



Crescenta Valley Water District

2700 Foothill Blvd • La Crescenta, CA 91214

2010 Urban Water Management Plan

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DRAFT



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Acronyms Used in the Report

Act	Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
Basin	Verdugo Groundwater Basin
BDCP	Bay Delta Conservation Plan
BMP	Best Management Practice
Board	Metropolitan's Board of Directors
CDHS	California Department of Health Services
CDPH	California Department of Public Health
cfs	cubic feet per second
CII	Commercial Industrial Institutional
CIMIS	California Irrigation Management Information System
COG	Council of Governments
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CVWD	Crescenta Valley Water District
DBPs	Disinfection Byproducts
DMM	Demand Management Measure
DWR	Department of Water Resources
ETo	Evapotranspiration
FMWD	Foothill Municipal Water District
GCI	Glendale/CVWD Interconnection
GPCD	gallons per capita per day
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
IRP	Integrated Resources Plan
IWA	International Water Association
LACSD	Sanitation Districts of Los Angeles County
LADWP	Los Angeles Department of Water and Power
LAGWRP	Los Angeles/Glendale Water Reclamation Plant
LCID	La Cañada Irrigation District
LRWSP	Local, Reliable Water Supply Program
MAF	million acre-feet
MBR	membrane bioreactor
MCL	Maximum Contaminant Level
Metropolitan	Metropolitan Water District of Southern California
MOU	Memorandum of Understanding
MTBE	Methyl tertiary butyl ether
NDMA	N-nitrosodimethylamine
PPCPs	Pharmaceuticals and Personal Care Products
QSA	Quantification Settlement Agreement
RHNA	Regional Housing Needs Assessment
RUWMP	Regional Urban Water Management Plan
SBx7-7	Senate Bill x7-7
SCADA	Supervisory Control and Data Acquisition
SCAG	Southern California Association of Governments

SDP	Seawater Desalination Program
SWP	State Water Project
TDS	Total Dissolved Solid
ULARA	Upper Los Angeles River Area
ULFT	Ultra-Low-Flow Toilet
UWMP	Urban Water Management Plan
VOCs	Volatile Organic Compounds
WBIC	weather-base irrigation controller
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus Drought Management Plan

Executive Summary

This report serves as the 2010 update of the Crescenta Valley Water District's (CVWD) Urban Water Management Plan (UWMP). The UWMP has been prepared consistent with the requirements under Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act), which were added by Statute 1983, Chapter 1009, and became effective on January 1, 1984. The Act requires "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually" to prepare, adopt, and file an UWMP with the California Department of Water Resources (DWR) every five years. 2010 UWMP updates are to be adopted by August 1, 2011.

Since its passage in 1983, several amendments have been added to the Act. The most recent changes affecting the 2010 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. Water Conservation Act of 2009 or SBx7-7 enacted in 2009 is the water conservation component of the Delta package. It stemmed from the Governor's goal to achieve a 20% statewide reduction in per capita water use by 2020 (20x2020). SBx7-7 requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and an interim 10% goal by 2015.

Service Area and Facilities

CVWD provides water to a population of approximately 35,000 throughout its service area. CVWD receives its water from two main sources, the Verdugo Groundwater Basin, and imported water from the Foothill Municipal Water District (FMWD). CVWD provides potable drinking water to its customers via 12 local groundwater wells, and imported water supply through three Metropolitan connections and an inter-tie system with the City of Glendale as well as La Cañada Irrigation District.

Water Demand

Currently, the total water demand for the 35,000 people served by CVWD is approximately 4,400 acre-feet annually consisting of potable water.

CVWD has selected to comply with **Option 3** of the SBx7-7 compliance options. However, the minimum required target applies and CVWD's 2015 interim water-use target is 146.3 GPCD, and the 2020 final water-use target is **140.1 GPCD**.

Water Sources and Supply Reliability

Sixty one percent of CVWD's source water is local ground water supply in the Verdugo Basin. The majority of CVWD's ground water wells are located along the Verdugo Wash, south of Honolulu Avenue. Local groundwater is disinfected with chlorine before blending with Metropolitan's surface water. The remaining 39% of CVWD's source water is imported surface water supplied by FMWD, which is a member agency to Metropolitan. The sources of imported water supplies include the Colorado River and the State Water Project (SWP). Metropolitan's 2010 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full-service demands (non-interruptible agricultural and replenishment supplies) at the retail level under all foreseeable hydrologic conditions from 2015 through 2035.

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. Metropolitan's 2010 RUWMP finds that Metropolitan is able to meet full service demands of its member agencies with existing supplies from 2015 through 2035 during normal years, single dry year, and multiple dry years. CVWD is therefore capable of meeting the water demands of its customers in normal, single dry, and multiple dry years between 2015 and 2035, as illustrated in Table 3-12, Table 3-13, and Table 3-14, respectively.

Future Water Supply Projects

FMWD, CVWD's wholesale provider has initiated a Local, Reliable Water Supply Program (LRWSP) to reduce dependence on imported water supplies through development of recycled water as well as increased storm water capture and recharge and water conservation throughout the service area. Recycled water supplies currently comprise 1% of the total water supply within the FMWD service area, which could benefit CVWD in the future. FMWD plans to develop recycled water through the construction of up to three satellite membrane bioreactor (MBR) plants as part of a Regional Water Recycling Project. Alternative means of bringing recycled water to the area are also being reviewed. Recycled water produced by these plants will be used to replace demands on potable supplies for use in greenbelt irrigation and groundwater recharge. Future recycled water development is in the planning stages currently, and the amount of additional local production is not known.

CVWD is working towards the development of the Crescenta Valley County Park Multiuse Project. This Project will allow CVWD to increase groundwater storage in the Verdugo Basin by installation and maintenance of underground infiltration galleries underneath portions of the existing park. This will be accomplished by utilizing the existing Los Angeles County flood control channels (Verdugo Wash) and surface flow within the Crescenta Valley to divert storm water during the rainy season and capturing

dry weather flow to proposed underground infiltration basins within the recreational areas. The project will potentially increase the local water supply by an annual average of 340 ac-ft per year, thus enhancing CVWD's groundwater resource and reducing dependence on imported supplies. Also, through the process of capture, treatment and reuse of storm water and dry weather flow, the project would potential reduce pollutant load from contaminating the Los Angeles River.

In addition, CVWD will be installing a new interconnection with the City of Los Angeles, Department of Water and Power (LADWP) that should be complete by the end of 2011. LADWP/CVWD interconnection allows for CVWD to receive up to 2.2 cfs and have the ability to back-feed FMWD. This emergency connection would be able to supply an additional 1.9 MGD.

CVWD is planning to replace its older groundwater wells with new modern constructed wells over the ten (10) year period starting in 2015. The existing wells are between 55 to 80 years old and have reached the end of their useful life. CVWD's current program is to perform at least two (2) well rehabilitations a year which includes cleaning the well casing with chemical treatment and installation of steel linear to extend the life of a well.

1. Introduction

1.1. Urban Water Management Plan Requirements

Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act), require "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually" to prepare, adopt, and file an UWMP with the California Department of Water Resources (DWR) every five years. 2010 UWMP updates are due to DWR by August 1, 2011.

This UWMP provides DWR with information on the present and future water resources and demands and provides an assessment of CVWD's water resource needs. Specifically, this document will provide water supply planning for a 25-year planning period in 5-year increments. The plan identifies water supplies for existing and projected demands, quantifies water demands during normal year, single-dry year, and multiple-dry years, and identifies supply reliability under the three hydrologic conditions. This document includes the following analyses:

- Water Service Area and Facilities
- Water Sources and Supplies
- Water Use by Customer Type
- Demand Management Measures
- Water Supply Reliability
- Planned Water Supply Projects and Programs
- Water Shortage Contingency Plan
- Recycled Water

Since its passage in 1983, several amendments have been added to the Act. The most recent changes affecting the 2010 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. The Water Conservation Act of 2009 or SBx7-7 enacted in 2009 is the water conservation component of the Delta package. It stemmed from the Governor's vision to achieve a 20% statewide reduction in per capita water use by 2020. SBx7-7 requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and an interim 10% goal by 2015. Urban retail water suppliers must include in their 2010 UWMPs the following information from their target-setting process:

- Baseline daily per capita water-use
- 2020 Urban water-use target
- 2015 Interim water-use target
- Compliance method being used along with calculation method and support data

Wholesale water suppliers are required to include an assessment of present and proposed future measures, programs, and policies that would help achieve the 20% by 2020 goal.

The other recent amendment made to the UWMP Act to be included in the 2010 UWMP is set forth by SB 1087, Water and Sewer Service Priority for Housing Affordable to Low-Income Households. SB 1087 requires water and sewer providers to grant priority for service allocations to proposed developments that include low income housing. SB 1087 also requires UWMPs to include projected water use for single- and multi-family housing needed for low-income households.

The sections in this UWMP correspond to the outline of the Act, specifically, Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of CVWD's water utility. The UWMP Checklist has been completed, which identifies the location of Act requirements in this Plan and is included as Appendix A.

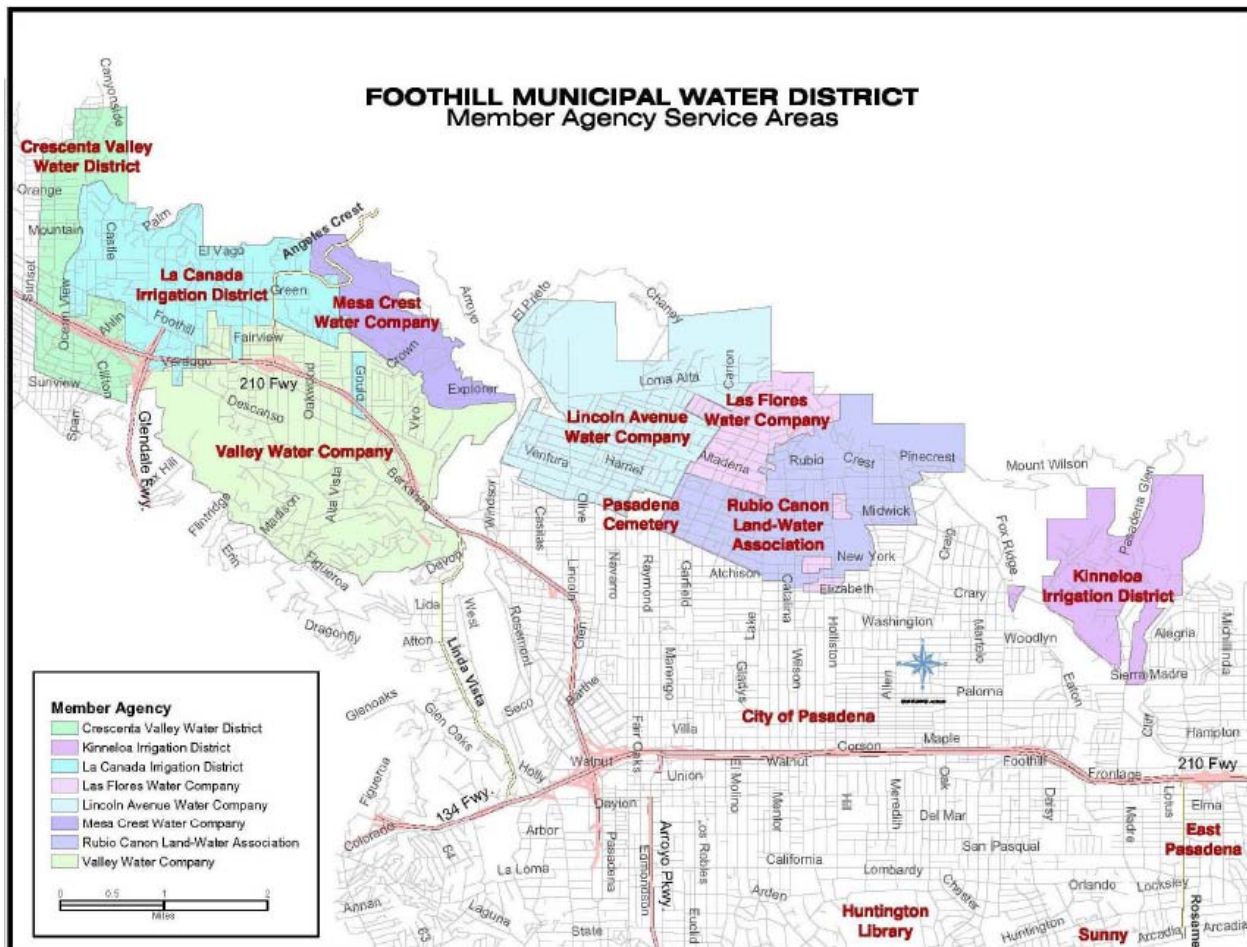


Figure 1-1: Regional Location of Urban Water Supplier

1.2. Agency Overview

CVWD was incorporated in 1950 to serve water to a rapidly growing residential community north of the City of Los Angeles.

CVWD supplies water to approximately 35,000 customers in the Crescenta Valley, which includes the unincorporated areas of La Crescenta, Montrose, and portions of Glendale and La Cañada-Flintridge. CVWD has a 5-member Board of Directors that participate in the management of the District. The current members of the Board of Directors are:

- Kathy Ross – Board President
- Judy Tejada – Board Director
- Kerry Erickson – Board Director
- James Bodnar – Board Director
- Ken Putnam – Board Director

1.3. Service Area and Facilities

1.3.1. CVWD's Service Area

CVWD's service area comprises approximately four square miles within the unincorporated areas of La Crescenta and Montrose, as well as portions of the cities of Glendale and La Canada-Flintridge in Los Angeles County. The service area ranges in elevation from approximately 1,200 feet to almost 3,000 feet above sea level, due to its location next to the San Gabriel Mountains and sloping terrain.

1.3.2. CVWD's Water Facilities

CVWD's water sources are 12 local groundwater wells, with an average depth of 200 ft., one mountain tunnel (gravity fed), and imported water supply through three separate Foothill Municipal Water District (FMWD)/Metropolitan Water District (Metropolitan) connections and an inter-tie systems with the City of Glendale as well as La Cañada Irrigation District. On a long term basis, approximately 60% of CVWD's annual water demand is met by the local groundwater supply and 40% by imported water. This ratio does change depending on the water supply conditions, weather, and demand. CVWD operates 11 separate water pressure zones served by 14 pumping stations and 17 storage reservoirs totaling 17.5 million gallons.

2. Water Demand

2.1. Overview

Currently, the total water demand for the 35,000 people served by CVWD is approximately 4,400 acre-feet annually consisting of potable water.

The passage of SBx7-7 will increase efforts to reduce the use of potable supplies in the future. This new law requires all of California's retail urban water suppliers serving more than 3,000 AFY or 3,000 service connections to achieve a 20% reduction in demands (from a historical baseline) by 2020. Due to great water conservation efforts in the past decade, CVWD is on its way to meeting this requirement on its own.

This section will explore in detail CVWD's current water demands by customer type and the factors which influence those demands as well as provide a perspective of its expected future water demands for the next 25 years. In addition, to satisfy SBx7-7 requirements, this section will provide details of CVWD's SBx7-7 compliance method selection, baseline water use calculation, and its 2015 and 2020 water use targets.

2.2. Factors Affecting Demand

Water consumption is influenced by many factors including climate characteristics of that hydrologic region, demographics, land use characteristics, and economics. The key factors affecting water demand in CVWD's service area are discussed below.

