City of Camarillo

FINAL DRAFT
UWMP

2010 Urban Water Management Plan

May 2011

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City of Camarillo
2010 Urban Water Management Plan
Contact Sheet

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The Water supplier is a: **Municipality**

The Water supplier is a: **Retailer**

Utility services provided by the water supplier include: **Water**

Is This Agency a Bureau of Reclamation Contractor? **No**

Is This Agency a State Water Project Contractor? **No**

City of Camarillo

URBAN WATER MANAGEMENT PLAN

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City of Camarillo
Urban Water Management Plan

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LIST OF ABBREVIATIONS

Abbreviation	Description
AB	Assembly Bill
ADD	Average Day Demand
af	Acre Feet
afy	Acre Feet per Year
BMP	Best Management Practices
BPS	Booster Pumping Station
CDR	Center for Demographic Research
CIMIS	California Irrigation Management Information System
CRWQCB	California Regional Water Quality Control Board
DMMs	Demand Management Measures
DOF	Department of Finance
DPH	Department of Public Health
du/ac	Dwelling Units per Acre
DWR	Department of Water Resources
EPA	Environmental Protection Agency
ETo	Evapotranspiration
FAR	Floor Area Ratio
ft-MSL	Feet above Mean Sea Level
FY	Fiscal Year
gpcd	Gallons per Capita per Day
gpm	Gallons per Minute
GWMP	Groundwater Management Plan
HGL	Hydraulic Grade Line
HOA	Home Owners' Association
IRP	Integrated Resource Plan
MAF	Million Acre Feet
MCL	Maximum Contaminant Level
MFR	Multi-Family Residential
MG	Million Gallons
mgd	Million Gallons per Day
mg/l	Milligrams per Liter
MOU	Memorandum of Understanding
MWDSC	Metropolitan Water District of Southern California
RUWMP	Regional Urban Water Management Plan
RW	Recycled Water
RWMP	Recycled Water Master Plan
RWQCB	Regional Water Quality Control Board
SAWPA	Santa Ana Watershed Project Authority
SB	Senate Bill
SCAG	Southern California Association of Governments
SDP	Seawater Desalination Project
SFR	Single Family Residential
SOI	Sphere of Influence
SWP	State Water Project
TDS	Total Dissolved Solids
ULF	Ultra Low Flush
UWMP	Urban Water Management Plan
UWMPA	Urban Water Management Planning Act

Abbreviation	Description
WCS	Water Code Section
WMP	Water Master Plan
WRF	Water Reclamation Facility
WRCC	Western Regional Climate Center
WSA	Water Supply Assessment
WSDM	Water Surplus and Drought Management
WSRP	Water Shortage Response Plan

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Table I-2 Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1.3 Appendix B
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Section 1.4 Appendix B
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Appendix B
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 1.3 Appendix B
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Appendix B
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Section 1.4 Appendix B
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Appendix B
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 6.3

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 1.3 Appendix B
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 1.3 Appendix B
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Chapter 2 Figure 2.1
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Sections 2.3 and 2.4
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in “Baseline Daily Per Capita Water Use.” See Section M.	Section 2.3
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.3
12	Describe other demographic factors affecting the supplier’s water management planning.	10631(a)		Section 2.2
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 6.1 Section 5.1 Tables 6.1 to 6.4
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier’s implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Section 1.4

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		Not Applicable Until 2015
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 5.2 Table 5.3
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	[Need to Obtain]
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Table 5.4
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 3.1 Table 3.1
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 3.5
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Section 3.5
16	Describe the groundwater basin.	10631(b)(2)		Section 3.5
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		Section 3.5

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Section 3.5 Appendix C
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Section 3.5
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 3.5
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 3.5
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 7.6
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 7.2
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 3.6 Section 7.7
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Chapter 4
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 4.1

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 4.1
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 4.2
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 4.3
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Sections 4.2 and 4.3
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 4.4
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Not Applicable
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b]				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Section 3.5 and 3.6
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Sections 7.4 and 7.5
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Section 7.3
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Chapter 8

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		[Not Included]
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Sections 8.1 and 8.2
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 8.2.1
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 8.2
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 8.2.3
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 8.4
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Section 8.3 Appendix E
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 8.6
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Section 7.7

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 7.4 and 7.5
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 6.2
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 6.2
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 6.2
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Not Applicable
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Appendix F

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

Chapter 1

INTRODUCTION

1.1 PURPOSE

The California Water Code requires urban water suppliers within the state to prepare and adopt Urban Water Management Plans (UWMPs) for submission to the California Department of Water Resources (DWR). The UWMPs, which must be filed every five years, must satisfy the requirements of the Urban Water Management Planning Act (UWMPA) of 1983 including amendments that have been made to the Act. The UWMPA requires urban water suppliers servicing 3,000 or more connections, or supplying more than 3,000 acre-feet (af) of water annually, to prepare an UWMP.

The purpose of the UWMP is to maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during water drought conditions. This report, which was prepared in compliance with the California Water Code, and as set forth in the guidelines and format established by the DWR, constitutes the City of Camarillo (City) 2010 UWMP.

1.2 BACKGROUND

1.2.1 Urban Water Management Planning Act

In 1983, State Assembly Bill (AB) 797 modified the California Water Code Division 6, by creating the UWMPA. Several amendments to the original UWMPA, which were introduced since 1983, have increased the data requirements and planning elements to be included in the 2005 and 2010 UWMPs.

Initial amendments to the UWMPA required that total projected water use be compared to water supply sources over the next 20 years, in 5-year increments. Recent DWR guidelines also suggest projecting through a 25-year planning horizon to maintain a 20-year timeframe until the next UWMP update has been completed and for use in developing Water Supply Assessments.

Other amendments require that UWMPs include provisions for recycled water use, demand management measures, and a water shortage contingency plan, set forth therein. Recycled water was added in the reporting requirements for water usage and figures prominently in the requirements for evaluation of alternative water supplies, when future projections predict the need for additional water supplies. Each urban water purveyor must coordinate the preparation of the water shortage contingency plan with other urban water purveyors in the area, to the extent practicable. Each water supplier must also describe their water demand management measures that are being implemented, or scheduled for implementation.

In addition to the UWMPA and its amendments, there are several other regulations that are related to the content of the UWMP. In summary, the key relevant regulations are:

- AB 1420: Requires implementation of demand management measures (DMMs)/best management practices (BMPs) and meeting the 20 percent reduction by 2020 targets to qualify for water management grants or loans.
- AB 1465: Requires water suppliers to describe opportunities related to recycled water use and stormwater recapture to offset potable water use.
- Amendments Senate Bill (SB) 610 (Costa, 2001), and SB 221 (Daucher, 2001), which became effective beginning January 1, 2002, require counties and cities to consider information relating to the availability of water to supply new large developments by mandating the preparation of further water supply planning (Daucher) and Water Supply Assessments (Costa).
- SB 1087: Requires water suppliers to report single family residential (SFR) and multi-family residential (MFR) projected water use for planned lower income units separately.
- Amendment SB 318 (Alpert, 2004) requires the UWMP to describe the opportunities for development of desalinated water, including but not limited to, ocean water, brackish water, and groundwater, as long-term supply.
- AB 105 (Wiggins, 2004) requires urban water suppliers to submit their UWMPs to the California State Library.
- SBx7-7: Requires development and use of new methodologies for reporting population growth estimates, base per capita use, and water conservation. This water bill also extended the 2010 UWMP adoption deadline for retail agencies to July 1, 2011.
- SB 1478: This bill was signed on September 23, 2010and extends the 2010 UWMP deadline for wholesale agencies, such as the Metropolitan Water District of Southern California (MWDSC), to July 1, 2011, as SBx7-7 did for retail agencies.

The UWMPA is included for reference in Appendix C.

1.2.2 Previous Urban Water Management Plan

Pursuant to the UWMPA, the City previously prepared an UWMP in 2005, which was approved and adopted on December 14, 2005. Following initial adoption, the 2005 UWMP was amended, presented at a public hearing, and adopted as amended on May 10, 2006. This 2010 UWMP report serves as an update to the 2005 UWMP and pulls extensively from that report.

1.3 COORDINATION WITH APPROPRIATE AGENCIES

The UWMPA requires that the UWMP identify the water agency's coordination with appropriate nearby agencies.

> *10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

The City is the sole water supplier and water management agency for the area. While preparing the 2010 UWMP, the City coordinated its efforts with relevant agencies to ensure that the data and issues discussed in the plan were presented accurately. Table 1.1 summarizes how the UWMP preparation was coordinated with different agencies in area.

Table 1.1 Coordination with Appropriate Agencies (Guidebook Table 1)

Check at least one box on each row	Participated in Developing the Plan	Commented on the Draft	Attended Public Meetings	Was Contacted for Assistance	Was Sent a Copy of the Draft Plan	Was Sent a Notice of Intention to Adopt	Not Involved/ Not Informed
Camarillo Sanitary District							
Fox Canyon Groundwater Management Agency							
Camrosa Water District						✓	
Cal-American Water Company						✓	
Calleguas Municipal Water District						✓	
Pleasant Valley Mutual Water Company						✓	
Ventura County Water Company						✓	
Pleasant Valley Company Water District						✓	
Crestview Mutual Water Company						✓	

1.4 PUBLIC PARTICIPATION AND PLAN ADOPTION

The UWMPA requires that the UWMP show the water agency solicited public participation.

> 10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published … After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

In accordance with the UWMPA, the City held a public hearing and adopted the 2010 UWMP on [June 8, 2011]. A copy of the adopting resolution and resolution of intent to adopt are included in Appendix B. The hearing provided an opportunity for the City's customers, residents, and employees to learn and ask questions about the current and future water supply of the City.

A notice of the public hearing was published in the local newspaper on February 27, 2011, notifying interested parties that the draft 2010 UWMP was under preparation. Pursuant to California Code Section 6066, a notification of the time and place of the public hearing was published in the local newspaper on May 15 and 22, 2011. A copy of these notifications is included in Appendix B.

1.5 REPORT ORGANIZATION

The UWMP contains eight chapters, followed by appendices that provide supporting documentation for the information presented in the report. The chapters are briefly described below:

Executive Summary

Chapter 1 - Introduction. This chapter presents the purpose of this UWMP, describes the efforts of the City to coordinate the preparation of the UWMP with appropriate nearby agencies, and discusses the measures used to solicit public participation in the UWMP.

Chapter 2 - Service Area. This chapter presents a description of the City's water service area and various characteristics of the area served including climate, population, and other demographic factors.

Chapter 3 – Water Sources. This chapter presets a description of the agency's existing and future water supply sources for the next 25 years. The description of water supplies includes information on the groundwater usage such as water rights, determination if the basin is in overdraft, and other relevant information.

Chapter 4 – Water Reclamation. This chapter includes information on the City's existing recycled water system and usage, as well as the projected expansion of recycled water use per the recent Recycled Water Master Plan prepared in 2010.

Chapter 5 – Water Use. This chapter presents the quantity of water supplied to the agency's customers including a breakdown by user classification.

Chapter 6 – Water Conservation. This chapter is broken into two parts:

Part I addresses the requirements of the Water Conservation Act of 2009

Part II includes a description of the City's Best Management Practices (BMPs). This includes programs which are currently implemented or scheduled for implementation.

Chapter 7 – Reliability of Supply. In this chapter, the UWMP addresses the reliability of the agency's water supplies. This includes supplies that are vulnerable to seasonal or climatic variations. In addition, there is an analysis of supply availability in a single dry year and in multiple dry years.

Chapter 8 – Water Shortage Contingency Plan. This chapter includes an urban water shortage contingency analysis that includes stages of action to be undertaken in the event of water supply shortages; a water shortage contingency ordinance; prohibitions, consumption reduction methods and penalties; an analysis of revenue and expenditure impacts and measures to overcome these impacts; actions to be taken during a catastrophic interruption; and a mechanism for measuring water use reduction.

1.6 ACKNOWLEDGEMENTS

Carollo Engineers wishes to acknowledge and thank the following City staff:

Lucie McGovern	Water Superintendent
Tom Smith	Deputy Director of Public Works

Their cooperation and courtesy in obtaining a variety of necessary information were valuable components in completing and producing this report.

The following staff of Carollo Engineers was involved in the preparation of this plan:

Patrick White, P.E.	Principal-in-Charge
Inge Wiersema, P.E.	Project Manager
Brian Brenhaug, P.E.	Project Engineer
John Meyerhofer	Staff Engineer
Li-Chen Wang	GIS and graphics

Chapter 2

SERVICE AREA AND POPULATION

The UWMPA requires that the UWMP include a description of the water purveyor's service area and various characteristics of the area served including climate, population, and other demographic factors.

> *10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
>
> *10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

2.1 LOCATION

Camarillo is located on Highway 101 in the Pleasant Valley portion of the Oxnard Plain, 9 miles inland from the Pacific Ocean, and 45 miles northwest of the City of Los Angeles. Camarillo is situated in the southern portion of Ventura County and is surrounded by open hills, mountains, and agricultural lands. The majority of the City is approximately 150 feet above mean sea level (ft-msl) while the northern foothill regions are as high as 360 ft-msl. The City's location is shown in Figure 2.1.

2.2 SERVICE AREA

The City's water service area consists of approximately 9,100 acres, about 75 percent of the City's total incorporated area of 12,186 acres. Figure 2.1 shows the City's water service area in relation to the City boundary. The Camrosa Water District, Pleasant Valley County Water District, Pleasant Valley Mutual Water Company, and Crestview Mutual Water Company serve the remaining 3,100 acres. As shown on Figure 2.1, the City's water service area extends outside the City boundary to serve some small areas to the west and north of the City.

Since the City's 2005 UWMP, the City's water service has annexed the airport water system, referred to as the Camarillo Utility Enterprise or the Ventura County Water Company. This annexation was completed in August 2006.

2.3 LAND USE

Land use within the service area is primarily residential, with some elements of commercial, industrial, and irrigated cropland. The City is approximately 50 percent residential, 5 percent commercial, 10 percent industrial, 10 percent agriculture, 15 percent public, and the remainder is parks and other uses. Table 2.1 summarizes the General Plan land use categories.

Table 2.1 Land Use Categories
2010 Urban Water Management Plan
City of Camarillo

Land Use	Area(1) (acres)	Percentage of Total
Residential - Rural Density	1,848	17.3%
Residential - Low Density	2194	20.5%
Residential - Low-Medium Density	971	9.1%
Residential - Medium Density	176	1.6%
Residential - High Density	250	2.3%
Residential - Mobile Home	127	1.2%
Commercial - General Commercial	472	4.4%
Commercial - Office	112	1.0%
Industrial - Industrial	869	8.1%
Industrial - Industrial/Commercial	7	0.1%
Industrial - Research and Development	188	1.8%
Conservation - Agriculture	1225	11.4%
Conservation - Natural Open Space	458	4.3%
Conservation - Urban Reserve	0	0.0%
Public - Public	748	7.0%
Public - Mini Park	1	0.0%
Public - Neighborhood Park	74	0.7%
Public - Community Park	95	0.9%
Public - City-Wide Park	73	0.7%
Public - Schools, Elementary	102	1.0%
Public - Schools, Middle School	39	0.4%
Public - Schools, High	69	0.6%
Public - Quasi-Public/Utility	261	2.4%
Public - Historic Site	6	0.1%
Public - Waterway Linkage	334	3.1%
Total	**10,699**	**100.0%**

**Table 2.1 Land Use Categories
2010 Urban Water Management Plan
City of Camarillo**

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Public - Historic Site	6	0.1%
Public - Waterway Linkage	334	3.1%
Total	**10,699**	**100.0%**

Notes:
(1) Areas do not include street.

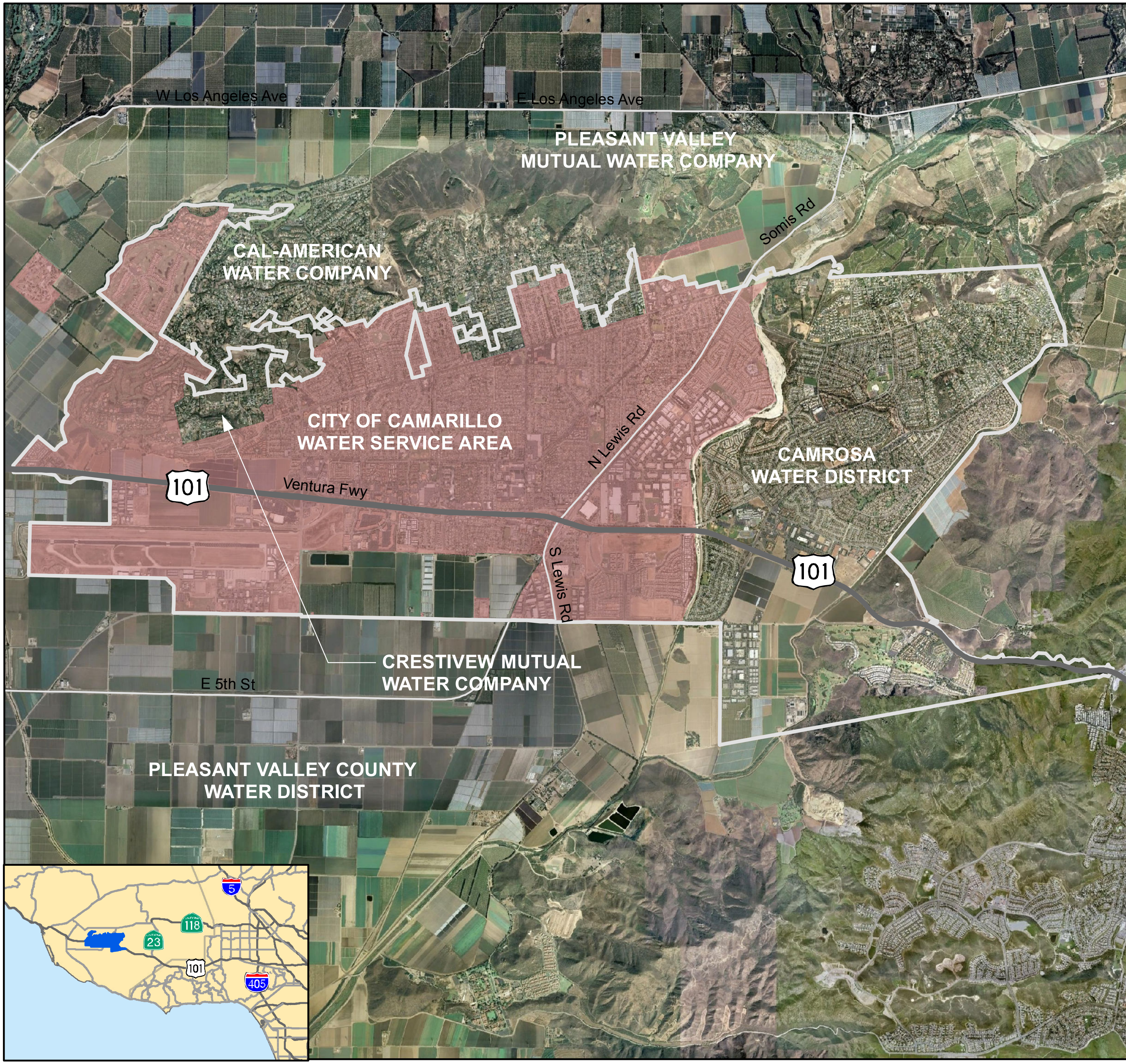


Figure 2.1
2010 Urban Water
Management Plan
City of Camarillo

carollo

2.4 POPULATION

Population projections, shown in Table 2.2 and Figure 2.2, were used to forecast water requirements for the City. Since the City's water service area does not coincide with the City boundary, percentage growth from population projections from the SCAG Integrated Forecast (SCAG, 2010) for the City of Camarillo was adapted to the historical population within the City's water service area.

