ALBERT A. WEBB ASSOCIATES

# 2015 URBAN WATER MANAGEMENT PLAN

Prepared for

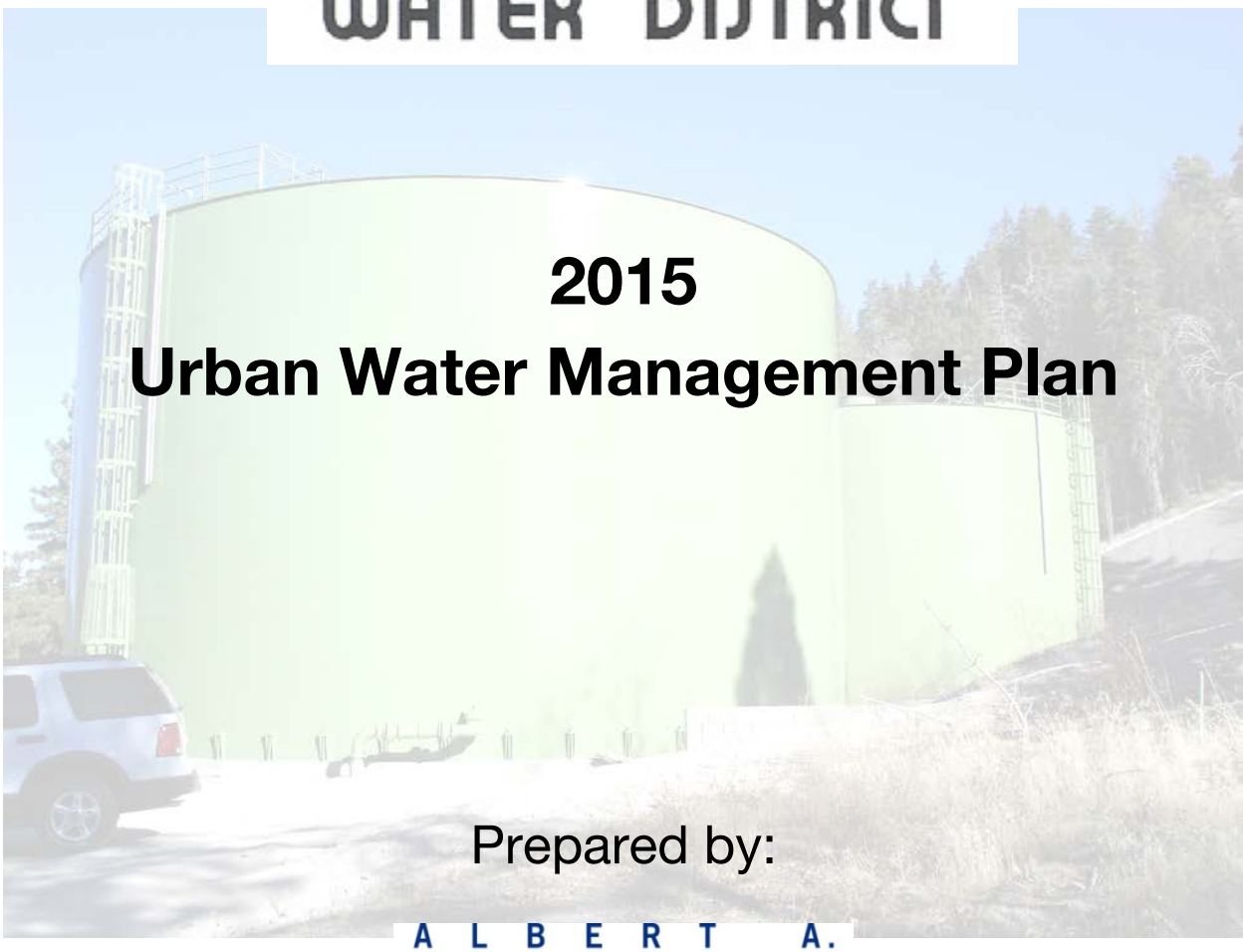
crestline village WATER DISTRICT

Adopted July 19, 2016

www.webbassociates.com

crestline village

WATER DISTRICT



# 2015
# Urban Water Management Plan

Prepared by:

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# TABLE OF CONTENTS AND ACRONYMS

## Table of Contents

## List of Charts



## List of Figures

## List of Tables

## Appendices

## Acronyms, Units of Measurement, Chemical Symbols

Acronyms, units of measurement and chemical symbols used throughout the UWMP are identified in this section.

### Acronyms

| | |
|---|---|
| ACS | American Community Survey |
| AMI | Advanced Meter Infrastructure |
| AWWA | American Water Works Association |
| BDCP | Bay Delta Conservation Plan |
| BMP | Best Management Practice |
| CASGEM | California Statewide Groundwater Elevation Monitoring |
| CCR | California Code of Regulations |
| CDP | Census Designated Place |
| CEC | California Energy Commission |
| CIMIS | California Irrigation Management Information System |
| CLAWA | Crestline-Lake Arrowhead Water Agency |
| CSD | Crestline Sanitation District |
| CUWCC | California Urban Water Conservation Council |
| CVP | Central Valley Project |
| CVWD | Crestline Village Water District |
| CWC | California Water Code |
| CWP | California Water Plan |
| DAC | Disadvantaged Community |
| DDW | Division of Drinking Water |
| DMM | Demand Management Measure |
| DWR | Department of Water Resources |
| EPA | Environmental Protection Agency |
| ERP | Emergency Response Plan |
| GAC | Granulated Activated Carbon |
| IGC | Independent Geo-Environmental Consultants |
| ILI | Infrastructure Leaking Index |
| LACSD | Lake Arrowhead Community Services District |
| LAFCO | Local Agency Formation Commission (of San Bernardino County) |
| LGWC | Lake Gregory Water Company |
| MHI | Median Household Income |
| MOU | Memorandum of Understanding |
| N/A | Not Applicable |
| NOAA | National Oceanic and Atmospheric Administration |
| PWS | Public Water System |
| PWSS | Public Water System Statistics |
| RWQCB | Regional Water Quality Control Board |
| SB | California Senate Bill |

**Acronyms**

| | |
|---|---|
| SBVMWD | San Bernardino Valley Municipal Water District |
| SGMA | 2014 Sustainable Groundwater Management Act |
| SGPWA | San Gorgonio Pass Water Agency |
| SWP | State Water Project |
| SWRCB | State Water Resources Control Board |
| THMs | Trihalomethanes |
| UWMP | Urban Water Management Plan |
| WEBB | Albert A. Webb Associates |
| WRCC | Western Regional Climate Center |
| WSCP | Water Shortage Contingency Plan |
| WUE | Water Use Efficiency |

**Units of Measurement and Chemical Symbols**

| | |
|---|---|
| AF | Acre Feet |
| AF/Yr | Acre Feet per Year |
| CCF | Hundred Cubic Feet |
| CF | Cubic Feet |
| CY | Calendar Year |
| $ET_O$ | Evapotranspiration Rate |
| °F | Fahrenheit |
| FY | Fiscal Year |
| GPCD | Gallons per Capita per Day |
| GPM | Gallons per Minute |
| MGD | Million Gallons per Day |
| R-GPCD | Residential-Gallons per Capita per Day |

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# Executive Summary

Since the adoption of the 2010 Urban Water Management Plan, the Crestline Village Water District has been successful in meeting the goals and intent of both the Urban Water Management Planning Act of 1983, and the Water Conservation Act of 2009. During the last five years, the District has accomplished the following:

- Adopt Ordinance No. 35 and Resolution No. 421 to implement the emergency State regulations for water conservation as part of the District's Water Shortage Contingency Plan;
- Replace all of the meters in the District service area and upgrade to an Advanced Metering Infrastructure system;
- Retire the debt service necessary to upgrade the water system infrastructure of the Lake Gregory area to State standards;
- Replace 130 water service laterals and 34 mainline pipes that were broken or leaking;
- Lay the groundwork for the construction of two new groundwater wells; and
- Decrease daily per capita water use approximately 21 percent since 2013.

Crestline Village Water District provides an excellent example of successful water conservation efforts in response to State drought regulations, becoming one of the top three water agencies in the Inland Empire based on percentage conserved. This Plan estimates the District's full-time 2015 population at 7,588 persons, and forecasts a growth of 1,671 additional full-time residents by 2035. Full-time residents constitute 56 percent of total connections, and the trend is anticipated to increase based on historical patterns. During 2015, 41.8 percent of water into the system was produced from District wells, with the difference purchased from the local wholesaler. Based on the growth assumptions contained herein, eight additional wells at the rate of two every five years would be needed to meet water demand over the next 20 years, assuming normal rainfall amounts. By 2035, the District's total water demand is estimated to be approximately 738 acre-feet per year, an increase of nearly 21 percent from 2015. Ongoing conservation will be necessary however, because the District water supplies from low-production fractured bedrock aquifers are contingent on precipitation. In light of future drought conditions, which decrease local well production, and spikes in water use that can vary seasonally, meeting 100 percent of Crestline Village customer water demands will continue to be predicated on assurances of ample supply of imported water purchased from the wholesale supplier, CLAWA.

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# CHAPTER 1: INTRODUCTION AND OVERVIEW

## 1.1 Background

As specified in the California Water Code (CWC) Sections §10608-10656, Urban Water Management Plans (UWMPs or Plans) are required by "urban water suppliers" pursuant to the Urban Water Management Planning Act of 1983. An "urban water supplier" may be publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually. UWMPs are intended to support long-term resource planning by urban water suppliers, and to ensure adequate water supplies are available to meet existing and future water demands.

Every urban water supplier is also required to assess the reliability of its water sources over a 20-year planning horizon, and report its progress on 20 percent reduction in per-capita urban water consumption by the year 2020, as required in the Water Conservation Act of 2009 ("SB X7-7," aka, Senate Bill 7 of the Senate's 7th Extraordinary Session). Prior to the adoption of the UWMP Act, there were no specific requirements that water agencies conduct long-term resource planning. While many water agencies conducted long-term water supply and resource planning prior to the Act, those that did not were left vulnerable to supply disruptions during dry periods or catastrophic events.

UWMPs must be updated by the urban water supplier at least once every five years and submitted to the Department of Water Resources (DWR). DWR staff then reviews the submitted plans to make sure they have completed the requirements identified in the California Water Code (CWC), Sections §10608– 10656, then submits a report to the Legislature summarizing the status of the plans.

This UWMP follows the chapter organization outlined in the DWR UWMP Guidebook (March, 2016) and utilizes data kept and maintained by Crestline Village Water District, as well as supplemental data from Crestline-Lake Arrowhead Water Agency and Crestline Sanitation District. The required UWMP tables provided by DWR are shades of blue and titled "Table 2-1," for example. The additional tables created during the writing of this report have no color and contain letters after the Table number (e.g., Table 2A). Required tables pertaining to Chapter 5 Baselines and Targets begin with "SB X7-7 Table…" and are shaded green and brown.

Albert A. Webb Associates (WEBB) is the District Engineer for Crestline Village Water District and submits this document on their behalf with their review and approval. A copy of Resolution No. 428 adopted by the CVWD Board of Directors on July 19, 2016 is provided in **Appendix L**.