2.2.1. Climate Characteristics

CVWD has a Mediterranean climate, with a "foothill" characteristic, specifically, but with some coastal influence. Summers are warm to hot, and dry while winters are cool and have an annual average precipitation of approximately 23.5 inches.

Another feature of this foothill Mediterranean climate is the frequency of high-velocity, low-humidity, northeasterly winds in the fall and early winter. Therefore, CVWD is highly prone to wildfire danger during these periods. Adequate storage of reservoir water supply is deemed critical by the local fire jurisdictions. The average evapotranspiration (ET_o) is 54 inches per year which is more than twice the annual average rainfall. This translates to a high demand for landscape irrigation for homes, commercial properties, and parks. Moreover, a region with low rainfall like Southern California is also more prone to droughts. Average annual ET_o, temperatures and rainfall are shown in Table 2-1.

Table 2-1: Climate Characteristics

	Standard Monthly Average ETo (inches) [1]	Annual Rainfall (inches) [2]	Average Temperature (°F) [3]
Jan	1.90	4.97	53.3
Feb	2.33	5.78	54.2
Mar	3.65	4.18	55.7
Apr	4.91	1.43	56.3
May	6.07	0.53	62.6
Jun	6.93	0.19	66.0
Jul	7.71	0.04	71.7
Aug	7.24	0.18	73.0
Sep	5.34	0.47	71.5
Oct	3.99	0.97	64.3
Nov	2.43	1.88	60.7
Dec	1.95	2.99	55.2
Annual	54.44	23.60	62.0

[1] Average Evapotranspiration is an average value taken from station #133 (Glendale) and station #159 (Monrovia) provided by CIMIS.

[2] Data provided by Crescenta Valley Water District from station FC251. Average from 1970-2010.

[3] Data provided by Western Regional Climate Center from station 040144 (Altadena). Average from 1922-2010.

The sources of CVWD’s imported water supplies, the State Water Project (SWP) and Colorado River Aqueduct (CRA), are influenced by weather conditions in Northern California and along the Colorado River Basin region. Both regions have recently been suffering from multi-year drought conditions and record low rainfalls which directly impact demands and supplies to CVWD and Southern California.

2.2.2. Demographics

CVWD serves a population of 35,000. Because there is no correlation between the latest Census Blocks and CVWD’s service boundaries, CVWD’s population was estimated through an analysis of number of connections and average household size. The population within CVWD’s service area is expected to increase by 4% in the next 25 years, or 0.17% annually. Table 2-2 shows the population projections for the next 25 years based on CVWD’s analysis.

There is no industry in CVWD’s service area and there are less than 5% commercial or institutional accounts. CVWD does not anticipate any significant increases in employment for the area based on the land availability and the zoning. The 0.17% annual

average increase was obtained from the California Department of Finance statistical records. Densification will occur as single family lots are converted to multi-family dwellings where it is allowed by zoning classification and the governing agency.

Table 2-2: Population – Current and Projected

	2010	2015	2020	2025	2030	2035-opt
Service Area Population	35,000	35,300	35,600	35,900	36,200	36,500

2.2.3. Land Use

Land use in the service area is primary residential with two commercial/business corridors along Foothill Boulevard and Honolulu Avenue. Of the residential service, much of the area south of Foothill Boulevard continues to be converted over time to multi-family units as zoning permits. There are no industrial or agricultural water users within CVWD, and institutional users are limited to schools and parks and freeway landscaping.

CVWD currently provides water service to over 8,000 accounts and wastewater collection service to over 6,000 accounts. CVWD’s service area is for the most part built-out with densification accomplished through single-family lot splits and conversion of single-family to multi-family dwelling units.

2.3. Water Use by Customer Type

The knowledge of an agency’s water consumption by type of use or by customer class is key to developing that agency’s water use profile which identifies when, where, how, and how much water is used, and by whom within the agency’s service area. A comprehensive water use profile is critical to the assessment of impacts of prior water conservation efforts as well as to the development of future conservation programs.

This section provides an overview of CVWD’s water consumption by customer type in 2005 and 2010, as well as projections for 2015 to 2035. The customer classes are categorized as follows: single-family residential, multi-family residential, commercial/industrial/institutional (CII), dedicated landscape, and agriculture. Other water uses including sales to other agencies and non-revenue water are also discussed in this section.

2.3.1. Overview

CVWD has maintained approximately 8,100 customer connections to its potable water distribution system since 2005. CVWD is projecting a 7% increase in the number of connections through to 2035. All water connections in CVWD’s service area are metered.

Approximately 88% of CVWD’s water demand is residential. Commercial and dedicated landscape sectors each consume approximately 8% of CVWD’s potable water supply. A small portion of CVWD’s demand is from government/institutional establishments such as municipal buildings. CVWD does not provide any sales to agriculture, nor other agencies, saline water intrusion barriers, groundwater recharge, or conjunctive use.

Tables 2-3 and 2-4 provide a summary of the past, current, and projected water use by customer class and the number of water service customers by sector in five-year increments from 2005 through to 2035.

Table 2-3: Past, Current and Projected Service Accounts by Water Use Sector

Calendar Year	Number of Accounts by Water Use Sector					
	Single Family	Multi-Family	Commercial	Institutional/Gov	Landscape	Total Accounts
2005	6,842	705	369	72	39	8,027
2010	6,879	709	371	72	39	8,070
2015	6,948	716	375	73	40	8,151
2020	7,018	723	378	74	40	8,233
2025	7,087	730	382	75	40	8,315
2030	7,157	737	386	75	41	8,397
2035	7,227	745	390	76	41	8,479

Table 2-4: Past, Current and Projected Water Demand by Water Use Sector

Calendar Year	Water Demand by Water Use Sectors (AFY)					
	Single Family	Multi-Family	Commercial	Institutional/Gov	Landscape	Total Demand
2005	3,361	1,015	228	185	184	4,973
2010	2,989	903	203	165	164	4,422
2015	3,548	1,072	241	195	194	5,250
2020	3,768	1,138	256	207	206	5,575
2025	3,846	1,161	261	212	211	5,690
2030	3,927	1,186	266	216	215	5,810
2035	4,015	1,212	272	221	220	5,940

2.3.2. Residential

The great majority (88%) of water sold by CVWD in the current year (2010) goes to residential use. This percentage appears to be the same as the last UWMP update in 2005. Per capita trends are estimated due to the uncertainty of the population estimates in CVWD’s service area. However, the population growth within the area is relatively

small. Water consumption by the residential sector is projected to remain at about 90% through the 25-year planning horizon.

2.3.3. Non-Residential

In 2010 non-residential demand was approximately 12% of the overall demand and is expected to remain so through 2035. CII uses (excluding large landscape) represent a combined 8% of CVWD’s total demand. Demands from government/institutional establishments are expected to remain around 4% of CVWD’s total water demands for the next 25 years.

2.3.4. Other Water Uses

2.3.4.1. Sales to Other Agencies

CVWD does not sell water to other agencies except in cases of emergency.

2.3.4.2. Non-Revenue Water

Non-revenue water is defined by the International Water Association (IWA) as the difference between distribution systems input volume (i.e. production) and billed authorized consumption. Non-revenue water consists of three components: unbilled authorized consumption (e.g. hydrant flushing, fire fighting, and blow-off water from well start-ups), real losses (e.g. leakage in mains and service lines), and apparent losses (unauthorized consumption and metering inaccuracies).

CVWD’s non-revenue water accounts for about 7% of CVWD’s total demand (Table 2-5).

Table 2-5: Additional Water Uses and Losses (AFY)

Water Use	2005	2010	2015	2020	2025	2030	2035-opt
Saline Barriers							
Groundwater Recharge							
Conjunctive Use							
Raw Water							
Recycled Water							
Flushing	-	2	2	2	2	2	2
Unaccounted-for System Losses	350	325	325	340	360	360	360
Total	350	327	327	342	362	362	362

2.4. SBx7-7 Requirements

2.4.1. Overview

SBx7-7 which became effective on February 3, 2010, is the water conservation component to the Bay Delta legislative package. It seeks to implement Governor Schwarzenegger's 2008 water use reduction goals to achieve a 20% statewide reduction in urban per capita water use by December 31, 2020. As discussed above, the bill requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and an interim 10% goal by 2015. The bill establishes methods for urban retail water suppliers to determine targets to help achieve water use reduction targets. The retail water supplier is to select one of the four target-setting methods (compliance options). The retail agency may choose to comply with SBx7-7 as an individual or as a region in collaboration with other water suppliers. Under the regional compliance option, the retail water supplier must still report the water use target for its individual service area. The bill also includes reporting requirements for the 2010, 2015, and 2020 UWMPs. An agency that does not comply with SBx7-7 requirements will not be eligible for a water grant or loan from the State on and after July 16, 2016.

2.4.2. SBx7-7 Compliance Options

DWR has established four compliance options for urban retail water suppliers to choose from. Each supplier is required to adopt one of the four SBx7-7 requirement options. The four options are:

- *Option 1* requires a simple 20% reduction from the baseline by 2020 and 10% by 2015.
- *Option 2* employs a budget-based approach by requiring an agency to achieve a performance standard based on three metrics:
 - Residential indoor water use of 55 GPCD
 - Landscape water use commiserate with a Model Landscape Ordinance
 - 10% reduction in baseline CII water use
- *Option 3* requires achievement of 95% of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan.
 - CVWD falls in the South Coast hydrologic region which has a 2020 target of 149 GPCD¹.
- *Option 4* requires the subtraction of Total Savings from the Base GPCD:
- Total Savings includes indoor residential savings, meter savings, CII savings, and landscape and water loss savings.

¹ California Department of Water Resources 20x2020 Water Conservation Plan (February 2010)
www.water.ca.gov/wateruseefficiency/sb7/docs/20x2020plan.pdf

State Hydrologic Region Targets

The 20x2020 Water Conservation Plan proposed Statewide Interim and Final 2020 targets. In addition, interim and final targets are established for each of the state's 10 hydrologic regions based on population, climate, and water use. The hydrologic region targets were incorporated into the Water Conservation Bill of 2009. Current water use and conservation targets vary among the regions due to many factors, such as land use patterns (lot sizes, square footage of irrigated landscape), and industrial and socioeconomic characteristics (the cost of water and income level of residents)².

CVWD's Compliance Option Selection

CVWD has selected compliance **Option 3**.

While each retail agency is required to choose a compliance option in 2010, DWR allows for the agency to change its compliance option in 2015. This will allow CVWD to determine its water-use targets for Compliance Options 2 and 4 since CVWD anticipates more data to be available for target calculation in the future.

2.4.3. Baseline Water-Use

The first step to calculating an agency's water use target is to determine its base daily-per-capita water-use (baseline water-use). This baseline water-use is essentially the agency's gross water-use divided by its service area population, reported in gallons per capita per day (GPCD). Gross water use is defined as volume into the distribution system while deducting any recycled water for direct use during a 10-year period. The baseline water-use is calculated as a continuous 10-year average during a period which ends no earlier than December 31, 2004 and no later than December 31, 2010. Agencies for which recycled water made up 10% or more of 2008 retail water delivery can use up to a 15-year average for the calculation.

Since CVWD does not use recycled water, a 10-year instead of a 15-year rolling average was calculated. CVWD's baseline water use is **152.4 GPCD**, which was obtained from the 10-year period January 1, 1996 to December 31, 2005.

Tables 2-6 and 2-7 provide the base period ranges used to calculate the baseline water use for CVWD as well as the service area population and annual water use data from the base daily per capita water use. Data provided in Table 2-6 was used to calculate the continuous 10-year average baseline. Moreover, regardless of the compliance method adopted by CVWD, it will need to meet the minimum water-use target of 5% reduction

² California Department of Water Resources 2010 Final UWMP Guidebook (March 2011)

from a five-year baseline as calculated in Table 2-7.

Table 2-6: Base Daily per Capita Water Use – 10-year range

Highest Available Baseline [1]		Beginning	Ending
10 Year Avg		January 1, 1996	December 31, 2005

Calendar Year	Service Area Population	Gross Water Use (gallons per day)	Daily Per Capita Water Use
1996	31,277	4,710,600	151
1997	31,530	4,907,772	156
1998	31,784	4,531,334	143
1999	32,040	5,006,650	156
2000	32,299	5,104,085	158
2001	32,559	5,030,984	155
2002	32,822	5,170,823	158
2003	33,086	5,110,451	154
2004	33,353	5,111,645	153
2005	33,622	4,755,257	141
Base Daily Per Capita Water Use:			152.4

[1] The most recent year in base period must end no earlier than December 31, 2004, and no later than December 31, 2010. The base period cannot exceed 10 years unless at least 10 percent of 2008 retail deliveries were met with recycled water.

Table 2-7: Base Daily per Capita Water Use – 5-year range

Highest Available Baseline [2]		Beginning	Ending
5 Year Avg		January 1, 2003	December 31, 2007

Calendar Year	Service Area Population	Gross Water Use (gallons per day)	Daily Per Capita Water Use
2003	33,086	5,110,451	154
2004	33,353	5,111,645	153
2005	33,622	4,755,257	141
2006	33,893	4,876,725	144
2007	34,167	4,932,677	144
Base Daily Per Capita Water Use:			147.5

[2] The base period must end no earlier than December 31, 2007, and no later than December 31, 2010.

2.4.4. SBx7-7 Water Use Targets

Under Compliance Option 3, CVWD has chosen to achieve 95% of the State’s hydrologic region target of 141.6 GPCD by 2020. However, the minimum required target calculated from the five-year base daily GPCD found in Table 2-7 comes to 140.1 GPCD in 2020. Therefore, the required minimum target applies for CVWD.

Under the minimum required target, CVWD’s 2015 interim water-use target is 146.3 GPCD, and the 2020 final water-use target is **140.1 GPCD** as summarized in Table 2-8.

Table 2-8: Preferred Compliance Option and Water Use Targets

	Baseline	2015 Target	2020 Target
Option 3 - 95% of State Hydrologic Region Targets	152.4	146.3	140.1

2.5. Demand Projections

2.5.1. 25 Year Projections

One of the main objectives of this UWMP is to provide CVWD’s future water demand outlook. Currently, CVWD’s total annual water demand is 4,422 acre-feet comprising of 61% local groundwater and 39% imported water.

As illustrated in Table 2-9, CVWD’s water demand is expected to increase by 34% in the next 25 years.

Table 2-9: Current and Projected Water Demands (AFY)

Water Supply Sources	2010	2015	2020	2025	2030	2035-opt
FMWD (Imported Treated Full Service (non-int.))	1,721	1,956	2,281	2,396	2,516	2,646
Verdugo Basin GW	2,701	3,294	3,294	3,294	3,294	3,294
Total	4,422	5,250	5,575	5,690	5,810	5,940

Table 2-10 shows the projected demands for imported water that CVWD has provided to FMWD its wholesale agency illustrating the amount of water CVWD wishes to purchase from FMWD over the next 25 years.

Table 2-10: CVWD’s Demand Projections Provided to Wholesale Suppliers (AFY)

Wholesaler	2015	2020	2025	2030	2035-opt
FMWD	1,956	2,281	2,396	2,516	2,646

2.5.2. Low Income Household Projections

One significant change to the UWMP Act since 2005 is the requirement that retail water suppliers develop water use projections for “low-income” households at the single-family and multifamily level. These projections assist retail suppliers with compliance with Section 65589.7 of the Government Code, which requires suppliers to grant a priority for the provision of service to low income households. Consistent with this Code section, a

low-income household is defined as a household earning 80% of the County of Los Angeles' median income or less.