Table 2.2 Projected Population

2010 UWMP Projection Years	2015	2020	2025	2030	2035
Service Area Population[(1)]	46,902	48,213	49,323	50,293	50,918

Notes:
(1) Source: SCAG growth trends applied to historical service area population (SCAG, 2010)

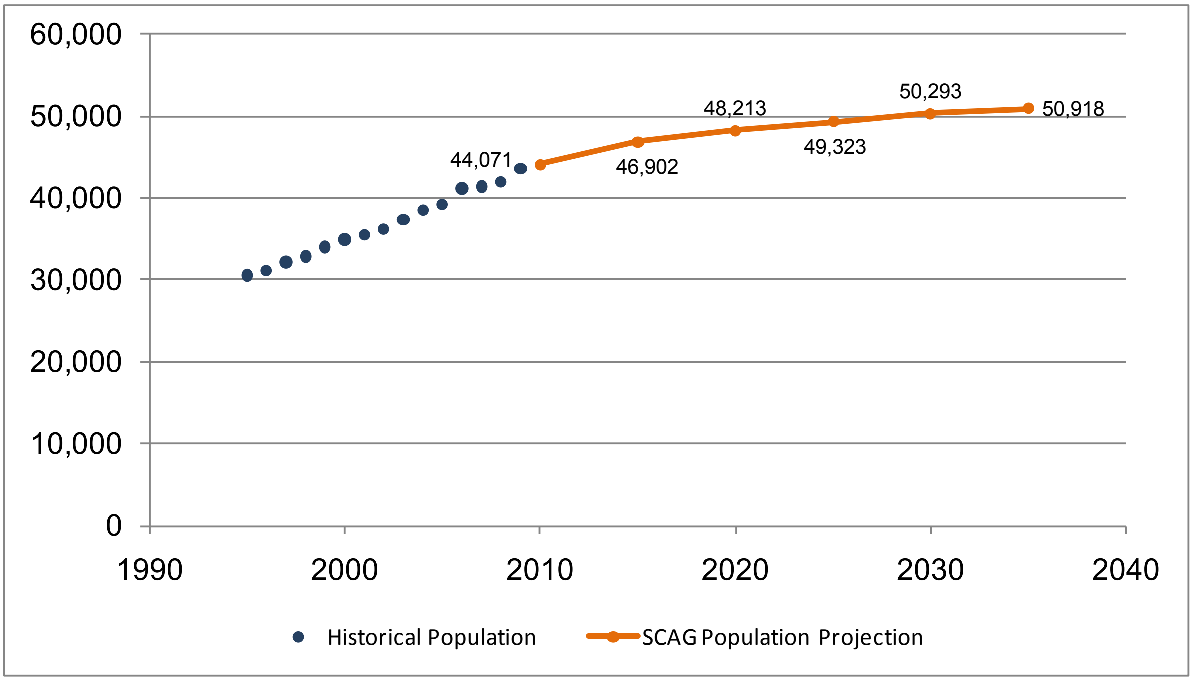


Figure 2.2 Historical and Projected Population

Since the City's water service area does not coincide with the City's boundaries, historical population shown in Figure 2.2 was calculated according to DWR methodologies, based on the number of service connections each year. The population within the water service area in 2000 was established through census data from the 2000 census (USCB, 2000). The population within the water service area was then compared with the number of service connections in 2000 to establish a population-to-account ratio, which could then be applied to the remaining years between 1995 and 2009. This method incorporated both single and multi-family population-to- account ratios through the number of single family and multi-family connections.

2.5 CLIMATE

The City's service area climate is a semi-arid environment with mild winters, warm summers and moderate rainfall, consistent with coastal Southern California. The climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or dry hot Santa Ana winds. Table 2.3 summarizes the standard monthly average evapotranspiration (ETo) rates, rainfall, and temperature. The City's average monthly temperature ranges from 51.6 to 70.6 degrees Fahrenheit (°F), with an annual average temperature of 61.1°F. The daily extreme low and high temperatures have been measured to be 31°F and 100°F, respectively. ETo averages a total of 46.43 inches. The average annual temperature is 61.1°F.

Table 2.3 Climate Characteristics

Month	Standard Monthly Average ETo(1) (inches)	Monthly Average Rainfall(2) (inches)	Monthly Average Temperature(2) (°F)		
			Average	Minimum	Maximum
January	1.83	3.17	56.30	45.7	66.9
February	2.20	3.79	55.80	45.7	65.9
March	3.42	1.63	56.95	47.0	66.9
April	4.49	1.24	57.85	57.9	67.6
May	5.25	0.44	61.40	52.8	70.0
June	5.67	0.03	64.45	56.4	72.5
July	5.86	0.01	67.65	59.5	75.8
August	5.61	0.00	67.60	59.2	76.0
September	4.49	0.01	66.65	58.1	75.2
October	3.42	0.70	63.8	53.8	73.5
November	2.36	1.09	59.6	48.7	70.5
December	1.83	1.68	55.55	44.8	66.3
Annual	**46.43**	**13.86**	**61.10**	**51.6**	**70.6**

Notes:
(1) Source: California Irrigation Management Information System (CIMIS) Station 152 – Camarillo (CIMIS, 2010). Represents monthly average ETo from January 2000 to November 2010.
(2) Source: Western Regional Climate Center (WRCC) Station 046572 – Oxnard WSFO, California (WRCC, 2010). Represents monthly average data from May 1998 to July 2010.

As shown in Table 2.3, the historical annual average precipitation is approximately 13.9 inches. Records show that the monthly precipitation has been as high as 9.56 inches and as low as 0.0 inches. Most of the rainfall occurs during the period of November through April.

Chapter 3

WATER SUPPLY

The UWMPA requires that the UWMP include a description of the agency's existing and future water supply sources for the next 25 years. This section includes an overview of the City's supplies along with projections of usage of each source of supply followed by a detailed discussion on each supply source. This detailed discussion includes information on imported water supplies, recycled water supplies, groundwater supply facilities, and the groundwater basin such as water rights, determination of whether the basin is in overdraft, and other information from the groundwater management plan, which can be found in Appendix C.

> *10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
>
> *10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a) [to 20 years or as far as data is available]. If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*
>
> *10631 (b) (1) A copy of any groundwater management plan adopted by the urban water supplier…*
>
> *10631 (b) (2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or board has adjudicated the rights to pump groundwater…For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted…*
>
> *10631 (b) (3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic records.*
>
> *10631 (b) (4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonable available, including, but not limited to, historic use records.*

3.1 SUPPLY OVERVIEW

The City's water system supplies water from two sources, groundwater and imported water. The City pumps groundwater from the Fox Canyon Aquifer. The City's imported water supplier is Calleguas Municipal Water District (CMWD), a member of the Metropolitan Water District of Southern California (MWDSC). MWDSC's imported water originates from the Colorado River Aqueduct and the State Water Project (SWP); however, the City's imported supply from MWDSC has historically been from the SWP due to its location in the MWDSC supply system.

Total demands for the City from 2005 to 2009 averaged 9,863 acre-feet per year (afy). In 2009, 4,019 afy came from groundwater sources (i.e., Fox Canyon Aquifer) and 5,586 afy from imported water supplies (i.e., MWDSC's SWP supply via CMWD). Figure 3.1 shows the breakdown in deliveries in 2009.

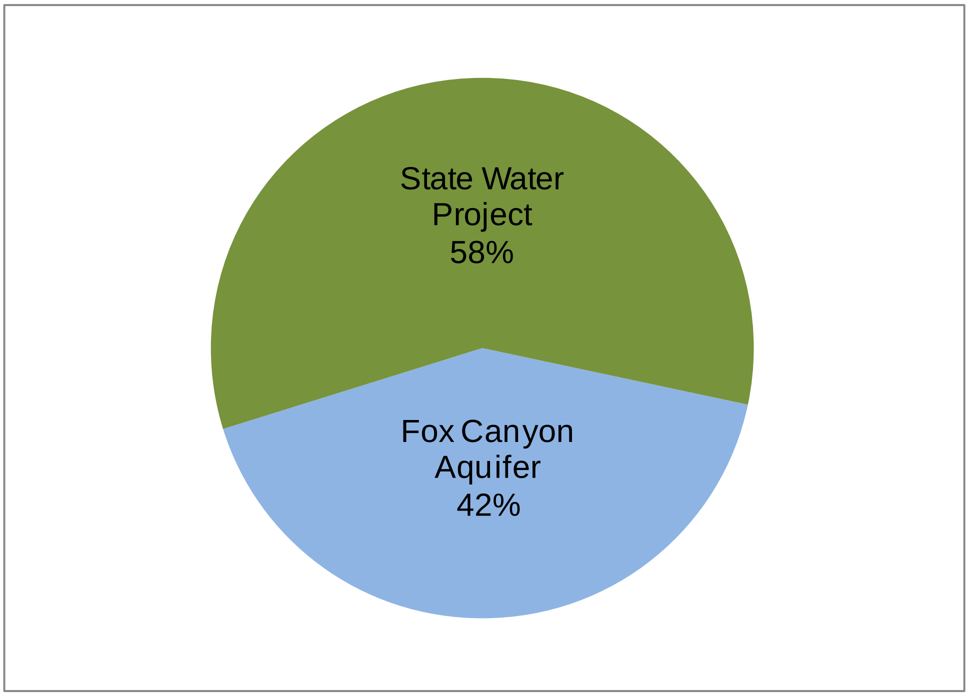


Figure 3.1 City Water Supplies for 2009

Between 1995 and 2009, the City's local groundwater supply, on average, met about 39 percent of the overall demand with the remaining 61 percent met by imported water. These numbers vary from year to year depending upon weather conditions, groundwater recharge rates, and groundwater blending requirements due to groundwater quality. Future demand projections assume that the City will continue to pump similar volumes of groundwater as the past five years until the completion of the Camarillo Regional Groundwater Desalter (Desalter). With the construction of the Desalter, the City's allocation will increase and the City will use groundwater to satisfy the most of its annual demand. Groundwater pumping is currently kept below the City's current Fox Canyon Groundwater Management Agency (FCGMA) groundwater allocation of 4,279 afy. The anticipated sources of water supply through the planning horizon of 2035 are shown in Table 3.1.

Table 3.1 Current and Projected Water Supply

Supply Source	Annual Supply (afy)					
	2010[1]	2015	2020[2]	2025	2030	2035
Imported Water (CMWD/MWDSC)[2]	4,550	6,344	153	375	570	695
Groundwater[3]	4,036	4,000	9,279	9,279	9,279	9,279
Recycled Water[4]	0	220	220	220	220	220
Total	**8,586**	**10,564**	**9,652**	**9,875**	**10,069**	**10,194**

Notes:
(1) 2010 represents actual historical data, all future values are based in population and gpcd projections
(2) The amount of imported water from year 2020 onward is determined as the balance between projected demand, and groundwater and recycled water production.
(3) The Camarillo Regional Groundwater Desalter is anticipated to complete in 2016/2017 and will increase the City's groundwater by 5,000 afy, increasing the groundwater pumping allotment from approx. 4,279 afy to 9,279 afy.
(4) The Village at the Park development is planned to use approx. 220 afy of recycled water. Recycled water is further discussed in Chapter 4.

The ability of the supplies to meet future growth in demands is discussed in Chapter 5. As shown in Table 3.1, groundwater pumping undergoes a dramatic increase in 2020 due to the implementation of the regional groundwater desalter. Recycled water is projected to be utilized at the new Village at the Park, increasing recycled water use within the City's service area to 220 afy. Imported water is used to meet additional demands and is anticipated to decline between 2010 and 2020 in order for the City to reach the Water Conservation Act of 2009 target for 2020. The imported supply then increases slightly along with normal population growth.

3.2 DISTRIBUTION SYSTEM AND STORAGE

The City's existing water distribution system consists of approximately 190 miles of 6-inch through 20-inch diameter pipelines, which include eight (US 101) freeway crossings. Other components of the City's water distribution system include: six reservoirs (four above ground and two underground) with a total combined capacity of 13.4 million gallons (MG), four groundwater wells, eight connections for importing water from CMWD, three pumping stations, and 11 pressure reducing valve locations.

3.3 IMPORTED WATER

10631 (k). Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that indentifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same 5 year increments, and during various water year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan information requirements of subdivisions (b) and (c), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

The City has purchased imported water from CMWD since April of 1966. CMWD receives treated SWP supplies from MWDSC's Jensen Treatment Plant located in Granada Hills, and supplies the City through eight turnouts from its Oxnard-Santa Rosa Feeder and Camarillo Feeder. Each of the City's turnouts has a rated capacity of 2,000 gpm.

In 1960, CMWD became a member agency of MWDSC. MWDSC is comprised of 26 member agencies; CMWD is the fifth largest member agency in terms of average annual water deliveries.

CMWD distributes potable water on a wholesale basis to 19 local purveyors, who deliver water to area residents, businesses, and agricultural customers. The water supplied by CMWD currently represents approximately 73 percent of the total municipal and industrial water supply within its service area. CMWD's service area encompasses approximately 375 square miles. Land use in the area is primarily residential, commercial, industrial, and irrigated cropland (BV, 2010).

The treated imported water is delivered to CMWD through MWDSC's West Valley Feeder No. 2 Pipeline. The water is then conveyed to Simi Valley, where the majority is distributed to CMWD's customers through their transmission system. The remainder is injected into the Las Posas aquifer or stored in Lake Bard. Water stored at Lake Bard, also called Wood Ranch Reservoir, is treated through CMWD's Lake Bard Water Filtration Plant, which has a capacity of 65 million gallons per day (mgd) (BV, 2010). This increases the supply reliability of the CMWD system and all of its customers.

3.4 SURFACE WATER

The City does not utilize local surface water supplies.

3.5 GROUNDWATER

The City and the surrounding area rest on an alluvial deposit approximately 1,000 feet thick, which is comprised of several aquifers interbedded with gravel, sand, and clay lenses. The clay lenses preclude any significant groundwater movement from one aquifer to the next. The City's water service area lies almost entirely in the Pleasant Valley Basin, but there are also several separate groundwater basins in the area, separated by a series of faults or folds, which also reduce groundwater movement from one basin to another. Groundwater in the region generally flows southwest.

The Pleasant Valley Basin historically has been replenished by subsurface inflows from the Oxnard Plain Basin, East and West Las Posas Basins, and the Santa Rosa Basin. Subsurface inflow over the past several years has been limited to only the Oxnard Plain and the East Las Posas Basins. Over pumping in the other basins has lowered water tables and prevented subsurface inflows into the Pleasant Valley Basin.

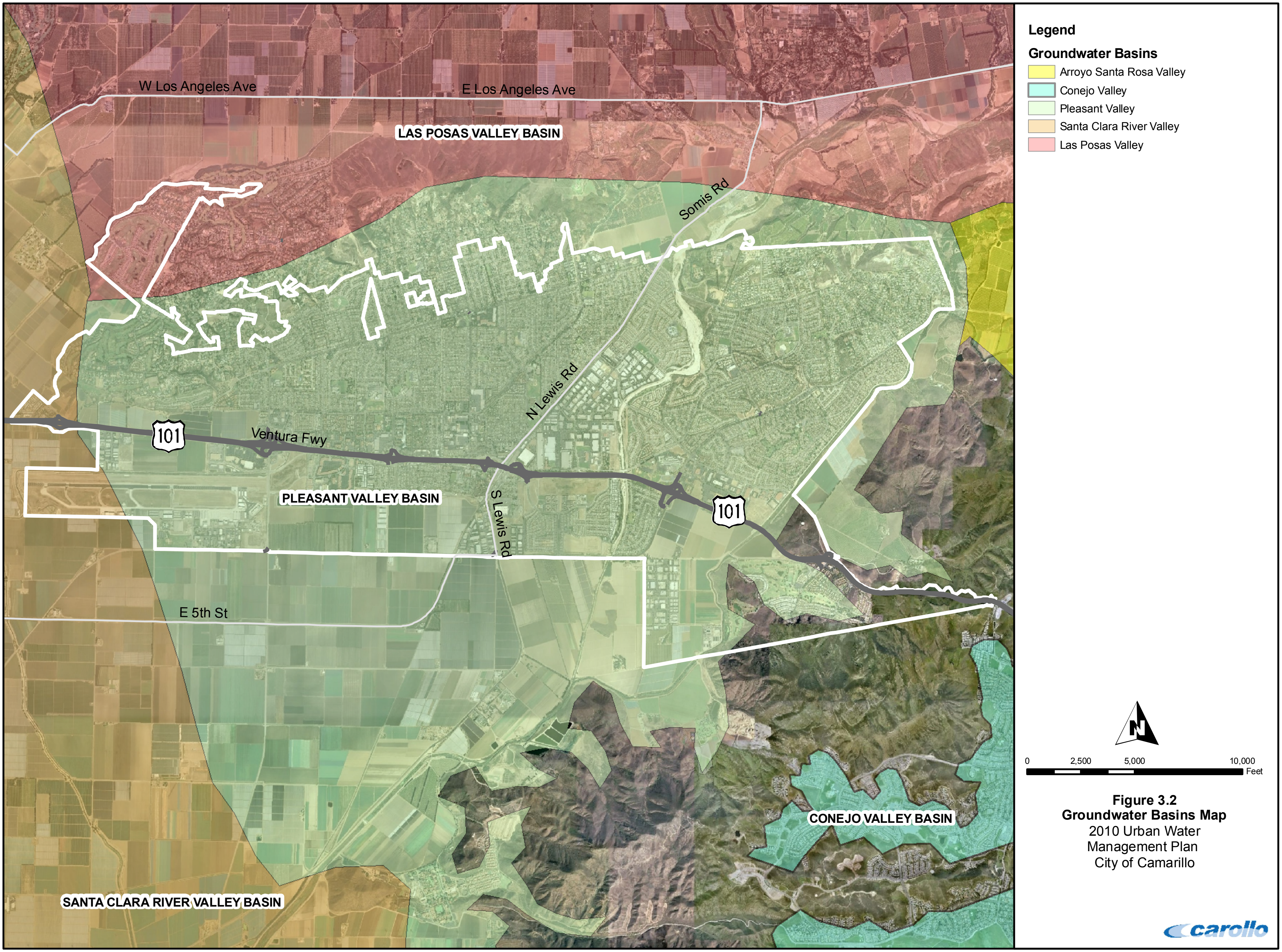


Figure 3.2
Groundwater Basins Map
2010 Urban Water
Management Plan
City of Camarillo

Most of the groundwater within the basin is contained within alluvial deposits and within the Fox Canyon and Grimes Canyon aquifers. The Fox Canyon Aquifer is the major water bearing unit in the Pleasant Valley Basin. The upper strata of the basin are alluvial deposits, which average 400 feet in thickness and consist of water bearing sands and gravels separated by clay lenses. The Fox Canyon aquifer is within the bottom of the San Pedro formation, which underlies the alluvial deposits. It varies in thickness from 400 feet to 1,500 feet and is effectively sealed from percolation of water from above by impervious materials located at the bottom of the alluvial deposits. Beneath the San Pedro formation lies the Santa Barbara formation containing the Grimes Canyon aquifer.

3.5.1 Groundwater Quality

The lower part of the area's aquifer system is generally considered to contain the better quality water with total dissolved solids (TDS) as low as 250 mg/L, although in some areas the TDS levels are in excess of 2,000 mg/L. TDS concentrations in excess of 1,000 mg/L are not uncommon in the upper aquifer system. The large number of well operators and continued pumping has created a severe overdraft of the Fox Canyon Aquifer. Saline intrusion from the coast and salinity associated with low groundwater levels are the primary water quality concern in the Pleasant Valley basin. Low groundwater levels extend from underneath the City to the ocean.