## 1.2 Purpose

The Mission Statement of Crestline Village Water District (CVWD or District) states: "To provide our community with a reliable water system that delivers high quality water for its health and safety needs (Minutes, 2012)." To illustrate the CVWD service area boundary in relation to surrounding features, a regional vicinity map is provided in **Figure 1-1**, a city/community vicinity map in **Figure 1-2,** and topographic map in **Figure 1-3**. The purpose of the 2015 UWMP is to outline progress toward conservation and supply reliability goals since the 2010 UWMP was prepared (WEBB, 2013), and to outline future long-term opportunities to meet projected water demands. To be clear, the identification of future potential opportunities for water supplies in the UWMP neither commits CVWD to any stated endeavor, nor precludes them from exploring a different project that is not identified in the UWMP.

The sections of the CWC that apply to UWMPs (§10608– 10656) require water suppliers to report, describe, and evaluate:

- Water deliveries and uses;
- Water supply sources;
- Efficient water uses;
- Demand management measures, and
- Water shortage contingency planning.

Another purpose of the UWMP is to obtain eligibility for any water management grant or loan administered by DWR. In order for CVWD to be eligible, they must have a current UWMP on file that has been determined by DWR to address the requirements of the CWC. A current UWMP must also be maintained by CVWD throughout the term of any grant or loan administered by DWR.[1] Beginning in 2016, retail water suppliers like CVWD are also required to comply with the water conservation requirements in SB X7-7 in order to be eligible for State water grants or

[1] An UWMP may also be required in order to be eligible for other State funding, depending on the conditions that are specified in the funding guidelines.

loans (CWC §10608.56(a)). As detailed in Chapter 5, CVWD has met the 2015 Interim Urban Water Use Target and the requirements of SB X7-7.

Another purpose of this document is to inform the future needs of the District to its wholesale water provider, which is Crestline-Lake Arrowhead Water Agency (CLAWA).

Likewise, this document is also intended to communicate forecasted growth to the wastewater services provider, Crestline Sanitation District (CSD).

*There is no substitute for water planning at the local water supplier level. Only a local supplier has the knowledge, ability to consider the unique circumstances of the individual agency, can provide for participation by the community, and tailor the planning to local conditions (DWR UWMP Guidebook,* March 2016).

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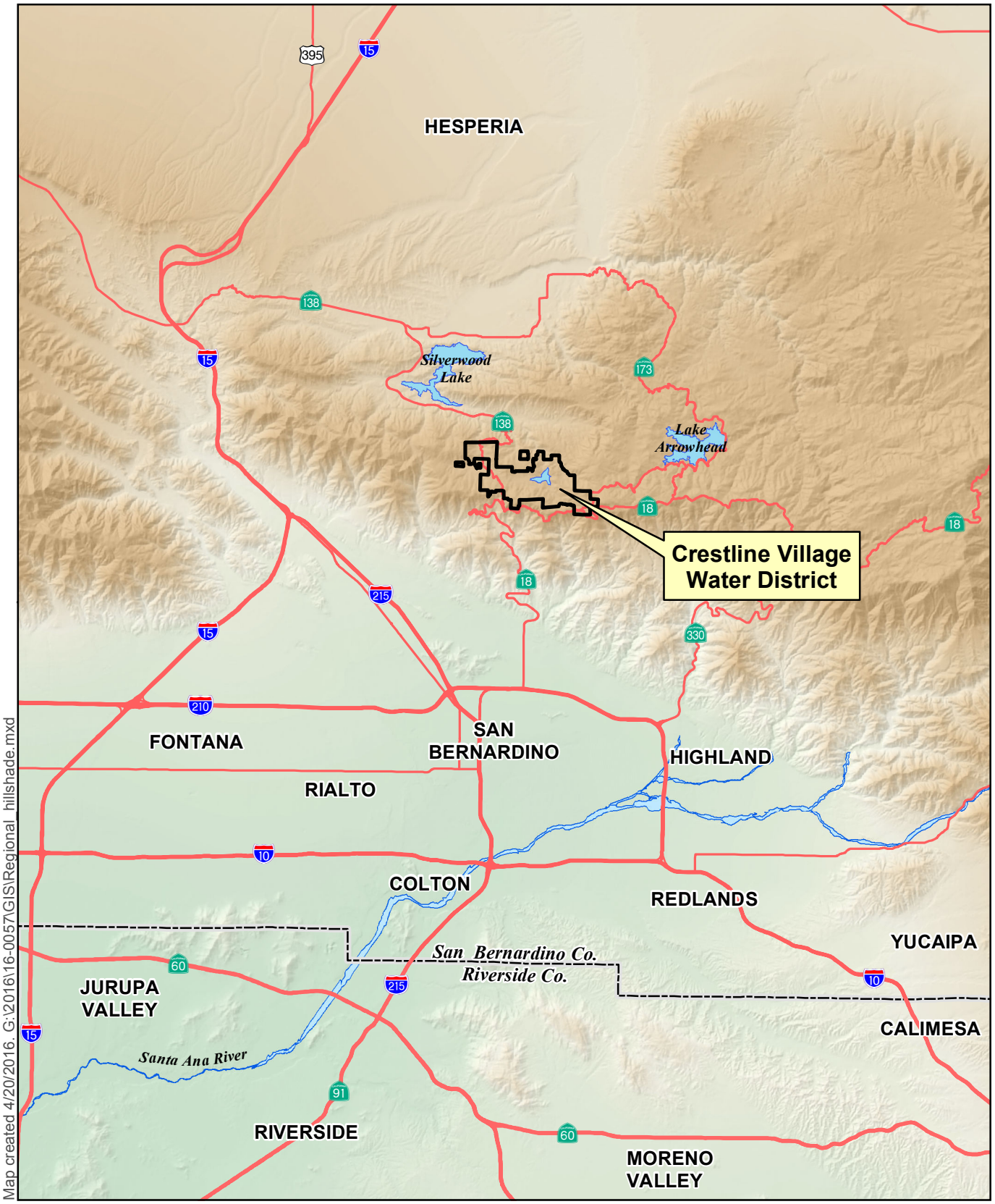


Figure 1-1 – Regional Vicinity Map

2015 Urban Water Management Plan

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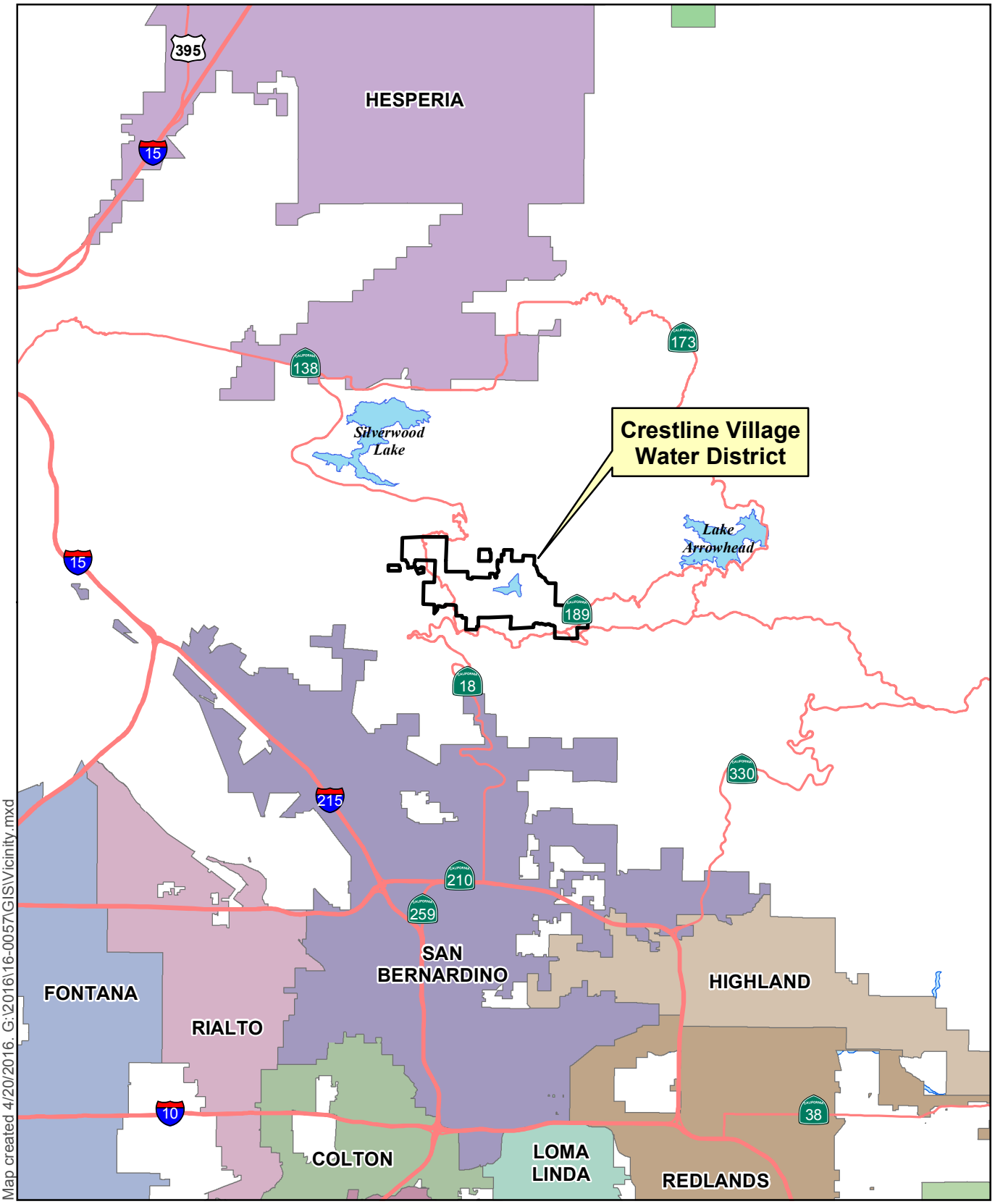


