTHER WATERS
4 - MEDIUM DENSITY (40-60 U/L)	11 - LIGHT INDUSTRIAL	16 - RURAL	10 - FIELDS
5 - MEDIUM HIGH DENSITY (60-80 U/L)			11 - PRESERVE ZONE



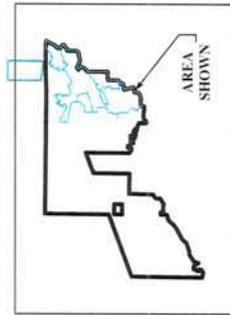
* From County of Riverside General Plan
Landuse Designation adopted October 2003



**JURUPA COMMUNITY SERVICES DISTRICT
MASTER WATER PLAN
900, 1100, 1200, & 1350 PRESSURE ZONES
LAND USE ***

Legend

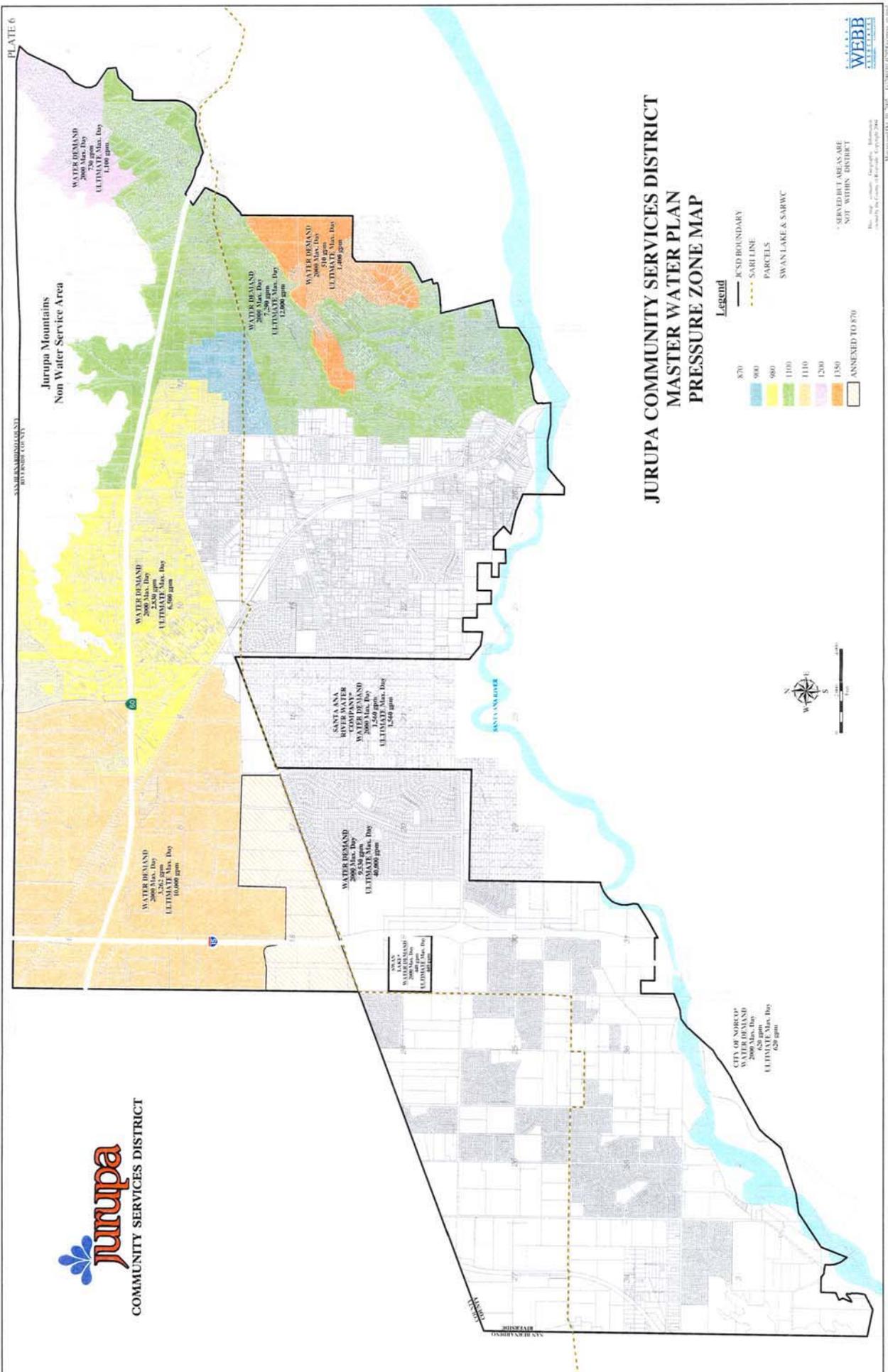
RESIDENTIAL	COMMERCIAL/INDUSTRIAL	OPEN SPACE	MISCELLANEOUS
1. SINGLE-FAMILY (1-1/2) S.F.	7. BUSINESS	11. OPEN SPACE	1. FLOOD
2. MULTIFAMILY (2-4) S.F.	8. OFFICE	12. CONSERVATION	24. HIGHWAY
3. LOW-DENSITY (1-1/2) S.F.	9. LIGHT INDUSTRIAL	13. OPEN SPACE/FOREST	2. SUBDIVISION
4. MEDIUM-DENSITY (1-1/2) S.F.	10. HEAVY INDUSTRIAL	14. WETLANDS	3. PARKS
5. HIGH-DENSITY (1-1/2) S.F.	11. PUBLIC UTILITIES	15. PUBLIC UTILITIES	4. PUBLIC LOT
6. HIGH-DENSITY (1-1/2) S.F.	12. PUBLIC UTILITIES	16. WATER	