Other regional groundwater quality issues involve high TDS and occasionally high nitrate concentrations. Seawater intrusion has long been a concern and was the issue that precipitated the creation of the FCGMA. The intrusion occurs exclusively along the coastline in the Oxnard Plain and Pleasant Valley Basins.

Chloride as a particular constituent of concern in the East and South Las Posas basins, recently affecting the City's wells (CMWD, 2011). High nitrate concentrations in the groundwater is a problem localized in the Oxnard Plain and Forebay basins. Drinking water wells in the impacted areas are often affected during and following dry periods. The primary sources of nitrate are septic systems and agricultural fertilizer. To address the problem, septic systems are now prohibited in the Oxnard Plain Forebay and BMPs are being implemented to limit agricultural contributions (BV, 2010).

3.5.2 Groundwater Levels and Historical Trends

Historically, it was assumed that the lower aquifer system of the Pleasant Valley Basin was confined and received little overall recharge across the fault that extends from the Camarillo Hills to Port Hueneme. However, since the early 1990s, water levels began to rise in the northern adjacent basins. The City has two existing wells in the northeast portion of the Pleasant Valley Basin and these wells confirm that rising water levels in the northern adjacent basins directly impact recharge rates, water quality, and water levels in the Pleasant Valley Basin area. Recharge in the area may be the result of uplift and folding of lower aquifer units that allow rapid stream flow percolation.

The portion of the Pleasant Valley Basin east of the City is not well understood because there are not very many wells. Along Calleguas Creek near California State University Channel Islands, water has been produced historically from aquifer depths that are shallower than the typical lower aquifer well, suggesting that water bearing strata are not limited to the lower aquifers in that area (FCGMA, 2007).

3.5.3 Sources of Recharge and Discharge

As mentioned in Section 3.5.1, much of Pleasant Valley Basin's recharge originates with the Las Posas Basin to the north. As water makes its way southwest through the watershed, Las Posas Basin, as well as Pleasant Valley Basin, receive recharge water. CMWD supplements natural groundwater recharge in the area through the use of groundwater injection. Some of the water imported by CMWD is stored in the Las Posas Groundwater Basin.

3.5.4 Groundwater Pumping

The annual amount of groundwater pumped since the 2005 UWMP is presented in Table 3.2.

Table 3.2 Amount of Groundwater Pumped

	Historical Groundwater Pumped from Basin (afy)				
Basin Name	**2006**	**2007**	**2008**	**2009**	**2010**
Pleasant Valley Basin	3,890	4,070	3,943	4,019	4,036
% of Total Water Supply(1)	**40.66%**	**39.03%**	**38.44%**	**41.84%**	**47.01%**

Notes:
(1) Camarillo Public Water System Statistics

As shown in Table 3.2, the amount of groundwater pumped in the Pleasant Valley Basin has gone up slightly, but remained fairly consistent over the last five years.

Table 3.3 groundwater supply projections are consistent with those presented in Table 3.1.

Table 3.3 Amount of Groundwater to be Pumped

	Annual Groundwater Pumped from Basin (afy)					
Basin Name	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Pleasant Valley Basin	4,000	4,000	9,279	9,279	9,279	9,279
Total	**4,000**	**4,000**	**9,279**	**9,279**	**9,279**	**9,279**

Notes:
(1) Assumes the City will pump recent historical volumes prior to the completion of the desalination plant, and will fully utilize its basin allocation after the desalter's completion

As shown in Table 3.3, the amount of groundwater pumped is anticipated to remain constant until the construction of the Camarillo Regional Groundwater Desalter. These estimates are based on the assumption that the City will pump a volume similar to what was pumped between 2005 and 2009 until the construction of a groundwater desalination plant is completed. The groundwater desalination plant will enable the City to utilize 5,000 afy of additional groundwater, resulting in a new basin allocation of 9,279 afy. It is anticipated that the desalter will be completed by 2016/2017. Hence, the amount of groundwater produced is increased in planning year 2020. The City's adjusted allocation of 9,279 afy is assumed to remain consistent through the planning horizon. Further details on the City's groundwater are available in the FCGMA Groundwater Management Plan, available in Appendix C. Also, basin information, such as California Groundwater Bulletin 118, is also presented in Appendix C.

It was assumed that the City will maximize groundwater first and then fulfill remaining demand with imported water, meaning that imported water, rather that groundwater, will decrease to meet conservation targets.

3.5.5 Basin Overdraft

Oxnard Plain, the hydrologic region just south of the City, began experiencing saltwater intrusion into its groundwater supply as early as 1930. In the Port Hueneme area, seawater in the aquifer system reached its farthest point inland in the early 1980s. Following the high rainfall in year 1983, chloride levels began to decrease in many of the area's wells. This improving trend was accelerated in the 1990s as aquifer pressures were restored and seawater was pushed back towards the coast.

The lower aquifer system, of which the Fox Canyon Aquifer is a part of, did not drop below sea level until the late 1950s. The over pumping of the aquifers that led to seawater intrusion also led to land subsidence of up to 2.2 feet in the Pleasant Valley area as dewatered clay layers between aquifer zones collapsed from reduced hydrostatic pressures. This subsidence is permanent, as refilling the sand and gravel aquifers does not force water back into the dry clay layers.

The FCGMA was created to moderate the use of groundwater within the area. In 1985, the FCGMA summed all water inputs and outputs to determine how much could be extracted from the basins in the region. Since that initial analysis, basin yield in the area has been recalculated several times. It has been found that many of the inland basins which do not abut the coastline are hydrologically connected to the coastal basins, evidenced by the continuity of groundwater elevation contours across their boundaries (FCGMA, 2007).

Although the Pleasant Valley Basin, the basin which the City overlies and from which the City draws from, is in a state of overdraft, the basin is not adjudicated. The FCGMA Ordinance established reductions in extraction allocations as a method to reduce overdraft of the groundwater basin. The reductions were scheduled to reduce groundwater pumping by 25 percent over a 15 year period. In 2010, the reduction was set to 75 percent of historical allocation. The City's historical allocation is 4,082 afy. After including transfers and the 25 percent reduction, the City's "adjusted allocation" for 2010 was 4,279 afy. Pending approval by the FCGMA, the introduction of the Desalter will increase the City's groundwater allocation by 5,000 afy to 9,279 afy. This will significantly decrease reliance on imported water and allow the City to meet the majority of its demands with groundwater pumped from the Pleasant Valley Basin. Further information on the FCGMA's overdraft reduction can be found in the FCGMA Ordinance Code and the Groundwater Management Plan included in Appendix C.

To combat basin saline intrusion, land subsidence, and groundwater quality degradation, FCGMA instituted an ordinance prohibiting the drilling of new wells in the lower aquifer system within the region, instead requiring that wells be drilled into the more easily replenishable upper aquifer system. Further plans to address basin overdraft include additional storage projects and utilization of groundwater injection.

3.6 DESALINATED WATER

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long term supply.

The UWMPA requires that the UWMP address the opportunities for development of desalinated water, including ocean water, brackish water, and groundwater. Table 3.4 summarizes the City's opportunities for the various types of desalinated water supply.

Table 3.4 Opportunities for Desalinated Water

Sources of Water	Existing Desalinated Water	Opportunities for Desalinated Water
Ocean Water	None	None
Brackish Ocean Water	None	None
Brackish Groundwater	None	Camarillo Regional Groundwater Desalter
Other	None	None

As summarized in Table 3.4, for the City is not pursuing ocean water desalination, but is in the planning stages of developing a groundwater desalination plant, as discussed below.

3.6.1 Brackish Water and/or Groundwater Desalination

Currently, high TDS levels are found within the groundwater basin underlying the City's water service area. This necessitates the blending of pumped groundwater with imported water to lower the TDS prior to introduction to the potable water system. This has limited the amount of groundwater the City is able to pump, and increases dependence on imported water for blending.

The planned groundwater desalination plant will allow the City to increase its groundwater allocation and use, consequently lowering the amount of imported water required for blending. Desalinated water from the Camarillo Regional Groundwater Desalter is anticipated to be supplied directly to the City's distribution system as well as to CMWD feeders for supply to other CMWD members (BV, 2010). As previously discussed, if the groundwater desalination plant is operational by 2016/2017, the City will then be able to pump approximately 9,200 afy of groundwater.

3.6.2 Seawater Desalination

At this time it is neither practical nor economically feasible for the City to implement a seawater desalination program. However, the City's could provide financial assistance to other purveyors in exchange for water supplies. A discussion of MWDSC's regional efforts to support desalinated water is included in the Chapter 7 with the discussion of supply reliability.

3.7 RECYCLED WATER

A portion of the treated effluent from the Camarillo Sanitary District's Camarillo Water Reclamation Plant (WRP) is currently supplied local recycled water users. In addition, CSD has agreements with the Camrosa Water District that allow for delivery of tertiary treated recycled water to Camrosa. Additional details about Camarillo Sanitary District's recycled water system can be found in Chapter 4.

Chapter 4

RECYCLED WATER

This chapter includes information on water recycling and its potential for use as a water source for the City in accordance with the UWMPA.

> *10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:*
>
> *10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*
>
> *10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.*
>
> *10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse determination with regard to the technical and economic feasibility of serving those uses, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*
>
> *10633 (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.*
>
> *10633 (e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*
>
> *10633 (f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recirculating uses.*

4.1 COLLECTION AND TREATMENT SYSTEMS

The Camarillo Sanitary District (CSD) provides wastewater collection and treatment for the City's water service area. CSD also treats wastewater for areas within the City boundary but outside the water service area and areas north of the City served by Cal American Water Company, Pleasant Valley Mutual Water Company, Crestview Mutual Water Company, and Pleasant Valley County Water District.

CSD treats the wastewater collected within its service area at the Camarillo Water Reclamation Plant (Camarillo WRP), which is located in the southeast portion of the City adjacent to Conejo Creek. Camarillo WRP was initially designed with a capacity of 2.75 mgd and currently treats an average of 4.0 mgd or 4,480 afy of wastewater and has a peak capacity of 7.25 mgd (Camarillo, 2010). Tertiary treatment processes were added as a part of Camarillo WRP's most recent expansion in 2005.

CSD also maintains approximately 158 miles of underground sewer lines and four lift stations as a part of its wastewater collection system. Historically, CSD has recycled wastewater through agricultural irrigation of nearby farmlands and landscape irrigation in the vicinity of Camarillo WRP. Disposal of non-recycled wastewater is accomplished through discharge into Conejo Creek.

Recycled water is supplied to a local farmer, Smith Ranch, who apportions water among various fields adjacent and near to Camarillo WRP. Depending on the location of the field, water is either pumped directly to the fields from Camarillo WRP or to storage for distribution to fields farther from Camarillo WRP. Recycled water is supplied to agricultural users in the daytime and to non-agricultural irrigation users during the night. CSD also supplies tertiary treated recycled water to the Village at the Park Community which uses the water to irrigate landscaping and a 54 acre sports park.

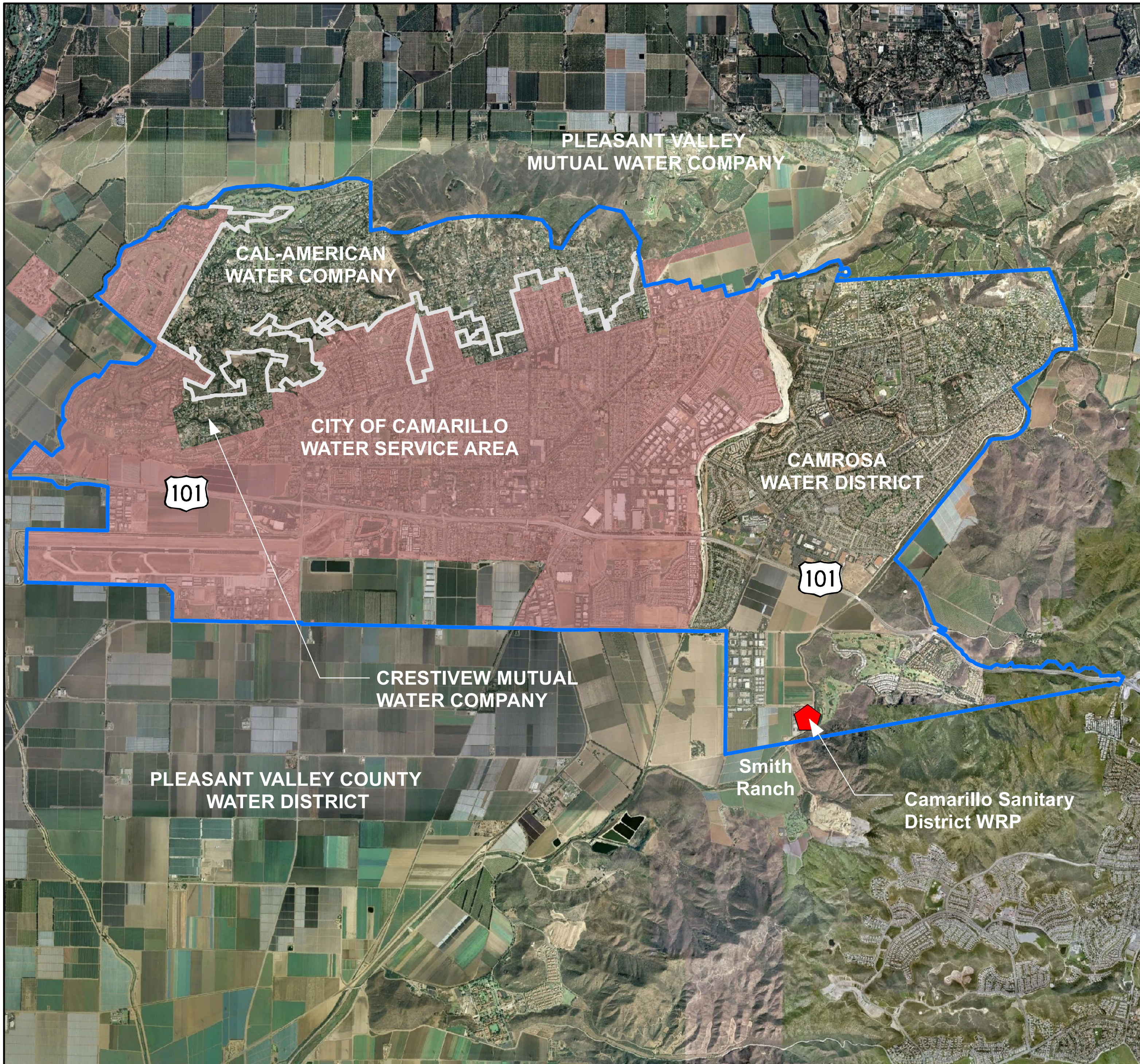
CSD's existing recycled water distribution system consists of about 4,200 feet of 8-inch pipeline from Camarillo WRP south across Conejo Creek to a storage pond at the Smith Ranch and west from Camarillo WRP to adjacent fields. CSD is planning to construct a 24-inch diameter pipeline to Camrosa Water District's recycled water distribution system. This pipeline is sized to facilitate the transfer of the entire effluent flow from Camarillo WRP.

Table 4.1 presents the current and projected wastewater collected from the City's water service area along with current and projected wastewater collected from CSD's entire service area. Table 4.1 demonstrates that all of the treated wastewater from CSD is and will continue to be treated to recycled water quality standards. CSD has recently added tertiary treatment to its entire WRP, and the volumes shown in Table 4.1 reflect this. While the entire volume treated at the WRP currently meets tertiary treatment requirements, not all water is used in recycled water applications.

Table 4.1 Wastewater Collection and Treatment

	Projected Annual Flow (afy)					
Type of Wastewater	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Estimated Wastewater Collected and Treated in Service Area(1)	3,309	3,521	3,620	3,703	3,776	3,823
Wastewater Collected and Treated in Camarillo Sanitary District(2)	4,223	4,368	4,368	4,368	4,368	4,368
CSD Volume that Meets Recycled Water Standard(2)	4,223	4,368	4,368	4,368	4,368	4,368

Notes:
(1) This table assumes a 30% return to sewer ratio for wastewater collected and treated in service area
(2) Historical 2010 flow data obtained from Engineer Compliance Report (Carollo, 2010). Flow projections for 2015 through 2035 for CSD and recycled water projections are from the 2010 Calleguas MWD UWMP (BV, 2010).
(3) The entire volume treated at the WRP currently meets tertiary treatment requirements, but not all water is used in recycled water applications.



Legend

- CSD Service Area Boundary
- City Limits
- City Water Service Boundary

0 2,500 5,000 10,000 Feet

Figure 4.1
CSD Service Area
2010 Urban Water
Management Plan
City of Camarillo

carollo

Since the wastewater flow from the City's water service area is collected along with wastewater flow from CSD's entire service area, actual wastewater flow data from the City's water service area was not available. The projected wastewater flow for the City's water service area in Table 4.1 is instead estimated based on an assumed return-to-sewer ratio of 30 percent. The collection and treatment for CSD's entire service area is based on the data presented in the Calleguas 2010 UWMP (BV, 2010).

Based on the Calleguas 2010 UWMP, recycled water is anticipated to be delivered to Pleasant Valley County Water District and Camrosa Water District (CWD) in the future. An exception of approximately 500 afy will be delivered to Smith Ranch, and over 220 afy will be delivered to the Village at the Park Community, eliminating all discharge to Conejo Creek by 2015.

Other uses of recycled water include irrigation of non-food crops, such as fodder fiber and seed crops, and processed foods, and landscape irrigation at the Conejo Mountain Memorial Cemetery. Each of these uses are outside the City's water service area. The City has determined that establishing recycled water service within its water service area beyond the future deliveries to Smith Ranch and Village at the Park would not be economically viable.

As discussed above, CSD currently discharges excess wastewater (treated to tertiary standards) to Conejo Creek. Table 4.2 lists the current and projected disposal method for this flow of discharging to Conejo Creek.

Table 4.2 Disposal of Non-Used Recycled Wastewater

Method of Disposal	Treatment Level	Annual Discharge Flow (afy)					
		2010	2015	2020	2025	2030	2035
Discharge to Conejo Creek	Tertiary	2,755	-	-	-	-	-
Total		**2,755**	**-**	**-**	**-**	**-**	**-**

Notes:
(1) The annual discharge flow to Conejo Creek of 0 is based on Engineering Compliance Report (Carollo, 2010). Flows for 2015 through 2035 are based on 100% usage of all recycled water. The exact quantity to be taken is unknown at this time.

As shown in Table 4.2, it is anticipated that once CSD is able to connect to CWD's recycled water distribution system, the entire flow from Camarillo WRP will be used for recycled water purposes. However, the amount of recycled water which CWD will be able to use is not known at this time and may increase the amount of non-recycled wastewater to be discharged to Conejo Creek from 0 at 2015 to something greater but less than current discharge of 2,755 afy.

4.2 RECYCLED WATER USES

Table 4.3 presents a comparison of anticipated 2010 recycled water use of the City's wastewater by others as presented in the City's 2005 UWMP to the actual recycled water use by the City's in 2010.

Table 4.3 2005 UWMP Projected 2010 Recycled Water Use Compared to 2010

Type of Use	Treatment Level	Projected[1] 2010 Recycled Water Use (afy)	Actual Recycled Water Use[2] 2010 (afy)
Agriculture and Landscape	Tertiary	4,368	1,468
Total		**4,368**	**1,468**

Notes:
(1) From City's 2005 UWMP (UWMP, 2005)
(2) From 2010 usage listed in Appendix E of the Engineering Compliance Report (Carollo, 2010)
(3) User Types which are not included in this table (e.g., Groundwater Recharge, Indirect Potable Reuse) have no existing or projected demands within the City's water service area or in CSD's service area and the associated rows were removed for clarity. The breakdown of demands between agricultural and landscape irrigation uses was not available.