Sources: San Bernardino ISD, 2016

0 2 4 6 Miles

Figure 1-2 – City and Community Map

2015 Urban Water Management Plan

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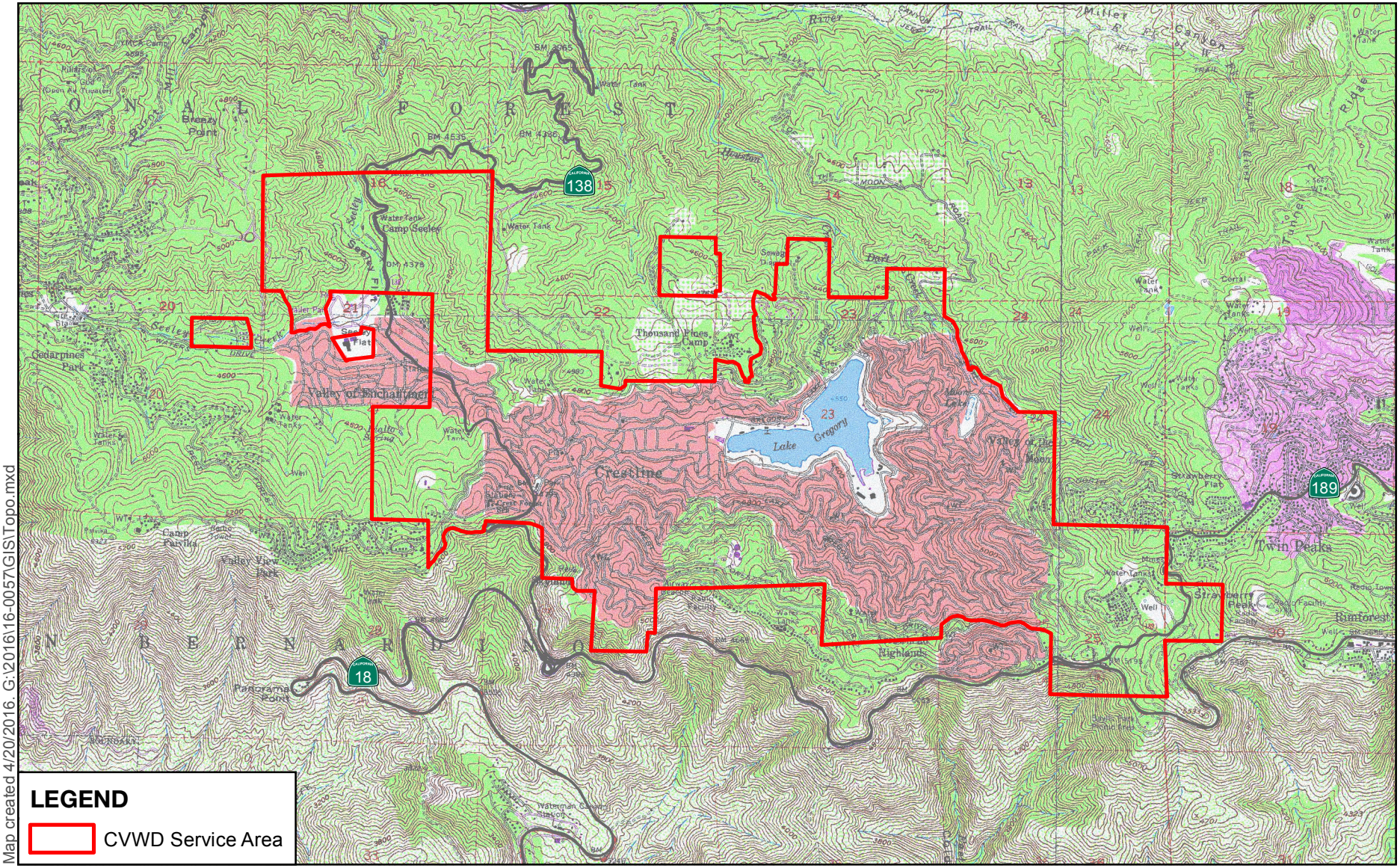


Figure 1-3 – Crestline Village Water District Service Area

2015 Urban Water Management Plan

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# CHAPTER 2: PLAN PREPARATION

## 2.1 Basis for Preparation

CWC Section 10620 states: *Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*[1] Crestline Village Water District (CVWD) is considered an "urban retail water supplier" because it directly provides potable municipal water to more than 3,000 connections. The District is not a "wholesale" supplier. Therefore, the tables and information provided in the subject UWMP follow the requirements for "retail" water suppliers. A checklist to ensure compliance of this Plan with the UWMP Act requirements is provided in **Appendix A**.

Public Water Systems (PWSs) are the systems that provide drinking water for human consumption. These are regulated by the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW). The PWS name and number, the total number of active connections and volume of water supplied to all customers as of December 31, 2015, is shown in **Table 2-1.** DWR guidelines require the water use and planning data for the entire year of 2015, and because CVWD reports on a calendar year (CY) basis, data included in this UWMP is through December 31, 2015.

**Table 2-1 Retail Only: Public Water Systems**

| Public Water System Number | Public Water System Name | Number of Municipal Connections 2015 | Volume of Water Supplied 2015 |
|---|---|---|---|
| CA3610015 | Crestline Village Water District | 4,952 | 252,139 CCF |
| | | | (579 AF) |

Source: CVWD Annual Report Table 6b.

During CY 2015, CVWD delivered 252,139 hundred cubic feet (CCF), or 579 acre-feet (AF) of water to 4,952 active connections.[2]

DWR suggests water suppliers engage in *regional* planning to reduce inefficiencies when many agencies are involved. Although the CWC provides mechanisms for participating in area-wide,

[1] "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity (CWC §10614).
[2] In addition, there were 121 inactive accounts at the end of 2015.

regional, watershed, or basin-wide urban water management planning, CVWD has chosen "Individual Reporting" for its UWMP (see **Table 2-2: Plan Identification**). Since one of the goals of this UWMP, as stated in Chapter 1.2, is to inform CLAWA of the future increases in demand for imported water supplies, CVWD hopes this plan will foster future collaboration with CLAWA and other mountain water suppliers.

CVWD has notified and solicited input from the following pertinent agencies for preparation of this Plan:

- County of San Bernardino
- Crestline-Lake Arrowhead Water Agency
- Lake Arrowhead Community Services District
- Running Springs Water District
- Arrowbear Park County Water District
- U.S. Department of Agriculture Forest Service
- Crestline Sanitation District
- San Bernardino County Fire
- Rim of the World Unified School District
- Lahontan Regional Water Quality Control Board
- Save Our Forest Association
- Division of Drinking Water, San Bernardino District
- Sierra Club, Big Bear Group
- Santa Ana Regional Water Quality Control Board
- Santa Ana Watershed Project Authority
- Mojave Water Agency
- Cedarpines Park Mutual Water Company
- Valley of Enchantment Mutual Water Company
- Valley View Park Mutual Water Company
- Strawberry Lodge Mutual Water Company
- Alpine Water Users Association
- Crestline/Lake Gregory Chamber of Commerce

At least 60 days before the public hearing on the Plan, the District is required to notify every city or county to whom they provide water that they are reviewing and considering changes to the plan. CVWD issued a notification letter to the agencies listed above on March 2, 2016 and then issued a second letter on May 20, 2016, which included the exact date, time, and location of the public hearing held on July 19, 2016. The draft UWMP was provided for public review on the CVWD Web site and a hard copy at the District offices beginning July 5th. Copies of the required letters and public notification in *The Alpenhorn News* and *The Mountain News* newspapers of the public hearing are included in **Appendix B**.

| Table 2-2: Plan Identification | | |
|---|---|---|
| Select Only One | Type of Plan | |
| ☑ | Individual UWMP | |
| | ☐ | Water Supplier is also a member of a RUWMP |
| | ☐ | Water Supplier is also a member of a Regional Alliance |
| ☐ | Regional Urban Water Management Plan (RUWMP) | |

**Table 2-3: Agency Identification** identifies the District as a water retailer and the data provided herein is based on calendar year (CY) reporting with volumes calculated in units of "hundred cubic feet" or CCF.

| Table 2-3: Agency Identification | |
|---|---|
| Type of Agency (select one or both) | |
| ☐ | Agency is a wholesaler |
| ☑ | Agency is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☑ | UWMP Tables Are in Calendar Years |
| ☐ | UWMP Tables Are in Fiscal Years |
| Units of Measure Used in UWMP (select from Drop down) | |
| Unit | CCF |

Beginning in 1972 through present-day, CVWD has supplemented its well production with purchased supplies from the local wholesaler in the region, Crestline-Lake Arrowhead Water Agency (CLAWA)[3]. Chapter 6 details CLAWA's supply and relationship with CVWD. CLAWA is identified in **Table 2-4** as the District's wholesale supplier and acknowledges that CLAWA has been notified of this Plan.

| Table 2-4 Retail: Water Supplier Information Exchange |
|---|
| The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631. |
| Wholesale Water Supplier Name *(Add additional rows as needed)* |
| Crestline-Lake Arrowhead Water Agency |

[3] CLAWA was exempt from preparing a 2015 UWMP, including water use reduction targets for SB X7-7 per DWR.

Retail agencies, like CVWD, that receive a water supply from one or more wholesalers, like CLAWA, are required to provide their wholesaler(s) with their projected water demand from that source, in five-year increments for 20 years. CWC Section 10631(j) requires CVWD to include documentation in the UWMP that they have provided CLAWA with their water use projections. **Appendix C** contains documentation that CVWD provided **Table 4-2**: Demands for Potable and Raw Water-Projected, and **Table 6-9**: Water Supplies-Projected to CLAWA on June 15, 2016, and again with updated figures on July 5, 2016 to meet this requirement.

# CHAPTER 3: SYSTEM DESCRIPTION

## 3.1 General Description

Crestline Village Water District (CVWD) provides domestic water service to the Crestline and Lake Gregory communities in unincorporated San Bernardino County, California. Crestline is located about ten miles north of the City of San Bernardino in the San Bernardino Mountains, where most land is within the Mountaintop Ranger District of the San Bernardino National Forest. Crestline and neighboring mountain communities occupy islands of private land surrounded by National Forest territory. The CVWD service area is located along the crest of the San Bernardino Mountains and in adjacent valleys high on the mountains' north slopes. The terrain is rugged, with moderate-to-steep slopes and elevations ranging from about 4,000 feet to over 5,600 feet. The elevation at Lake Gregory is 4,550 feet (USGS datum). Unlike Southern California's valleys, this area experiences a four-season climate. The District's service area lies predominantly on the north side of State Highway 18 (Rim of the World Drive) and is served by State Highways 138 and 18.

CVWD was organized on January 19, 1954 by the citizens of Crestline, under the authority of the County Water District Law (CWC Sections 31000, et seq.). CVWD was originally known as the Crestline Village County Water District and served only the immediate Crestline area, with approximately 1,600 service connections. All of CVWD's water supplies were from local sources until Crestline-Lake Arrowhead Water Agency (CLAWA) began delivering imported water in 1972. Since then, CVWD has relied on both local and imported water supplies. The area served by CVWD has grown over the years, as additional land has been annexed. The largest change occurred on October 1, 1979, when CVWD acquired the facilities of the Lake Gregory Water Company (LGWC) and accepted responsibility for providing retail water service in the area around Lake Gregory. By acquiring the LGWC, the District almost doubled in size.

CVWD is a public agency with an elected five-person Board of Directors. The Board of Directors is the legislative governing body for CVWD and is responsible for developing and implementing laws that govern the services provided within the jurisdiction of its community services. Each of the five Board Members is elected to four-year terms by registered voters who reside within the CVWD service territory. The full Board of Directors conduct public

meetings on the 3rd Tuesday of each month at the CVWD office located at 777 Cottonwood Drive in Crestline.

## 3.2 Service Area Boundary

The CVWD service area covers 2,840 acres (4.4 square miles) of unincorporated San Bernardino County and includes the mountain communities of Crestline and Lake Gregory. At approximately 4,600 foot elevation, the District is located along the crest of the San Bernardino Mountains and consists of rugged terrain with moderate to steep slopes. Refer to **Figures 1-1, 1-2,** and **1-3** for vicinity maps. The District's service area is generally bounded by Highway 18 and the south face of the San Bernardino Mountains to the south, the community surrounding Lake Arrowhead to the east, very rural National Forest land to the west and generally uninhabited north slope of the mountains and start of the 'high desert' to the north. The service area generally surrounds Lake Gregory and its surrounding community.