* From County of Riverside General Plan
Landuse Designation adopted October 2003



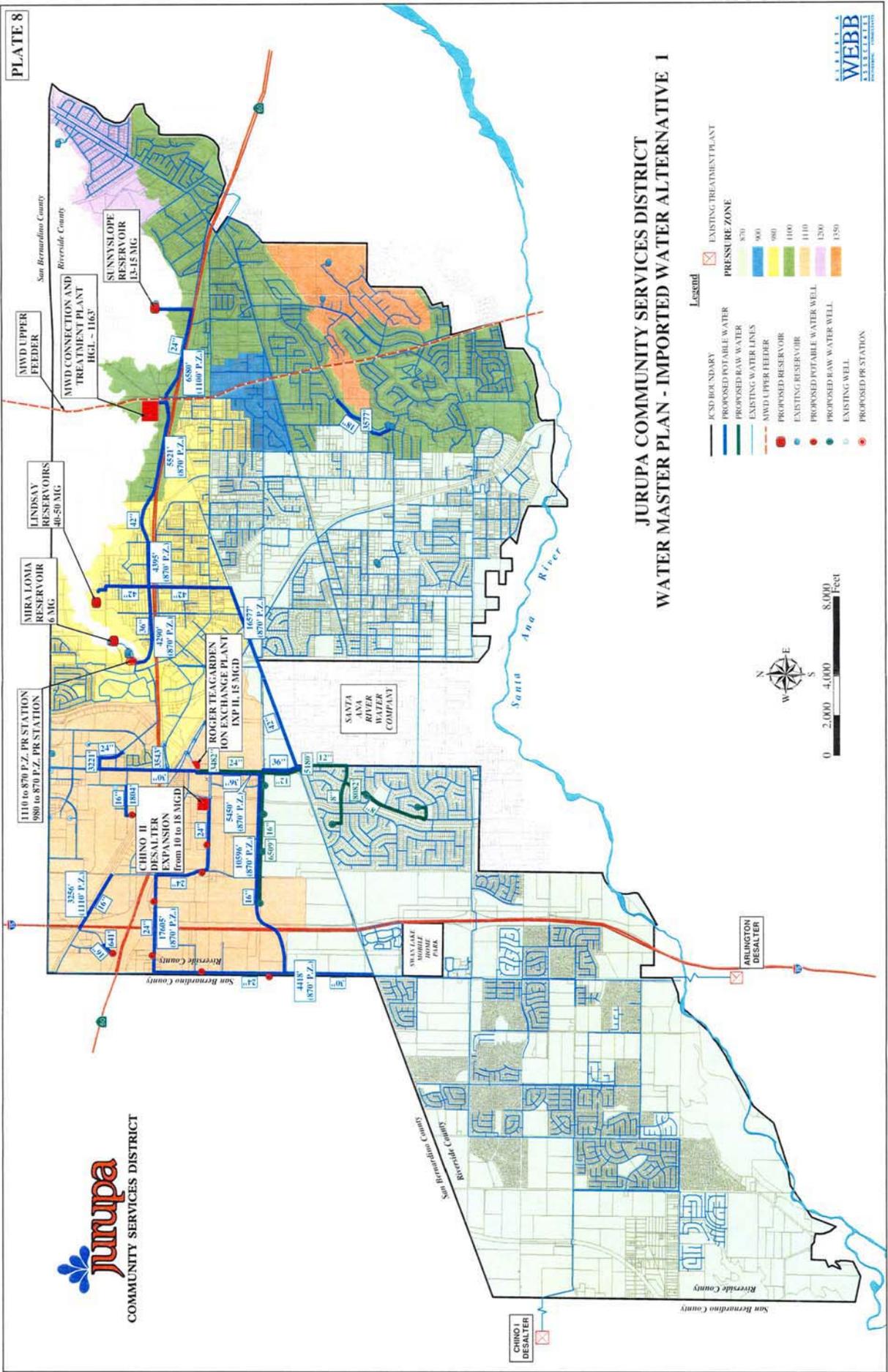
Prepared by: Webb Engineers, Architects
10000 E. Main Street, Suite 100
Riverside, CA 92504