As shown in Table 4.3, the projected recycled water demand for 2010 in the City's 2005 UWMP was 4,368 acre-feet (af). This value was derived by assuming the first 850 af of recycled water supply would continue to be delivered to Smith Ranch, and that the remainder would be delivered to Pleasant Valley County Water District and CWD as tertiary treated recycled water. Because the Camarillo WRP has yet to be connected to CWD's recycled water distribution system, the portion of wastewater anticipated for delivery to Pleasant Valley County WD and CWD in the City's 2005 UWMP instead has continued to be discharged to Conejo Creek.

4.3 POTENTIAL USES AND PROJECTED DEMAND

As outlined above, recycled water generated within the City service area, but not utilized by the City is anticipated to see two potential uses. A portion will continue to be utilized for agricultural irrigation and landscaping purposes near the Camarillo WRP while the remainder is anticipated to be supplied to recycled water distribution systems within the water service areas of Pleasant Valley County Water District and CWD. It should be noted that the recycled water supplied to agricultural irrigation uses near Camarillo WRP as well as potential supplies to these neighboring agencies does not lead to recycled water offsets within the City and therefore does not affect future demand projections for the City.

Projected recycled water supplied from Camarillo WRP is presented in Table 4.4. The Calleguas 2010 UWMP describes how Pleasant Valley County Water District and CWD intend to use the purchased recycled water for landscape irrigation, which coupled with Smith Ranch, makes the recycled water from Camarillo WRP solely intended for this one type of use.

Table 4.4 Camarillo WRP Recycled Water Uses – Actual and Potential

User Type	Treatment Level	Projected Recycled Water Demand(3) (afy)					
		2010	2015	2020	2025	2030	2035
Agricultural Irrigation	Tertiary	1,342	2,401	2,401	2,401	2,401	2,401
Landscape Irrigation	Tertiary	71	292	292	292	292	292
Industrial Reuse(1)	Tertiary	55	55	55	55	55	55
Unspecified(2)	Tertiary	0	1,620	1,620	1,620	1,620	1,620
Total		**1,468**	**4,368**	**4,368**	**4,368**	**4,368**	**4,368**
Use within City Service Area(6)	Tertiary	0	220	220	220	220	220

Notes:
(1) Camarillo WRP plant process use.
(2) Anticipated to be supplied to CWD and Pleasant Valley County Water District but use is currently unknown.
(3) Demands from Appendix E of the Engineering Compliance Report (Carollo, 2010)
(4) User Types which are not included in this table (e.g., Groundwater Recharge, Indirect Potable Reuse) have no existing or projected demands within the City's water service area or in CSD's service area and the associated rows were removed for clarity.
(5) Actual current and projected recycled water use for the City is 0. While service area water is used for tertiary treatment, usage of this recycled water is within CSD service area, but not that of the City.
(6) Recycled water used within the City service area for landscape irrigation, causing the 2015 increase in total landscape irrigation from Camarillo WRP. Use occurring in the Village at the Park Community.

As shown in Table 4.4, recycled water is projected for primarily agricultural and landscape irrigation uses, as well as some usage at the Camarillo WRP. Since usage for the recycled water supplied to CWD and Pleasant Valley County Water District is unknown at this time, this is provided separately in Table 4.4 under Unspecified.

4.4 INCENTIVES AND PLANNING

While the City is not anticipating the development of a recycled water distribution system within its water service area, the City will continue to support the use of recycled water from the wastewater generated within the City water service area to be put to use in areas outside the City's water service area. If development of CWD's recycled water system and agricultural irrigation uses associated with Smith Ranch do not fully utilize the tertiary treated wastewater supplied by Camarillo WRP, and the increasing cost of imported water changes the economic viability of recycled water, the City may consider development of a recycled water system within its water service area.

Chapter 5

WATER DEMAND

The UWMPA requires that the UWMP identify the quantity of water supplied to the agency's customers including a breakdown of demands and demand projections by user classification.

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the- following uses:
>
> (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.
>
> (2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

5.1 PAST, CURRENT, AND PROJECTED WATER USE

This section describes the historical, current, and projected water use through year 2035. It also describes the types of customer accounts in the City and the breakdown of accounts throughout the system.

5.1.1 Historical Water Use

Water demands (or water use) represent water that leaves the distribution system through metered or unmetered connections or at pipe joints (leaks) or breaks. Water demands occur throughout the distribution system based on the number and type of consumers in each location. Annual historical water demands within the City's service area between 1995 and 2009 are presented in Table 5.1 along with population and per capita demand.

Water demands shown in Table 5.1 are based on calendar year consumption figures provided by the City. Population is included for the same time period, estimated based on DWR calculations from the number of service connections installed each year.

Table 5.1 Historical Water Use

Year	Demand[(1)] (afy)	Population[(2)]	Per Capita Consumption (gpcd)
1995	6,871	30,580	201
1996	7,166	31,097	206
1997	7,936	32,170	220
1998	7,338	32,887	199
1999	8,762	34,031	230
2000	9,326	34,939	238
2001	8,756	35,451	220
2002	9,885	36,156	244
2003	8,888	37,340	212
2004	9,646	38,514	224
2005	9,457	39,283	215
2006	9,567	41,174	207
2007	10,429	41,416	225
2008	10,258	41,973	218
2009	9,605	43,672	196
2010	8,585	46,694	164
Average	**8,905**	**37,336**	**214**

Notes:
(1) Demands obtained from Public Water System Statistics Sheets
(2) Historic population estimates were calculated from the number of service connections installed each year between 1990 and 2010. A benchmark of the year 2010 was used based on census data (USCB, 2000).

As shown in Table 5.1, City demands increased over the last 16 years, growing from 6,871 afy to more than 10,000 afy and recently declined to about 8,500 afy. In the same period, the population has increased to nearly 47,000.

5.1.2 Per-Capita Consumption

Per capita demands are calculated by dividing the total system demands by the City's population. The resulting number is the average number of gallons consumed, per person, per day for that year. Annual per capita demands are included in Table 5.1. Over the last 15 years, the per capita consumption has ranged between 164 and 230 gpcd. As shown, the City's average per capita demand over the last 16 years was 214 gpcd.

5.1.3 Projected Water Use

Based on the future trends in population obtained from the Southern California Association of Governments (SCAG) and established per capita water consumption rates, the City's future water requirements were estimated and summarized in Table 5.2. The per capita water consumption factors were determined by establishing consumption targets to meet future water conservation requirements throughout the state (as discussed in more detail in Chapter 6). The City's average gpcd from 1999 to 2008, 223 gpcd, was used as the baseline consumption and applied to the projection for 2010. The baseline was reduced by 10 percent to 201 gpcd for the 2015 projection, and by the full 20 percent, 179 gpcd, required by the water conservation act of 2009 for year 2020 and onward.

Table 5.2 Demand Projections

Year	Per Capita Consumption (gpcd)[2]	Population[1]	Demand (afy)
2010	223	44,071	11,029
2015	201	46,902	10,564
2020	179	48,213	9,652
2025	179	49,323	9,875
2030	179	50,293	10,069
2035	179	50,918	10,194

Notes:
(1) Population Projections from Table 2.2 for the City service area.
(2) Per capita consumption based on baseline period for 2010 and SBx7-7 targets for 2015 and 2020 through 1035

As shown in Table 5.2, the City's demands are anticipated to decrease from 11,029 afy to 10,194 afy in 2035. Over this same time period, the population of the City is anticipated to grow by over 5,000 to approximately 50,918. This demand projection is based on per capita consumption rates which have been specifically calculated to satisfy the water conservation targets laid out in the Water Conservation Act of 2009. Put simply, the listed per capita consumption values will allow the City to realize a 20 percent reduction in water use in 2020. More details regarding the per capita consumption rates presented in Table 5.2 can be found in Chapter 6.

5.2 WATER USAGE BY CLASSIFICATION

The current and projected water deliveries by sector are summarized in Table 5.3 along with those for 2005. As shown, the City does not have any unmetered accounts and is planning to continue installing meters for all future accounts.

The water loss calculations for calendar year 2005 showed an estimated water loss of five percent. As this water loss is low compared to the typical water loss range of 5 to 10 percent, it is assumed that this is the minimum amount of water loss that can realistically be achieved. The water loss for future planning years is therefore also estimated at five percent.

Table 5.3 Water Demand Projections by Sector

Use	2005(1)		2010(1)		2015		2020		2025		2030		2035	
	# of accounts(2)	Demand (afy)	# of accounts(2)	Demand (afy)	# of accounts(2)	Demand (afy)	# of accounts(2)	Demand (afy)	# of accounts(2)	Demand (afy)	# of accounts(2)	Demand (afy)	# of accounts(2)	Demand (afy)
SFR	11,147	4,632	11,211	4,213	13,984	5,204	14,374	4,755	14,705	4,864	14,995	4,960	15,181	5,021
MFR	187	594	379	660	308	676	316	618	323	632	330	645	334	653
Comm./Inst.	757	1,137	889	1,133	1,000	1,248	1,028	1,140	1,051	1,167	1,072	1,190	1,086	1,204
Ind.	7	163	18	59	11	134	12	123	12	126	12	128	12	2,111
Land./Irr.	528	1,959	623	1,791	705	2,188	724	1,999	741	2,045	755	2,085	765	130
Other	19	39	15	14	26	43	27	40	28	40	28	41	29	42
Ag.	11	485	11	337	13	542	13	495	13	507	14	516	14	523
Unmetered System Losses (5%)(3)		473		377		528		483		494		503		510
Total	12,928	9,457	11,736	8,585	16,046	10,564	16,495	9,652	16,875	9,875	17,206	10,069	17,420	10,194

Notes:

(1) Years 2005 and 2010 based in actual historical data, 2015 to 2035 based on projections incorporating water conservation targets

(2) Number of accounts shown are based on average account type breakdown from 2005 to 2009 for non-conservation water use projections

(3) Assumes 5% water loss

(4) Demands by each account type based on average usage breakdown by account type from 2005 to 2009 for conservation water use projections (see Figure 5.1)

(5) Water uses which are not included in this table (e.g., Groundwater Recharge and Conjunctive Use) have no existing or projected demands within the City's water service area and the associated rows were removed for clarity.

As shown in Table 5.3, projected water usage is slated to decrease in order to meet 2020 conservation targets. The decrease in demand takes future conservation goals into account. The number of projected accounts is based on the historic account-to-demand ratios from 2005 through 2009 (average of 1.37 afy per account) multiplied by non-conservation demand projections. The reason for basing account numbers on non-conservation projections is that, while water use will diminish, the number of accounts will not. In other words, the City will meet its reduction goals by having every account use 20 percent less water, rather than removing 20 percent of all accounts. The projections in Table 5.3 account for this fact by basing account growth on non-conservation projections, but assuming that conservation goals will still be met.

The average breakdown of the number of accounts by account type between 2005 and 2009 is depicted graphically on Figure 5.1.

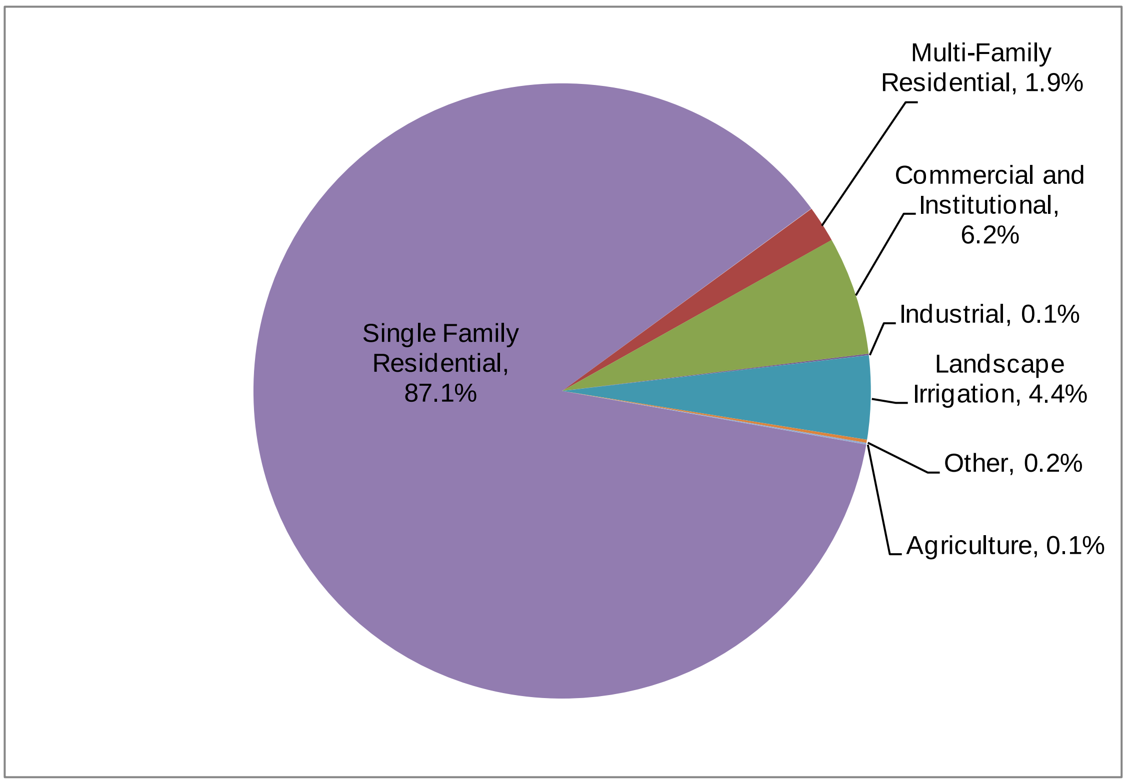


Figure 5.1 Breakdown of Average Number of Accounts by Account Type (2005-09)

Water demands met by the City are primarily from residential uses. From year 2005 to 2009, residential uses (single family and multi-family) accounted for 59 percent of water consumption and 87percent of the City's accounts. During the same period, landscape irrigation accounted for 22 percent of water consumption but only 4.4 percent of the City's accounts. The remaining water use was divided between commercial, industrial, institutional, and agricultural uses.

5.3 PROPOSED DEVELOPMENTS

The UWMPA requires that the UWMP identify the major developments within the agency's service area that would require water supply planning.

> 10910. (a) Any city or county that determines that a project, as defined in section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.
>
> 10912. For the purpose of this part, the following terms have the following meanings:
>
> 10912 (a) "Project" means any of the following:
> (1) A proposed residential development of more than 500 dwelling units.
> (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
> (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
> (4) A proposed hotel or motel, or both, having more than 500 rooms.
> (5) A proposed industrial, manufacturing or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
> (6) A mixed-use project that includes one or more of the projects specified in this subdivision.
> (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

City staff identified one major development planned within its service area, the Springville Specific Plan. This development is anticipated to be constructed by 2015.

The Springville Specific Plan proposes a mix of residential densities and types, as well as a Village Center with mixed use development, featuring local serving specialty retail, commercial and residential uses. The emphasis of the development plan is a gateway to the retail village, the village square, and the specific plan residential community, featuring increased pedestrian activity, landscaped parkways, parks, open space, and an enhanced circulation system. The land use summary indicates 173.5 acres of total development, with 1,350 residential units (EIP, 2008). As the Springville Specific Plan falls within the City's water service area, the City will supply water service. Water demands associated with this development are accounted for in the demand projections.

5.4 LOW INCOME HOUSING

The UWMPA requires that the UWMP identify low income housing developments within the agency's service area and develop demand projections for those units.

> 10631.1(a). The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier

The City's 2009 General Plan Update (Camarillo, 2009) provides information on Regional Housing Needs Allocation Progress (RHNA). This element of the update contains plans to construct low and very low income housing units between January 1, 2006 and June 30, 2014. A total of 1318 of these low income dwelling units are in construction or remain to be built before the 2014 deadline.

Assuming the 1318 dwelling units reflect the SCAG defined average of 3.19 people per dwelling unit, the projected 2020 per capita water usage of 179 gpcd, would result in a total of 843 afy of low income housing water consumption in the year 2020.

Table 5.4 Low Income Projected Water Demands

	Demand (afy)				
	2015	**2020**	**2025**	**2030**	**2035**
Low Income Housing	-	843	843	843	843

Notes:
(1) Based on planned low income housing development as described in the City's General Plan (Camarillo, 2009). The General Plan projects housing needs through 2014.

As shown in Table 5.4, water demands for planned low income housing units are 843 afy. This value is assumed for all years beyond 2015. The 2009 General Plan Update does not provide information on single family versus multi-family low income dwelling units, so the total average number of people per dwelling unit (3.19) for the entire City was used.

Chapter 6

WATER CONSERVATION

The UWMPA requires the UWMP involve a discussion of the agency's water conservation measures. This includes an overview of the supplier's Best Management Practices (BMPs) as well as a discussion of how the supplier intends to meet the water conservation targets established by SBx7-7.

> 10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis. (2) It is the intent of the Legislature that the urban water use targets described in subdivision (a) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020

6.1 WATER CONSERVATION

6.1.1 Water Conservation Target Methods per SBx7-7

The Water Conservation Act of 2009 (SBx7-7) is the new law governing water conservation in California that was enacted November 2009. This law requires that all water suppliers increase water use efficiency with the overall goal to decrease per capita consumption within the state by 20 percent by year 2020. DWR provided four different methods to establish water conservation targets. These four methods can be summarized as follows.

- **Method 1 – Baseline Reduction Method.** The 2020 water conservation target of this method is defined as a 20 percent reduction of average per capita demand during a 10-year continuous baseline period that should end between 2004 and 2010.

- **Method 2 – Efficiency Standard Method.** The 2020 water conservation target of this method is based on calculating efficiency standards for indoor use separately from outdoor use for residential sectors and an overall reduction of 10 percent for commercial, industrial, and institutional (CII) sectors. The aggregated total of the efficiency standards in each area is then used to create a conservation target.

- **Method 3 – Hydrologic Region Method.** This method uses the ten regional urban water use targets for the state. Based on the water supplier's location within one of these regions, a static water use conservation target for both 2015 and 2020 is assigned.

- **Method 4 – BMP-based Method.** This method uses previous BMPs of a supplier in order to establish a conservation target for 2020. Depending on how aggressively the water supplier has pursued water reduction and conservation in the past, a new conservation target for 2020 will be assigned.

6.1.2 City's Water Conservation Targets

Method 1 establishes baseline water consumption in gpcd based on historical population and historical demand numbers. Any 10-year consecutive period between 1995 and 2010 can be selected to establish the baseline per capita demand for the water supplier using the average per capita consumption in gpcd from that 10-year period. If an agency uses 10 percent or more recycled water in year 2008, the baseline value can also be determined with a 15-year consecutive period between 1990 and 2010. Since the City does not utilize recycled water within its water service area, the baseline period must be 10 years in length and end between 2004 and 2010.

The baseline value is then reduced by twenty percent to determine the year 2020 conservation target. The intermediate target for year 2015 is the mid-point value between the baseline and year 2020 target values.

In addition to the 10-year baseline period, a 5-year period needs to be selected in any year ending no earlier than 2007 to determine the minimum required reduction in water use. The selected 10-year and 5-year base period ranges are summarized in Table 6.1.

Table 6.1 Base Period Ranges

Base	Parameter	Value	Units
Water Deliveries	2008 total water deliveries	10,258	af
	2008 total volume of delivered recycled water	0	af
	2008 recycled water as a percent of total deliveries	0	%
10-year Base Period	Number of years in base period	10	years
	Year beginning base period range	1999	
	Year ending base period range	2008	
5-year Base Period	Number of years in base period	5	years
	Year beginning base period range	2004	
	Year ending base period range	2008	

Table 6.1 shows the characteristics of the 10 and 5 year period selected as the baselines for the City in meeting the Water Conservation Act of 2009. The City's historical water consumption for the period 1995 through 2010 is shown in Figure 6.1. This figure also depicts the minimum, average, and maximum 10-year baseline values. As shown, the 10-year period with the highest baseline consumption starts in 1999 and ends in 2008.