In order to identify the low income housing projections within its service area, DWR³ recommends that retail suppliers rely on either the Housing Element and General Plans or on the Regional Housing Needs Assessment (RHNA) or Regional Housing Needs Plan information developed by the Local Council of Governments (COG), in coordination with the California Department of Housing and Community Development (CDHCD).

The RHNA process quantifies the need for housing by income group within each jurisdiction during specific planning period and is used in Housing Element and General Plan updates. COGs are required by the State Housing Law to determine the existing and projected regional housing needs for persons at all income levels. The RHNA is to prioritize local resource allocation and to help decide how to address existing and future housing needs.

Existing and projected housing needs for Los Angeles County were incorporated into the Southern California Association of Governments' (SCAG) 2007 Final Regional Housing Need Allocation Plan (2007 RHNA Plan)⁴. This plan covers the planning period January 1, 2006 to June 30, 2014. The next RHNA process is not expected to be completed until fall of 2012.

For the purpose of this 2010 UWMP, the percentages of low-income households for the cities within CVWD's service area were obtained from each cities most current Housing Element of the General Plan. CVWD's service area covers portions of the City of Glendale⁵, the City of La Canada Flintridge⁶, and unincorporated area within Los Angeles County⁷. The percentages of low-income households reported in the Housing Elements were obtained from RHNA and other sources such as the Housing and Urban Development Comprehensive Housing Affordability data.

The projected water demands for low-income households in CVWD's service area were estimated by calculating the percentage of projected low income units in the service area

³ California Department of Water Resources, Guidebook to Assist Urban Water Suppliers to Prepare a 2010 UWMP, Final (March 2011)

⁴ Southern California Association Governments, Final Regional Housing Need Allocation Plan for Jurisdictions within the Six County SCAG Region (July 2007)

⁵ City of Glendale's Housing Element of the General Plan (January 2009)
http://www.ci.glendale.ca.us/planning/pdf_files/Housing%20Element/Jan2009Final%20Housing%20Element.pdf

⁶ City of La Canada Flintridge's Housing Element of the General Plan (Draft December 2010)
http://www.lacanadaflintridge.com/city/city_hall/planning/docs/generalplan/2010/draftgeneralplan/LCF_G_P_Chpt_9_Housing.pdf

⁷ County of Los Angeles Department of Regional Planning's Housing Element (2008)
http://planning.lacounty.gov/assets/upl/project/housing_20090126-housing-element.pdf

as a percentage of the total projected units from the Housing Element. Given that CVWD’s service area covers portions of two cities and unincorporated area within Los Angeles County, a weighted average of the low income for each city served by CVWD was calculated based on the portion of each city within the water district (based on number of connections). Table 2-11 summarizes the portion of city served by CVWD, the low income households by city, and the weighted percentage of low income household in CVWD.

Table 2-11: Weighted Percentage of Low-income Household within CVWD’s Service Area

City	Portion of City Served by CVWD (by no. of connections)	% Low Income Households by City (Housing Element)	Weighted % Low Income Households
Glendale	2.4%	40.8%	0.98%
La Canada Flintridge	7.3%	11.4%	0.83%
Unincorporated Area	0.2%	38.4%	0.08%
Total	10%	Weighted Average	1.9%

Table 2-12 provides a breakdown of the projected water needs for low-income single family and multifamily units. The projected water demands shown here represent 1.9% of the projected water demand by customer type for single-family and multifamily categories provided in Table 2-4 above. For example, the total single-family residential demand is projected to be 3,548 AFY in 2015 and 4,015 AFY in 2035. The projected water demands for housing needed for single family low-income households is 67 and 76 AFY for 2015 and 2035, respectively.

Table 2-12: Projected Water Demands for Housing Needed for Low-income Households (AFY)

Water Use Sector	2015	2020	2025	2030	2035
Total Retail Demand	5,250	5,575	5,690	5,810	5,940
Total Residential Demand	4,620	4,906	5,007	5,113	5,227
Total Low-income Households Demand	87	93	95	97	99
SF Residential Demand - Total	3,548	3,768	3,846	3,927	4,015
SF Residential Demand - Low-income Households	67	71	73	74	76
MF Residential Demand - Total	1,072	1,138	1,161	1,186	1,212
MF Residential Demand - Low-income Households	20	22	22	22	23

3. Water Sources and Supply Reliability

3.1. Overview

Sixty one percent of CVWD's source water is local ground water supply in the Verdugo Basin. The majority of CVWD's ground water wells are located along the Verdugo Wash, south of Honolulu Avenue. Local groundwater is disinfected with chlorine before blending with Metropolitan's surface water. The remaining 39% of CVWD's source water is imported surface water supplied by FMWD, which is a member agency to Metropolitan. The sources of imported water supplies include the Colorado River and the State Water Project (SWP). Metropolitan's 2010 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full service demands (non-interruptible agricultural and replenishment supplies) at the retail level under all foreseeable hydrologic conditions from 2015 through 2035. The imported water supply numbers shown here represent only the amount of supplies projected to meet demands and not the full supply capacity.

Figure 3-1 provides a projection of CVWD's water supply sources for the next 25 years.

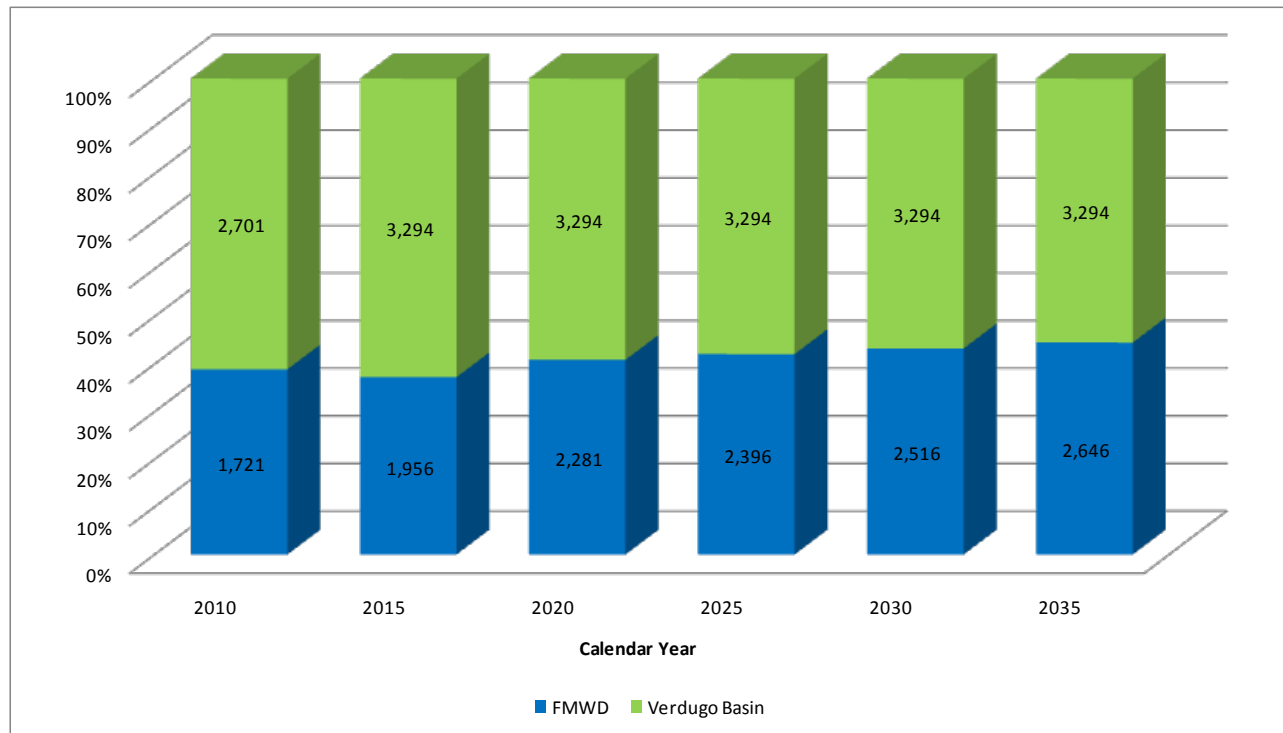


Figure 3-1: Current and Projected Water Supplies (AFY)

3.2. Imported Water

CVWD currently relies on 1,721 AFY of imported water wholesaled by Metropolitan through FMWD to supplement local groundwater. Imported water represents approximately 39% of CVWD's total water supply. Metropolitan's principal sources of water originate from two sources - the Colorado River via the Colorado Aqueduct and the Lake Oroville watershed in Northern California through the SWP. This water is treated at Metropolitan's Weymouth Treatment Plant. In 2009, the Weymouth Treatment Plant received a blend of 25% Colorado River and 75% SWP.

Metropolitan's Upper Feeder is tapped by FMWD in the vicinity of Seco Street and Rosemont Avenue in the City of Pasadena. Water flows from Metropolitan's system into FMWD's Arroyo Seco Gravity Main which traverses in a northerly direction in the vicinity of Rosemont Avenue and terminates at FMWD's Main Pumping Plant located near Rosemont Avenue and Washington Boulevard in the City of Pasadena.

3.2.1. Metropolitan's 2010 Regional Urban Water Management Plan

Metropolitan's 2010 Regional Urban Water Management Plan (RUWMP) reports on its water reliability and identifies projected supplies to meet the long-term demand within its service area. It presents Metropolitan's supply capacities from 2015 through 2035 under the three hydrologic conditions specified in the Act: average year, single dry-year, and multiple dry-years.

Colorado River Supplies

Colorado River Aqueduct supplies include supplies that would result from existing and committed programs and from implementation of the Quantification Settlement Agreement (QSA) and related agreements to transfer water from agricultural agencies to urban uses. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 MAF on an as-needed basis.

State Water Project Supplies

Metropolitan's SWP supplies have been impacted in recent years by restrictions on SWP operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fishery Service which were issued on December 15, 2008 and June 4, 2009, respectively. In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available State Banks Pumping Plant capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

In June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for Metropolitan staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. The Delta Action Plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Bay-Delta while the long-term solution is implemented.

State and Federal resource agencies and various environmental and water user entities are currently engaged in the development of the Bay Delta Conservation Plan (BDCP), which is aimed at addressing the basic elements that include the Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development. In evaluating the supply capabilities for the 2010 RUWMP, Metropolitan assumed a new Delta conveyance is fully operational by 2022 that would return supply reliability similar to 2005 condition, prior to supply restrictions imposed due to the biological opinions.

Storage

Storage is a major component of Metropolitan's dry year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing its Water Supply Allocation Plan (WSAP), is dependent on its storage resources. In developing the supply capabilities for the 2010 RUWMP, Metropolitan assumed a simulated median storage level going into each of five-year increments based on the balances of supplies and demands.

Supply Reliability

Metropolitan evaluated supply reliability by projecting supply and demand conditions for the single- and multi-year drought cases based on conditions affecting the SWP (Metropolitan's largest and most variable supply). For this supply source, the single driest-year was 1977 and the three-year dry period was 1990-1992. Metropolitan's analyses are illustrated in Tables 3-1, 3-2, and 3-3 which correspond to Metropolitan's 2010 RUWMP's Tables 2-11, 2-9 and 2-10, respectively. These tables show that the region can provide reliable water supplies not only under normal conditions but also under both the single driest year and the multiple dry year hydrologies.

Table 3-1: Metropolitan Average Year Projected Supply Capability and Demands for 2015 to 2035

Average Year Supply Capability¹ and Projected Demands Average of 1922-2004 Hydrologies (acre-feet per year)					
Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct ²	1,550,000	1,629,000	1,763,000	1,733,000	1,734,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply ³	1,507,000	1,529,000	1,472,000	1,432,000	1,429,000
Aqueduct Capacity Limit ⁴	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Colorado River Aqueduct Capability	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
Demands					
Firm Demands of Metropolitan	1,826,000	1,660,000	1,705,000	1,769,000	1,826,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan⁵	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
Surplus	1,479,000	1,877,000	2,104,000	1,898,000	1,708,000
Programs 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					
Colorado River Aqueduct Supply ³	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit ⁴	0	0	0	0	0
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	588,000	689,000	1,051,000	1,051,000	1,051,000
Potential Surplus	2,067,000	2,566,000	3,155,000	2,949,000	2,759,000

¹ Represents Supply Capability for resource programs under listed year type.

² California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

³ Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

⁴ Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

⁵ Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Source: Metropolitan's 2010 RUWMP

**Table 3-2: Metropolitan Single-Dry Year Projected Supply Capability and Demands for
2015 to 2035**

**Single Dry-Year
Supply Capability¹ and Projected Demands
Repeat of 1977 Hydrology
(acre-feet per year)**

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct ²	522,000	601,000	651,000	609,000	610,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply ³	1,416,000	1,824,000	1,669,000	1,419,000	1,419,000
Aqueduct Capacity Limit ⁴	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	2,457,000	2,782,000	2,977,000	2,823,000	2,690,000
Demands					
Firm Demands of Metropolitan	1,991,000	1,889,000	1,921,000	1,974,000	2,039,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan⁵	2,171,000	2,162,000	2,201,000	2,254,000	2,319,000
Surplus	286,000	620,000	776,000	569,000	371,000
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	556,000	556,000	700,000	700,000	700,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply ³	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit ⁴	0	0	0	0	0
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	762,000	862,000	1,036,000	1,036,000	1,036,000
Potential Surplus	1,048,000	1,482,000	1,812,000	1,605,000	1,407,000

¹ Represents Supply Capability for resource programs under listed year type.

² California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

³ Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

⁴ Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

⁵ Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Source: Metropolitan's 2010 RUWMP

Table 3-3: Metropolitan Multiple-Dry Year Projected Supply Capability and Demands for 2015 to 2035

Forecast Year	2015	2020	2025	2030	2035
Multiple Dry-Year Supply Capability¹ and Projected Demands Repeat of 1990-1992 Hydrology (acre-feet per year)					
Current Programs					
In-Region Storage and Programs	246,000	373,000	435,000	398,000	353,000
California Aqueduct ²	752,000	794,000	835,000	811,000	812,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply ³	1,318,000	1,600,000	1,417,000	1,416,000	1,416,000
Aqueduct Capacity Limit ⁴	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	2,248,000	2,417,000	2,520,000	2,459,000	2,415,000
Demands					
Firm Demands of Metropolitan	2,056,000	1,947,000	2,003,000	2,059,000	2,119,000
IID-SDCWA Transfers and Canal Linings	180,000	241,000	280,000	280,000	280,000
Total Demands on Metropolitan⁵	2,236,000	2,188,000	2,283,000	2,339,000	2,399,000
Surplus	12,000	229,000	237,000	120,000	16,000
Programs Under Development					
In-Region Storage and Programs	162,000	280,000	314,000	336,000	336,000
California Aqueduct	242,000	273,000	419,000	419,000	419,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply ³	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit ⁴	0	0	0	0	0
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	404,000	553,000	733,000	755,000	755,000
Potential Surplus	416,000	782,000	970,000	875,000	771,000

¹ Represents Supply Capability for resource programs under listed year type.

² California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

³ Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

⁴ Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

⁵ Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Source: Metropolitan's 2010 RUWMP

3.2.2. CVWD’s Imported Water Supply Projections

Based on Metropolitan’s supply projections that it will be able to meet full service demands under all three hydrologic scenarios, FMWD, CVWD’s wholesale supplier, projects that it would also be able to meet the demands of its retail agencies under these conditions.