JURUPA COMMUNITY SERVICES DISTRICT MASTER WATER PLAN PRESSURE ZONE MAP

- Legend**
- 870
 - 900
 - 980
 - 1100
 - 1110
 - 1200
 - 1350
 - ANNEXED TO 870
- - - - - JCSJ BOUNDARY
 - - - - - SARBLINE
 PARCELS
 SWAN LAKE & SARWC
- * SERVED BUT AREAS ARE NOT WITHIN DISTRICT
 * SERVED BUT AREAS ARE NOT WITHIN DISTRICT



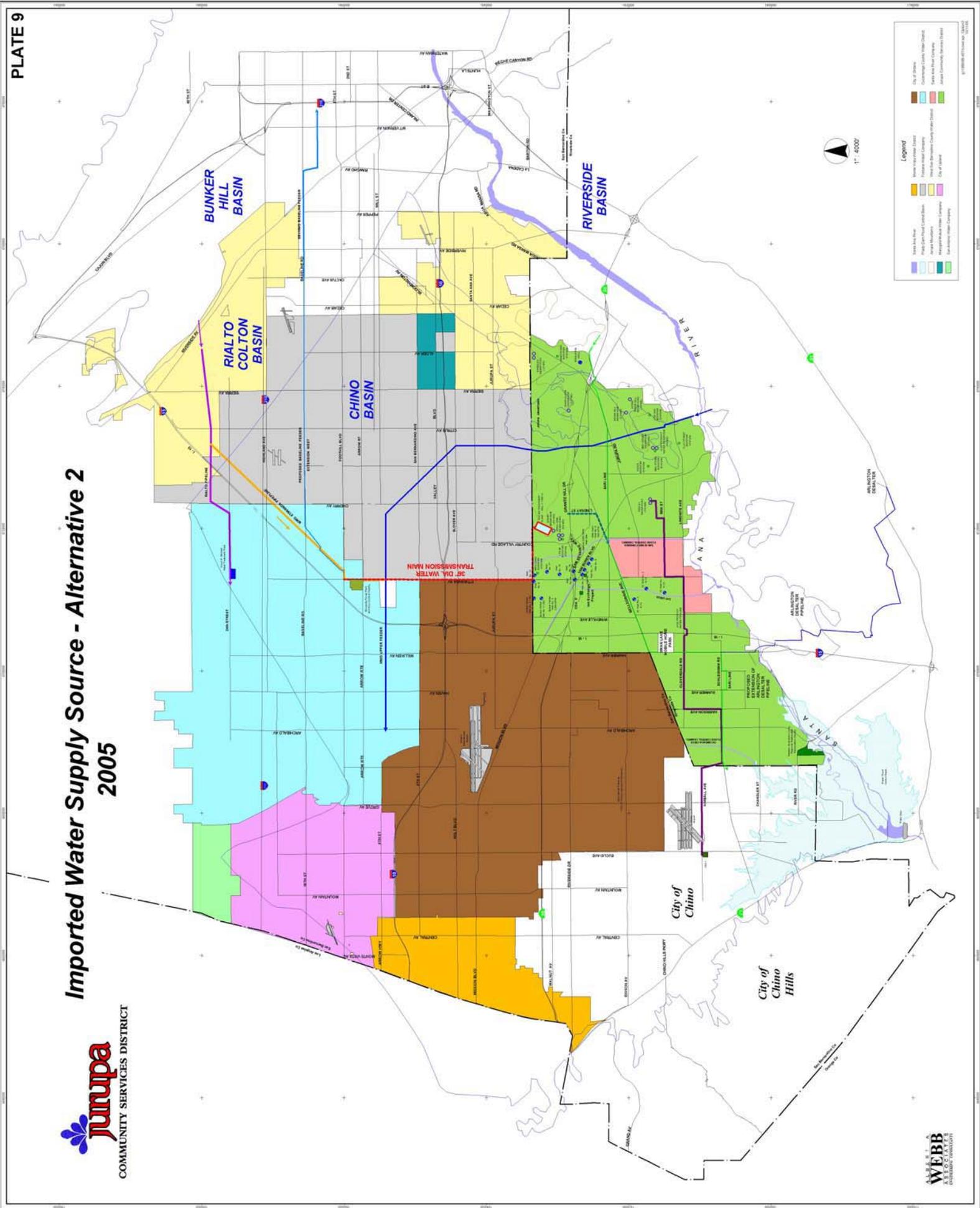


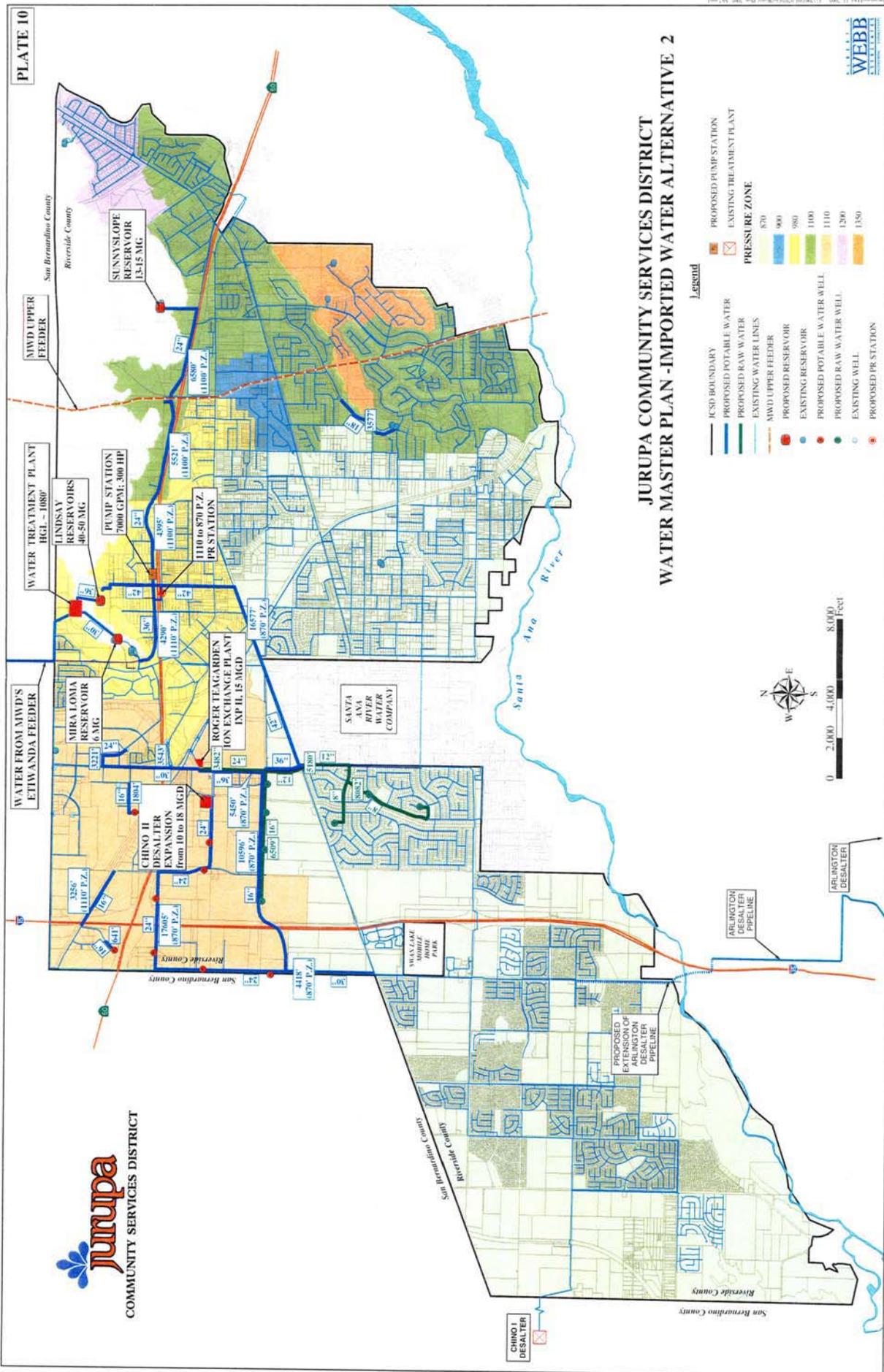
**JURUPA COMMUNITY SERVICES DISTRICT
WATER MASTER PLAN - IMPORTED WATER ALTERNATIVE 1**

- Legend**
- FCSD BOUNDARY
 - PROPOSED POTABLE WATER
 - PROPOSED RAW WATER
 - EXISTING WATER LINES
 - MWD UPPER FEEDER
 - PROPOSED RESERVOIR
 - EXISTING RESERVOIR
 - PROPOSED POTABLE WATER WELL
 - PROPOSED RAW WATER WELL
 - EXISTING WELL
 - PROPOSED PRESTATION
 - EXISTING TREATMENT PLANT
 - PRESSURE ZONE