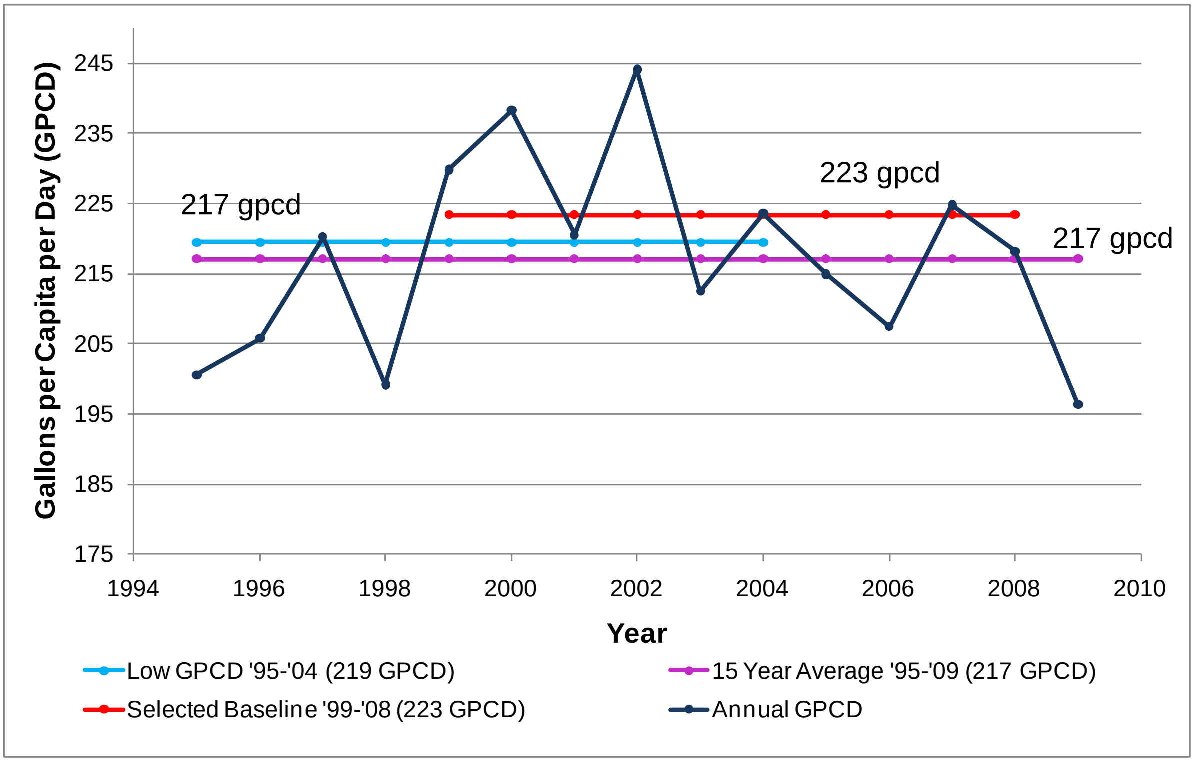


Figure 6.1 Historical Consumption

As shown in Figure 6.1, although the yearly per capita demand varies significantly over a 15-year period between 1995 and 2009, the high average, low average, and 15-year average are all relatively close in value. Although more recent per capita demand values show a decline compared to previous years, this is partly due to the recent drought reflecting more aggressive conservation outreach efforts by the City.

Table 6.2 Base Daily Per Capita Water Use – 10 Year Range

Base Period Year		Distribution System Population[1]	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	Calendar Year			
Year 1	1999	34,031	7.8	230
Year 2	2000	34,939	8.3	238
Year 3	2001	35,451	7.8	220
Year 4	2002	36,156	8.8	244
Year 5	2003	37,340	7.9	212
Year 6	2004	38,514	8.6	224
Year 7	2005	39,283	8.4	215
Year 8	2006	41,174	8.5	207
Year 9	2007	41,416	9.3	225
Year 10	2008	41,973	9.2	218
Average	**n/a**	**38,028**	**8.5**	**223**

Notes:
1) Estimated from the number of service connection and year 2000 census data as shown in Figure 2.2 and described in Chapter 2

Table 6.2 shows City population, total volume of consumption, and per capita consumption of the selected 10-year baseline period. The average per capita consumption during this period was 223 gpcd. Based on Method 1, a twenty percent reduction from this baseline period determines the City's 2020 conservation target at 179 gpcd.

Table 6.3 shows the population, total volume of consumption, and the per capita consumption of a five year baseline period. The five-year baseline value is used to determine the minimum required reduction in water use.

Table 6.3 Base Daily Per Capita Water Use – 5 Year Range

Base Period Year		Distribution System Population[1]	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	Calendar Year			
Year 1	2004	38,514	8.6	224
Year 2	2005	39,283	8.4	215
Year 3	2006	41,174	8.5	207
Year 4	2007	41,416	9.3	225
Year 5	2008	41,973	9.2	218
Average	**n/a**	**40,472**	**8.8**	**218**

Notes:
1) Estimated from the number of service connection and year 2000 census data as shown in Figure 2.2 and described in Chapter 2

As shown in Table 6.3, the average consumption in the period 2004-2008 was 218 gpcd. The minimum per capita consumption for year 2020 is defined as 95 percent of this value, reflecting a minimum water conservation of five percent. This equates to a minimum water conservation target of 207 gpcd.

As the water conservation target from the 10-year baseline period (179 gpcd) is lower than the minimum water conservation target (207 gpcd), the City's water conservation targets are as follows:

- Year 2015 Target: 201 gpcd (10 percent reduction)
- Year 2020 Target: 179 gpcd (20 percent reduction)

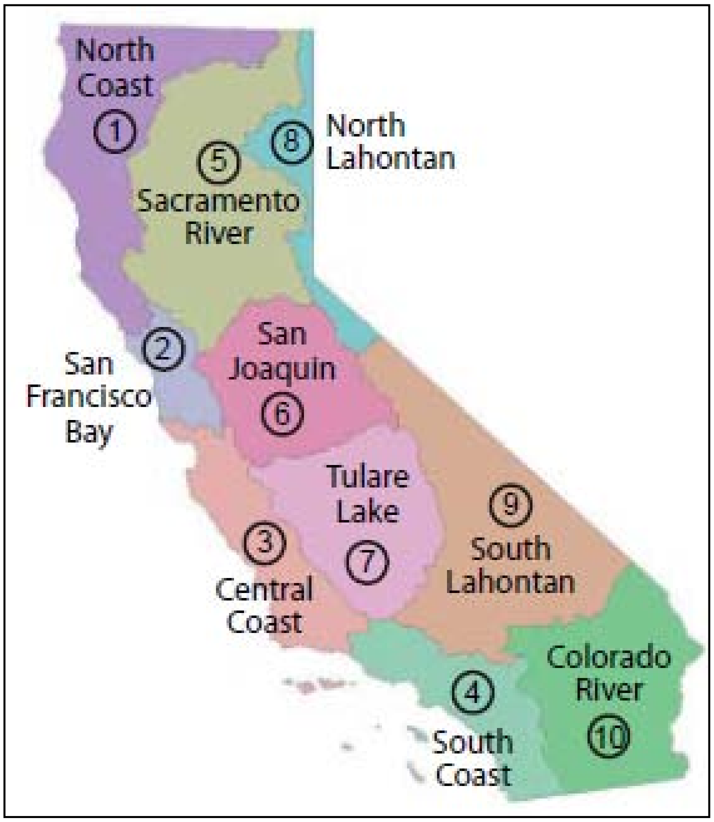
6.1.3 Method 2

Method 2 uses performance standards for both indoor and outdoor usage to establish the supplier's 2020 water conservation target. Method 2 consists of a series of four steps and utilizes actual water use data and estimates from the water supplier. First, the method assumes a standard statewide indoor use target of 55 gpcd. Then, the landscaped area for the supplier's entire service area is determined. Commercial, institutional, and industrial water use is accounted for separately using historical billing data. The performance standards for outdoor landscape irrigation, based on acreage, and commercial, institution, and industrial use, based on demands, are then applied to those totals. Finally, the performance standards for all three sectors are added together to determine the Method 2 2020 conservation target.

There is insufficient data to calculate Method 2 for the City. Principally, the effort associated with digitizing or surveying the amount of irrigated landscape within the City's service area would be a significant effort.

6.1.4 Method 3

The State's 20 by 2020 water conservation plan has identified specific urban water use targets for 2015 and 2020 for each of the ten hydrologic regions shown in Figure 6.2. The City falls in Hydrologic Region 4 (South Coast) which has a target use of 142 gpcd for year 2020.



The City's water conservation targets using Method 3 are as follows:

- Year 2015 Target: 183 gpcd (18 percent reduction)
- Year 2020 Target: 142 gpcd (36 percent reduction)

6.1.5 Method 4

Method 4 uses the supplier's BMP reports as a guide to set the 2020 conservation target. The intent behind Method 4 is to use the BMP reports to account for what water conserving measures the supplier has already taken in order to set a more accurate and realistic target for the future and take into consideration the supplier's previous water conservation efforts.

Provisional Method 4

Method 4 is based on the City's BMP efforts and has been released as a provisional method, subject to later revisions during the 2015 UWMP cycle.

The methodology for the provisional method relies on the base daily per capita use in 2000 and reduction in the three urban use sectors:

- Residential indoor;

- Commercial, industrial, and institutional (CII); and
- Landscape use and water loss.

A discussion of each of these components, and the calculated savings in each of these sectors is included below.

Residential Indoor Savings

Since indoor and outdoor water use is delivered through a single meter, an assumption of 70 gpcd has been provided by DWR for standard residential indoor water use.

To determine indoor residential savings, Method 4 outlines two methodologies. First, a (BMP) calculator has been developed to sum the savings for four conservation elements including single and multi-family residential housing toilets, residential washers, and showerheads. Due to insufficient data on the water savings associated with these measures, the City will use what has been termed the “default option” to determine these savings. Based on the draft provisional method, this default value is 15 gpcd.

Commercial, Industrial, and Institutional Savings

Baseline CII water can be easily established for the City since all commercial, industrial, and institutional connections were metered in 2000. The calculated baseline CII use for the baseline period 1999 through 2008 was 31 gpcd. The CII gpcd is determined using the population for the service area.

The provisional method estimates a default value for CII savings of 10 percent of the per capita CII demand. The CII water savings are therefore 3.1 gpcd.

Landscape and Water Loss Savings

The landscape and water loss water use is determined by subtracting the default indoor water use of 70 gpcd and CII water use of 31 gpcd from the calculated baseline per capita use of 223. Based on calculated baseline per capita water use, the landscape and water loss use is 122 gpcd.

The draft provisional method estimates a default value for landscape and water loss savings of 21.6 percent. The landscape and water loss savings are therefore 26.4 gpcd.

Metered Savings

Since all connections within the City are currently metered, no water savings are associated with metering unmetered accounts.

Summary

Based on the steps above, the total water savings is estimated at 44 gpcd. When compared with the baseline demand of 223 gpcd, this would result in a water conservation target of

179 gpcd. A summary of baseline water use by sector and individual savings calculated using Method 4 is included in Table 6.4.

Table 6.4 Method 4 Target Determination Summary

Baseline Water Use (gpcd)				Water Savings (gpcd)				
Residential Indoor[(1)]	CII[(2)]	Landscape/ Water Loss	Total	Residential /Indoor[(3)]	CII[(4)]	Landscape Water	Metered	Total
70	31	122	223	-15.0	-3.1	-26.4	0.0	179

Notes:
(1) Assumed value based on guidelines in provisional Method 4.
(2) Source: DWR Public Water System Statistics and additional sources as described in Section 6.1.1.
(3) Default savings based on guidelines in provisional Method 4.
(4) CII water savings of 10 percent based on guidelines in provisional Method 4.
(5) Landscape and water loss savings of 21.6 percent based on guidelines in provisional Method 4.

6.1.6 Recommended Method

The water conservation targets per method as developed with data provided by the City are summarized in Table 6.5. As shown, Method 1 and Method 4 result in the same targets. However, Method 1 will allow the City the greatest freedom in reaching these targets.

Table 6.5 Conservation Method Overview

	Conservation Target (gpcd)		Reduction by 2020 (%)	
Supply Source	Year 2015	Year 2020	From Baseline[(1)]	From 2009 Usage[(2)]
Method 1	201	179	20%	9%
Method 2	n/a	n/a	n/a	n/a
Method 3	183	142	36%	28%
Method 4	201	179	20%	9%

Notes:
1) Baseline consumption is 223 gpcd
2) 2009 consumption is 196 gpcd

Based on an evaluation of each method as described above and discussions with City staff, it was decided to use Method 1 for the 2010 UWMP. The following section discusses the various BMPs available to the City to achieve this reduction in water use.

6.1.7 Demand Projections with Water Conservation

Table 6.6 presents City demand projections with and without water conservation targets in accordance with the Water Conservation Act of 2009. The demand projections in afy were derived from the population projections presented in Chapter 2 and the per capita consumption targets described above. Demands shown for the year 2010 were based on a per capita consumption of 223 gpcd which reflect historic trends over the last several years. The actual water demand in 2010 was 8,586 af due to water conservation as well as weather and economic factors.

Year 2015 serves as an interim point, with projected per capita consumption reduced to meet the 2015 target.

Table 6.6 Demand Projections

Year	Projected Water Demand without Conservation (afy)	Projected Water Demand with Target Conservation (afy)
2010	11,029	11,029
2015	11,737	10,564
2020	12,065	9,652
2025	12,343	9,875
2030	12,586	10,069
2035	12,742	10,194

Notes:

(1) Population Projections are taken from Table 2.2.

(2) Non-conservation projections are based on population growth combined with baseline consumption of 223 gpcd, whereas conservation projections are based on 2020 conservation target consumption of 179 gpcd

As shown in Table 6.6 and graphically in Figure 6.3, water conservation requirements of SBx7-7 reduce projected water demand for year 2020 from 12,065 afy to 9,652 afy. The following section discusses the various BMPs available for the City to achieve this reduction in water use.

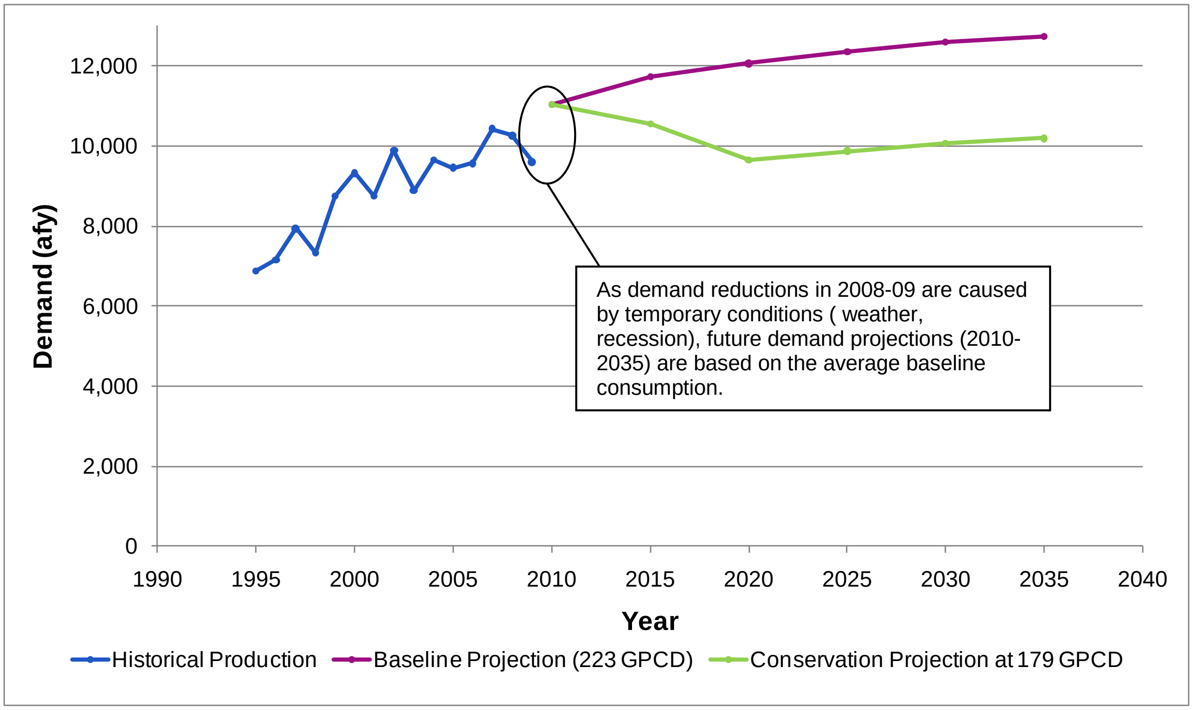


Figure 6.3 Projected Water Demands with and without Conservation

6.2 BEST MANAGEMENT PRACTICES

The City is a signatory to the Memorandum of Understanding regarding Urban Water Conservation in California (MOU) and is therefore a member of the California Urban Water Conservation Council (CUWCC). The City became a signatory to the MOU in 1991 and submits annual reports outlining progress towards implementing the 14 BMPs in the MOU. BMPs are conservation practices that have been identified by the CUWWC: conferences, BMP workshops, free publications, research regarding water management practices, leadership on water legislation and networking with other agencies and special interest groups, for example.

The City has, in good faith, tried to address, or plans to address, all of the BMP targets listed in the CUWCC MOU except where mentioned below. BMP Number 10 applies only to wholesale agencies and is not reported in this plan.

BMP signatories can submit their most recent BMP Report with their UWMP to address the urban water conservation requirements specified in the UWMPA. As a member of CUWCC and signatory of its MOU, the City realizes the importance of the BMPs to ensure a reliable future water supply. The City is committed to implementing water conservation and water recycling programs to maximize sustainability in meeting future water needs for its customers.

The City's previous UWMP provided information regarding the City's conservation measures already in place and those that would improve the efficiency of water use within the City.

> 10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
>
> (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:
>
> (A) Water survey programs for single-family residential and multifamily residential customers.
>
> (B) Residential plumbing retrofit.
>
> (C) System water audits, leak detection, and repair.
>
> (D) Metering with commodity rates for all new connections and retrofit of existing connections.
>
> (E) Large landscape conservation programs and incentives.
>
> (F) High-efficiency washing machine rebate programs.
>
> (G) Public information programs.
>
> (H) School education programs.
>
> (I) Conservation programs for commercial, industrial, and institutional accounts.
>
> (J) Wholesale agency programs.
>
> (K) Conservation pricing.
>
> (L) Water conservation coordinator.
>
> (M) Water waste prohibitions.
>
> (N) Residential ultra-low-flush toilet replacement programs.

While the CUWCC has re-classified the BMPs, the numbered classification system will be used in this discussion since the City's efforts have been categorized accordingly.

Table 6.7 Best Management Practices

Best Management	Implemented	Planned for Implementation	Not Applicable
BMP 1 - Water Survey Programs	✓		
BMP 2 - Residential Plumbing Retrofit	✓		
BMP 3 - Water System Audits			✓
BMP 4 - Metering with Commodity Rates	✓		
BMP 5 - Landscape Irrigation Programs	✓		
BMP 6 - Washing Machine Rebate Program	✓		
BMP 7 - Public Information Program	✓		
BMP 8 - School Education Program	✓		
BMP 9 - Commercial, Industrial, and Institutional Conservation Programs	✓		
BMP 10 - Wholesale Agency Programs			✓
BMP 11 - Conservation Pricing	✓		
BMP 12 - Water Conservation Coordinator	✓		
BMP 13 - Water Waste Prohibition	✓		
BMP 14 - Ultra Low Flush Toilet Replacement	✓		

6.2.1 BMP 1 - WATER SURVEY PROGRAMS

This program consists of offering water audits to single family and multi-family residential customers. Audits include reviewing water usage history with the customer, identifying leaks inside and outside the home, and recommending improvements.