California Water Code section 10631 (k) requires the wholesale agency to provide information to the urban retail water supplier for inclusion in its UWMP that identifies and quantifies the existing and planned sources of water available from the wholesale agency. Table 3-4 indicates the wholesaler’s water availability projections by source for the next 25 years as provided to CVWD by FMWD.

Table 3-4: Wholesaler Identified & Quantified Existing and Planned Sources of Water (AFY)

Wholesaler Sources	2015	2020	2025	2030	2035-opt
FMWD	1,956	2,281	2,396	2,516	2,646

3.3. Groundwater

CVWD owns and operates 12 production wells in the Verdugo Groundwater Basin (Basin). The Verdugo Basin is an adjudicated basin within the Upper Los Angeles River Area (ULARA). The Basin has an adjudicated "safe yield" of 7,150 acre-feet per year (AFY). CVWD shares groundwater rights in this basin with the City of Glendale. As the only two water-rights holders in the Verdugo Basin, CVWD has an annual entitlement of 3,294 acre-feet and the City of Glendale has an annual entitlement of 3,856 acre-feet.

ULARA is the watershed or surface drainage area tributary to the upper Los Angeles River. The watershed consists of a total of 329,000 acres, including approximately 123,000 acres of valley fill area and 206,000 acres of hill and mountain areas, located primarily in the County of Los Angeles, with a small portion in the County of Ventura. The San Fernando Basin is the major groundwater basin in ULARA and underlies 112,047 acres. Other basins include the Sylmar, Verdugo and Eagle Rock Basins.

From 2000 to 2010, CVWD has pumped groundwater ranging from 2,575 to more than 3,412 acre-feet. The Verdugo Groundwater Basin, a sub-basin of the San Fernando Basin which is within the Upper Los Angeles River Area (ULARA) Groundwater Basin, was adjudicated in a court decision in 1979 and is controlled by the ULARA Watermaster. A copy of the ULARA judgment is included in this UWMP as Appendix B. CVWD’s prescriptive rights in the Verdugo Basin are 3,294 AFY. To date, the neighboring City of

Glendale, as the only other basin rights holder, has not pumped its full adjudication (3,856 AFY) in the Verdugo Basin. In any year, the Watermaster may allow excess pumping within the Basin by either party as long as the total yield of 7,150 acre-feet annually is not exceeded.

The water quality of the Verdugo Basin is high in nitrates and selected wells show the presence of Volatile Organic Compounds (VOCs) (Tetrachloroethylene (PCE)) above the California Department of Public Health (CDPH) maximum contaminant levels (MCLs). Groundwater containing nitrate is either blended with imported water and/or treated at CVWD’s Glenwood Nitrate Reclamation Facility to meet drinking water standards. Blending with other well water or imported water is sufficient to supply water at less than the MCL for PCE as approved by CDPH. During the past 5 years that have been well with MTBE levels above the California Department of Public Health (CDPH) maximum contaminant levels (MCLs). Wells with MTBE levels above the secondary standard were taken out of service. At the present time, MTBE is not present in any of the District’s wells above the secondary CDPH standard. MTBE levels are monitored weekly throughout CVWD.

It is CVWD’s goal to maintain full groundwater pumping capabilities in the Verdugo Basin to pump its adjudicated right of 3,294 AF every year. As shown in Table 3-5, CVWD has a projection of 3,294 AFY of groundwater. The City of Glendale is working on a new project that is planned to be constructed within the next few years that will replace their existing wells, which may result in their ability to increase their water production. Since the 2005 UWMP CVWD implemented a long-term capital improvement program to rehabilitate its original 12 wells. In addition, CVWD is planning to install a least 2 new wells to replace the older wells within the next 5 years.

Table 3-5: Groundwater Pump Rights (AFY)

Basin Name	Pumping Right (AFY)
Verdugo Basin	3,294
Total	3,294

Table 3-6 shows CVWD’s recent groundwater production from the Verdugo Basin in the past 5 years from 2005 to 2009.

Table 3-6: Amount of Groundwater Pumped in the Past 5 Years (AFY)

Basin Name(s)	2005	2006	2007	2008	2009
Verdugo Basin	3,051	3,687	3,144	3,222	3,084
% of Total Water Supply	57%	67%	57%	61%	66%

Table 3-7 shows the amount of groundwater projected to be pumped from the Verdugo Basin by CVWD over the next 25 years.

Table 3-7: Amount of Groundwater Projected to be Pumped (AFY)

Basin Name(s)	2015	2020	2025	2030	2035-opt
Verdugo Basin GW	3,294	3,294	3,294	3,294	3,294
% of Total Water Supply	63%	59%	58%	57%	55%

3.4. Supply Reliability

3.4.1. Overview

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. CVWD depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure it has adequate supplies. Development of groundwater augments the reliability of the imported water system. There are various factors that may impact reliability of supplies, such as legal, environmental, water quality and climate, which are discussed below. The water supplies are projected to meet full service demands; Metropolitan’s 2010 RUWMP finds that Metropolitan is able to meet with existing supplies, full service demands of its member agencies starting 2015 through 2035 during normal years, single dry year, and multiple dry years.

Metropolitan’s 2010 Integrated Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full service demands at the retail level under all foreseeable hydrologic conditions from 2015 through 2035. The foundation of Metropolitan’s resource strategy for achieving regional water supply reliability has been to develop and implement water resources programs and activities through its IRP preferred resource mix. This preferred resource mix includes conservation, local resources such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance and infrastructure improvements. FMWD is reliant on Metropolitan for all of its imported water. With the addition of planned supplies under development, Metropolitan’s 2010 RUWMP finds that Metropolitan will be able to meet full service demands from 2015 through 2035, even under a repeat of the worst drought. Table 3-8 shows the reliability of the wholesaler’s supply for single dry year and multiple dry year scenarios.

Table 3-8: Wholesaler Supply Reliability - % of Normal AFY

Wholesaler Sources	Single Dry	Multiple Dry Water Years		
		Year 1	Year 2	Year 3
Metropolitan	100%	100%	100%	100%

In addition to meeting full service demands from 2015 through 2035, Metropolitan projects reserve and replenishment supplies to refill system storage. FMWD’s 2010 UWMP states that it will meet full service demands to its customers from 2015 through 2035. Table 3-9 shows the basis of water year data used to predict drought supply availability.

Table 3-9: Metropolitan’s Basis of Water Year Data

Water Year Type	Base Year	Base Year	Base Year
Normal Water Year	Average 1922-2004		
Single-Dry Water Year	1977		
Multiple-Dry Water Years	1990	1991	1992

3.4.2. Factors Impacting Reliability

The Act requires a description of the reliability of the water supply and vulnerability to seasonal or climatic shortage. CVWD relies on local groundwater and import supplies provided by Metropolitan through FMWD. The following are some of the factors identified by Metropolitan that may have an impact on the reliability of Metropolitan supplies.

Environment – Endangered species protection needs in the Sacramento-San Joaquin River Delta have resulted in operational constraints to the SWP system. The Bay-Delta’s declining ecosystem caused by agricultural runoff, operation of water pumps and other factors has led to historical restrictions in SWP supply deliveries. SWP delivery restrictions due to these biological opinions resulted in the loss of about one-third of the available SWP supplies in 2008.

Legal – Listings of additional species under the Endangered Species Act and new regulatory requirements could impact SWP operations by requiring additional export reductions, releases of additional water from storage or other operational changes impacting water supply operations. Additionally, the Quantification Settlement Agreement has been challenged in courts and may have impacts on the Imperial Irrigation District and San Diego County Water Authority transfer. If there are negative impacts, San Diego could become more dependent on the Metropolitan supplies.

Water Quality –Water imported from the CRA contains high level of salts. The operational constraint is that this water needs to be blended with SWP supplies to meet the target salinity of 500 mg/L of total dissolved solids (TDS). Another water quality concern is related to the quagga mussel. Controlling the spread and impacts of quagga mussels within the CRA requires extensive maintenance and results in reduced operational flexibility.

Climate Change – Changing climate patterns are expected to shift precipitation patterns and affect water supply. Unpredictable weather patterns will make water supply planning even more challenging. The areas of concern for California include the reduction in the Sierra Nevada snowpack, increased intensity and frequency of extreme weather events, and rising sea levels causing increased risk of levee failure.

Legal, environmental, and water quality issues may have impacts on Metropolitan supplies. It is believed, however, that climatic factors would have more of an impact than the others. Climatic conditions have been projected based on historical patterns; however severe pattern changes may occur in the future. Table 3-10 shows the factors resulting in inconsistency of supply.

Table 3-10: Factors Resulting in Inconsistency of Supply

Name of Supply	Legal	Environmental	Water Quality	Climatic
State Water Project	X	X		
Colorado River			X	X

These and other factors are addressed in greater detail in Metropolitan’s 2010 RUWMP.

3.4.2.1. Water Quality

Imported Water - Metropolitan is responsible for providing water of a high quality throughout its service area. The water that Metropolitan delivers is tested both for currently regulated contaminants and for additional contaminants of concern as over 300,000 water quality tests are conducted each year to regulate the safety of its water supplies. Metropolitan’s supplies originate primarily from the CRA and from the SWP. A blend of these two sources, proportional to each year’s availability of the source, is then treated and delivered throughout Metropolitan’s service area.

Metropolitan’s primary sources face individual water quality issues of concern. The CRA water source contains a higher level of total dissolved solids (TDS) and a lower level of organic material, while the SWP contains a lower TDS level while its level of organic materials is much higher, lending to the formation of disinfection byproducts (DBPs). To remediate the CRA’s high level of salinity and the SWP’s high level of organic materials,

Metropolitan has been blending CRA water with SWP supplies as well as implementing updated treatment processes to decrease the disinfection byproducts. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium VI while also investigating the potential water quality impact of emerging contaminants, N-nitrosodimethylamine (NDMA) and pharmaceuticals and personal care products (PPCPs). Metropolitan has assured its ability to overcome the above mentioned water quality concerns through its protection of source waters, implementation of renovated treatment processes, and blending of its two sources. While unforeseeable water quality issues could alter reliability, Metropolitan's current strategies ensure the deliverability of high quality water.

Groundwater – CVWD's water system is and has been in compliance with all CDPH water quality standards. Groundwater quality does not impact water supply at this time due to CVWD's Nitrate treatment plant and the ability to blend waters below the MCL for PCE, Nitrate and MTBE.

In 2006, CVWD experienced Methyl tertiary butyl ether (MTBE) levels above the public health goal and removed a well from service. That well was placed back into service in May 2008. However, another well was taken out of service in September 2008 due to high levels of MTBE. That well was placed back into service in March 2011. MTBE levels attributed to a reduction in groundwater pumping below the adjudicated amount in 2009 and 2010. Currently, all wells are in production and contain only trace amounts of MTBE.

In order to assure continued production, a GAC treatment plant has been designed and would be able to be constructed within 6 months if necessary. Should complete contamination of CVWD's groundwater occur for a temporary or extended period of time due to high concentrations of MTBE, imported water would be used to meet CVWD demand. A maximum of 5.3 million gallons per day can be obtained from FMWD, CVWD's wholesale provider and 3.2 million gallons per day is available from CVWD's emergency connection with the City of Glendale. Additionally, CVWD will be completing a second emergency interconnection with the City of Los Angeles by the end of 2011. This would supply an additional 1.9 million gallons per day. The available supply of imported water exceeds CVWD's highest historical and projected daily demand.

Table 3-11 shows the impact in acre-feet per year that water quality would have on supply.

Table 3-11: Water Quality – Current and Projected Water Supply Impacts (AFY)

Water Source	2010	2015	2020	2025	2030	2035-opt
Imported	0	0	0	0	0	0
Local	0	0	0	0	0	0

3.4.3. Normal-Year Reliability Comparison

CVWD has entitlements and/or written contracts to receive imported water from Metropolitan via the regional distribution system. Although pipeline capacity rights do not guarantee the availability of water, per se, they do guarantee the ability to convey water when it is available to the Metropolitan distribution system. All imported water supplies assumed in this section are available to CVWD from existing water transmission facilities. Table 3-12 shows supply and demand under normal year conditions. Water supplies are projected to be available from Metropolitan; however, it is not included here since projected supplies meet projected demands.

Table 3-12: Projected Normal Water Supply and Demand (AFY)

	2015	2020	2025	2030	2035
Total Demand	5,250	5,575	5,690	5,810	5,940
Verdugo Basin GW	3,294	3,294	3,294	3,294	3,294
Imported	1,956	2,281	2,396	2,516	2,646
Total Supply	5,250	5,575	5,690	5,810	5,940

3.4.4. Single Dry-Year Reliability Comparison

CVWD has documented that it is 100% reliable for single dry year demands from 2015 through 2035 with a demand increase of 10.4% using FY 2006-07 as the single dry year. Table 3-13 compiles supply and demand projections for a single dry water year. The available imported supply is greater than shown; however, it is not included because all demands are met.

Table 3-13: Projected Single-Dry Year Water Supply and Demand (AFY)

	2015	2020	2025	2030	2035
Total Demand	5,796	6,155	6,282	6,414	6,558
Verdugo Basin GW	3,294	3,294	3,294	3,294	3,294
Imported	2,502	2,861	2,988	3,120	3,264
Total Supply	5,796	6,155	6,282	6,414	6,558

3.4.5. Multiple Dry-Year Reliability Comparison

CVWD is capable of providing their customers all their water demands with significant reserves in multiple dry years from 2015 through 2035 with a demand increase of 10.4% using FY 1998-99 as the first multiple dry year, 8.3% using FY 1999-00 as the second multiple dry year, and 0% using FY 2000-01 as the third multiple dry year. This is true even if the demand projections were to be increased by a large margin. Table 3-14 shows supply and demand projections under multiple dry year conditions.

Table 3-14: Projected Multiple Dry Year Period Supply and Demand (AFY)

		2015	2020	2025	2030	2035
First Year Supply	Total Demand	5,796	6,155	6,282	6,414	6,558
	Verdugo Basin GW	3,294	3,294	3,294	3,294	3,294
	Imported	2,502	2,861	2,988	3,120	3,264
	Total Supply	5,796	6,155	6,282	6,414	6,558
Second Year Supply	Total Demand	5,686	6,038	6,162	6,292	6,433
	Verdugo Basin GW	3,294	3,294	3,294	3,294	3,294
	Imported	2,392	2,744	2,868	2,998	3,139
	Total Supply	5,686	6,038	6,162	6,292	6,433
Third Year Supply	Total Demand	5,250	5,575	5,690	5,810	5,940
	Verdugo Basin GW	3,294	3,294	3,294	3,294	3,294
	Imported	1,956	2,281	2,396	2,516	2,646
	Total Supply	5,250	5,575	5,690	5,810	5,940

4. Demand Management Measures

4.1. Overview

Water conservation, often called demand-side management, can be defined as practices, techniques, and technologies that improve the efficiency of water use. Such practices are referred to as Demand Management Measures (DMM). Increased efficiency expands the use of the water resource, freeing up water supplies for other uses, such as population growth, new industry, and environmental conservation.

The increasing efforts in water conservation are spurred by a number of factors: growing competition for limited supplies, increasing costs and difficulties in developing new supplies, optimization of existing facilities, delay of capital investments in capacity expansion, and growing public support for the conservation of limited natural resources and adequate water supplies to preserve environmental integrity.

CVWD recognizes the importance of water conservation and has made water use efficiency an integral part of water use planning. DMM as defined by the Act correspond to the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs). CVWD is currently implementing all applicable DMMs described in the Act. While, CVWD is not a signatory to Memorandum of Understanding regarding Urban Water Conservation in California and is not a member of CUWCC, CVWD is actively participating in many water conservation activities. CVWD is planning to be in compliance with the CUWCC's BMPs by 2015.