CVWD has a Sphere of Influence determined by the Local Agency Formation Commission of San Bernardino County (LAFCO), which can be viewed on the LAFCO Web site located at: http://www.sbclafco.org/Maps/WaterDistricts/CrestlineVillageWaterDistrict.aspx. A Sphere of Influence is defined as, "A plan for the probable physical boundaries and service area of a local agency, as determined by the commission." The Sphere of Influence covers approximately 12 square miles and includes the CVWD service area. The most recent update to the Sphere of Influence for CVWD was adopted January 19, 2011.[1] Although designation of a Sphere of Influence is a legal requirement for public agency water suppliers, it does not affect pre-existing service arrangements by others within the sphere. Also, inclusion in the Sphere of Influence does not mean that land will inevitably become annexed to CVWD. CVWD may consider annexing property into its service area only if requested by the property owner. The District is not actively pursuing any annexations at this time, nor is it aware of any pending or likely annexation applications in the near-term.

As shown on **Figure 3-1,** there are three non-contiguous portions of CVWD service area, as described from west to east: first, an isolated residential area called Stewart Ranch; second, the Valley of Enchantment elementary school, and third, an isolated residential area just north of Thousand Pines Christian Camp.

[1] LAFCO, County of San Bernardino Resolution No. 3122, available at http://www.sbcounty.gov/uploads/lafco/proposals/servicereviews/crest_forest/resolution3122.pdf.

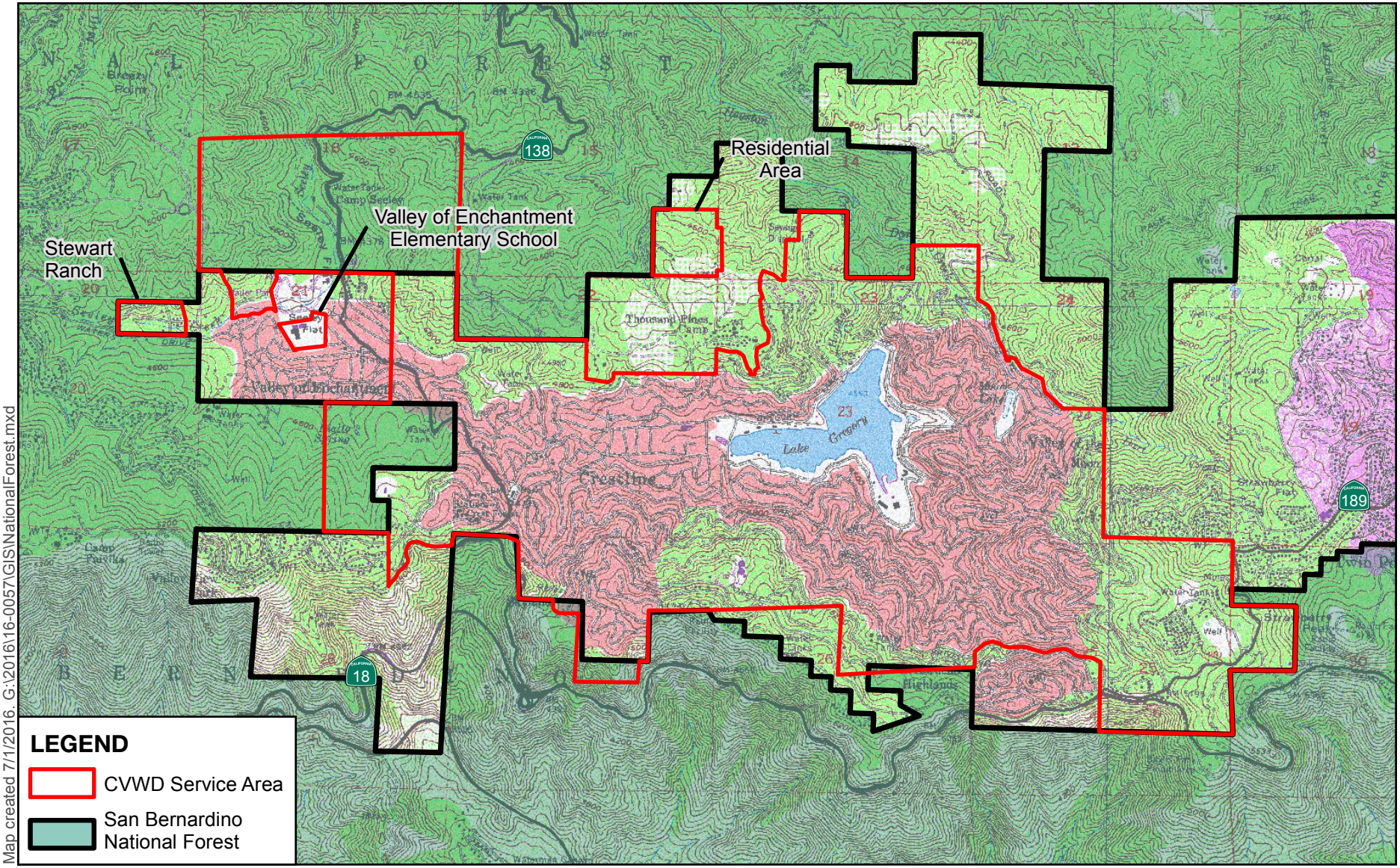



Figure 3-1 – San Bernardino National Forest

2015 Urban Water Management Plan

Each of the non-contiguous areas in the service area was served previously by private wells or small mutual water companies that could not continue service and asked CVWD to annex them into the District service area.

The lands immediately outside the service area are served by either private wells or small mutual water companies. There have been no annexations, consolidations, or other changes to the service area since the 2010 UWMP.

During 2015, CVWD produced water locally from 39 wells located on 22 individual sites. When local well production does not meet demand, CVWD purchases supplemental water supply from CLAWA, which is the State Water Project (SWP) contractor and water wholesaler to the San Bernardino Mountains area. CVWD has eight connections to the CLAWA water system at five sites; so depending on their location, customers may receive a mixture of well and imported water, just well water or just imported water. See **Appendix D** for a list of CVWD's sources of supply.

Supplemental water purchased from CLAWA has been treated at CLAWA's water treatment facility at Silverwood Lake. Water produced locally from CVWD's wells meets applicable drinking water standards and does not require treatment, other than chlorination of some wells. Thus, the District operates no centralized, complete water treatment facilities of its own. CVWD chlorinates water from its Pioneer, Horst, Wilson, and Old Mill Springs wells and monitors water quality at all wells.

The District currently has 14 water storage tanks at 12 locations, with a total storage capacity of 8.644 million gallons. Pumping and pressure-reducing facilities are used where needed. A schematic plan of CVWD's water system is provided in **Appendix E**. The system contains many miles of pipelines, of varying ages, types, and conditions.

## 3.3 Service Area Climate

CVWD’s service area is located in a mountainous climate that is generally cooler than the surrounding lower elevations. As shown on proceeding tables, summers are dry with average temperatures as high as 81°F and winters are wet and cool, with average temperatures as low as 25°F. The average evapotranspiration rate ($ET_o$), maximum, and minimum temperature data gathered from the Lake Arrowhead CIMIS (California Irrigation Management Information

System) station for the years of 2004 (when the station was established) through 2015 are provided in **Table 3A**.

**Table 3A: Evapotranspiration and Temperature Data for the District Service Area, 2004-2015**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Standard Monthly Average $ET_o$ (inches)** | 1.7 | 2.1 | 3.8 | 4.9 | 6.2 | 7.0 | 7.3 | 6.9 | 5.3 | 3.4 | 2.4 | 1.6 |
| **Average Max. Temperature (°F)** | 51 | 51 | 57 | 60 | 67 | 74 | 81 | 80 | 76 | 66 | 57 | 50 |
| **Average Min. Temperature (°F)** | 25 | 26 | 29 | 31 | 36 | 42 | 50 | 49 | 44 | 35 | 28 | 25 |

Source: CIMIS Station 192 Lake Arrowhead-San Bernardino (http://www.cimis.water.ca.gov/Default.aspx accessed 3/1/16).

The average monthly rainfall, snowfall, and snowfall depth data from the National Oceanic and Atmospheric Administration (NOAA) Crestline weather station are presented in **Table 3B**. Between 2010 and 2015, the average annual rainfall totaled 19.6 inches, and average annual snowfall was approximately 12 inches (**Table 3B**). Precipitation has been greater in the past, as shown in **Table 3C.**

**Table 3B: Rain and Snowfall Data for the District Service Area, 2010-2015**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Average Total Precipitation (inches)** | 2.5 | 3.1 | 2.0 | 2.0 | 0.99 | 0.0 | 0.4 | 0.2 | 0.4 | 1.3 | 2.9 | 3.8 | **19.6** |
| **Average Total Snowfall[1] (inches)** | 4.0 | 4.5 | 2.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | **12.2** |
| **Average Snow Depth[2] (inches)** | 7.0 | 6.3 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | **16.3** |

Source: NOAA National Environmental Satellite, Data, and Information Service (http://www.ncdc.noaa.gov/cdo-web/ accessed 3/1/2016). Station: CRESTLINE 0.2 WSW, CA US GHCND:US1CASR0019. Values in table represent rounded averages, thus, values reported as zero may not actually be equal to zero.
[1] Snowfall: Maximum amount of new snow that has fallen since the previous observation.
[2] Snow Depth: The total depth of snow (including any ice) on the ground at the normal observation time. The snow depth includes new snow that has fallen combined with snow already on the ground.

The entire State, and in particular Southern California is currently experiencing a severe ongoing drought, so for comparison the historical average rainfall and snowfall amounts from the Western Regional Climate Center (WRCC) are also provided in **Table 3C,** below. These historical average values represent averages from 1941 through 2011 at Lake Arrowhead, which is located nearly 5 miles to the east but maintains approximately the same elevation and geographic position on the mountain ridge.

**Table 3C: Historical Rain and Snowfall Data for the District Service Area, 1941-2011**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Historical Average Total Precipitation (inches)** | 8.6 | 7.9 | 6.5 | 2.9 | 1.1 | 0.2 | 0.1 | 0.4 | 0.8 | 1.6 | 4.2 | 5.7 | **40** |
| **Historical Average Total Snowfall (inches)** | 10.8 | 11.4 | 11.7 | 5.1 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 2.1 | 5.6 | **47.7** |

Source: WRCC Station 044671, Lake Arrowhead, CA. (http://www.wrcc.dri.edu, accessed 2/26/16)

Indeed, the average rainfall and snowfall depths from the last five years compared to historical averages illustrate the recent drought conditions, with roughly half the rain and snow received. The annual rainfall and in particular, the snowfall have a great influence on well production in a fractured bedrock aquifer. This illustrates the reliance on imported water purchased from CLAWA when local wells are unable to meet demand, especially during drought years.

### 3.3.1 Climate Change

Although the CWC does not specifically require the Plan to address climate change, DWR guidelines recommend a discussion of possible effects and an opportunity for water suppliers to outline response actions. The following discussion is guided by the "Climate Change Vulnerability Assessment" provided in the DWR guidelines that comes from the U.S. Environmental Protection Agency (EPA) and DWR document, "Climate Change Handbook for Regional Water Planning" (2011).