Imported Water Supply Source - Alternative 2 2005



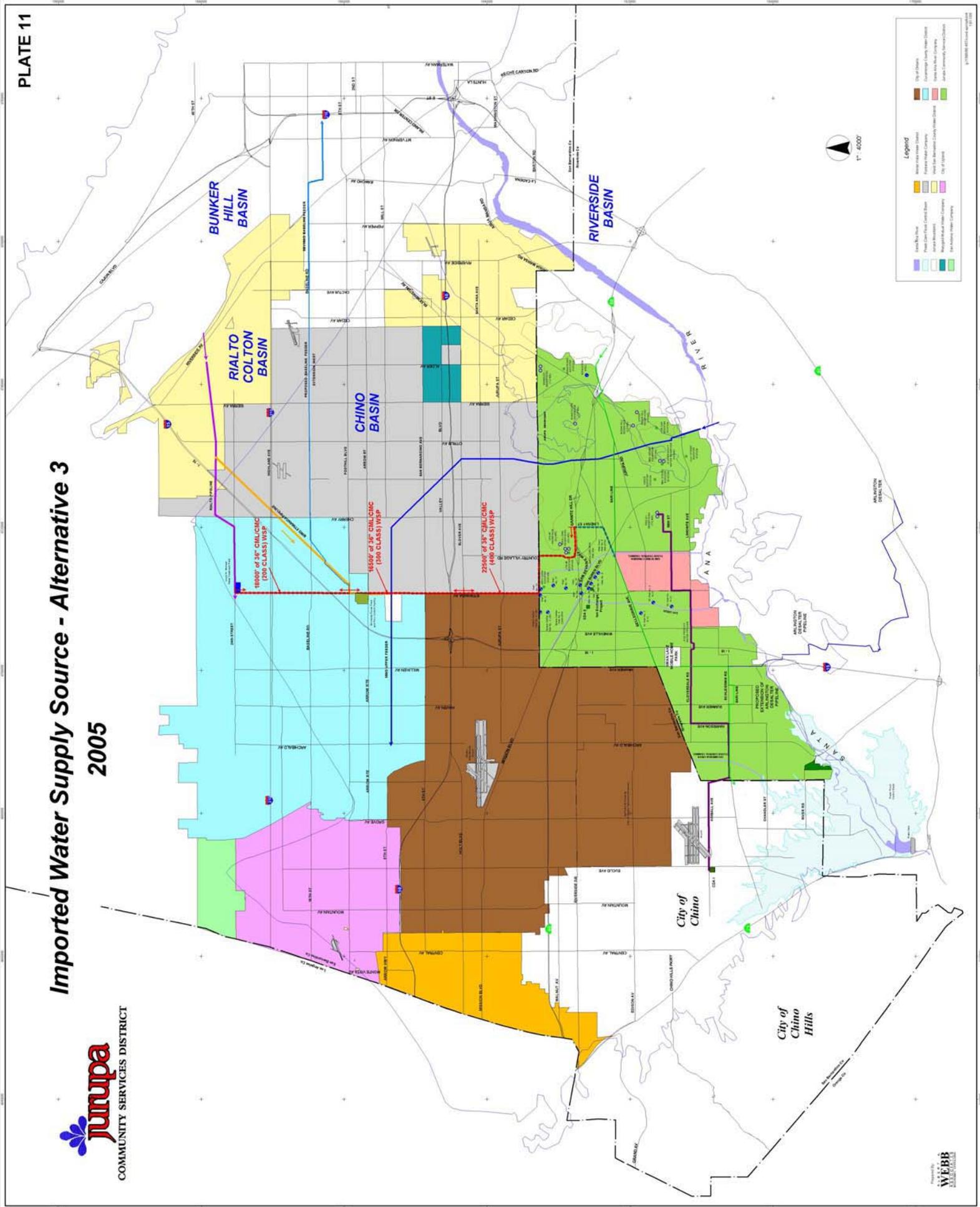


**JURUPA COMMUNITY SERVICES DISTRICT
WATER MASTER PLAN - IMPORTED WATER ALTERNATIVE 2**

- Legend**
- ICSD BOUNDARY
 - PROPOSED POTABLE WATER
 - EXISTING POTABLE WATER
 - EXISTING WATER LINES
 - MWD UPPER FEEDER
 - PROPOSED RESERVOIR
 - EXISTING RESERVOIR
 - PROPOSED POTABLE WATER WELL
 - PROPOSED RAW WATER WELL
 - EXISTING WELL
 - PROPOSED PR STATION
 - PROPOSED PUMP STATION
 - EXISTING TREATMENT PLANT
 - PRESSURE ZONE
 - 870
 - 900
 - 980
 - 1100
 - 1110
 - 1200
 - 1350