This section of the UWMP satisfies the requirements of § 10631 (f) & (j). It describes how each DMM is being implemented by CVWD and how CVWD evaluates the effectiveness of the DMMs implemented. This section also provides an estimate of existing conservation savings where information is available.

4.2. Water Use Efficiency Programs

CVWD actively participates in various Metropolitan residential and CII rebate programs, as well as local school and public education and outreach programs. CVWD also works cooperatively with FMWD, its regional wholesaler for technical and financial support needed to implement the DMMs.

Moreover, a Water Conservation Ordinance was adopted by CVWD Board of Directors in 2009 to reduce consumption and prohibit wasting water for all water-users within CVWD. This ordinance is described in more detail under Section 4.2.13.

Table 4-1 provides an overview of CVWD’s DMM program status and Table 4-2 provides CVWD’s Water Conservation Program budget for FY 2009-10.

Table 4-1: CVWD’s Demand Management Measures Overview

Demand Management Measure (DMM)	DMM Status		
	Past	Current	Future
Residential Water Surveys		X	
Residential Plumbing Retrofits		X	
System Water Audits, Leak Detection and Repair		X	
Metering with Commodity Rates		X	
Large Landscape Conservation Programs		X	
High-Efficiency Washing Machine Rebates		X	
Public Information Programs		X	
School Education Programs		X	
Commercial, Industrial and Institutional Programs		X	
Wholesale Agency Assistance		N/A	
Conservation Pricing		X	
Conservation Coordinator		X	
Water Waste Prohibition		X	
Residential ULFT Replacement Programs	X		

Table 4-2: CVWD’s Water Use Efficiency Programs Budget for FY 2010-11

DMM	Program Description	Budget
DMM 1	Water Audits	\$6,000
DMM 2	Water Conservation Promotional items	\$7,000
DMM 5	Turf Replacement Program	\$25,000
DMM 5	Synthetic Turf Project	\$2,500
DMM 5	Water Conservation Garden signs, plant tags, and walkway makeover	\$1,500
DMM 5	Water Conservation classes	\$2,500
DMM 6	Supplemental Rebates for Washers	\$5,000
DMM 7	Pipeline Newsletter	\$9,000
DMM 7	Water Conservation Signs (Alert Sign Re-do's)	\$3,000
DMM 7	Water Conservation Brochures and Materials	\$11,000
DMM 7	Community Activities Booths and Registration and supplies	\$6,500
DMM 8	School Program (Water where did you go) K-6 assembly	\$5,850
DMM 8	Water Conservation books for Schools and Library	\$2,500
DMM 14	HET Toilet Rebates for General Community	\$10,000
Others	Rain Barrel Rebate	\$2,250
Others	Waterless Carwash rebate	\$1,500
Others	Fire Department Waterless Carwash set-up	\$1,300
Others	Water Conservation Intern Program	\$15,000
	Total	\$117,400

4.2.1. DMM 1: Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

CVWD offers formal water audits for qualified residents (those using over 22 units of water per billing period). There is a budget limit of \$6,000 per year which covers 48 audits. The service is performed by a contractor, WaterWise Consulting. At the present time it is CVWD’s intention to outsource water audits. The firm WaterWise is available to take over this program and a copy of the survey form is attached as Appendix C. In addition to audits, CVWD’s customer service staff responds to residential and commercial requests for investigation of high water bills. The investigation consists of meter leak tests, meter accuracy testing, property leak checks, irrigation system analysis, or complete “on-premises” water audit. A water bill adjustment is given to all customers who demonstrate that they have repaired an on-site leak along with proof of the repair. This appears to be an effective water conservation measure although savings cannot be quantified until audit forms are developed and utilized.

In addition, CVWD's utility billing software identifies customers that exceed a higher-than-normal usage threshold in a given billing period, which prompts staff to further investigate as described above. Staff costs for this included measure are part of customer service duties.

CVWD also participates in various FMWD/Metropolitan programs aimed at increasing landscape water use efficiency for residential customers, including rebate programs which provide financial incentives for residential customers to purchase weather-based irrigation controllers (WBIC), rotating nozzles, and replace turf grass with, native/drought tolerant plants, and/or permeable paving. These devices have the potential to save 37 gallons per day per residence for WBIC, 3.6 gallons per day per rotating nozzle, and 0.125 gallons per day per square foot of turf grass replaced.

Between 2004 and 2010, 300 WBIC and 198 rotating nozzles rebates were given out to residential customers representing a combined life time water savings of 128 AF. Between 2008 and 2010, 93,000 sq. ft. of turf grass was replaced by synthetic turf, native/drought tolerant plants, and/or permeable paving translating to a savings of 13 AFY or a life time savings of 130 AF.

4.2.2. DMM 2: Residential Plumbing Retrofit

CVWD participates in the distribution of low-flow showerheads, aerators, hose shut-offs nozzles, water buckets and toilet-tank leak detection kits at its customer service counter and various local outdoor events. Assuming each device saves 3 gallons per day, approximately 3.4 AF are saved annually.

Additionally, CVWD through FMWD/Metropolitan offered rebates for ultra low-flush toilet (ULFT). Between 2004 and 2009, a total of 515 ULFTs were distributed under this program to single-family and multi-family homes within CVWD's service area representing a cumulative water savings of 68 acre-feet. The high efficiency toilet (HET) rebate program has since replaced the ULFT program as discussed under Section 4.2.14 DMM 14.

CVWD also works with the local building/planning departments of the City of La Canada Flintridge, City of Glendale, and County of Los Angeles to assure enforcement of the ULFT installation requirements for new construction, and supports the prohibition of sale of toilets using more than 1.6 gallons per flush. Developer's needs for fire-flow certificates, "will-serve" certificates, and ultimately water service connections are used as ways to insure compliance.

4.2.3. DMM 3: System Water Audits, Leak Detection and Repair

CVWD monitors water loss in its distribution system on an annual basis. It is CVWD’s highest priority to repair all known distribution system and service connection leaks immediately. In the past five years, non-revenue water averaged 7.4%.

A significant portion of non-revenue water could be attributed to meter inaccuracy. CVWD has embarked on a meter replacement program to replace all meters installed prior to 1990. Approximately, 2,300 meters are still to be replaced. Due to financial considerations, the automatic meter reading (AMR) project has been placed on hold. It is CVWD’s plan to install an AMR system within the next five years with Board approval. CVWD will begin replacing meters again in budget year 2011/2012 with an AMR universal meter. The proposed AMR system will assist CVWD in leak detection on the customer's side of the meter.

It appears that distribution system leaks are the most-likely culprit for loss water. CVWD has and will be continuing on its water main replacement program and is planning on a 20-year schedule to replace its deficient pipelines. CVWD prioritize its pipe replacement program by leak history, pipe size, fire-flow rates, and age. CVWD will be completing a new water master plan that will further address deficiencies in the system.

CVWD has not developed a formal methodology to estimate the water savings attributable to this DMM. There are, however, real water savings as a result of the proactive pre-screening leak detections and repair program which maintains an acceptable non-revenue water of 7%.

4.2.4. DMM 4: Metering with Commodity Rates

All utility water accounts are metered and billed monthly based on commodity rates. CVWD has a commodity rate structure based upon a billing unit of 1,000 gallons, commonly abbreviated as Kgal. A new four-tier water rate structure replaced the flat rate structure (\$3.32 per Kgal plus a monthly fixed charge based upon meter size) in 2008. The new rate structure is a four-tier increasing block rate (Table 4-3).

Table 4-3: CVWD’s Four-Tier Water Rate Structure

Single Family	Water Use Range:	Local Cost:	FMWD Cost:	Total Unit Cost:
Tier 1	0 - 10 units	\$1.70/unit	\$1.90/unit	\$3.60/unit
Tier 2	11-33 units	\$2.63/unit	\$1.90/unit	\$4.53/unit
Tier 3	34-50 units	\$4.05/unit	\$1.90/unit	\$5.95/unit
Tier 4	50 + Units	\$5.55/unit	\$1.90/unit	\$7.45/unit

Table 4-4: CVWD’s Irrigation Usage Charge

	Water Use Range:	Local Cost:	FMWD Cost:	Total Unit Cost:
Tier 1	0 - 70 units	\$2.63/unit	\$1.90/unit	\$4.53/unit
Tier 2	71 + units	\$5.55/unit	\$1.90/unit	\$7.45/unit

CVWD offers a senior-low income 20% discount on all water/sewer bills where the single family dwelling account holder meets specific age and annual income criteria.

4.2.5. DMM 5: Large Landscape Conservation Programs and Incentives

CVWD supports large landscape conservation through FMWD/Metropolitan’s regional programs including:

Save Water Save A Buck Rebate Program – As a member agency of FMWD, CVWD takes part in the Save Water Save a Buck Rebate Program which offers financial incentives to CII customers who purchase approved Weather Based Irrigation Controllers (WBICs) and rotating nozzles.

Turf Removal Program – On behalf of its member agencies, FMWD provides matching incentives for customers to replace turf grass with synthetic turf, drought tolerant/native plants, and permeable paving. CVWD provides a rebate of \$0.50 per square foot of turf removed up to \$800. The same amount of rebate is provided for drought tolerant plants and permeable paving. CVWD’s participation in the turf grass removal rebate program resulted in the installation of 93,000 sq. ft. of synthetic turf representing 13 AFY of savings or a lifetime savings of 130 acre-feet.

California Friendly Landscape Training – On behalf of its member agencies, FMWD supports Metropolitan’s California Friendly Landscape Training, which provides education to residential homeowners and professional landscape contractors on a variety of landscape water-use efficiency practices they can employ. These classes are hosted by Metropolitan’s member agencies to encourage participation across the county. The Professional Training Program course consists of four consecutive classes in landscape water management, each building upon principles presented in the preceding class. Each participant receives a bound handbook containing educational materials for each class. These classes are offered throughout the year and taught in both English and Spanish languages.

In addition, CVWD takes advantage of regional and local efforts which target and market to large landscape properties using bill inserts and direct marketing efforts.

CVWD also sponsors two to three independent water efficient gardening classes per year. Topics include turf removal, design, placement, irrigation, plant selection, composting, gardening with worms, and efficient watering practices.

4.2.6. DMM 6: High-Efficiency Washing Machine Rebate Programs

Starting in 2002, CVWD passed along Metropolitan's high efficiency washing machine rebate. CVWD promotes the program on its website, through its bi-monthly news publication and has flyers posted at the administration office and distributed at local events.

Residents in CVWD's service area are eligible to receive a \$135 rebate when they purchase a new High Efficiency Clothes Washer (HECW) as CVWD supplements Metropolitan's rebate. Rebates are available on a first-come, first-served basis, while funds last. Participants must be willing to allow an inspection of the installed machine for verification of program compliance. To qualify for a rebate, the HECW must have a water factor of 4.0 or less. An HECW with a water factor of 4 will use approximately 15 gallons of water per load compared to a conventional top-loading clothes washer which can use 40 gallons or more per load. Depending on use, these machines can save 10,000 gallons of water per year. Participants are encouraged to contact their local gas and/or electric utility as additional rebates may be available. Between 2004 and 2010, CVWD has given out 556 high-efficiency washing machine rebates to its customers. This equates to a water savings of 48 acre-feet to date.

4.2.7. DMM 7: Public Information Programs

CVWD provides water conservation literature, brochures, posters, landscape advice and tips, home water conservation devices etc., directly to the public and its customers. These materials are available at CVWD's Administrative Office and during special events. CVWD also maintains a library of water resource education conservation films and videos for loan to local organizations. Metropolitan will also provide speakers to various groups upon requests.

Table 4-5 shows past, current, and planned public information programs within CVWD's service area from 2006-2015.

Table 4-5: Public Information Programs

Actual	2006	2007	2008	2009	2010
Paid Advertising	Yes	Yes	Yes	Yes	Yes
Public Service Announcement	Yes	Yes	Yes	Yes	Yes
Bill Inserts/Newsletters/Brochures	Yes	Yes	Yes	Yes	Yes
Bill Showing Water Usage in Comparison to Previous Year's Usage *	No	Yes	Yes	Yes	Yes
Demonstration Gardens	Yes	Yes	Yes	Yes	Yes
Special Events, Media Events	No	Yes	Yes	Yes	Yes
Speaker's Bureau	No	No	No	Yes	Yes
Program to Coordinate with Other Government Agencies, Industry and Public Interest Groups and Media	No	Yes	Yes	Yes	Yes

Planned	2011	2012	2013	2014	2015
Paid Advertising	Yes	Yes	Yes	Yes	Yes
Public Service Announcement	Yes	Yes	Yes	Yes	Yes
Bill Inserts/Newsletters/Brochures	Yes	Yes	Yes	Yes	Yes
Bill Showing Water Usage in Comparison to Previous Year's Usage	Yes	Yes	Yes	Yes	Yes
Demonstration Gardens	Yes	Yes	Yes	Yes	Yes
Special Events, Media Events	Yes	Yes	Yes	Yes	Yes
Speaker's Bureau	Yes	Yes	Yes	Yes	Yes
Program to Coordinate with Other Government Agencies, Industry and Public Interest Groups and Media	Yes	Yes	Yes	Yes	Yes

Currently, CVWD does not have a method to evaluate the water savings attributable to this DMM, however, CVWD will continue to administer this DMM for its ability to educate and interact with customers.

4.2.8. DMM 8: School Education Programs

All of CVWD's schools fall under the Glendale Unified School District. Glendale Water and Power (GWP) has made a strong commitment to support educational excellence in the Glendale Unified schools. With this in mind, GWP provides "LivingWise", a water and energy classroom program to sixth grade students in both public and private Glendale schools. Since the program began in 2001, more than 80 teachers and more than 6,000 Glendale students have participated in this successful project.

The program was created by a group of teachers for the National Energy Foundation. It is a comprehensive set of 17 hands-on learning activities that use science and other core subjects so that "LivingWise" means being "water wise", "energy wise", and making "wise decisions to protect the environment.

Each teacher and student receives a LivingWise 86 page workbook and a kit filled with such items as low-flow showerheads, kitchen faucet aerators and toilet leak detection tablets as well as an energy efficient nightlight, a fluorescent light bulb and a CD-Rom computer disk with a "conservation entertainment experience". Because many of the lessons require the students to complete an activity at home, parents and other family members learn conservation practices right along with their students. At the end of the program, the students practice what they have learned by installing the water and energy saving kit items in their homes.

In addition to Glendale's program, CVWD offers to speak and conduct hands on activities in the classroom using Admiral Splash and other water related materials. Admiral Splash, which is produced by Metropolitan, is geared towards the fourth and fifth grades. Incorporating lessons in geography and science, students learn about the water cycle, water conservation, urban water run-off and water pollution.

CVWD also sponsors school assemblies from "Shows that Teach". Shows that Teach offer different lessons that always include water conservation, but are geared towards, the water cycle, water runoff, water quality, and water supplies and distribution systems. Each elementary school in CVWD's service area is invited to participate every-other-year.

Currently, CVWD does not have a method to evaluate the water savings attributable to this DMM, however, CVWD will continue to administer this DMM for its ability to educate and interact with customers.

4.2.9. DMM 9: Conservation Programs for Commercial, Industrial and Institutional Accounts

CVWD has a relatively small number of commercial (330) accounts and no industrial accounts. The vast majority of businesses within CVWD do serve as small mom and pop

shops or local restaurants. CVWD currently offers financial incentives under Metropolitan’s Save Water Save A Buck Rebate Program which offers rebates for various water efficient devices to some CII customers.