#### Water Demand

- *Do groundwater supplies in your region lack resiliency after drought events?*

- Response: During drought conditions, CVWD relies more heavily on purchased water from CLAWA, which they import from the State Water Project (SWP) via Lake Silverwood to meet the demands of its customers. There is a prohibition against discharging recycled wastewater at the elevation of the District's service area; thus, groundwater recharge is generally limited to natural recharge. Production from fractured bedrock aquifers depends heavily on the precipitation received over the year. This limits the resiliency of groundwater supplies after drought events.

- *Are water use curtailment measures effective in your region?*
  - Response: Curtailment measures have been extremely effective. The District was required to have an 8 percent reduction in water use through December 2015; indeed, it is actually down *21.7 percent* (General Manager's Report to Board, 2/16/16). CVWD has developed a seven-level Water Shortage Contingency Plan and uses Advanced Metering Infrastructure, which are discussed in detail in Chapter 8 of this document.

**Water Supply**

- *Does a portion of the water supply in your region come from snowmelt?*
  - Response: Although Crestline does not receive a significant amount of snow each winter, snowmelt is very important to feed the fractured bedrock wells that CVWD relies on to supplement it's purchased, imported water from CLAWA.

- *Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?*
  - Response: Crestline has supplemented its local water supply with imported water from CLAWA since 1972. CLAWA is a wholesale water provider, selling SWP water from Silverwood Lake to approximately 25 water purveyors in Southern California.

- *Would your region have difficulty in storing carryover supply surpluses from year to year?*

- Response: CLAWA has the ability to store carryover water through exchange agreements with other State Water Contractors. CLAWA does not have the ability however to store water locally in groundwater storage, or in Lake Silverwood.

**Water Quality**

- *Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?*
  - Response: Wildfires are always a threat to this mountainous region. The primary concern from fires on CVWD's local water supply is disruption of power. CVWD does have a system of water tanks throughout its service area that have storage volumes sized for land use regulatory fire flow compliance. CVWD also relies on SWP water from Silverwood Lake. When large areas of the forest surrounding the lake burned in 2003, mulch was laid down to limit erosion (CLAWA 2010 UWMP).

- *Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?*
  - Response: Lake Gregory has the following beneficial use designations: municipal (MUN), agriculture (AGR), groundwater (GWR), navigation (NAV), water contact recreation (REC-1), non-contact water recreation (REC-2), commercial and sport fishing (COMM), cold freshwater habitat (COLD), wildlife habitat (WILD), and spawning, reproduction and development (SPWN) (Lahontan RWQCB, 1995).[2] Lake Gregory is a man-made reservoir that is fed by snow melt and storm runoff. Storm runoff from an urban environment commonly carries pollutants which may occasionally impair the Lake's ability to meet all of its designated beneficial uses.

[2] Beneficial Uses may be designated by the RWQCB which are existing or potential uses for a waterbody. Many of the existing uses are documented by biological data or human use statistics; some are not. Lakes and streams may have potential beneficial uses established because: (1) plans already exist to put the water to those uses, (2) conditions (location, demand) make such future use likely, (3) the water has been identified as a potential source of drinking water based on the quality and quantity available (see Sources of Drinking Water Policy), and/or (4) existing water quality does not support these uses, but remedial measures may lead to attainment in the future. The establishment of a potential beneficial use can have different purposes such as: (1) establishing a water quality goal which must be achieved through control actions in order to reestablish a beneficial use as in No. 4, above, or (2) serving to protect the existing quality of a water source for eventual use (Lahontan Basin Plan, p.2-3).

**Flooding**

- *Are wildfires a concern in parts of your region?*
  - Response: The District does not experience an exaggerated risk of flooding resulting from the after-effects of wildfires. Some flooding is anticipated in certain canyons during rain events. Wildfires occur in the area periodically and with respect to water supply, they primarily interrupt electrical power requiring standby generators. The mountain vegetation may be drier and more vulnerable to become fuel if a spark occurs as temperatures increase. As described in Chapter 6, System Supplies, CVWD maintains water storage tanks for emergencies and fires. As growth continues, the District will evaluate each pressure zone and the fire flow requirements to determine if and when additional tanks are necessary.

**Ecosystem and Habitat Vulnerability**

- *Do climate-sensitive fauna or flora populations live in your area?*
  - Response: Unlike lower-elevation communities in Southern California, Crestline is located in a mountainous area that experiences four distinct seasons. Thus, native flora and fauna are sensitive to annual climate variations. Climate change is expected to increase the occurrence of drought and higher temperatures, which could reasonably be expected to negatively impact flora and fauna residing in the area. The District can work with agencies as necessary to help vulnerable species and habitats.

- *Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?*

  Response: A literature review of the California Natural Diversity Database, California Native Plant Society Inventory and other biological reports prepared for the Crestline service area identify approximately 40 special status floral and faunal species that are known to reside within the service area. Special status species are identified as endangered, threatened, or otherwise granted other special protections under federal or state laws. All of these species can reasonably be expected to feel the effects of climate change both directly and indirectly. Direct climate change impacts include possible heat stress from higher

temperatures or lack of water in the environment due to decreased rainfall. Indirect impacts include species displacement due to changing distributions of environmental landscapes. In general, increased temperatures and decreased rainfall throughout Southern California have caused the ranges of some low-elevation plant communities to shift to higher elevations. This shift may displace the existing higher-elevation communities. The District can work with agencies as necessary to help vulnerable species and habitats.

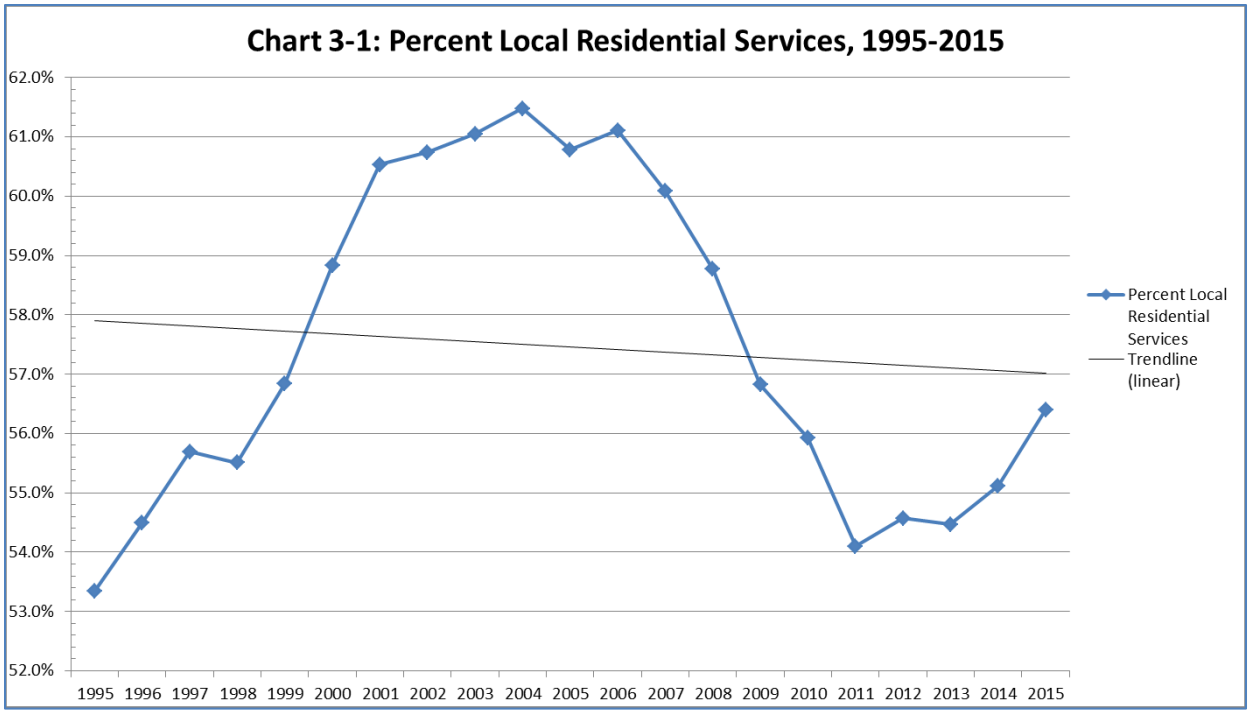
**Hydropower**

- *Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?*
  - Response: Increased development in this region may lead to increased energy demands; however, there are no opportunities for hydropower due to the isolated, mountainous character of the region.

## 3.4 Service Area Population and Demographics

The unincorporated community of Crestline (including Lake Gregory) makes up a majority of the District's service area. Crestline and neighboring communities are part of a mountain resort area that experiences significant tourism. There is a large seasonal population component as well as a substantial influx of visitors, which can quickly double the population. The seasonal population is not reflected in available demographic statistics that count only year-round residents. Seasonal changes in water demand in the mountain area are different from the normal seasonal variation in water use by customers in non-mountain areas, which reflect spikes in water demand for landscape irrigation, swimming pools, car washing, space cooling, etc. By contrast, Crestline and neighboring mountain resort areas experience significant seasonal swings in the number of people served, with peaks in both summer and winter due to the abundance of recreational activities within the mountain communities.

According to District records, the percentage of full-time customers is currently 56 percent of total connections, but as shown in **Chart 3-1**, this is known to fluctuate in response to economic up/downturns. Over the past 20 years, the proportion of full-time residents has been as high as 61.5 percent in 2004, and as low as 53.3 percent in 1995.




Source: CVWD records.

The District calculates an estimate of the "full-time" population as the number of residential meters with a local billing zip code (92325) multiplied by the number of persons per meter (from U.S. Census data every 10 years). Using this method for example, the District calculated a full-time population of 7,553 people in 2010 compared to the 2010 U.S. Census that gave a population of 7,542; a difference of only 11 people. Therefore, this method will be continued for any projections of the District's full-time population. The population within the District boundary from 2010 through 2015 is provided in **Table 3D,** using the District's methodology.

**Table 3D: Full-Time Resident Population Calculated by District, 2010-2015**

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| **Full-Time Service Area Population (calculated)** | 7,553 | 7,301 | 7,369 | 7,335 | 7,426 | 7,607 |

Source: CVWD Data, 2016.

CVWD analyzed its historical full-time population data and calculated an average annual growth rate of 0.8 percent, however, to estimate conservatively, the District will use an annual growth rate of 1 percent. The District's forecasted population increase of approximately 1,671 full-time residents by 2035 is provided in **Table 3-1**.

| Table 3-1 Retail: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2015 | 2020 | 2025 | 2030 | 2035 | 2040*(opt)* |
| | 7,588 | 7,975 | 8,382 | 8,809 | 9,259 | |
| NOTES: Assumes a 1% annual growth rate. | | | | | | |

Source: 2015 estimate from DWR Population Tool.

The CVWD service area includes residential, commercial, and institutional customers. The existing commercial businesses are oriented to tourists, seasonal and permanent residents. The development pattern in the CVWD service area is primarily detached single-family residential, which is expected to continue for the duration of the planning period. Spikes in population, and therefore water use, occur seasonally and during times of economic growth. As the local economic patterns rebound from the great recession, it can be expected to see part-time and full-time population growth, and therefore increased water use, in mountain communities. If that growth coincides with a drought period, dependence on imported supplies from CLAWA is anticipated to increase.