Imported Water Supply Source - Alternative 3 2005



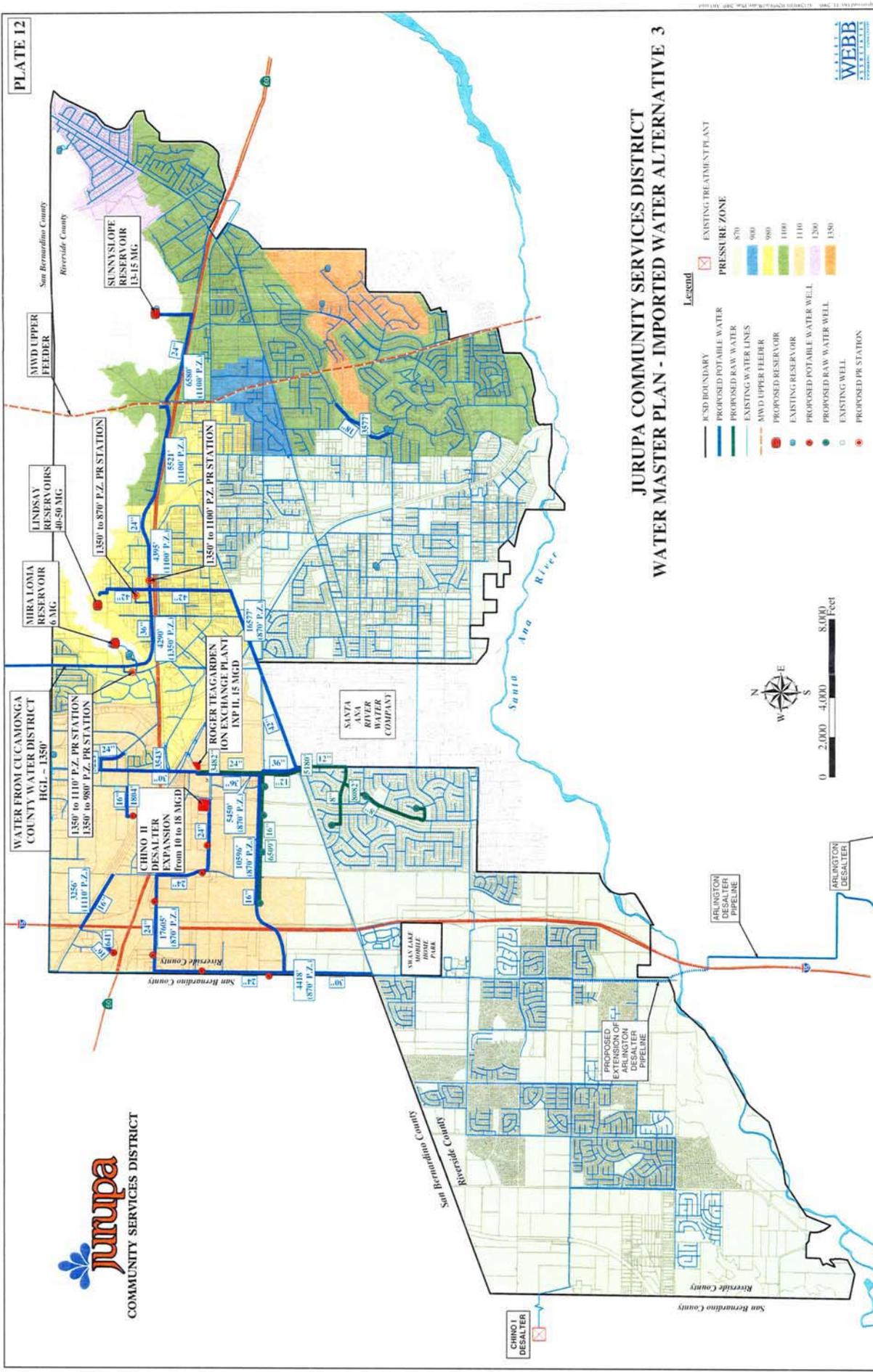


PLATE 12



**JURUPA COMMUNITY SERVICES DISTRICT
WATER MASTER PLAN - IMPORTED WATER ALTERNATIVE 3**

- Legend**
- KSD BOUNDARY
 - PROPOSED POTABLE WATER
 - PROPOSED RAW WATER
 - EXISTING WATER LINES
 - MWD UPPER FEEDER
 - PROPOSED RESERVOIR
 - EXISTING RESERVOIR
 - PROPOSED POTABLE WATER WELL
 - PROPOSED RAW WATER WELL
 - EXISTING WELL
 - PROPOSED PR STATION
- EXISTING TREATMENT PLANT**
- PRESSURE ZONE**
- 870
 - 980
 - 1100
 - 1200
 - 1350