Save Water Save a Buck – This program began in 2002 and offers rebates to assist CII customers in replacing high-flow plumbing fixtures with low-flow fixtures. Rebates are available only on those devices listed in Table 4-6 below and must replace higher water use devices. Installation of these devices is the responsibility of each participant. Participants may purchase and install as many of the water saving devices as are applicable to their site in accordance with the program as described below.

Table 4-6: Retrofit Devices and Rebate Amounts Available Under Save Water Save a Buck Program

Retrofit Device	Rebate Amount
High Efficiency Toilet	\$50
Ultra-Low-Water or Zero Water Urinal	\$200
Connectionless Food Steamers	\$485 per compartment
Air-Cooled Ice Machines (Tier III)	\$300
Cooling Tower Conductivity Controller	\$625
pH / Conductivity Controller	\$1,750
Dry Vacuum Pumps	\$125 per HP
Water Pressurized Broom	\$110
Weather Based Irrigation Controller and Computer Irrigation Controller	\$25 per station
Rotating Nozzles for Pop-up Spray Head Retrofits	\$3 (minimum of 25 per rebate)
Large Rotary Nozzles	\$7 (minimum of 8 sets per rebate)

CVWD also provided a list of restaurants to Metropolitan for retrofit of a pre-rinse spray valve. In 2004, 12 local restaurants had pre-rinse spray valves installed within their establishment.

Due to very limited number of CII customers, CVWD has no formal plans to initiate an active CII replacement program beyond the programs that Metropolitan offers.

4.2.10. DMM 10: Wholesale Agency Programs

CVWD is a retail water agency. Therefore, this DMM does not apply. CVWD is a member agency of FMWD. FMWD provides financial incentives or equivalent resources, as appropriate and beneficial to distributing retail agencies, to advance water conservation efforts and effectiveness.

4.2.11. DMM 11: Conservation Pricing

All of CVWD's utility water accounts are metered and billed monthly based on commodity rates. CVWD has a commodity rate structure based upon a billing unit of 1,000 gallons, commonly abbreviated as Kgal. A new four-tier water rate structure replaced the flat rate structure (\$3.32 per Kgal plus a monthly fixed charge based upon meter size) in 2008. The new rate structure is a four-tier increasing block rate as summarized in Section 4.2.4 above.

CVWD operates a domestic sewage collection system for its customers. CVWD's sewer service rates are a fixed (non-commodity) monthly fee for residential customers but are based upon water usage for commercial customers (commodity-based). Schools are charged for sewer service based upon average daily attendance (indirect commodity based).

CVWD does offer a water conservation pricing incentive to any sewer customer sector. A 10% discount off the customer's monthly sewer fees are applied in a bi-monthly billing period where the residential or commercial account water used that period are at 12 billing units or less ($\leq 12,000$ gallons). There is currently no accurate method to assess the water savings being accomplished by this DMM.

CVWD has not conducted an evaluation of the water savings attributable to this DMM, however, CVWD will continue to make customers aware of the rate structure and use it as a tool to affect water conservation. CVWD also has plans to establish a new sewer rate structure that would provide further conservation incentive to customers.

Table 4-7 below provides a summary of CVWD's water and sewer rate structures.

Table 4-7: Conservation Pricing

RETAILERS			
Residential		Water	Sewer
Water Rate Structure- Tiered Rates: Tier 1 – 1-10 units (unit=1,000 gals) Tier 2 – 11-33 units Tier 3 – 34-50 units Tier 4 – 51 units and above	\$3.60 \$4.53 \$5.95 \$7.45	Sewer Rate Structure	\$27.50/mo.
Year Rate Effective	01/2011	Year Rate Effective	01/1/2010
Commercial			
Water Rate Structure	\$4.53 per unit	Sewer Rate Structure	Based on water use
Year Rate Effective	01/2011	Year Rate Effective	01/01/2010
Industrial			
Water Rate Structure	NA	Sewer Rate Structure	
Year Rate Effective		Year Rate Effective	
Institutional/Government			
Water Rate Structure	\$4.53 per 1000 gals	Sewer Rate Structure	Based on use
Year Rate Effective	01/2011	Year Rate Effective	01/1/2010
Irrigation			
Water Rate Structure -Tiered Rates: Tier 1 – 1-70 units Tier 2 – 70 units and above	\$4.53 \$7.45	Sewer Rate Structure	NA
Year Rate Effective	01/2011	Year Rate Effective	NA
Other			
Water Rate Structure for Primary Schools (based on ADA)	\$4.53 per 1000 gals 01/2011	Sewer Rate Structure Effective 01/2010	\$66.00 / 100 students
Water Rate Structure for Jr. High and High Schools (based on ADA)	\$4.53 per 1000 gals 1/2011	Sewer Rate Structure Effective 01/2010	\$132.10 / 100 students
WHOLESALERS			
Water Rate Structure	NA	Sewer Rate Structure	NA
Year Rate Effective	NA	Year Rate Effective	NA

4.2.12. DMM 12: Water Conservation Coordinator

CVWD created a Program Specialist position in 2003. The Program Specialist's duties include coordination work related to water quality, conservation, education, public outreach, safety, and environmental reporting. A Water Conservation Specialist position was added in 2008 to provide administrative support to CVWD's water use efficiency programs.

4.2.13. DMM 13: Water Waste Prohibition

CVWD adopted its updated Water Conservation Program as part of CVWD's Rules and Regulations in April 2010. The Rules and Regulations specify water waste prohibitions for five stages – 1) Normal, 2) Increased Voluntary, 3) Extraordinary, 4) Rationing, and 5) Critical. Prohibitions apply to the following:

- Water hose usage
- Overspray and runoff
- Decorative fountains, similar structures, and swimming pools
- Leaks
- Hand watering
- Vehicle washing
- Construction water restrictions
- Use of fire hydrants
- Drinking water upon requests (at hotels, restaurants, etc)
- Pre-rinse spray valves
- Posting of CVWD's water conservation policy notice at the one hotel located in CVWD's service area
- Landscape irrigation
 - Irrigation times
 - Irrigation days

In non-emergency times, CVWD Rules & Regulations contain a Water Waste Prohibition Policy allowing termination of water service to customers who do not comply with a notice to remedy their wasteful practice. Additionally, the Rules and Regulations contain a leak repair policy whereby a financial incentive (one-time bill adjustment) is provided for customers who promptly fix internal plumbing leaks. The aforementioned sections of the Rules & Regulations are included in Appendix C.

Finally, the Water Conservation Specialist works cooperatively with property owners to reduce water waste. CVWD's billing software automatically flags high usage thresholds from meter reading data for additional staff follow-up. Also, CVWD's field staff reports all visible water waste situations observed to Customer Service for additional follow-up by CVWD's Water Conservation Specialist.

CVWD has not conducted an evaluation of the water savings attributable to this DMM.

4.2.14. DMM 14: Residential Ultra-Low-Flush Toilet Replacement Programs

CVWD, in concert with FMWD and Metropolitan, has an agreement for participation in a Residential ULFT Retrofit and a CII Retrofit Incentive Project that lasted through June 2009.

A new program offered by FMWD, through Metropolitan offers rebates for HETs (1.28 gallons per flush) for both residential and CII customers. The ULFT portion of this program concluded in June 2009.

CVWD is currently supplementing the rebate amount for HET's adding an additional 50% to the dollar amount.

Between 2004 and 2010, 515 ULFTs and 614 HETs have been installed within CVWD's service area representing a combined water savings of 72 acre-feet to date.

5. Water Supplies Contingency Plan

5.1. Overview

Recent water supply challenges throughout the American Southwest and the State of California have resulted in the development of a number of policy actions that water agencies would implement in the event of a water shortage. In Southern California, the development of such policies has occurred at both the wholesale and retail level. This section describes new and existing policies that Metropolitan, FMWD and CVWD have in place to respond to water supply shortages, including a catastrophic interruption and up to a 50% reduction in water supply.

5.2. Shortage Actions

5.2.1. Metropolitan

As an importer of water from multiple sources, including both the Colorado River and Sierra Nevada Mountain runoff, a number of water supply challenges have impacted the reliability of Metropolitan's imported supplies. In response to these challenges, Metropolitan has implemented existing policies as well as developed new ones.

The first action that Metropolitan implements in the event of a water shortage is the suspension and/or reduction of its interruptible supplies, which are supplies sold at a discount in return for the buyers agreeing to be the first to be cutback in the event of a shortage. Metropolitan currently has two interruptible programs for agricultural users and groundwater replenishment, under which supplies were either suspended or reduced in 2007.

Additionally, in preparation for the possibility of being unable to meet "firm demands" (non-interruptible supplies) of its member agencies, in February 2008, Metropolitan's Board of Directors (Board) adopted the Water Supply Allocation Plan (WSAP), which was subsequently updated in June 2009.

Metropolitan's plan includes the specific formula for calculating member agency supply allocations and the key implementation elements necessary for administering an allocation. Metropolitan's WSAP is the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and is part of Metropolitan's 2010 RUWMP.

Metropolitan's WSAP was developed in consideration of the principles and guidelines described in Metropolitan's 1999 Water Surplus and Drought Management Plan

(WSDM), with the objective of creating an equitable needs-based allocation. The plan's formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50%. The formula takes into account: impact on retail customers and the economy; growth and population; changes in supply conditions; investments in local resources; demand hardening aspects of non-potable recycled water use; implementation of conservation savings program; participation in Metropolitan's interruptible programs; and investments in facilities.

The formula is calculated in three steps: base period calculations, allocation year calculations, and supply allocation calculations. The first two steps involve standard computations, while the third step contains specific methodology developed for the WSAP.

Step 1: Base Period Calculations – The first step in calculating a water supply allocation is to estimate water supply and demand using a historical-based period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the three most recent non-shortage years, 2004-2006.

Step 2: Allocation Year Calculations – The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies.

Step 3: Supply Allocation Calculations – The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. Each element and its application in the allocation formula are discussed in detail in Metropolitan's WSAP.

In order to implement the WSAP, in April each year, the Metropolitan Board makes a determination on the level of the regional shortage, based on specific criteria. If it is determined that allocations are necessary, they go into effect in July for that year and remain for a 12-month period, although the schedule is at the discretion of Metropolitan's Board.

Metropolitan's 2010 RUWMP forecasts that Metropolitan will be able to meet projected firm demands throughout the forecast period from 2015 to 2035. However, these projections do not mean that Metropolitan would not implement its WSAP during this period.

5.2.2. Foothill Municipal Water District (FMWD)

FMWD's shortage action plan mirrors Metropolitan's plan with three exceptions. The first exception is, since FMWD does not take delivery of any Interim Agricultural Program water, reference to those deliveries has been deleted.

The second exception is the adjustment for conservation credits. In Metropolitan's plan, an adjustment is made for demand hardening due to both active conservation and plumbing-code based conservation. This adjustment is calculated through an accounting model using estimates of various conservation factors. Metropolitan is unable to calculate this adjustment to the sub-agency level such as CVWD. FMWD does not have this type of model, and it would be expensive to create one. As a solution, the rebates that FMWD has provided to agencies in 2004, 2005 and 2006 are used as the basis for the adjustment. FMWD's conservation credit is allocated to each sub-agency based on the proportion of conservation credits each agency received in comparison to the total in 2004, 2005 and 2006.

The third exception is due to the way the water is allocated. Without a further adjustment, total water allocated to FMWD's member agencies will never match the total water allocated to FMWD. Thus, an adjustment has been added to prorate the difference between the amount allocated to FMWD by Metropolitan and the initial allocation by FMWD.

Additionally, FMWD will reconcile over use and under use of member agency allocations at the same time that Metropolitan does, typically at the end of every 12 months. Any allocation that is under used by FMWD's agencies will be pooled together in one pot to be distributed to those agencies that over use their allocation. The agencies taking any of that pooled water will be charged the regular FMWD Tier 1 or Tier 2 rate for having taken the water plus 50% of Metropolitan's penalty rate. Any penalties assessed would go into FMWD's Water Resource and Conservation Fund. Once the pooled water is used, agencies will pay the FMWD Tier 1 or Tier 2 rate for taking the water plus 100% of the Metropolitan penalty rate.

5.2.2.1. Supply Allocation Formula Elements

The following are the elements of Metropolitan's allocation formula:

Base Period – A three-year average of historical water use utilizing calendar years 2004, 2005 and 2006 will be used. Water use is divided into three components: total retail demand, locally produced water and imported water.

Growth Adjustment – Retail demands are adjusted for growth between the base period and the time of allocation based on county level estimates of average annual growth in

population. Agencies have an option to use weighted average population and job growth instead based on an appeal process to Metropolitan.

Local Supply Adjustment – Gains and losses in local supply from the base period used and the time of allocation would be made if approved by Metropolitan.

Extraordinary Increases in Local Supply – These increases are previously unscheduled water transfers or groundwater overproduction. Only a portion of these increases would count in the base period local production. This portion would be tied to the Regional Shortage Level and is calculated in such a manner to ensure that agencies are not discouraged from producing or developing these extraordinary increases.

Conservation Savings – An adjustment is made for demand hardening due to active conservation based on rebates provided by FMWD in 2004, 2005 and 2006. The conservation credit FMWD receives is allocated to agencies based on the proportion of conservation credits each agency received in comparison to the total in 2004, 2005 and 2006.

Conservation Rate Structure – This plan defines a conservation rate structure as one in which there is at least two tiers of volumetric water rates with a price differential between the top and bottom tiers of at least 10%. Agencies may receive .5% of an adjustment on the appropriate portion of the base period retail demand by submitting documentation showing proof of this rate structure and the amount of retail demand covered by the rate structure. FMWD will submit the documentation to Metropolitan. Once Metropolitan approves the adjustment, FMWD will pass it through to the appropriate retail agency.

Regional Shortage Percentage – This is the percentage of shortage between supplies and demands and will be declared by Metropolitan’s Board.

Wholesale Minimum Allocation – This is the first step in the formula and provides the minimum imported water allocation. It is set at one and a half times the Regional Shortage Percentage, meaning no agency can be allocated imported water greater than one and a half times the Regional Shortage Percentage. For example, if the Regional Shortage Percentage is 20%, then no agency would receive an imported water allocation greater than a 30% reduction in imported water demands.

Retail Impact Adjustment Maximum – This adjustment occurs when a Regional Shortage is greater than 10%. It is the maximum additional allocation an agency may receive based on impacts to retail customers. Those agencies with less local supplies would receive a higher adjustment than those agencies with more local supplies. This adjustment’s maximum percentage is one-half of the Regional Shortage Percentage. For example, if the Regional Shortage Percentage is 20%, then no agency would receive an adjustment greater than 10% of its dependence of imported water.

Total FMWD Allocation – A preliminary allocation is provided to agencies based on calculations that mirror Metropolitan’s plan (except for conservation as described above). Without a further adjustment, total water allocated to FMWD’s member agencies will never match the total water allocated to FMWD. Thus, an adjustment has been added to prorate the difference between the amount allocated to FMWD by Metropolitan and the initial allocation by FMWD.

Penalty Rates – Member agency allocations would be enforced through a penalty rate structure. It is recommended that this penalty rate structure mirror Metropolitan’s ascending penalty rate block structure. This structure provides a lower penalty for minor over use of allocations, and a higher penalty for major over use of allocations.