Development in the San Bernardino Mountains is naturally constrained by the terrain, limited access, and lack of support infrastructure, as well as policies that place much of the area off-limits to significant development. Most of the mountain area, including the majority of CVWD's service area is surrounded by or within the San Bernardino National Forest (**Figure 3-1**). Forest lands are devoted primarily to resource protection and recreational use; however they do become available for development from time to time but it is extremely rare.

U.S. Census data is gathered at three levels of precision: at the broadest level for unincorporated areas is the Census Designated Place (CDP), followed by Census Tracts that are made up of Block Groups. California Code of Regulations Section 596.1(b)(2) defines a "disadvantaged community (DAC)" as, "A community with an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI." According to U.S. Census data collected from 2009 to 2013 by the Water Management Planning Tool at DWR, the statewide MHI is $61,094, and 80 percent of that is the DAC threshold of $48,875. [3]

[3] Source: *U.S. Census American Community Survey (ACS) 5-Year Data: 2009-2013* (with a median household income (MHI) of $61,094 and hence a calculated disadvantaged communities (DAC) threshold of $48,875) located at the DWR Water Management Planning Tool, https://gis.water.ca.gov/app/boundaries/

The Census Block Groups that qualify as "disadvantaged" and "severely disadvantaged" are shown in **Figure 3-2**.[4] The information contained in Figure 3-2 is taken directly from the DWR Web site feature called, "Disadvantaged Communities (DAC) Mapping Tool." The mapping tool is a reference to assist local agencies to evaluate DAC status, using the definition provided in Proposition 84 Guidelines. Having areas that qualify as a DAC opens the District to the possibility of applying for State grant funding to assist with the implementation, planning, and disadvantaged community involvement efforts through Proposition 1 (Water Quality, Supply, and Infrastructure Improvement Act of 2014), and potentially grant funding through Proposition 84, Chapter 2 (Integrated Regional Water Management). In the event CVWD proceeds with either grant opportunity, additional research per the grant application requirements may be necessary.

[4] "Severely" disadvantaged communities have an annual median household income less than 60 percent of the State's annual median household income, or $36,656 according to the ACS data shown here.

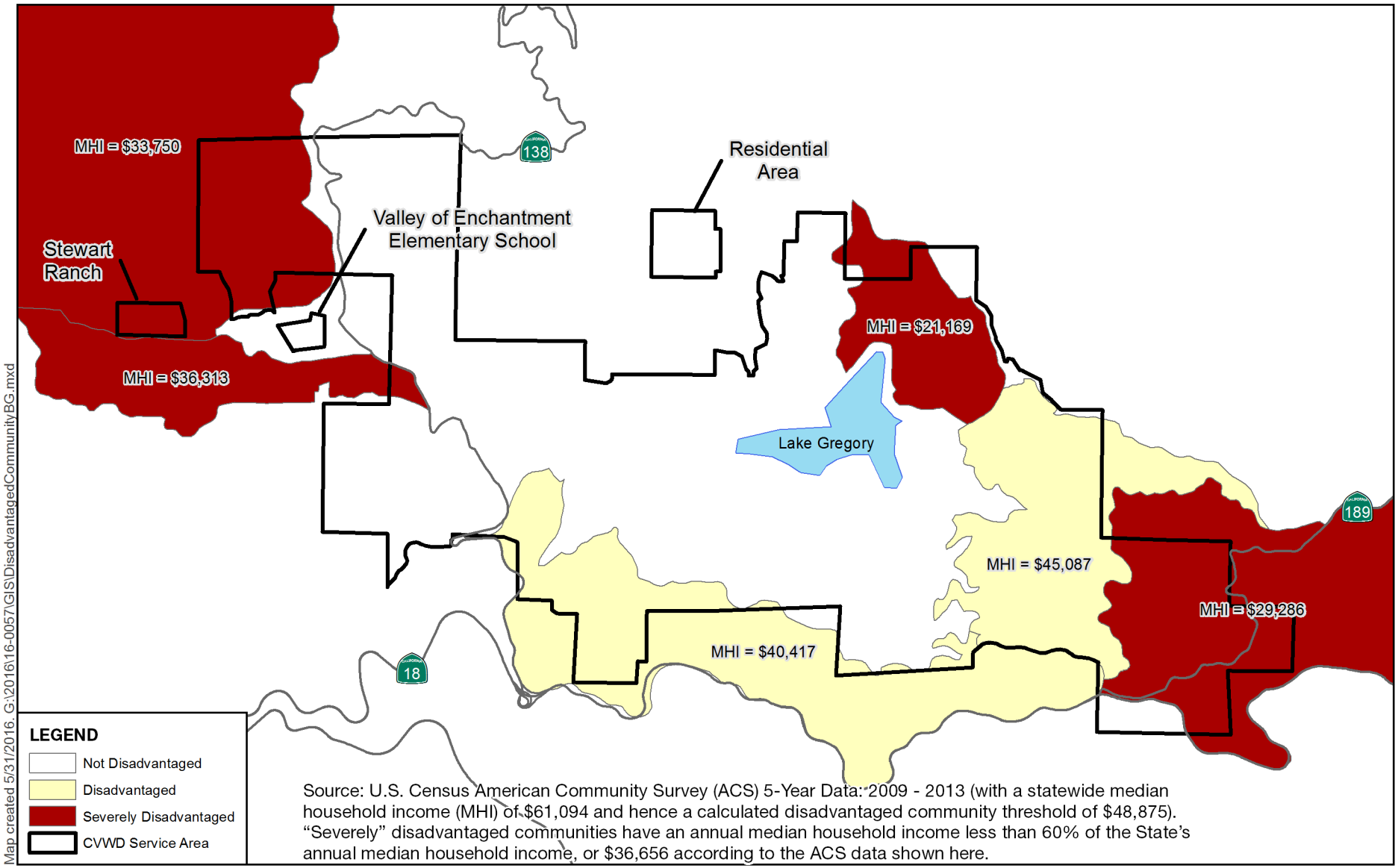



Figure 3-2 – Disadvantaged Community by Census Block Group

2015 Urban Water Management Plan

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# CHAPTER 4: SYSTEM WATER USE

This chapter describes and quantifies CVWD's current potable water use[1] and water use projections through the year 2035, to the extent information are available. Impacts to water use from climate change are discussed in Chapter 3 and recycled water is discussed separately in Chapter 6.

The CVWD service area, at approximately 4,600 feet elevation, has distinct characteristics compared to other suppliers within Southern California. Encompassing the unincorporated communities of Crestline and Lake Gregory within the San Bernardino National Forest, "mountain living" and "mountain communities" inherently use water differently than communities in the valley. Water-intensive landscaping such as lawns or large manicured frontage features are rare. It is crucial to understand that conservation of water is standard practice in this mountain community.

## 4.1 Current Use

As of December 31, 2015, CVWD delivered 252,139 CCF (579 AF) of potable water and system losses are estimated at 32 AF. The 2010 UWMP estimated a higher demand volume of 291,852 CCF (670 AF) for 2015. As shown in **Table 4-1**, the actual metered water use for CVWD is divided into five sectors: single-family residential, multifamily residential, commercial, institutional/governmental and losses. The majority of customer accounts are single-family residential.

**Table 4-1 Retail: Demands for Potable and Raw Water - Actual**

| Use Type *(Add additional rows as needed)* | 2015 Actual | | | |
|---|---|---|---|---|
| ***Drop down list*** *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool* | Additional Description *(as needed)* | Level of Treatment When Delivered *Drop down list* | Volume (CCF) | Volume (AF) |
| Single Family | | Drinking Water | 213,790 | 490.8 |
| Multi-Family | | Drinking Water | 6,716 | 15.4 |
| Commercial | | Drinking Water | 31,633 | 72.6 |
| Losses | Production minus consumption | Drinking Water | 13,734 | 31.5 |
| | | **TOTAL** | 265,873 | 610 |

NOTES: CY 2015. Units in hundred cubic feet (CCF). Source: CVWD Annual Report Table 6b. Losses here differ slightly from water loss audit in Table 4-4 to be consistent with the production and consumption numbers from the Annual Report, which are used throughout the document.

[1] The terms "water use" and "water demand" are used interchangeably in the UWMP per DWR guidelines.

As of 2015, the District does not serve any industrial or agricultural end users, nor does it sell water to other agencies. Landscape irrigation is not separately metered at any locations. Other possible sectors of use include saline water intrusion barriers, groundwater recharge, conjunctive use, exchanges, surface water augmentation, transfers, or wetlands/wildlife habitat – the District does not serve any of these. The District does not sell or purchase non-potable or recycled water. System losses are reported separately from this discussion in Chapter 4.3. The District's water use by sector from 2011 to 2015 is shown in **Table 4A**.

**Table 4A: Historic Water Use by Sector, 2011-2015 (AF)**

| | 2011 | 2012 | 2013[2] | 2014 | 2015 |
|---|---|---|---|---|---|
| **Single-Family Residential** | 559 | 544 | 560 | 526 | 491 |
| **Multifamily Residential** | 18 | 19 | 17 | 16 | 15 |
| **Commercial/Institutional** | 101 | 89 | 98 | 92 | 72 |
| **Real Losses** | 46 | 31 | 65 | 39 | 32 |
| **Total (AF)** | **724** | **683** | **740** | **673** | **610** |

Source: CVWD PWSS/Annual Reports and District water loss data.

As illustrated in **Table 4A**, water use over the past five years has been on the decline across all sectors. This pattern coupled with the State's water conservation mandates that have been heeded by the community has provided a new paradigm for the District to project future water demands.

## 4.2 Projected Use

Estimating future demand as accurately as possible allows water agencies to manage their water supply and appropriately plan their infrastructure investments. Factors to consider are current and future land uses, number of occupants or dwelling units, and typical water demand generation factors.

As previously mentioned, the mountainous Crestline community has different water use characteristics than those exhibited by typical urban areas. Large lots with expansive landscaped areas are nonexistent and the cost of water due to its local scarcity and higher

[2] The reporting changed beginning in 2013 from "Public Water System Statistics" reports under the review of DWR, to "Annual Report to the Drinking Water Program" reports under the review of the State Water Resources Control Board (SWRCB).

pricing of imported water typically provide for much lower per capita use. The population served by CVWD has done an excellent job of conserving water, both historically and recently. Many of the conservation measures discussed in this plan are already in effect, following public input and with public support. In other words, much of the water management planning process for CVWD has already taken place through past District actions, with full public involvement and review.

CVWD analyzed its historical full-time population data and calculated an average annual growth rate of 0.8 percent, however, to estimate conservatively, the District will use an annual growth rate of 1 percent which has been applied to the District's water consumption projections shown below in **Table 4-2**. Please refer to **Table 3-1** in Chapter 3 for population projections.

**Table 4-2 Retail: Demands for Potable and Raw Water - Projected**

| Use Type *(Add additional rows as needed)* | Additional Description *(as needed)* | Projected Water Use | | | | |
|---|---|---|---|---|---|---|
| *Drop down list* May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool | | 2020 | 2025 | 2030 | 2035 | 2040-opt |
| Single Family | | 224,695 | 236,157 | 248,204 | 260,864 | |
| Multi-Family | | 7,059 | 7,419 | 7,797 | 8,195 | |
| Commercial | | 33,247 | 34,943 | 36,725 | 38,598 | |
| Losses | | 13,734 | 13,734 | 13,734 | 13,734 | |
| **TOTAL (CCF)** | | 278,735 | 292,253 | 306,460 | 321,391 | 0 |
| **TOTAL (AF)** | | 640 | 671 | 704 | 738 | |

NOTES: Assumes 1% per year growth rate. Units in CCF unless otherwise shown. Losses assumed constant.