Upon request, City personnel will perform on-site inspection of residences and businesses for potential internal leaks. Leak detection kits are available and are provided to residents free of charge, upon request. As an incentive to complete the audit, the City provides free low-flow showerheads and kitchen/bathroom shut-off nozzles. Also, the City provides exterior audits for residence with landscape irrigation systems.

6.2.2 BMP 2 - RESIDENTIAL PLUMBING RETROFIT

This program consists of installing physical devices to reduce the amount of water used or to limit the amount of water that can be served to the customer. In accordance with State law, low-flow fixtures have been required on all new construction since 1978. In addition, State legislation enacted in 1990 requires all new buildings after January 1, 1992 to install Ultra-Low-Flush Toilets (ULFT).

Several studies suggest that water use savings resulting from miscellaneous interior retrofit fixtures can range between 25 and 65 gpd per housing unit. The studies also suggest that installation of retrofit fixtures in older single-family homes tend to produce more savings, while newer multi-family homes tend to produce fewer saving per housing unit.

Assuming approximately 50 percent saturation for both single and multi-family accounts, one would estimate current water savings within the City at 368 afy from single family conservation, and 8 afy from multi-family conservation, yielding a total of 376 afy for BMP 2. If the City were to increase total residential account saturation to 80 percent, further water conservation could be achieved. Retrofitting an additional 3,942 single family accounts and 88 multi-family accounts would likely decrease use by approximately 226 afy. 80 percent saturation of the residential sector would entail a water savings of 602 afy, or 25 percent of the 2,413 af reduction in 2020.

6.2.3 BMP 3 - SYSTEM WATER AUDITS, LEAK DETECTION, AND REPAIR

A water audit is a process of accounting for water use throughout a water system in order to quantify unmetered water usage. Unaccounted-for water is the difference between metered production and metered usage on a system-wide basis.

2010 public water system statistics records show approximately 4 percent unaccounted-for water loss of the City's water production. This is relatively low compared to the typical range of 5 to 10 percent experienced by most agencies in Southern California. For this reason, the City does not provide a comprehensive system leak detection program. The City is conscientious about locating and repairing main and service connection leaks when they occur. The Water Conservation Program provides assistance in locating leaks on private property and City Municipal Code Chapter 14.12 prohibits leak durations of more than 72 hours.

6.2.4 BMP 4 - METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS

This BMP requires water meters for all new connections and billing by volume of use, as well as establishment of a program for retrofitting any existing unmetered connections. All connections within the City are metered and customers are billed according to the amount of water used. As the City continues to install meters at all its new connections, this program will not provide foreseeable water conservation opportunities.

6.2.5 BMP 5 - LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES

This BMP calls for agencies to start assigning reference ETo based water budgets to accounts with dedicated irrigation meters and to provide water use audits to accounts with mixed use meters.

Based on the historical billing records of 2009, the City currently serves approximately 611 accounts with dedicated irrigation meters that have a combined annual water demand of 2,118 afy. This equates to an average water use of 3.5 afy per landscape meter. Assuming that these landscape customers could save 30 percent of their water use, or 1 afy, through more efficient watering techniques and ETo sensors, the City could potentially save approximately 300 afy by implementing landscape conservation programs with 50 percent of landscaping customers. This would result in 12 percent of the 2,413 af reduction needed in 2020.

Although a detailed water conservation analysis would be required to obtain a more accurate savings estimate, it can be concluded that this BMP has the potential to contribute significantly towards achieving the City's water conservation goals. Financial incentives, including regional funding from MWDSC, are also available to improve landscape water use efficiency.

6.2.6 BMP 6 - HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAM

This program generally provides financial incentives (rebate offers) to qualifying customers who install high-efficiency washing machines in their homes.

These machines typically use 15 to 25 gallons less water per load than typical washers. If the City were to achieve 60 percent saturation of the single family residential customers, the City would potentially add approximately 6,728 HECWs. At an average of 1 load per day and 20 gallons of water savings per load, this program could potentially contribute over 150 afy of conservation, or 6 percent of the 2,413 af reduction in 2020.

6.2.7 BMP 7 - PUBLIC INFORMATION PROGRAMS

This program consists of distributing information to the public through a variety of methods including brochures, radio, television, school presentations and videos, and websites. The City maintains a newsletter which is distributed regularly and often touches on water issues. The City has also distributed water information in its monthly bills, at special events, and on its homepage.

6.2.8 BMP 8 - SCHOOL EDUCATION PROGRAM

This BMP requires water suppliers to implement a school education program that includes providing educational materials and instructional assistance. Brochures are distributed on various water issues, and the City participates in MWDSC programs to promote student Water Awareness. A number of teachers have included water conservation classes as part of their curriculum.

6.2.9 BMP 9 - CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL ACCOUNTS

The City targets commercial, industrial, and institutional water accounts with a monthly consumption of 200 hcf or more for water audits. Such programs typically involve turf fields, smart irrigation timers, and industrial process water use reductions. Currently, the City has approximately 900 CII accounts. Assuming that the City has the potential to implement 100 new CII programs by year 2020 and that each program would, on average, save 0.5 afy per program, the total savings of the CII program would generate approximately 50 afy of water conservation, which is about 2 percent of the 2,413 afy water conservation goal for year 2020.

6.2.10 BMP 10 - WHOLESALE AGENCY PROGRAMS

This BMP applies to wholesale agencies and defines a wholesaler's role in terms of financial, technical, and programmatic assistance to its retail agencies implementing BMPs.The City is not a wholesale agency, so this BMP does not apply.

6.2.11 BMP 11 - CONSERVATION PRICING

Camarillo implements a tiered rate structure which applies a uniform standby rate on most of the fixed costs of supplying water, which does not vary with the amount of water used. Most of the variable costs are applied as the commodity portion of the rate, which is proportional to the amount of water used and purchased from MWDSC.

6.2.12 BMP 12 - WATER CONSERVATION COORDINATOR

The City employs one full time Water Conservation Technician and a Water Conservation Coordinator; it budgets for an annual Water Conservation Program.

6.2.13 BMP 13 - WATER WASTE PROHIBITION

The City has implemented municipal code specifically to address water waste. These prohibitions are part of the water shortage contingency plan, and are further discussed in Chapter 8.

6.2.14 BMP 14 - RESIDENTIAL ULTRA-LOW-FLUSH TOILET REPLACEMENT PROGRAMS

State legislation requires the installation of efficient plumbing in new construction and, effective in 1994, requires that only ULFTs be sold in California. There have been over 4,000 ULFTs installed through this program in the City since the program began. Assuming three people per household, five flushes per person per day, and one gallon savings per flush, this has resulted in a water savings of approximately 15 gpd for each household.

Over time, this program, combined with the natural replacement of toilets with ULFTs, could increase the City's water savings substantially. Upon reaching a theoretical residential market saturation of 50 percent, the City would save approximately 110 afy which is about 4.5 percent of the 2,413 afy water conservation goal for year 2020.

6.3 WATER CONSERVATION IMPLEMENTATION PLAN

The BMP's currently implemented by the City have been effective in reducing water consumption, but further efforts will need to be made to reach the 2020 water conservation target. The City's historic per capita and future projections are shown in Figure 6.4.

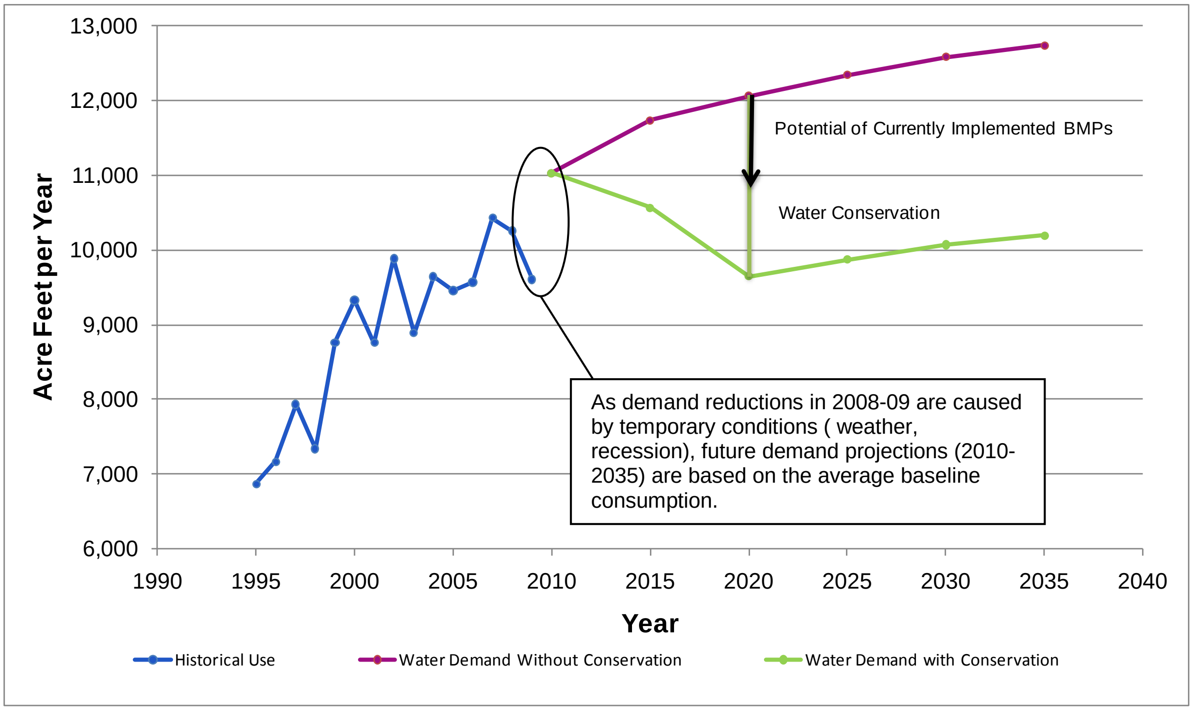


Figure 6.4 Projected Water Demands with and without Conservation

The conservation and non-conservation projections diverge rapidly after 2010, revealing conservation savings the City will need to implement by year 2020. The potential effect of current BMP programs by 2020 is shown in Figure 6.4. This value is listed as potential because it is based on the assumption that currently implemented BMPs will continue to be practiced and will have an affect on the City's water consumption. A breakdown of the potential water conservation amounts by BMP as described in the previous sections is graphically presented in Figure 6.5.

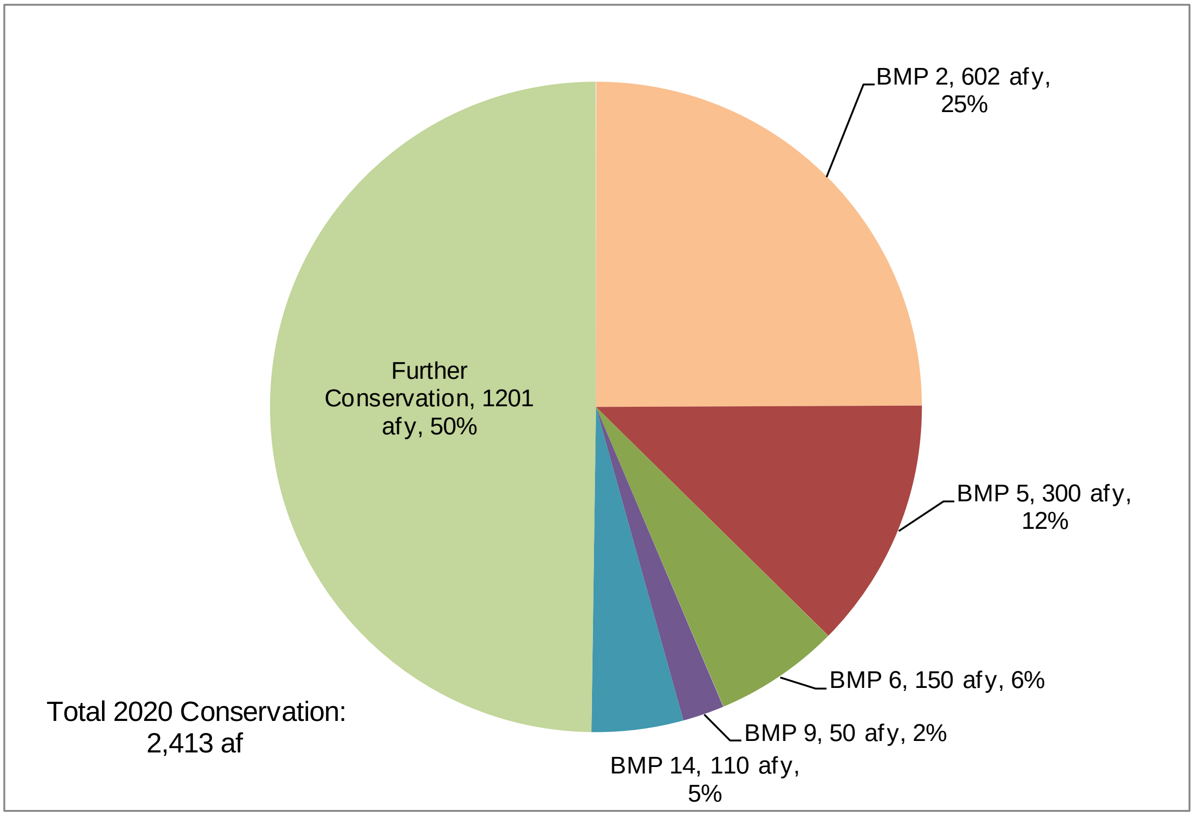


Figure 6.5 Water Conservation Savings by Method

As shown in Figure 6.5, current BMP programs will only account for 1,212 af of the 2,413 afy of conservation needed to reach the 9,652 af target in 2020, which equates to about 50 percent of the total water conservation goal. This figure, however, only accounts for 5 of the 13 BMP's (discounting BMP 10) which the City can use to reduce water consumption. BMP's such as school education, water surveying, and other such methods remain viable strategies to reduce consumption by an additional 1,201 af.

To achieve the necessary amount of water conservation, the City should prioritize its efforts towards expanding its large scale BMP programs to result in large conservation gains. Continued support of residential retrofits is also essential because of the City's largely residential customer base. Finally, although some BMP's do not result in tangible conservation savings, such as school and public education programs, these efforts provide much needed support as the City strives to meet its 2020 conservation target.

Chapter 7

WATER RELIABILITY PLANNING

The UWMPA requires that the UWMP address the reliability of the agency's water supplies. This includes supplies that are vulnerable to seasonal or climatic variations. In addition, an analysis must be included to address supply availability in a single dry year and in multiple dry years.

> *10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
>
> *10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.*
>
> *10631 (c) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.*
>
> *10631 (c) Provide data for each of the following: (1) An average water year, (2) A single dry water year, (3) Multiple dry water years.*
>
> *10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:*
>
> *10632 (b) An estimate of the minimum water supply available during each of the next three-water years based on the driest three-year historic sequence for the agency's water supply.*

The UWMPA also requires that the UWMP include information on the quality of water supplies and how this affects management strategies and supply reliability.

> 10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631 and the manner in which water quality affects management strategies and supply reliability.

Finally, the UWMPA lays out an approximate methodology for how suppliers should make the dry year supply and demand comparisons, and what information needs to be presented.

> *10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional, or local agency population projections within the service area of the urban water supplier.*

7.1 OVERVIEW OF WATER SUPPLY RELIABILITY

The City faces many of the same water supply issues as other water purveyors in Southern California. Drought, climatic challenges, water conveyance, environmental regulation, and competition for water from outside the region all force changes in water deliveries and the timing of those deliveries.

As discussed in Chapter 3, the City's water supply consists of two sources: imported water and groundwater. In 2009, the City received approximately 42 percent of its total water from local groundwater sources and 58 percent imported, although this breakdown will change with the implementation of the regional groundwater desalter. The following sections outline and summarize the supply reliability of these two sources. Reliability is described first in a general, conceptual sense, and then projected demands for the two sources are compared against supply projections, to numerically estimate and determine the City's total supply reliability.

7.1.1 Imported Water Supply Reliability

Although the City purchases its water from CMWD, the water is imported to the region by MWDSC. For this reason, when examining imported water supply reliability it is most important to consider the reliability estimates given by MWDSC. Moreover, at the time of the writing of this report, MWDSC offers the most comprehensive and up-to-date estimates of imported water supply reliability.

Because of competing needs and uses associated with water resources, and because of concerns related to the regional water operations, MWDSC has undertaken a number of planning efforts during the past fifteen years. Some of the most recent documents include the 2010 Integrated Water Resources Plan Update, Water Surplus and Drought Management Plan, Water Supply Allocation Plan, and Long-term Conservation Plan. These documents were reviewed for the purpose of preparing the City's 2010 UWMP.

MWDSC's customers receive water from three different sources. The first is from the customer's own local resources (such as ground or surface water) while the remaining is imported from two sources: the Colorado River (via the CRA), and the Sacramento-San Joaquin River Delta via the SWP. The City receives imported water only from the SWP at this time.

7.1.2 Groundwater Supply Reliability

The City historically receives approximately 40 percent of its total water supply from groundwater. The City has made efforts in the past to decrease its reliance on imported water by additional pumping and development of its groundwater resources. Overdraft and subsidence in the Pleasant Valley basin has caused FCGMA to restrict pumping. This has resulting in the City using a greater percentage of imported water. As mentioned above and in Chapter 3, the implementation of the regional desalter will increase the City's groundwater supply.

7.2 FUTURE SUPPLY PROJECTS AND PROGRAMS

The three agencies who bear primary responsibility for providing water supplies to the City are MWDSC, CMWD, and the City itself. This section outlines the future supply projects and programs planned by these three agencies.

7.2.1 Projects Planned by MWDSC

As described in its Regional UWMP, MWDSC plans to meet its supply reliability goal through the following programs.

- Surface water storage programs related to the SWP and Colorado River
- Colorado River water management programs
- SWP management programs
- Central Valley/SWP storage and transfer programs
- Water conservation
- Development of local supplies
- Water recycling projects
- Ocean desalination programs
- Groundwater banking programs in Southern California region

The implementation approach and the achievements to-date for each of these programs are discussed in detail in Chapter 3 of MWDSC's Regional UWMP. The projected increase in supply availability due to these programs under average year conditions is summarized in Table 7.1.

Table 7.1 MWDSC's Current and Planned Supply Programs

Program Description	2015 (afy)	2020 (afy)	2025 (afy)	2030 (afy)	2035 (afy)
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct	1,550,000	1,629,000	1,763,000	1,733,000	1,734,000
Colorado River Aqueduct	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**3,485,000**	**3,810,000**	**4,089,000**	**3,947,000**	**3,814,000**
Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	382,000	383,000	715,000	715,000	715,000
Colorado River Aqueduct	187,000	187,000	187,000	182,000	182,000
Capability of Planned Programs	**588,000**	**689,000**	**1,051,000**	**1,051,000**	**1,051,000**
Supply Increase					
Total (afy)	4,073,000	4,499,000	5,140,000	4,998,000	4,865,000
Total (%)	+17%	+18%	+26%	+27%	+28%

Notes:
Source: Table 2-11 from MWDSC RUWMP (MWDSC, 2010).

7.2.2 Projects Planned by CMWD

At this time, CMWD has outlined plans various projects which range in scale from regional to local, but all of which provide some benefit to the City. A few of these projects are listed below.

- Los Posas Aquifer Storage and Recovery
- Lake Bard and Lake Bard Water Treatment Plant
- Salinity Management Project
- Transfer Opportunities

A more complete list and description of future projects can be found in CMWD's 2010 UWMP.