5.2.2.2. Conservation Plan Ordinance

The FMWD Board of Directors adopted Water Conservation Plan Ordinance No. 772-0409 in April 2009. Ordinance No. 772-0409 establishes a comprehensive staged water conservation program that will encourage reduced water consumption within the FMWD through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the FMWD.

5.2.3. Crescenta Valley Water District

CVWD has adopted a Water Conservation Program. The purpose of this program is to provide water conservation regulations, in a phased approach, to minimize the effect of a shortage of water supplies on the customers of CVWD during various critical stages of a water shortage. Along with permanent water conservation requirements, CVWD’s Water Conservation Program consists of the following five stages found in Table 5-1 to respond to a reduction in potable water available to CVWD for distribution to its customers with Phase 1 conservation requirements in effect at all times unless a mandatory conservation stage has been implemented by CVWD Board of Directors.

Table 5-1: Water Supply Shortage Stages and Conditions – Rationing Stages

Stage No.	Water Supply Conditions	% Shortage
Phase 1 - Color Code “Blue” – Normal Water Conservation Alert	FMWD can meet all Member Agency Demands	0%
Phase 2 - Color Code “Green” – Increased Voluntary Water Conservation Alert	Some supplies have been impacted and customers should increase efforts to conserve	15%
Phase 3 - Color Code “Yellow” – Extraordinary Water Conservation Alert	Metropolitan Water District of Southern California is pulling water from most of its storage programs to meet demands. Extraordinary conservation is called for from customers.	30%
Phase 4 - Color Code “Orange” – Rationing Water Conservation Alert	Metropolitan Water District of Southern California has implemented its allocation plan to its member agencies.	40%
Phase 5 - Color Code “Red” – Critical Water Conservation Alert	Water supplies are only available for health and safety needs.	50%

5.3. Three-Year Minimum Water Supply

As a matter of practice, Metropolitan does not provide annual estimates of the minimum supplies available to its member agencies. As such, Metropolitan member agencies must develop their own estimates for the purposes of meeting the requirements of the Act.

Section 135 of the Metropolitan Water District Act declares that a member agency has the right to invoke its “preferential right” to water, which grants each member agency a preferential right to purchase a percentage of Metropolitan’s available supplies based on specified, cumulative financial contributions to Metropolitan. Each year, Metropolitan calculates and distributes each member agency’s percentage of preferential rights. However, since Metropolitan’s creation in 1927, no member agency has ever invoked these rights as a means of acquiring limited supplies from Metropolitan.

As an alternative to preferential rights, Metropolitan adopted the Water Shortage Allocation Plan (WSAP) in February 2008. Under the WSAP, member agencies are allowed to purchase a specified level of supplies without the imposition of penalty rates. The WSAP uses a combination of estimated total retail demands and historical local supply production within the member agency service area to estimate the firm demands on Metropolitan from each member agency in a given year. Based on a number of

factors, including storage and supply conditions, Metropolitan then determines whether it has the ability to meet these firm demands or will need to allocate its limited supplies among its member agencies. Thus, implicit in Metropolitan's decision not to implement an allocation of its supplies is that at a minimum Metropolitan will be able to meet the firm demands identified for each of the member agencies.

In order to estimate the minimum available supplies from Metropolitan for the period 2011-2013, an analysis was performed to assess the likelihood that Metropolitan would re-implement mandatory water use restrictions in the event of a 1990-92 hydrologic conditions over this period. Specific water management actions during times of water shortage are governed by Metropolitan's Water Shortage and Drought Management Plan (WSDM Plan). Adopted by the Metropolitan Board in 1999, the WSDM Plan provides a general framework for potential storage actions during shortages, but recognizes that storage withdrawals are not isolated actions but part of a set of resource management actions along with water transfers and conservation. As such, there is no specific criterion for which water management actions are to be taken at specific levels of storage. The implementation of mandatory restrictions is solely at the discretion of the Metropolitan Board and there are no set criteria that require the Board to implement restrictions. Given these conditions, the analysis relies upon a review of recent water operations and transactions that Metropolitan has implemented during recent drought.

The first step in the analysis was a review of projected SWP allocations to Metropolitan, based on historical hydrologies. As with the recent drought, potential impacts to SWP supplies from further drought and the recently implemented biological opinions are anticipated to be the biggest challenges facing Metropolitan in the coming three years.

A review of projected SWP allocations from the DWR's State Water Project Delivery Reliability Report 2009 (2009 SWP Reliability Report) was made to estimate a range of conservative supply assumptions regarding the availability of SWP supplies. The 2009 SWP Reliability Report provides estimates of the current (2009) and future (2029) SWP delivery reliability and incorporates regulatory requirements for SWP and CVP operations in accordance with USFWS and NMFS biological opinions. Estimates of future reliability also reflect potential impacts of climate change and sea level rise.

The analysis assumes a maximum SWP allocation available to Metropolitan of 2,011,500 AF and a Metropolitan storage level of 1,700,000 AF at 2010 year-end. The analysis also assumes a stable water supply from the Colorado River in the amount of 1,150,000 AF through 2015. Although the Colorado River watershed has also experienced drought in recent years, Metropolitan has implemented a number of supply programs that should ensure that supplies from this source are relatively steady for the next three years. Based on estimated "firm" demands on Metropolitan of 2.12 MAF, the annual surplus or deficit was calculated for each year of the three-year period.

A review of recent Metropolitan water management actions under shortage conditions was then undertaken to estimate the level of storage withdrawals and water transfers that Metropolitan may exercise under the 1990-92 hydrologic conditions were identified. For this analysis, it was assumed that, if Metropolitan storage levels were greater than 2 MAF at the beginning of any year, Metropolitan would be willing to take up to 600 TAF out of storage in that year. Where Metropolitan storage supplies were between 1.2 MAF and 2 MAF at the beginning of the year, it was assumed that Metropolitan would be willing to take up to 400 TAF in that year. At storage levels below 1.2 MAF, it was assumed that Metropolitan would take up to 200 TAF in a given year.

It was also assumed that Metropolitan would be willing to purchase up to 300 TAF of water transfer in any given year. For years where demands still exceeded supplies after accounting for storage withdrawals, transfer purchases were estimated and compared against the 300 TAF limit.

Table 5-2: Metropolitan Shortage Conditions

Study Year	Actual Year	SWP Allocation (%)	SWP (AF)	CRA (AF)	Total (AF)	Demand (AF)	Surplus/Shortage (AF)	Storage at YE (AF)	Transfers (AF)
2011	1990	30%	603,450	1,108,000	1,711,450	2,124,000	(400,000)	1,300,000	(12,550)
2012	1991	27%	542,820	1,108,000	1,650,820	2,123,000	(200,000)	1,100,000	(272,180)
2013	1992	26%	522,990	1,108,000	1,630,990	2,123,000	(200,000)	900,000	(292,010)

Based on the analysis above, Metropolitan would be able to meet firm demands under the driest three-year hydrologic scenario using the recent water management actions described above without re-implementing mandatory water use restrictions on its member agencies. Given the assumed absence of mandatory restrictions, the estimated minimum imported water supplies available to FMWD from Metropolitan is assumed to be equal to Metropolitan’s estimate of demand for firm supplies for FMWD, which Metropolitan uses when considering whether to impose mandatory restrictions. Thus, the estimate of the minimum imported supplies available to FMWD is 10,090 AF.

FMWD has also adopted a shortage allocation plan and accompanying allocation model that estimates firm demands on FMWD. Assuming FMWD would not be imposing mandatory restrictions if Metropolitan is not, the estimate of firms demands in FMWD’s allocation model has been used to estimate the minimum imported supplies available to each of FMWD’s member agencies for 2011-13. Thus, the estimate of the minimum imported supplies available to CVWD is 2,968 AF⁸.

As captured in its 2010 RUWMP, Metropolitan believes that the water supply and demand management actions it is undertaking will increase its reliability throughout the

⁸ FMWD Water Shortage Allocation model (2009)

25-year period addressed in its plan. Thus for purposes of this estimate, it is assumed that Metropolitan and FMWD will be able to maintain the identified supply amounts throughout the three-year period.

Metropolitan projects reliability for full service demands out to the year 2035. Based on the FMWD Water Supply Allocation Plan, CVWD is expected to fully meet demands for the next three years assuming Metropolitan and FMWD are not in shortage, and zero allocations are imposed for Imported Supplies. Normal year supplies are based on the Base Period supply in the FMWD Water Supply Allocation Plan, which is the average of the last three non-shortage calendar years 2004, 2005, and 2006. The Three Year Estimated Minimum Water Supply is listed in Table 5-3.

Table 5-3: Three-Year Estimated Minimum Water Supply (AFY)

Source	Normal (2011)	2012	2013	2014
Imported Supply	2,340	2,968	2,968	2,968
Local Supplies	3,217	2,704	2,704	2,704
<i>Total</i>	<i>5,557</i>	<i>5,672</i>	<i>5,672</i>	<i>5,672</i>

5.4. Catastrophic Supply Interruption

Given the great distances that imported supplies travel to reach the FMWD service area, the region is vulnerable to interruptions along hundreds of miles of aqueducts, pipelines and other facilities associated with delivering the supplies to the region. Additionally, CVWD’s water supply is distributed to customers through an intricate network of pipes, storage tanks and pumps that are susceptible to damage from earthquakes and other disasters.

5.4.1. Metropolitan

Metropolitan has comprehensive plans for stages of actions it would undertake to address a catastrophic interruption in water supplies through its WSDM and WSAP Plans. Metropolitan also developed an Emergency Storage Requirement to mitigate against potential interruption in water supplies resulting from catastrophic occurrences within the Southern California region, including seismic events along the San Andreas Fault. In addition, Metropolitan is working with the State to implement a comprehensive improvement plan to address catastrophic occurrences that could occur outside of the Southern California region, such as a maximum probable seismic event in the Delta that would cause levee failure and disruption of SWP deliveries. For greater detail on Metropolitan’s planned responses to catastrophic interruption, please refer to Metropolitan’s RUWMP.

5.4.2. Crescenta Valley Water District

For a sudden or catastrophic water supply interruption, CVWD has developed an Emergency Preparedness and Disaster Response Plan as required by CDHS to ensure the most effective use of its resources for the benefit and protection of facilities and employees, in addition to the preservation of a reliable water supply for its customers.

Power Outage – In the event of a power outage, CVWD maintains five (5) emergency standby power generators. One of the emergency generators is stationary and dedicated to power water supply wells and the auxiliary equipment at the Glenwood Operations Center. Three (3) emergency generators are portable and are mounted on trailers. They can be mobilized to any pump station for movement of water out of a reservoir into a higher pressure zone. Each pump station site is equipped with emergency power receptacles and transfer switches that allow personnel to hook-up the portable generators. The fourth generator is located at CVWD’s Administrative Office. CVWD also has Universal Power Supply (UPS) systems on the computer systems at the Administrative Office, the SCADA systems at the Glenwood Operations Facility and at booster station at well sites. In addition, FMWD operates standby emergency generators that could be used by CVWD.

Water Outage – In the event of a water outage, CVWD has the ability to receive water from the City of Glendale and La Canada Irrigation District through emergency water supply interconnections. In addition, CVWD will be installing a new interconnection with the City of Los Angeles, Department of Water and Power (LADWP) that should be complete by the end of 2011.

City of Glendale Interconnection:

- Glendale/CVWD Interconnection (GCI) was installed in 2004 and allows for CVWD to receive up to 5.0 cfs from Glendale.
- Glendale and CVWD also have an agreement for emergency hydrant-to-hydrant interconnections that allow CVWD to take water from Glendale or for Glendale to take water from CVWD.

La Canada Irrigation District (LCID) Interconnection:

- CVWD has an interconnection with LCID that allows CVWD to take water from LCID into CVWD's Zone 3.
- LCID has two (2) interconnections with CVWD that allows LCID to take water from CVWD into LCID westerly zones.

LADWP Interconnection:

- LADWP/CVWD interconnection allows for CVWD to receive up to 2.2 cfs and have the ability to back-feed FMWD
- FMWD also has two bypass systems that would allow them flexibility to move LADWP water in emergency situations.

CVWD is an active member of the southern region of the statewide WARNS, the Water Agency Response Network, a mutual aid coalition of water departments and agencies which allows for coordination of resources during disasters or catastrophic events.

Supplemental Water Supplies – Supplemental water supplies to help offset future shortages due to drought would be available through FMWD via Metropolitan and their WSDM. The WSDM is referenced in FMWD’s UWMP and described in detail in Metropolitan’s UWMP.

Preparation actions for possible catastrophes are listed in Table 5-4.

Table 5-4: Preparation Actions for Catastrophe

Possible Catastrophe	Preparation Actions
Regional Power Outage	<ul style="list-style-type: none"> • Emergency Preparedness and Disaster Response Plan • Standby Emergency Power Generators • Interconnections with nearby agencies. • Water Agency Response Network Membership • Supplemental Water Supplies
Earthquake	
Supply Contamination	
Terrorist Act which Interrupts Service	
Other(s)	

5.5. Prohibitions, Penalties and Consumption Reduction Methods

Prohibitions

The FMWD Water Conservation Plan Ordinance No. 772-0409 lists water conservation requirements which shall take effect upon implementation by the FMWD Board of Directors. Combined with CVWD’s Water Conservation Plan, these prohibitions shall promote the efficient use of water, reduce or eliminate water waste, complement CVWD’s Water Quality regulations and urban runoff reduction efforts, and enable implementation of CVWD’s Water Shortage Contingency Measures. Prohibitions include, but are not limited to: restrictions on outdoor watering, washing of vehicles, food preparation establishments, repairing of leaks and other malfunctions, swimming pools,

decorative water features, construction activities, and water service provisions which can be found in Table 5-5.