Water consumption is conservatively expected to increase from approximately 610 AF in 2015 to 738 AF in 2035, an increase of 128 AF or roughly 21 percent. Over the next 20 years, this is an annual increase of 6.4 AF. Water losses are held constant in light of the District's advanced metering system that allows daily monitoring and response to leaks within 24 hours. It is important to remember however, that the starting point for this projection is during a time of substantial conservation and would be considered low compared to what might be expected during more "normal" years (or water use during non-drought years). This is not intended to downplay future water demands and subsequent need for more local wells and increased dependency on CLAWA supplies when local well production is limited. Rather, it is intended to only be an accurate reflection of current conditions and for planning purposes, the District expects the "drought condition" to become more common.

The District's current and projected total water demands are summarized in **Table 4-3**; note that the District does not purchase or supply raw water and recycled water services are not feasible, as detailed in Chapter 6.

**Table 4-3 Retail: Total Water Demands**

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 *(opt)* |
|---|---|---|---|---|---|---|
| Potable and Raw Water *From Tables 4-1 and 4-2* | 265,873 | 278,735 | 292,253 | 306,460 | 321,391 | 0 |
| Recycled Water Demand* *From Table 6-4* | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL WATER DEMAND (CCF)** | 265,873 | 278,735 | 292,253 | 306,460 | 321,391 | 0 |
| **TOTAL WATER DEMAND (AF)** | 610 | 640 | 671 | 704 | 738 | |
| **Recycled water demand fields will be blank until Table 6-4 is complete.* | | | | | | |

Although future water savings (or "Passive Savings") from codes, standards, ordinances, or transportation and land use plans are not included in the District's demand projections, CVWD has been very successful in reducing demand as detailed in Chapter 9.

## 4.3 Distribution System Water Losses

Distribution system water losses (also known as "real losses") are the physical water losses from the water distribution system and the supplier's storage facilities, up to the point of customer consumption. Real losses can occur because of leaking or broken pipes, leaks or overflows at storage tanks, or leaks at service connections. California Senate Bill No. 1420 (SB 1420) requires water utilities that submit UWMPs to calculate annual system water losses using the water audit methodology developed by the American Water Works Association (AWWA). SB 1420 also requires that utilities submit these audits every five years as part of their respective UWMP. To facilitate user-friendly and consistent water auditing practices, AWWA has developed the AWWA Free Water Audit Software, which is based on the principles of the AWWA M36 Water Audit methodology. Per DWR guidelines, utilities must use this software to complete their audit. The total water loss volume for 2015 is summarized in Table 4-4. The complete water loss audit is included in Appendix F and summarized below.

| Table 4-4 Retail: 12 Month Water Loss Audit Reporting | |
|---|---|
| Reporting Period Start Date (mm/yyyy) | Volume of Water Loss* |
| 01/2015 | 14,705.42 |
| ** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.* | |
| NOTES: Losses shown in Table 4-1 are slightly less and calculated as the difference between production and consumption, to maintain consistency with data used from Annual Report. | |

The water audit performed on the CVWD data for calendar year 2015 considered the water supplied, the water consumed, pipeline system details, and cost data to arrive at a "Water Audit Data Validity Score" of 81 out of 100. The Data Validity Score of 81 puts CVWD's water audit data within "Level IV" on a five-level rating scale.[3] DWR provided suggestions for data improvement for each Level to control water loss in five focus areas, as shown below.

**Table 4B: DWR Water Loss Control Recommendations**

| | Audit Data Collection | Short-Term Loss Control | Long-Term Loss Control | Target-Setting | Benchmarking |
|---|---|---|---|---|---|
| **Level IV (score 71-90)** | Refine data collection practices and establish as routine business process | Refine, enhance or expand ongoing programs based on economic justification | Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management | Establish mid-range (5 year horizon) apparent and real loss reduction goals | Performance Benchmarking – Infrastructure Leakage Index (ILI) is meaningful in comparing real loss standing. |

Based on the District's water loss audit provided in **Appendix F**, it had a system loss of 34 AF or 5.5 percent, which is considered low by industry standards. According to District records, the system loss for the last 28 years of data is less than 9 percent, on average. For the last 19 years, system loss has been kept at an average of 6 percent (CVWD Annual Sources of Supply/System Loss/Rainfall spreadsheet). In the early 1990s, the District significantly reduced water loss by conducting annual pipeline replacement projects. With incorporation of the

[3] The AWWA Water Audit provides another performance indicator in addition to the Data Validity Score called the Infrastructure Leakage Index (ILI). However, the ILI is not discussed here since the Water Audit manual located in the DWR Guidebook, Appendix L, advises not to use the ILI for small systems or those that operate at low pressure.

District's advanced metering infrastructure (AMI) system beginning in 2011 (detailed in Chapter 8), CVWD can quickly (within 24 hours of a consistently running meter) identify customers that may have leaks, breaks, or other irregular water use situations.

## 4.4 Water Use for Lower Income Households

California Senate Bill No. 1087 (SB 1087) requires the water use projections of an UWMP to include the water demands for affordable housing as identified in the housing element of any city, county, or city and county in the service area of the supplier. SB 1087 builds on an existing statutory priority for providing water and sewer services to affordable housing developments. CVWD will not deny nor condition approval of water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households. Because Crestline is within unincorporated San Bernardino County, it is not assigned a specific regional housing needs allocation. The allocation for all of unincorporated San Bernardino County applies to all of the unincorporated communities and is up to the County to determine. Therefore, future water demands of affordable housing projects are not specifically called out in CVWD's water use projections (**Table 4-5**).

| Table 4-5 Retail Only: Inclusion in Water Use Projections | |
|---|---|
| Are Future Water Savings Included in Projections?<br>(Refer to Appendix K of UWMP Guidebook)<br>*Drop down list (y/n)* | No |
| If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found. | |
| Are Lower Income Residential Demands Included In Projections?<br>*Drop down list (y/n)* | No |

As discussed previously in Chapter 3, several areas of the District meet the criteria for "disadvantaged community" or DAC, according to the 2009-2013 American Community Survey (ACS). A DAC meets the same criteria as the definition for "low-income", which is an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI (CCR Section 596.1). Therefore, the District's projections for water use are essentially of that for a low-income community. However, because the District is located in an unincorporated area there are no low-income housing needs projections available, and cannot provide the verification needed by DWR to meet this requirement.

# CHAPTER 5: BASELINES AND TARGETS

With the adoption of the Water Conservation Act of 2009, also known as the SB X7-7, the State set a goal of reducing per capita urban water use by 20 percent by the year 2020. Each retail urban water supplier must determine baseline water use during their baseline period and also target water use for the years 2015 and 2020 in order to help the State achieve the 20 percent reduction. In this Plan, CVWD must demonstrate compliance with their Interim Water Use Target for the year 2015 to determine if they are on-track to achieve the 2020 target. Compliance is verified by DWR reviewing the SB X7-7 Verification Forms submitted with this UWMP **(Appendix G).** Tables from the SB X7-7 Verification Forms that are shown in Chapter 5 differ from the UWMP tables in the rest of this UWMP as they are colored green and brown and begin with the title "SB X7-7 Table …"

## 5.1 SB X7-7 Baselines and Targets

For the 2010 UWMP, the District calculated their 2020 Urban Water Use Target with "Target Method 3", which is "95 percent of Hydrologic Regional Target from the 20 x 2020 Water Conservation Plan (draft, April 30, 2009)." The District's reported Target for 2020 was 162 gallons per capita per day (GPCD) however; the baselines have been updated using the DWR Population Tool. Therefore, as allowed by DWR guidelines, CVWD will herein revise its water use baselines and targets for 2015 and 2020.

On May 9, 2016, Governor Brown issued Executive Order B-37-16,[1] which directs DWR to publish a draft framework by January 10, 2017 to develop new water use targets as part of a permanent framework for urban water agencies. The Executive Order states:

> These water use targets shall be customized to the unique conditions of each water agency, shall generate more statewide water conservation than existing requirements, and shall be based on strengthened standards for: (a) indoor residential per capita water use; (b) outdoor irrigation, in a manner that incorporates landscape area, local climate, and new satellite imagery data; (c) commercial, industrial, and institutional water use; and (d) water lost through leaks.

[1] https://www.gov.ca.gov/docs/5.9.16_Executive_Order.pdf

CVWD will review the new regulations when they become available and revise the water conservation targets described herein as needed.

## 5.2 Updating Calculations from 2010 UWMP

As allowed by the CWC and explained in DWR guidelines, water agencies may update their 2020 Target using a different Target method and/or revising population estimates for the baseline years. CVWD used Target Method 3 in their 2010 Plan, and will continue to use Target Method 3 in their 2015 Plan. Population estimates used to calculate the Targets and Baselines are derived from DWR's Population Tool provided in **Appendix H**. The calculation methodology for Target Method 3 is detailed in **Appendix G** and summarized below.

## 5.3 Baseline Periods

According to the CWC, water suppliers who used less than 10 percent recycled water in 2008 must use a 10-year baseline period for water use and calculate the average water use, in GPCD,[2] over that length of time. CVWD has never used recycled water and will therefore continue using a 10-year baseline period beginning in 2001 and ending in 2010, as identified in the 2010 UWMP.

Water suppliers must also calculate water use, in GPCD, for a 5-year baseline period, which is used to confirm that the selected 2020 target meets the minimum water use reduction requirements. In other words, the 10-year baseline can be considered the "Baseline GPCD" and the 5-year baseline as the "Target Confirmation". The District selected in their 2010 Plan a 5-year base period beginning in 2006 and ending in 2010 as shown in **SB X7-7 Table 1.**

[2] GPCD Terminology: Two terms are often used interchangeably; Daily per Capita Water Use and Gallons per Capita per Day (GPCD). Daily per Capita Water Use is the amount of water used per person per day. In the UWMP, this is total water use within a service area, divided by population and is measured in gallons. GPCD is Daily per Capita Water Use measured in gallons. These are different from R-GPCD, which is solely the residential water use divided by population, and is used in drought reporting to the State Water Resources Control Board.

| SB X7-7 Table-1: Baseline Period Ranges | | | |
|---|---|---|---|
| **Baseline** | **Parameter** | **Value** | **Units** |
| 10- to 15-year baseline period | 2008 total water deliveries | 328,442 | Hundred Cubic Feet |
| | 2008 total volume of delivered recycled water | - | Hundred Cubic Feet |
| | 2008 recycled water as a percent of total deliveries | 0.00% | Percent |
| | Number of years in baseline period[1, 2] | 10 | Years |
| | Year beginning baseline period range | 2001 | |
| | Year ending baseline period range[3] | 2010 | |
| 5-year baseline period | Number of years in baseline period | 5 | Years |
| | Year beginning baseline period range | 2006 | |
| | Year ending baseline period range[4] | 2010 | |
| *[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If* | | | |
| *2 The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.* | | | |
| *[3] The ending year must be between December 31, 2004 and December 31, 2010.* | | | |
| *[4] The ending year must be between December 31, 2007 and December 31, 2010.* | | | |

## 5.4 Service Area Population

In order to correctly calculate annual GPCD, agencies must determine the population that they served for each baseline year in both of the baseline periods and for the 2015 compliance year. The DWR Population Tool (**Appendix H**) generated population numbers that are close to the District's internal method described in Chapter 3, and are therefore used for measuring SB X7-7 compliance.