7.2.3 Projects Planned by the City

The following projects were listed as planned in the 2005 UWMP in order to enhance the operations and reliability of the City's water infrastructure. However, these projects will increase reliability not supplies.

- Airport Water System Improvements
- Pleasant Valley Rd Reclaimed Water Main
- Develop New Wells

In addition to these projects, which were slated for completion by 2010, the City also has plans to implement its groundwater desalination facility in 2016 and 2017 in order to use its groundwater supply without blending.

- Groundwater Desalination Program

7.3 FACTORS RESULTING IN INCONSISTENCY OF SUPPLY

There are a variety of factors that can impact water supply reliability. Factors impacting the City's supply sources are indicated with an "X" in Table 7.2. A brief discussion on each of these factors is provided below.

Table 7.2 Factors Resulting in Inconsistency of Supply

Water Supply Sources	Specific Source Name	Limitation Quantification	Legal	Environmental	Water Quality	Climatic	Additional Information
Imported	MWDSC/CMWD	-	-	X	-	X	-
Groundwater	Pleasant Valley Basin	-	-	-	X	-	-

7.3.1 Environmental

Given the fragile state of many of California's ecosystems, environmental concerns inevitably arise during the water planning process. The delicacy of these systems can, in turn, reduce the availability of water supply due to the enforcement of environmental legislation. The recent legal actions involving the Endangered Species Act in the Delta are an example of the competition between environmental concerns and water users over water supply. The environmental issues which impact supply reliability for the City are primarily dealt with by MWDSC. In June 2007, MWDSC's Board approved a Delta Action Plan that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. MWDSC continues to develop principles to help achieve its mission to provide adequate and reliable supplies of high quality water in an environmentally and economically responsible way.

7.3.2 Water Quality

Water quality impacts on the groundwater supply are discussed below in Section 7.7. The overdrafted basin contributes to its water quality problems.

7.3.3 Climatic

MWDSC's service area encompasses three major climate zones, while MWDSC's water sources are drawn from an immense area. The Colorado River watershed is over 246,000 square miles while the SWP draws from about 32,000 square miles. Due to these geographic considerations, a reduction in supply in one watershed due to climatic variability can be extreme and may be balanced by availability in the other watershed. However, with the long term drought in the Colorado River watershed, this supply has not been able to compensate for the dry climatic conditions in the Feather River watershed of the SWP.

In addition, climate change will add many new uncertainties to the challenges of planning, and irrespective of the debate associated with the sources and cause of increasing concentrations of greenhouse gasses, changes in weather will significantly affect water supply planning. MWDSC intends to explore opportunities to continually increase efficiency, join the California Climate Action Registry, support environmental practices, develop solar power at some of their water treatment facilities, and pursue renewable water and energy programs that promote sustainability. Given that climatic pressures will unarguably affect supply reliability, continual attention to this issue will be necessary on the part of MWDSC.

7.4 SUPPLY RELIABILITY

There are two aspects of supply reliability that can be considered. The first relates to immediate service needs and is primarily a function of the availability and adequacy of the supply facilities. The second aspect is climate-related, and involves the availability of water during mild or severe drought periods. This section compares water supplies and demands during three water scenarios: normal water year, single dry water year, and multiple dry water years. These scenarios are defined as follows.

- **Normal Year**:
  The normal year is a year in the historical sequence that most closely represents median runoff levels and patterns. The supply quantities for this condition are derived from historical average yields.

- **Single Dry Year**:
  This is defined as the year with the minimum useable supply. The supply quantities

for this condition are derived from the minimum historical annual yield.

- **Multiple Dry Years**:
  This is defined as the three consecutive years with the minimum useable supply. Water systems are more vulnerable to these droughts of long duration, because they deplete water storage reserves in local and state reservoirs and in groundwater basins. The supply quantities for this condition are derived from the minimum historical three consecutive years' annual average yields.

In identifying historical supply reliability conditions throughout dry year and multiple dry year events, the chosen years are consistent with the years in MWDSC's 2010 RUWMP. As summarized in Table 7.3, MWDSC has identified 1977 as the single driest year since 1922 and the years 1990 through1992 as the driest multiple years over that same period. These years represent the years in which the least amount of imported water was available from MWDSC.

Table 7.3 Basis of Water Year Data

Water Year Type	**Base Year(s)**
Average Water Year	2008
Single Dry Water Year	1977
Multiple Dry Water Years	1990-1992

Sources:
Regional UWMP (MWDSC, 2010) for single and multiple dry years, and historical consumption and population data provided by City for average year.

MWDSC's RUWMP does not identify a particular year that would represent average water year conditions. To determine the average water year, the City's historical per capita water usage was evaluated. By normalizing water consumption with population and thus expressing consumption in gpcd, the increase in demands due to growth is eliminated. The historical per capita consumption in the period 1995-2009 is shown in Figure 7.1. As shown, the average consumption in the period was 217 gpcd. As the per capita consumption in 2008 was 218 gpcd and the closest to the 15 year average of 217 gpcd, this year was selected to represent average year conditions.

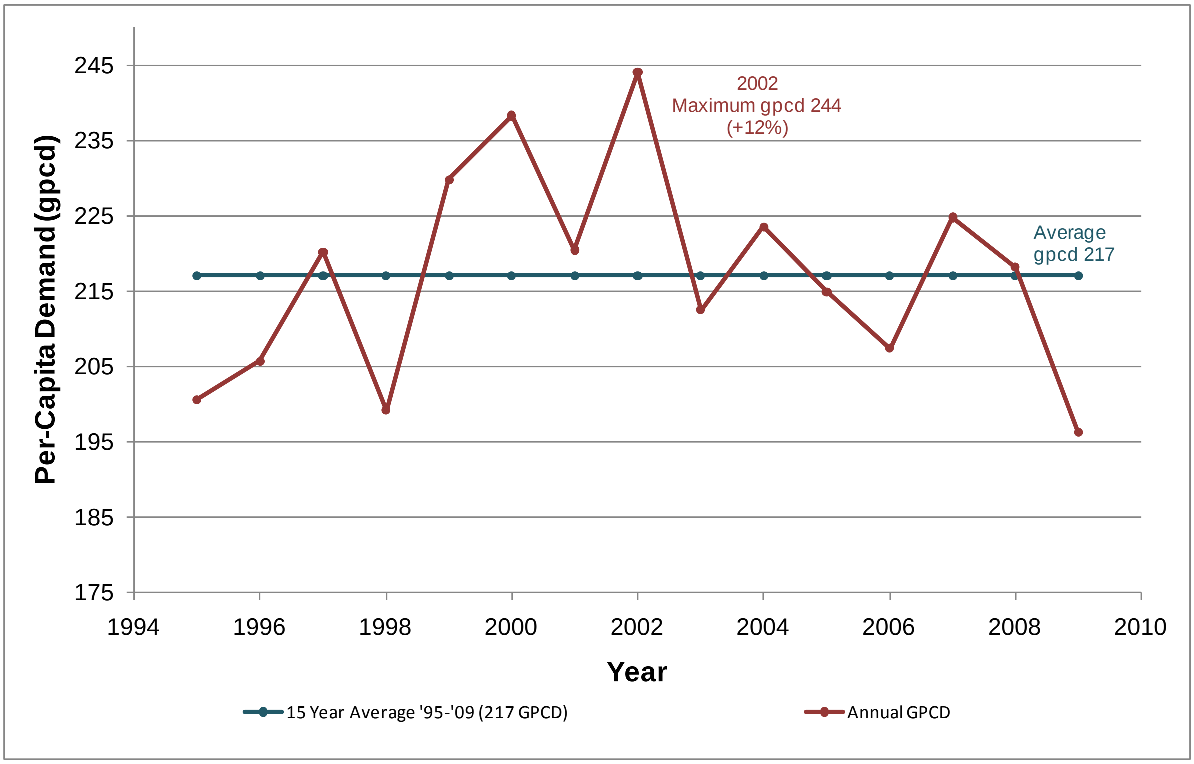


Figure 7.1 Historical Per Capita Consumption Variation

Supply reliability for these historical conditions is presented in Table 7.4. The total amount of available imported water in MWDSC's multiple dry years is less than during average year conditions.

Table 7.4 Supply Reliability – Historical Conditions

Water Supply Source	Average Year (2008)	Single Dry Year (2002)	Multiple Dry Years		
			2000	2001	2002
Imported (afy)	6,315	n/a	n/a	n/a	n/a
% of Normal	100%	n/a	n/a	n/a	n/a
Groundwater (afy)	3,943	n/a	n/a	n/a	n/a
% of Normal	100%	n/a	n/a	n/a	n/a
Total (afy)	10,258	n/a	n/a	n/a	n/a
% of Normal	100%	n/a	n/a	n/a	n/a

Notes:
Source:

Because the City relies on imported water and groundwater, comparing average year conditions to historical drought events doesn't provide a good indication of supply availability. Furthermore, while the source of MWDSC's water might change and fluctuate during drought periods (between groundwater banking, SWP, CRA, etc), imported water as a source for the City would remain both constant and unchanged under MWDSC's RUWMP conclusions of 100 percent supply reliability to meet demands during dry years.

Because of this aspect of the City's water sources, it was not considered realistic to use a historical condition based approach for future dry year planning. Instead the year with the maximum relative per capita usage was selected to project future demands during single and multiple dry years. Using a per capita comparison provided a single factor with which to simulate the effects of a dry year on demand. As shown in Figure 7.1, the maximum per capita use in the 15-year period was 244 gpcd in 2002, which is 12 percent higher than the average consumption of 217 gpcd.

This method differs from the single and multiple dry year demand projections presented in MWDSC's 2010 Regional UWMP, but provides a more conservative planning basis.

7.4.1 Demand Variations

The demand projections shown in Table 7.5 were obtained from the MWD-MAIN Water Use Forecasting System (MWD-Main), which is based on forecasts taken from the SCAG 2007 Regional Transportation Plan and the SANDAG Series 12: 2050 Regional Growth Forecast.

Table 7.5 MWDSC Retail Demands for Average, Single, and Multiple Dry Years

Retail Municipal and Industrial Demand	2015 (afy)	2020 (afy)	2025 (afy)	2030 (afy)	2035 (afy)
Average Year (afy)	4,978,000	5,170,000	5,330,000	5,491,000	5,627,000
Single Dry Year (afy)	5,000,000	5,194,000	5,354,000	5,515,000	5,653,000
Multiple Dry Year (afy)	5,004,000	5,232,000	5,409,000	5,572,000	5,715,000
Single Dry Year Increase(1)	0.4%	0.5%	0.5%	0.4%	0.5%
Multiple Dry Year Increase(1)	0.5%	1.2%	1.5%	1.5%	1.6%

Notes:
(1) As percentage of Average Year Conditions
(2) Source: Tables 2-6, 2-7, and 2-8 of Regional UWMP (MWDSC, 2010)

As shown in Table 7.5, the MWDSC's RUWMP shows that the single and multiple dry year retail municipal and industrial demands only increased between 0.4 and 1.6 percent. This is a very low estimate of demand increases, which typically involve a projected increase of at least 5 percent. Demand variations due to dry year conditions are anticipated to be less noticeable in the much larger service area of MWDSC than in the City's service area because:

- MWDSC's customers may experience different levels of extreme dry weather within different portions of its large service area,
- MWDSC's service area includes many urban regions with very limited outdoor demands, making those areas less sensitive to weather variations, and
- MWDSC's service area includes more industrial and other non-residential demands that are not sensitive to weather.

The City's demands are expected to increase more during hydrological dry years than MWDSC's demand as the entire area would experience extreme dry weather conditions at the same time and because the primarily residential character with plentiful outdoor usage makes demands more weather dependent. This added further reason to use the City's historical demands normalized for population (per capita consumption) as shown in Figure 7.1 as a basis for projecting the demand increase during single and multiple dry years. This means that 2008 was chosen as the base year for average year conditions and the supplies available for the single dry and multiple dry years were increased by 12 percent.

7.5 SUPPLY AND DEMAND COMPARISON

The UWMPA requires that the UWMP demonstrate that sufficient water supplies be available to meet the next 25 years of projected water demands under different water year types in five year increments.

7.5.1 Average Year

The projected average year demands and supplies compared in five year increments are presented in Table 7.6 through Table 7.10. This comparison consists of a number of steps described below.

First, the projected average year demands for 2015 through 2020 were compared with the year 2010 demands. As shown, the projected demands for the entire planning period are projected to remain below the year 2010 demand. This decrease reflects the SB7X-7 water conservation targets combined with limited growth potential within the City. This trend is discussed in more detail later.

Table 7.6 City Projected Average Year Water Demands

Description	2015	2020	2025	2030	2035
Projected Average Year Demand (afy)	10,564	9,652	9,875	10,069	10,194
Increase Compared to 2010[1] (afy)	(465)	(1,377)	(1,154)	(960)	(835)
Increase Compared to 2010 (%)	-4%	-12%	-10%	-9%	-8%
Demand as % of 2010 Demand	96%	88%	90%	91%	92%

Notes:
1) Based on a 2010 Average Year Demand of 11,029 afy.

Secondly, the average year supplies from MWDSC for 2015 through 2020 are compared with the year 2010 supplies. This comparison only includes the current supply programs operated by MWDSC, such as the existing in-region storage programs, the SWP via the California Aqueduct, and the Colorado River Aqueduct. For conservative planning purposes, the capacities of the new programs that are under development are not included in the summary presented in Table 7.7. It should be noted that the average year supply for 2010 was obtained from the 2005 RUWMP as this information was not presented in the 2010 Plan. As shown, there has been a significant increase in the estimated supply capacity between year 2010: 2.7 million acre feet (maf)) and 2015 (3.5 maf).

Table 7.7 MWDSC Projected Average Year Supplies

Description	2015	2020	2025	2030	2035
Average Year Supply(1) (afy)	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
Increase Compared to 2010(2) (afy)	817,000	1,142,000	1,421,000	1,279,000	1,146,000
Increase Compared to 2010	31%	43%	53%	48%	43%
Supply as % of 2010 Supply	131%	143%	153%	148%	143%

Notes:
1) Based on the current supply programs as listed in Table 2-11 from the 2010 Regional UWMP.
2) Based on the projected supply capacity of 2,668,000 afy obtained from 2005 Regional UWMP.

Subsequently, projected MWDSC supplies and demands were compared under average year conditions. As shown in Table 7.8, the projected supplies are substantially greater (174 to 181 percent) than the projected demands through the planning horizon of 2035. This reflects a combination of increased water conservation efforts by the member agencies as well an increase in supplies.

Table 7.8 MWDSC Projected Average Year Supply as Percentage of Demand

Description	2015	2020	2025	2030	2035
Average Year Supply(1) (afy)	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
Average Year Demand(2) (afy)	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
MWDSC Supply as % of Demand	174%	197%	206%	193%	181%

Notes:
1) Based on the current supply programs as listed in Table 2-11 from the 2005 Regional UWMP.
2) Based on total demands on Metropolitan as listed in Table 2-11 from the 2010 Regional UWMP.

The last step to determine imported water supply and demand involves the comparison of the relative increase in the City's demand with the relative increase in MWDSC supplies. This comparison is presented in Table 7.9. As shown, the imported water supplies are projected to increase proportionately more (46-60 percent) than the City's demands. This difference indicates that it is reasonable to expect that MWDSC would have sufficient supplies available to accommodate the City's projected demands under average year conditions as CMWD would get its proportional share of the increased supplies as one of MWDSC's 26 member agencies.

Groundwater supply and demand projections are based on simpler assumptions. Through 2015, groundwater supply and demand are both held at current FCGMA allocations. In 2015, it is assumed that the City will utilize only 4,000 af. This value is a reflection of historical trends which accommodate blending proportions that the City must utilize to compensate for certain groundwater quality considerations. It was assumed that the City will have constructed its groundwater desalter by 2020. This project will allow the City to pump its 9,279 af; this quantity is used for 2020 through 2035 groundwater supply and demand values.

Although groundwater supply could potentially decrease during single or multiple dry year events due to a reduction in recharge quantities, it was assumed here that the City will continue to pump its full allocation and allow the basin to recover during wetter years. In the event of an extended drought where groundwater levels become a concern, the FCGMA may establish new or temporary allocations at that time. As such, groundwater supply is assumed to remain equal to demand over the projected timeframe.

Table 7.9 Comparison of Supply and Demands under a Normal Year

Row	Description	2015	2020	2025	2030	2035
1	City Demand Increase as % of 2010 Demand (from Table 7.6)	96%	88%	90%	91%	92%
2	MWDSC Supply Increase as % of 2010 Supply (from Table 7.7)	131%	143%	153%	148%	143%
3	MWDSC Supply as % of Demand (from Table 7.8)	174%	197%	206%	193%	181%
4	**Difference MWD Supply Increase and City Demand Increase (Row 3 – Row 1)**	**46%**	**54%**	**60%**	**53%**	**47%**

The ratios presented in Table 7.9 were used to project the imported water supply availability for each planning year. By combining the imported water supplies with the other supply sources, the total available supply capacity is calculated. The available supplies were then compared with projected demands to determine if the City has sufficient water supplies available to meet future demand under average year conditions. This summary is presented in Table 7.10.

Table 7.10 Supply and Demand Comparison – Normal Year					
Water Sources	**2015**	**2020**	**2025**	**2030**	**2035**
Supply					
Projected Supply as a % of Demand During a Normal Year(1)	174%	197%	206%	193%	181%
Imported Water Supply(2)	11,021	302	773	1,097	1,258
Groundwater Supply	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	220	220	220	220	220
Total Supply	**15,241**	**9,801**	**10,273**	**10,596**	**10,757**
% of Normal Year	100%	100%	100%	100%	100%
Demands					
Imported Water	6,344	153	375	570	695
Groundwater(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	220	220	220	220	220
Total Demand	**10,564**	**9,652**	**9,875**	**10,069**	**10,194**
% of Year 2010(4)	96%	88%	90%	91%	92%
Difference Supply - Demand	**4,677**	**149**	**398**	**528**	**563**
Difference as % of Supply	**31%**	**2%**	**4%**	**5%**	**5%**
Difference as % of Demand	**44%**	**2%**	**4%**	**5%**	**6%**

Notes:
1) From Table 7.8.
2) Calculated by multiplying the imported water demand with the imported water supply (%) from Row 1.
3) Groundwater demands are assumed to be identical to groundwater supply
4) Year 2010 deliveries were 11,029 afy.

As shown in Table 7.10, it is projected that the City has sufficient supplies available to meet water demands through 2035 under average year conditions with a supply surplus ranging from 44 to 2 percent of the projected demands. The reason for this wide range of supply surplus is the City's substantial change in supply composition. Starting in 2020, the City will meet most of its demand with groundwater. Because of groundwater's unique supply profile (a large underground aquifer which is depleted and recharged only on a long timescale) the supply is assumed to equal demand.

The decrease in available supply should not be taken to imply reduced reliability. Rather, the reduced imported water supply implies a proportionately smaller share of MWDSC's supply surplus.

7.5.2 Single Dry Year

As described in the previous section, the projected average year water demands were increased by 12 percent to estimate water demands during dry years. The projected imported water supplies were obtained from MWDSC's R2010 UWMP. The projected single dry year demands and supplies compared in five year increments are presented in Table 7.11 and Table 7.12. Details on the calculations of the values presented in this table are included in Appendix H.

Row	Description	2015	2020	2025	2030	2035
Table 7.11 Comparison of Supply and Demands Under a Single Dry Year						
1	City of Camarillo Demand Increase as % of 2010 Demand	108%	98%	101%	103%	104%
2	MWDSC Supply Increase as % of 2010 Supply	86%	98%	105%	99%	95%
3	MWDSC Supply as % of Demand	113%	129%	135%	125%	116%
4	**Difference MWD Supply Increase and City of Camarillo Demand Increase (Row 3 – Row 1)**	**5%**	**30%**	**35%**	**23%**	**12%**

Notes:
Details on the calculations in each row are included in Appendix H.