Table 5-5: Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Hose washing of sidewalks, walkways, driveways, or parking areas, tennis courts, patios, porches or other paved areas shall not be permitted. Exception: Flammable or other dangerous substances may be disposed of by direct hose flushing by public safety officers for the benefit of public health and safety. Businesses or schools required to hose down public eating areas will be provided with access to a water broom.	Phase 1-Color Code "Blue"
Use of water for any purpose which results in overspray, excessive runoff onto hardscapes, driveways, streets, adjacent lands or into gutters shall not be permitted.	Phase 1-Color Code "Blue"
Water used to clean, fill or maintain levels in decorative fountains or similar structures must be part of a recirculation system.	Phase 1-Color Code "Blue"
Leaks from any facility both inside and outside of a customer's premises must be repaired within seventy-two hours after the customer is notified of, or discovers the leak. Failure to affect the repair of any leak shall subject said customer to all penalties provided herein for waste of water.	Phase 1-Color Code "Blue"
No watering, sprinkling or irrigating shall take place between the hours of nine a.m. (9:00AM) and five p.m. (5:00PM) in any landscaped or vegetated areas, including, but not limited to, golf courses, parks, cemeteries and school areas landscaped with, but not limited to, grass, lawn, groundcover, shrubbery, annual and perennial plants, crops, trees, and California-friendly plantings. With the exception of drip irrigation systems or weather based irrigation controllers, residential timers shall not run for more than a total of 10 minutes per station.	Phase 1-Color Code "Blue"
Hand watering of non-turf areas is allowed using a hose with a positive shut-off nozzle or watering can within the allowable times as specified above.	Phase 1-Color Code "Blue"

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
No watering, sprinkling or irrigating shall take place in any landscaped or vegetated areas on days when the wind is blowing causing overspray, and on days when it is raining.	Phase 1-Color Code "Blue"
The washing of commercial and non-commercial privately owned automobiles, trucks, trailers, motor-homes, boats, buses, airplanes and other types of vehicles is restricted to use of a hand-held bucket and quick rinses using a hose with a positive shut-off nozzle. Exceptions: the use of wash water which is on the immediate premises of a commercial car wash or commercial service station; where health, safety and welfare of the public is contingent upon frequent vehicle cleaning, such as garbage trucks and vehicles which transport food and perishables.	Phase 1-Color Code "Blue"
Water for construction purposes including but not limited to de-brushing of vacant land, compaction of fills and pads, trench backfill and other construction uses, shall be used in an efficient manner which will not result in runoff.	Phase 1-Color Code "Blue"
The use of potable water from fire hydrants shall be limited to firefighting related activities or other activities immediately necessary to maintain the health, safety, and welfare of the residents of the city.	Phase 1-Color Code "Blue"
No restaurant, hotel, café, cafeteria or other public place where food is sold, served or offered for sale, shall serve drinking water to any customer unless expressly requested by a customer.	Phase 1-Color Code "Blue"
Hotels, motels, and other commercial lodging establishments are requested to post notices informing their guests about the city's water conservation policy and urging guests to conserve water. Water conservation notices will be provided by CVWD.	Phase 1-Color Code "Blue"
Hotels, motels and other commercial lodgings are requested to post notices giving their guests the option of not laundering towels and linens daily.	Phase 1-Color Code "Blue"
Where applicable, restaurants must utilize water conserving nozzles.	Phase 1-Color Code "Blue"
Outdoor watering only on assigned odd or even days.	Phase 2 – Color Code "Green" Phase 3 – Color Code "Yellow"

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Residential and commercial landscape irrigation is limited to no more than three (3) days per week on Tuesday, Thursday and Saturday. Watering limits are seven (7) minutes per watering station. Exempt are public areas owned or operated by School Districts or public use areas greater than 4,000 square feet.	Phase 4 -Color Code "Orange"
The filling, refilling or adding of water to indoor and outdoor pools, wading pools, or spas is prohibited. Exemptions: Commercial Repairs mandated by the Federal Virginia Graeme Baker Act, or adding water for the prevention of equipment failure is permissible, however, the District strongly urges that a cover be used to prevent evaporation and thereby reducing the frequency of refilling.	Phase 4 - Color Code "Orange"
The use of water to clean, maintain, fill, or refill decorative fountains or similar structures is prohibited. Exemptions: Adding water for the prevention of equipment failure is permissible.	Phase 4 - Color Code "Orange"
Vehicle washing is restricted to the use of a hand-held bucket and quick rinses using a hose with a positive shut-off nozzle.	Phase 4 - Color Code "Orange"
Fix leaks within 48 hours.	Phase 4 - Color Code "Orange"
All outdoor water use is prohibited	Phase 5 - Color Code "Red"
Fix any leaks within 24 hours.	Phase 5 - Color Code "Red"

Consumption Reduction Methods

Methods to reduce the use of potable water exist in all Water Shortage Levels and are listed in Table 5-6.

Table 5-6: Consumption Reduction Methods

Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Phase 1 Conservation Measures	"Blue"	0
Phase 2 Conservation Measures	"Green"	15%
Phase 3 Conservation Measures	"Yellow"	30%
Phase 4 Conservation Measures	"Orange"	40%
Phase 5 Conservation Measures	"Red"	50%

Penalties

Any customer who violates provisions of CVWD’s Water Conservation Plan Ordinance by either excess use of water or by specific violation of one or more of the applicable water use restrictions for a particular mandatory conservation stage may be cited by CVWD and may be subject to written notices, surcharges, fines, flow restrictions, service disconnection, and/or service termination which are detailed in Table 5-7.

Table 5-7: Penalties and Charges

Penalties or Charges	Stage When Penalty Takes Effect
Written Notice (Warning)	First Violation (Any Phase)
Written Notice with Description of Penalties	Second Violation (Any Phase)
Flow restrictors (With associated Fees)	Third Violation (Any Phase)
Discontinuation of water service.	Flagrant Disregard of ordinance or Multiple Violations (Any Phase)

5.6. Impacts to Revenue

CVWD has established a target reserve of funds within its annual budget that address the issue of loss revenue during a water shortage or drought situation. CVWD has a 25% rate stabilization fund since 2001 that can offset short-term loss of revenue. In the case of a long-term water shortage or drought situation, CVWD has instituted a tiered rate structure on its customers to offset the loss of revenue that will occur. Such measures are listed in Tables 5-8 and 5-9.

Table 5-8: Proposed Measures to Overcome Revenue Impacts

Name of Measures
Reserve Funds
Rate Stabilization Fund
Rate Structure Adjustment

Table 5-9: Proposed Measures to Overcome Expenditure Impacts

Name of Measures
Obtain Alternative Sources of Funding
Defer certain expenditures

5.7. Reduction Measuring Mechanism

Under normal water supply conditions, potable water production figures are recorded daily. Water Production totals are reported to the General Manager and the Management staff on a daily basis and monthly totals are incorporated into CVWD’s Water Production Report.

During any declared water shortage emergency, the General Manager and the Management staff will compare the daily water production to a maximum water supply capacity and a targeted daily production to see if the reduction goals are being met. Said daily updates will be forwarded to CVWD’s Board of Directors semi-monthly. Corrective action may be taken by the Board of Directors if reduction goals are not met.

During local water shortage emergencies due to natural disaster, production figures will be monitored daily by the General Manager, and the Management staff. Reports will be provided to the Board of Directors as necessary.

Water Use Monitoring Mechanisms are listed in Table 5-10.

Table 5-10: Water Use Monitoring Mechanisms

Mechanisms for Determining Actual Reductions	Type of Data Expected
Daily Records	Potable water production figures

6. Recycled Water

6.1. Agency Coordination

Cost-effective opportunities for using recycled water are limited due to the lack of large users or large irrigated areas within CVWD’s service area. In addition, there is presently a possible source from Glendale Water and Power, but no infra-structure is available source of such recycled water supply. This potential use of recycled water is continually assessed by CVWD, FMWD and Metropolitan.

Table 6-1: Participating Agencies

Participating Agencies	Participated
Water Agencies	FMWD, Metropolitan
Wastewater Agencies	City of Los Angeles
Groundwater Agencies	ULARA
Planning Agencies	LA County, City of Glendale

6.2. Wastewater Description and Disposal

CVWD operates a sewage collection system with approximately 6,300 connections. The system transports this wastewater outside CVWD boundaries to a regional wastewater treatment plant owned by the City of Los Angeles. CVWD pays a flow-based share of treatment and disposal costs to the City of Los Angeles and the treated effluent from the Los Angeles-Glendale Water Reclamation Plant (LAGWRP). CVWD generates approximately 550-600 million gallons of raw wastewater annually.

6.3. Current Recycled Water Uses

There are currently no recycled water uses within CVWD’s service area.

6.4. Potential Recycled Water Uses

FMWD, CVWD’s wholesale provider has initiated a Local, Reliable Water Supply Program (LRWSP) to reduce dependence on imported water supplies through development of recycled water as well as increased storm water capture and recharge and

water conservation throughout the service area. Recycled water supplies currently comprise 1% of the total water supply within the FMWD service area, which could benefit CVWD in the future. FMWD plans to develop recycled water through the construction of up to three satellite membrane bioreactor (MBR) plants as part of a Regional Water Recycling Project. Alternative means of bringing recycled water to the area are also being reviewed. Recycled water produced by these plants will be used to replace demands on potable supplies for use in greenbelt irrigation and groundwater recharge. Future recycled water development is in the planning stages currently, and the amount of additional local production is not known.

6.4.1. Direct Non-Potable Reuse

CVWD does not have the potential for direct non-potable reuse within their service area due to no existing recycled water system.

6.4.2. Indirect Potable Reuse

CVWD does not have the potential for indirect potable reuse within their service area.

6.5. Optimization Plan

Since CVWD is not using recycled water at this time, it is not practical to provide a recycled water optimization plan as part of the 2010 UWMP. CVWD is investigating receiving recycled water if it becomes available to serve some of the large development areas.

For CVWD to determine if a recycled water project is cost-effective, cost/benefit analyses must be conducted for each potential project. This raises the issue of technical and economic feasibility of a recycled water project requiring a relative comparison to alternative water supply options. Analyses indicate that capital costs of water recycling in CVWD exceed the cost of purchasing additional imported water from Metropolitan.

CVWD will continue to conduct cost/benefit analyses for various recycled water projects and seek creative solutions in coordination with Metropolitan, FMWD, and other cooperative agencies. These include solutions for funding, regulatory requirements, institutional arrangements and public acceptance.

7. Future Water Supply Projects and Programs

7.1. Water Management Tools

Resource optimization, such as local groundwater, storm water recharge and recycled feasibility studies to minimize the needs for imported water, is key for CVWD to meet future water demands.

CVWD can meet projected demands with existing facilities and distribution system. With the eventual replacement of older wells with new and more efficient wells in addition to the continued efforts in reducing water waste.

7.2. Transfer or Exchange Opportunities

CVWD relies on efforts of FMWD and Metropolitan to pursue transfer or exchange opportunities. At this time, CVWD is not currently involved in any transfer or exchange opportunities.

7.3. Planned Water Supply Projects and Programs

Groundwater Recharge

CVWD is working towards the development of the Crescenta Valley County Park Multiuse Project. This Project will allow CVWD to increase groundwater storage in the Verdugo Basin by installation and maintenance of underground infiltration galleries underneath portions of the existing park. This will be accomplished by utilizing the existing Los Angeles County flood control channels (Verdugo Wash) and surface flow within the Crescenta Valley to divert storm water during the rainy season and capturing dry weather flow to proposed underground infiltration basins within the recreational areas. The project will potentially increase the local water supply by an annual average of 340 ac-ft per year, thus enhancing CVWD's groundwater resource and reducing dependence on imported supplies. Also, through the process of capture, treatment and reuse of storm water and dry weather flow, the project would potential reduce pollutant load from contaminating the Los Angeles River.

LADWP Interconnection

In addition, CVWD will be installing a new interconnection with the City of Los Angeles, Department of Water and Power (LADWP) that should be complete by the end of 2011. LADWP/CVWD interconnection allows for CVWD to receive up to 2.2 cfs and

have the ability to back-feed FMWD. This emergency connection would be able to supply an additional 1.9 MGD.

New Wells

CVWD is planning to replace its older groundwater wells with new modern constructed wells over the ten (10) year period starting in 2015. The existing wells are between 55 to 80 years old and have reached the end of their useful life. CVWD’s current program is to perform at least two (2) well rehabilitations a year which includes cleaning the well casing with chemical treatment and installation of steel liner to extend the life of a well. As shown in Table 7-1, CVWD will start in 2015 with replacement of Well 14, which includes land acquisition, design, new piping to either the Glenwood or Mills plant, drilling of the new well and abandonment of the old well.

Table 7-1: Well Replacement Schedule

CVWD - Well Replacement Project - 2015 - 2025											
Well No.	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1		X									
2											X
5									X		
6			X								
7										X	
8						X					
9					X						
10				X							
11							X				
12								X			
14	X										

7.4. Desalination Opportunities

CVWD does not have opportunities to directly develop desalinated supplies. It does not border the ocean and cannot participate directly in ocean desalination. However, CVWD supports Metropolitan’s Seawater Desalination Program (SDP), which provides incentives to Metropolitan’s member agencies of up to \$250 per acre-foot for the production of desalinated ocean water. Although CVWD is not able to directly participate in seawater desalination, it participates indirectly by supporting Metropolitan’s program.

7.4.1. Groundwater

There are currently no brackish groundwater opportunities within CVWD's service area.

7.4.2. Ocean Water

CVWD does not border the ocean and cannot participate directly in ocean desalination opportunities.

8. UWMP Adoption Process

8.1. Overview

Recognizing that close coordination among other relevant public agencies is the key to the success of its UWMP, CVWD worked closely with other entities to develop and update this planning document. CVWD also encouraged public involvement through a holding of a public hearing to learn and ask questions about their water supply.

This section provides the information required in Article 3 of the Water Code related to adoption and implementation of the UWMP. Table 8-1 summarizes external coordination and outreach activities carried out by CVWD and their corresponding dates. The UWMP checklist to confirm compliance with the Water Code is provided in Appendix A.

Table 8-1: External Coordination and Outreach

External Coordination and Outreach	Date	Reference
Encouraged public involvement (Public Hearing)	June 7, 2011 & June 14, 2011	Appendix E
Notified city or county within supplier's service area that water supplier is preparing an updated UWMP (at least 60 days prior to public hearing)	March 3, 2011	Appendix D
Held public hearing	June 21, 2011	Appendix E
Adopted UWMP		Appendix F
Submitted UWMP to DWR (no later than 30 days after adoption)		
Submitted UWMP to the California State Library and city or county within the supplier's service area (no later than 30 days after adoption)		
Made UWMP available for public review (no later than 30 days after filing with DWR)		

This UWMP was adopted by the Board of Directors on **MONTH DAY, YEAR**. A copy of the adopted resolution is provided in Appendix F.

A change from the 2004 legislative session to the 2009 legislative session required CVWD to notify any city or county within its service area at least 60 days prior to the public hearing. CVWD sent a Letter of Notification to the County of Los Angeles, City

of Glendale, City of La Cañada Flintridge, FMWD, and ULARA on March 3, 2011 that it is in the process of preparing an updated UWMP (Appendix D).

8.2. Public Participation

CVWD has actively encouraged community participation in its urban water management planning efforts by encouraging attendance and participation in the Board of Directors public meetings held bi-monthly.

8.3. Agency Coordination

All of CVWD’s water supply planning relates to the policies, rules, and regulations of its regional and local providers. CVWD is dependent on imported water from Metropolitan via FMWD and local groundwater from the Verdugo Basin which is an adjudicated basin within the ULARA. CVWD is also a member of the Administrative Committee, which oversees the ULARA Watermaster. The Watermaster is responsible for coordinating all groundwater pumping activities within the Verdugo Basin. As such, CVWD involved these entities in the development of its 2010 UWMP at various levels of contribution as summarized in Table 8-2.

Table 8-2: Coordination with Appropriate Agencies

	Participated in Plan Development	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Copy of Draft Plan	Sent Notice of Intention to Adopt	Not Involved/No Information
FMWD	X	X	X	X	X	X	
City of Glendale	X	X	X	X	X	X	
ULARA		X		X	X	X	
City of La Canada Flintridge			X	X	X	X	
LA County						X	

8.4. UWMP Submittal

8.4.1. Review of Implementation of 2005 UWMP

As required by California Water Code, CVWD summarizes the implementation of the Water Conservation to date, and compares the implementation to those as planned in its 2005 UWMP.

Comparison of 2005 Planned Water Conservation Programs with 2010 Actual Programs

CVWD recognizes the importance of water conservation and has made water use efficiency an integral part of water use planning. CVWD is not a California Urban Water Conservation Council (CUWCC) signatory; however, it is currently implementing all 14 DMMs described in the Act. DMMs as defined by the Act correspond to the CUWCC's Best Management Practices (BMPs). For CVWD's specific achievements in the area of conservation, please see Section 4 of this Plan.

8.4.2. Filing of 2010 UWMP

The Board of Directors reviewed the Final Draft Plan on **DATE**. The five-member Board of Directors approved the 2010 UWMP on **DATE**. See Appendix F for the resolution approving the Plan.

By August 1, 2011, CVWD's Adopted 2010 UWMP was filed with DWR, California State Library, County of Los Angeles and cities within CVWD's service area.