As shown in Table 7.11, imported water supply availability is projected to increase more (5 to 35 percent) than City demands. This difference indicates that, similar to average year conditions, it is reasonable to expect that MWDSC would have sufficient supplies available to accommodate projected demands under single dry year conditions as the City would receive its proportional share of increased supplies.

The ratios presented in Table 7.11 were used to project imported water supply availability for each planning year. By combining imported water supplies with groundwater supply sources, total available supply availability was calculated. The available supplies were then compared with projected demands to determine if the City has sufficient water supplies available to meet future demands under single dry year conditions. This summary is presented in Table 7.12.

Table 7.12 Supply and Demand Comparison – Single Dry Year

Water Sources	2015	2020	2025	2030	2035
Supply					
Projected Supply as a % of Demand During a Single Dry Year(1)	113%	129%	135%	125%	116%
Imported Water Supply(2)	8,636	1,707	2,132	2,248	2,245
Groundwater Supply(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	247	247	247	247	247
Total Supply	**12,883**	**11,234**	**11,659**	**11,774**	**11,772**
% of Normal Year	85%	115%	113%	111%	109%
Demands					
Imported Water	7,630	1,327	1,577	1,795	1,936
Groundwater(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	247	247	247	247	247
Total Demand	**11,878**	**10,853**	**11,103**	**11,321**	**11,462**
% of Year 2010(4)	108%	98%	101%	103%	104%
Difference Supply - Demand	**1,005**	**380**	**556**	**453**	**310**
Difference as % of Supply	**8%**	**3%**	**5%**	**4%**	**3%**
Difference as % of Demand	**8%**	**4%**	**5%**	**4%**	**3%**

Notes:
1) From Table 7.11.
2) Calculated by multiplying the imported water demand with the imported water supply (%) from Row 1.
3) Groundwater demands are assumed to be identical to groundwater supply
4) Year 2010 deliveries were 11,029 afy.

As shown in Table 7.12, it is projected that the City has sufficient supplies available to meet water demands through 2035 under single dry year condition with a total supply surplus ranging from 8 to 3 percent of the projected demands. Once again, the drop in surplus does not imply reduced supply reliability, but as explained in Section 7.5.1, results from a dramatic increase in utilization of regional groundwater supplies.

7.5.3 Multiple Dry Year

The projected average year water demands were increased by 12 percent to estimate water demands during both single and multiple dry years. Projected imported water supplies were obtained from MWDSC's 2010 RUWMP. The projected multiple dry year demands and supplies were compared in five year increments in Table 7.13 through Table 7.16. Details on the calculations of the values presented in this table are included in Appendix H.

Table 7.13 Comparison of Supply and Demands under Multiple Dry Years

Row	Description	2015	2020	2025	2030	2035
1	City of Camarillo Demand Increase as % of 2010 Demand	108%	98%	101%	103%	104%
2	MWDSC Supply Increase as % of 2010 Supply	86%	92%	96%	94%	92%
3	MWDSC Supply as % of Demand	101%	110%	110%	105%	101%
4	**Difference MWD Supply Increase and City Demand Increase (Row 3 – Row 1)**	**-7%**	**12%**	**10%**	**2%**	**-3%**

Notes:
Details on the calculations in each row are included in Appendix H.

The data in Table 7.13 shows an important change in supply values. As a percent of demand, the imported water supplies are projected to increase less (-7 to +10 percent) than City demands. This difference indicates that City demands on imported water in a multiple dry year scenario might outpace MWDSC's growth in supply. It's important to note that this increase in demand means that, although MWDSC has established that it will have sufficient supplies to meet demand, the rate at which MWDSC's supply is growing is frequently less than the rate at which individual agency demand is growing. As this difference is based on percentage growth however, it is important to consider the absolute values presented in the tables below. Furthermore, the City is projected to use such a smaller percentage of imported water as compared to groundwater, that it's unlikely that an imported water shortage would result in MWDSC and CMWD being unable to meet the City's imported water demands.

The ratios presented in Table 7.13 were used to project the imported water supply availability for each planning year. By combining the imported water supplies with the other supply sources, the total available supply capacity is calculated. The available supplies are then compared with the projected demands to determine if the City has sufficient water supplies available to meet future demand under multiple dry year conditions. This summary is presented in Table 7.14 (Dry Year 1), Table 7.15 (Dry Year 2), and Table 7.16 (Dry Year 3).

Table 7.14 Supply and Demand Comparison – Multiple Dry Year No. 1

Water Sources	2015	2020	2025	2030	2035
Supply					
Projected Supply as a % of Demand During Multiple Dry Years(1)	101%	110%	110%	105%	101%
Imported Water Supply(2)	7,671	1,466	1,740	1,887	1,949
Groundwater Supply(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	247	247	247	247	247
Total Supply	**11,919**	**10,992**	**11,267**	**11,413**	**11,475**
% of Normal Year	78%	112%	110%	108%	107%
Demands					
Imported Water	7,630	1,327	1,577	1,795	1,936
Groundwater(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	247	247	247	247	247
Total Demand	**11,878**	**10,853**	**11,103**	**11,321**	**11,462**
% of Year 2010(4)	108%	98%	101%	103%	104%
Difference Supply - Demand	**41**	**139**	**164**	**92**	**13**
Difference as % of Supply	**0.3%**	**1%**	**1%**	**1%**	**0.1%**
Difference as % of Demand	**0.3%**	**1%**	**1%**	**1%**	**0.1%**

Notes:
1) From Table 7.13.
2) Calculated by multiplying the imported water demand with the imported water supply (%) from Row 1.
3) Groundwater demands are assumed to be identical to groundwater supply
4) Year 2010 deliveries were 11,029 afy.

Table 7.15 Supply and Demand Comparison – Multiple Dry Year No. 2

Water Sources	2016	2021	2026	2031	2036
Supply					
Projected Supply as a % of Demand During Multiple Dry Years(1)	101%	110%	110%	105%	101%
Imported Water Supply(2)	7,465	1,521	1,788	1,917	1,977
Groundwater Supply(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	247	247	247	247	247
Total Supply	**11,713**	**11,047**	**11,315**	**11,443**	**11,503**
% of Normal Year	77%	113%	110%	108%	107%
Demands					
Imported Water	7,425	1,377	1,620	1,823	1,964
Groundwater(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	247	247	247	247	247
Total Demand	**11,673**	**10,903**	**11,147**	**11,350**	**11,490**
% of Year 2010(4)	106%	99%	101%	103%	104%
Difference Supply - Demand	**40**	**144**	**168**	**94**	**13**
Difference as % of Supply	**0.3%**	**1%**	**1%**	**1%**	**0.1%**
Difference as % of Demand	**0.3%**	**1%**	**2%**	**1%**	**0.1%**

Notes:
See footnotes listed in Table 7.14.

Table 7.16 Supply and Demand Comparison – Multiple Dry Year No. 3

Water Sources	2017	2022	2027	2032	2037
Supply					
Projected Supply as a % of Demand During Multiple Dry Years(1)	101%	110%	110%	105%	101%
Imported Water Supply(2)	7,259	1,576	1,837	1,946	2,005
Groundwater Supply(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	247	247	247	247	247
Total Supply	**11,507**	**11,102**	**11,363**	**11,473**	**11,532**
% of Normal Year	75%	113%	111%	108%	107%
Demands					
Imported Water	7,221	1,427	1,664	1,851	1,992
Groundwater(3)	4,000	9,279	9,279	9,279	9,279
Recycled Water Supply	247	247	247	247	247
Total Demand	**11,468**	**10,953**	**11,190**	**11,378**	**11,518**
% of Year 2010(5)	104%	99%	101%	103%	104%
Difference Supply - Demand	**39**	**149**	**173**	**95**	**13**
Difference as % of Supply	**0.3%**	**1%**	**2%**	**1%**	**0.1%**
Difference as % of Demand	**0.3%**	**1%**	**2%**	**1%**	**0.1%**

Notes:
1) See footnotes listed in Table 7.14.

As shown in Table 7.14 through Table 7.16, the projected demands for each source are lower than the projected supplies in each year of a three-year multiple dry year period.

Although the increase in demands outstrips MWDSC's growth in supply as a percentage, MWDSC is still projected as being able to meet the total volume of imported water needed by the City. In several of the multiple dry year scenarios, supply capability is projected to fall within a few hundred acre-feet of its availability, but in all cases demands will be met. It should be noted that these dry year demand summaries assume that the projected available supply from MWDSC only includes the existing supply programs and does not include the programs that are currently under development which are estimated to increase the imported water supplies by 17 to 39 percent, depending on the planning year and hydrologic conditions (see Table 7.1). It should be noted that these planned programs increase the total available imported water supply relatively more during single and multiple dry years than during average years. The underlying assumption that groundwater supply will equal groundwater demand also contributes to the supply reliability in multi year drought conditions.

Based on the positive supply surplus shown in this section and the two conservative planning assumptions listed above, it can be concluded that the City has sufficient supplies available to meet water demands through 2035 under average, single dry year, and multiple dry year conditions.

7.6 TRANSFER AND EXCHANGE OPPORTUNITIES

Water exchange and transfers are primarily taking place at the importer and wholesale supplier level. MWDSC's Central Valley and SWP storage and transfer program are an example of such an opportunity. The City does not, at this time, pursue separate water transfer or exchange opportunities with other agencies or suppliers. Such an arrangement could occur in the future.

7.7 WATER QUALITY IMPACTS ON SUPPLY

> *10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631 and the manner in which water quality affects management strategies and supply reliability.*

7.7.1 Groundwater Quality

Groundwater quality has historically proved problematic for the City, and has had adverse effects on their water supply. High levels of TDS and chloride have resulted in the City needing to blend their groundwater with imported water in order to achieve water quality standards. Since 2005, this has resulted in the City typically pumping 200 af less than their current groundwater allocation.

As mentioned in Chapter 3, The City of Camarillo has assessed the feasibility of constructing a groundwater treatment and desalination facility that would be located in the Somis Gap area of the Pleasant Valley Basin. This project would allow the City to stop pumping the groundwater aquifer in areas where the groundwater level is decreasing, and instead take water from areas where the groundwater is of poor quality, but increasing in quantity.

7.7.2 Imported Water Quality

The City's imported water is supplied by MWDSC through CMWD. Details of MWDSC's water quality can be found in its 2010 RUWMP.

7.7.3 Seawater Desalination

It is neither practical nor economically feasible to implement a seawater desalination program at this time. Due to geographic placement of the City's service area, it would not be cost effective to develop desalinated water from the ocean.

7.7.4 MWDSC's Desalination Program

Although, the City has not identified any specific project opportunities for desalination of seawater at this time, other desalination projects developed by MWDSC within the region indirectly benefit the City. The recent efforts to develop and implement desalination by MWDSC as described in its 2010 RUWMP are summarized in Table 7.17. The potential capacity of all these combined project ranges from 270,000 to 422,000 afy. Although the projects would not benefit the City directly, new supplies contribute to increasing the reliability of Southern California water supplies.

Table 7.17 MWDSC Desalination Project Opportunities

Project Name	Member Agency	Capacity (afy)	Status n/a
Long Beach Seawater Desalination Project(1)	LBWD	10,000	Pilot Study
South Orange Coastal Ocean Desalination Project(1)	MWDOC	16,000-28,000	Pilot Study
Carlsbad Seawater Desalination Project(1)	SDCWA	56,000	Permitting
West Basin Seawater Desalination Project(1)	WBMWD	20,000	Pilot Study
LADWP Seawater Desalination Project	LADWP	28,000	Unknown
Huntington Beach Seawater Desalination Project	MWDOC	56,000	Permitting
Camp Pendleton Seawater Desalination Project	SDCWA	56,000-168,000	Planning
Rosarito Beach Seawater Desalination Feasibility Study	SDCWA	28,000-56,000	Feasibility Study

Notes:
1) These SDPs have executed incentive agreements with MWDSC.

MWDSC's Seawater Desalination Program (SDP) was created in 2001 to encourage the development of seawater desalination by local agencies and was modeled after the Local Resources Program (LRP). To promote the development of local seawater desalination projects, MWDSC provides regional facilitation by supporting member agency projects during permit hearings and other proceedings, coordinating responses to potential legislation and regulations, and working with the member agencies to resolve related issues, such as greenhouse gas emission standards and seawater intake regulations. As seawater desalination continues to develop through the Southern California region, the City stands to benefit from such programs.

Chapter 8

WATER SHORTAGE CONTINGENCY PLAN

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that includes stages of action to be undertaken in the event of water supply shortages; a draft water shortage contingency resolution or ordinance; prohibitions, consumption reduction methods and penalties; an analysis of revenue and expenditure impacts and measures to overcome these impacts; actions to be taken during a catastrophic interruption; and a mechanism for measuring water use reduction.

8.1 STAGES OF ACTIONS

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that addresses specified issues.

> 10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:
>
> 10632 (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

The City implemented its current Water Shortage Contingency Plan (WSCP) in July 2009. The plan, included in Appendix E, was developed as a tool for the City to manage its water supplies in event of prolonged drought, natural disaster, or water failures.

Currently, Chapter 14.12 of the Camarillo Municipal Code, as amended by Urgency Ordinance 1039 (Ordinance), included in Appendix E, details the City's water conservation rules and water shortage contingency plan. The stages and their objectives are presented in Table 8.1.

Table 8.1 Water Shortage Stages and Reduction Objectives

Stage	Title	Supply Conditions (% of Normal)	Percentage Reduction of Demands
Permanent Restrictions			-
Stage 1 Shortage	Water Supply Alert	85 – 95%	15%
Stage 2 Shortage	Water Supply Shortage	70 – 84%	30%
Stage 3 Shortage	Critical Water Supply Shortage	60 – 69%	40%
Stage 4 Shortage	Severe Water Supply Shortage	50 – 59%	50%

As shown in Table 8.1, the water shortage stages include consideration of water shortages up to a Stage 4 Shortage, a Severe Water Supply Shortage, which includes reductions in water consumption by 50 percent.

8.2 PROHIBITIONS, CONSUMPTION REDUCTION METHODS, AND PENALTIES

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that addresses methods to reduce consumption.

> 10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:
>
> 10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
>
> 10632 (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.
>
> 10632 (f) Penalties or charges for excessive use, where applicable.

8.2.1 Mandatory Prohibitions on Water Wasting

The City's Ordinance includes several permanent restrictions in force under all stages including normal use, with prohibitions listed as follows:

- Irrigating during daytime hours and longer than 15 minutes
- Excessive flow or runoff
- Washing outdoor surfaces
- Leaks in distribution, irrigation, or plumbing systems
- Non-recirculating water fountains
- Washing vehicles without a self-closing nozzle
- Restaurants providing water without request
- Not providing guests the option to avoid laundering towels daily
- Single pass cooling systems
- Water conserving nozzles in restaurants
- Restrictions on commercial car wash facilities

Under conservation stages, the City's Ordinance includes the following additional water conservation measures, listed by stage (note that each stage includes the restrictions from prior stages).

- Stage 1 Shortage
  - Irrigation limited to four days a week
  - Water Impact Study for new service connections showing the project will not increase the City's demands
- Stage 2 Shortage
  - Irrigation limited to three days a week
  - Obligation to fix leaks reduced to 48 hours
  - Filling ponds or ornamental lakes restricted to sustaining aquatic life
  - Limited filling of pools and spas
  - Agricultural irrigation limited to three days per week
  - Construction water must use recycled water if available
- Stage 3 Shortage
  - Irrigation limited to two days a week
  - Agricultural irrigation prohibited unless recycled water is available
- Stage 4 Shortage
  - Watering is prohibited except with recycled water under restricted conditions
  - Obligation to fix leaks reduced to 24 hours
  - Washing of vehicles is prohibited
  - Limited filling of pools and spas
  - No new potable water service connections, except under restricted conditions
  - No building permits that increase water demands
  - No new annexations

8.2.2 Water Reduction Stage Triggering Mechanisms

The City's water conservation stages are determined by resolution of the City Council at a public meeting. Such resolution will be based on the current drought situation and the amount of imported water available from CMWD and MWDSC. Some of the specific reasons cited in the WSCP as potential reasons to change stages are listed as follows:

- Advancement to subsequent stage

  - Emergency condition, such as failure of pumping equipment, etc., that requires a percentage of water consumption reduction greater than that of the current stage.
  - Regulatory action that requires more than that stage's percentage reduction in water consumption.
  - Failure to maintain target water consumption reduction goal of that particular stage.
- Withdrawal to previous stage
  - Emergency condition has been decreased in severity or resolved, so that the previous target goal may be utilized.
  - Regulatory action has been resolved or modified.
  - Water consumption reductions have been above that necessary to meet target goals of the current stage.

When a resolution of the City Council has been issued to change the water stage, the public will be notified through publication of the resolution in the local newspaper, on the City's website, and in the billing statement.

8.2.3 Excessive Use Penalties

The City's WSCP lists the penalties for violating the conservation measures as follows (violations must be within a year of each other to count as a subsequent violation).

- First Violation: written warning
- Second Violation: fine not to exceed $100
- Third Violation: fine not to exceed $500
- Fourth and Subsequent Violations: fine not to exceed $1,000 and installation of a flow restriction device

The City also includes termination of service as a penalty for willful violation of the Ordinance.

8.2.4 Review Process

The WSCP includes an appeal process by which administrative review can be requested of a penalty. Once an administrative review has been completed, an appeal hearing can be requested. The decision of the appointed hearing officer will be final.

8.3 WATER SHORTAGE CONTINGENCY ORDINANCE/ RESOLUTION

According to the UWMPA, the UWMP is required to include an urban water shortage contingency analysis that includes a draft water shortage contingency resolution or ordinance.

> 10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:
>
> 10632 (h) A draft water shortage contingency resolution or ordinance.

The City established its WSCP through Urgency Ordinance 1039 (Ordinance), which is included in Appendix E along with the WSCP.

8.4 REVENUE AND EXPENDITURE IMPACTS/MEASURES TO OVERCOME IMPACTS

According to the UWMPA, the UWMP is required to include an urban water shortage contingency analysis that addresses the financial impacts from reduced water sales.

> 10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:
>
> 10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
>
> 10632 (g) An analysis of the impacts of each of the proposed measures to overcome those revenue and expenditure impacts, such as the development of reserves and rate adjustments.

Since the City meters all accounts and charges based on actual water usage, it is anticipated that water shortages would result in a reduction in revenue. Since exact information on the duration of a water shortage cannot be predicted, the City would determine the extent of any revenue and expenditure imbalance as well as proposed measures to overcome impacts to City revenues and expenditure imbalances at the time the water shortage has started.

Some actions the City may choose to consider include temporarily increasing water rates or delaying capital improvements until the shortage has ended.

8.5 ACTIONS DURING A CATASTROPHIC INTERRUPTION

The UWMPA requires that the UWMP include an urban water shortage contingency analysis that addresses a catastrophic interruption of water supplies.

> 10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:
>
> 10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

The City has included emergency conditions as a triggering action for advancement to a subsequent stage. Ostensibly, a catastrophic interruption could be considered an emergency condition.

8.6 REDUCTION MEASURING MECHANISM

> 10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:
>
> 10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

The City's water system currently has water meters on all production sources and customer connections. These meters record the amount of water consumed at each location. Customer consumption totals are tallied on monthly basis for billing purposes. The City's WSCP states that the Water Superintendent will inform the Public Works Director of any increase to water consumed or decrease to water supplies. The Public Works Director will then make recommendations to the City Manager on whether to change water shortage stages and will provide supporting reports of consumption or supply as required.