The Population Tool developed by DWR is particularly useful for agencies like CVWD whose service area boundaries do not match significantly to a city or census-designated place (CDP) and cannot use Department of Finance population data. The Tool utilizes U.S. Census year (i.e., 1990, 2000, and 2010) data and electronic maps of the CVWD service area (developed by WEBB) to obtain population numbers for census years. Using the number of residential meters (single-family and multifamily residential combined) from the District's annual Public Water System Statistics (PWSS) reports or Annual Reports to the SWRCB, the tool calculates the population for the non-census years as shown in **SB X7-7 Table 3**.

| SB X7-7 Table 3: Service Area Population | | |
|---|---|---|
| Year | | Population |
| 10 to 15 Year Baseline Population | | |
| Year 1 | 2001 | 7,176 |
| Year 2 | 2002 | 7,276 |
| Year 3 | 2003 | 7,363 |
| Year 4 | 2004 | 7,506 |
| Year 5 | 2005 | 7,503 |
| Year 6 | 2006 | 7,645 |
| Year 7 | 2007 | 7,615 |
| Year 8 | 2008 | 7,519 |
| Year 9 | 2009 | 7,339 |
| Year 10 | 2010 | 7,277 |
| 5 Year Baseline Population | | |
| Year 1 | 2006 | 7,645 |
| Year 2 | 2007 | 7,615 |
| Year 3 | 2008 | 7,519 |
| Year 4 | 2009 | 7,339 |
| Year 5 | 2010 | 7,277 |
| 2015 Compliance Year Population | | |
| **2015** | | 7,588 |

## 5.5 Gross Water Use

Gross water use is a measure of water that enters the distribution system of the supplier over a 12-month period (calendar year) with certain allowable exclusions. These exclusions are:

- Recycled water delivered within the service area;
- Indirect recycled water;
- Water placed into long term storage (surface or groundwater);
- Water conveyed to another urban supplier;
- Water delivered for agricultural use; or
- Process water.

None of the water brought into CVWD's system is used for any of the purposes listed above, and therefore does not qualify for any exclusions to its gross water use.

Gross water use is reported for each year in the baseline periods as well as 2015, the compliance year. Two versions of **SB X7-7 Table 4-A** are shown below for the District's water sources: one for CVWD's own wells (i.e., "The supplier's own water source"), and the other for water purchased from CLAWA (i.e., "A purchased or imported source"). This data is kept by CVWD in order to track historical well production and CLAWA purchases.

**SB X7-7 Table 4-A: Volume Entering the Distribution System(s)**
Complete one table for each source.

| **Name of Source** | Water purchased from CLAWA | | | |
|---|---|---|---|---|
| **This water source is:** | | | | |
| ☐ | The supplier's own water source | | | |
| ☑ | A purchased or imported source | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2001 | 212,582 | | 212,582 |
| Year 2 | 2002 | 268,619 | | 268,619 |
| Year 3 | 2003 | 259,788 | | 259,788 |
| Year 4 | 2004 | 244,889 | | 244,889 |
| Year 5 | 2005 | 77,055 | | 77,055 |
| Year 6 | 2006 | 107,503 | | 107,503 |
| Year 7 | 2007 | 203,416 | | 203,416 |
| Year 8 | 2008 | 143,983 | | 143,983 |
| Year 9 | 2009 | 144,677 | | 144,677 |
| Year 10 | 2010 | 94,616 | | 94,616 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2006 | 107,503 | | 107,503 |
| Year 2 | 2007 | 203,416 | | 203,416 |
| Year 3 | 2008 | 143,983 | | 143,983 |
| Year 4 | 2009 | 144,677 | | 144,677 |
| Year 5 | 2010 | 94,616 | | 94,616 |
| 2015 Compliance Year - Water into Distribution System | | | | |
| **2015** | | 154,756 | | 154,756 |

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

**SB X7-7 Table 4-A: Volume Entering the Distribution System(s)**
Complete one table for each source.

| **Name of Source** | CVWD Wells | | | |
|---|---|---|---|---|
| **This water source is:** | | | | |
| ☑ | The supplier's own water source | | | |
| ☐ | A purchased or imported source | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2,001 | 155152 | | 155,152 |
| Year 2 | 2,002 | 115503 | | 115,503 |
| Year 3 | 2,003 | 131688 | | 131,688 |
| Year 4 | 2,004 | 154629 | | 154,629 |
| Year 5 | 2,005 | 291483 | | 291,483 |
| Year 6 | 2,006 | 260456 | | 260,456 |
| Year 7 | 2,007 | 185163 | | 185,163 |
| Year 8 | 2,008 | 204937 | | 204,937 |
| Year 9 | 2,009 | 178715 | | 178,715 |
| Year 10 | 2,010 | 213353 | | 213,353 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2,006 | 260456 | | 260,456 |
| Year 2 | 2,007 | 185163 | | 185,163 |
| Year 3 | 2,008 | 204937 | | 204,937 |
| Year 4 | 2,009 | 178715 | | 178,715 |
| Year 5 | 2,010 | 213353 | | 213,353 |
| 2015 Compliance Year - Water into Distribution System | | | | |
| **2015** | | 111,117 | | 111,117 |

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

Annual gross water use is then the sum of the two water sources (**SB X7-7 Table 4-A** on the right and **SB X7-7 Table 4-A** on the left) for each year.

As shown in **SB X7-7 Table 4** below, and **Appendix G**, the 10-year baseline average gross water use from 2001 to 2010 is 364,821 CCF (838 AF). Likewise, the 5-year baseline average gross water use is 347,364 CCF (797 AF) and the 2015 compliance year gross water use is 265,873 CCF (610 AF).[3] This includes both sources of water to the District; pumping from its own wells and purchases from CLAWA.

| SB X7-7 Table 4: Annual Gross Water Use * | | | |
|---|---|---|---|
| **Baseline Year** *Fm SB X7-7 Table 3* | | **Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.* | **Annual Gross Water Use** |
| 10 to 15 Year Baseline - Gross Water Use | | | |
| Year 1 | 2001 | 367,734 | 367,734 |
| Year 2 | 2002 | 384,122 | 384,122 |
| Year 3 | 2003 | 391,476 | 391,476 |
| Year 4 | 2004 | 399,518 | 399,518 |
| Year 5 | 2005 | 368,538 | 368,538 |
| Year 6 | 2006 | 367,959 | 367,959 |
| Year 7 | 2007 | 388,579 | 388,579 |
| Year 8 | 2008 | 348,920 | 348,920 |
| Year 9 | 2009 | 323,392 | 323,392 |
| Year 10 | 2010 | 307,969 | 307,969 |
| **10 - 15 year baseline average gross water use** | | | **364,821** |
| 5 Year Baseline - Gross Water Use | | | |
| Year 1 | 2006 | 367,959 | 367,959 |
| Year 2 | 2007 | 388,579 | 388,579 |
| Year 3 | 2008 | 348,920 | 348,920 |
| Year 4 | 2009 | 323,392 | 323,392 |
| Year 5 | 2010 | 307,969 | 307,969 |
| **5 year baseline average gross water use** | | | **347,364** |
| 2015 Compliance Year - Gross Water Use | | | |
| **2015** | | 265,873 | **265,873** |
| * NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3 | | | |

*Volumes in CCF. To convert to AF, divide by 435.6.

[3] Indeed, this volume of water into the distribution system differs from the volume of water supplied shown in **Table 2-1** by approximately 32 AF. This can be explained by the system water loss between the point of production and the point of consumption.

## 5.6 Baseline Daily per Capita Water Use

To obtain the Daily Per Capita Water Use (GPCD), divide the yearly gross water use by the service area population. As shown on **Table 5**, the 10-year Average Baseline GPCD is 101 and the 5-year Average Baseline GPCD is 95. The 2015 Compliance Year GPCD of 72 is calculated in the same manner as the 5- and 10-year periods using the total population and total volume of water into the system.

**SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)**

| **Baseline Year** *Fm SB X7-7 Table 3* | | Service Area Population *Fm SB X7-7 Table 3* | Annual Gross Water Use *Fm SB X7-7 Table 4* | Daily Per Capita Water Use (GPCD) |
|---|---|---|---|---|
| 10 to 15 Year Baseline GPCD | | | | |
| Year 1 | 2001 | 7,176 | 367,734 | 105 |
| Year 2 | 2002 | 7,276 | 384,122 | 108 |
| Year 3 | 2003 | 7,363 | 391,476 | 109 |
| Year 4 | 2004 | 7,506 | 399,518 | 109 |
| Year 5 | 2005 | 7,503 | 368,538 | 101 |
| Year 6 | 2006 | 7,645 | 367,959 | 99 |
| Year 7 | 2007 | 7,615 | 388,579 | 105 |
| Year 8 | 2008 | 7,519 | 348,920 | 95 |
| Year 9 | 2009 | 7,339 | 323,392 | 90 |
| Year 10 | 2010 | 7,277 | 307,969 | 87 |
| **10-15 Year Average Baseline GPCD** | | | | **101** |
| 5 Year Baseline GPCD | | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Service Area Population *Fm SB X7-7 Table 3* | Gross Water Use *Fm SB X7-7 Table 4* | Daily Per Capita Water Use |
| Year 1 | 2006 | 7,645 | 367,959 | 99 |
| Year 2 | 2007 | 7,615 | 388,579 | 105 |
| Year 3 | 2008 | 7,519 | 348,920 | 95 |
| Year 4 | 2009 | 7,339 | 323,392 | 90 |
| Year 5 | 2010 | 7,277 | 307,969 | 87 |
| **5 Year Average Baseline GPCD** | | | | **95** |
| 2015 Compliance Year GPCD | | | | |
| **2015** | | 7,588 | 265,873 | **72** |

*Volumes in CCF. To convert to AF, divide by 435.6.

## 5.7 2015 and 2020 Targets

Each water supplier has four different methods to choose from when determining the 2020 Urban Water Use Target; they are:

- Method 1: *80 Percent of 10-Year Baseline GPCD;*
- Method 2: *Efficiency Standards (Indoor Residential Use, Landscaped Area Water Use and Baseline CII Water Use);*
- Method 3: *95 Percent of Hydrologic Regional Target from the 20 x 2020 Water Conservation Plan, State of California Agency Team, 2010;* and
- Method 4: *Savings by Water Sector.*

According to DWR, Methods 2 and 4 are the least commonly-used and Method 1 is the most common. CVWD chose Method 3 in their 2010 Plan and will continue for this 2015 Plan. As shown in **Figure 5-1**, most of CVWD's service area (94 percent) is within the South Lahontan Hydrologic Region and approximately 6 percent is within the South Coast Hydrologic Region.[4]

[4] Data source for CVWD District boundary: San Bernardino County GIS, 2016. Data source for hydrologic regions: California Dept. of Water Resources, 2016. South Coast Hydrologic Region contains the Los Angeles Regional Water Quality Control Board (RWQCB), Santa Ana RWQCB, and the San Diego RWQCB.

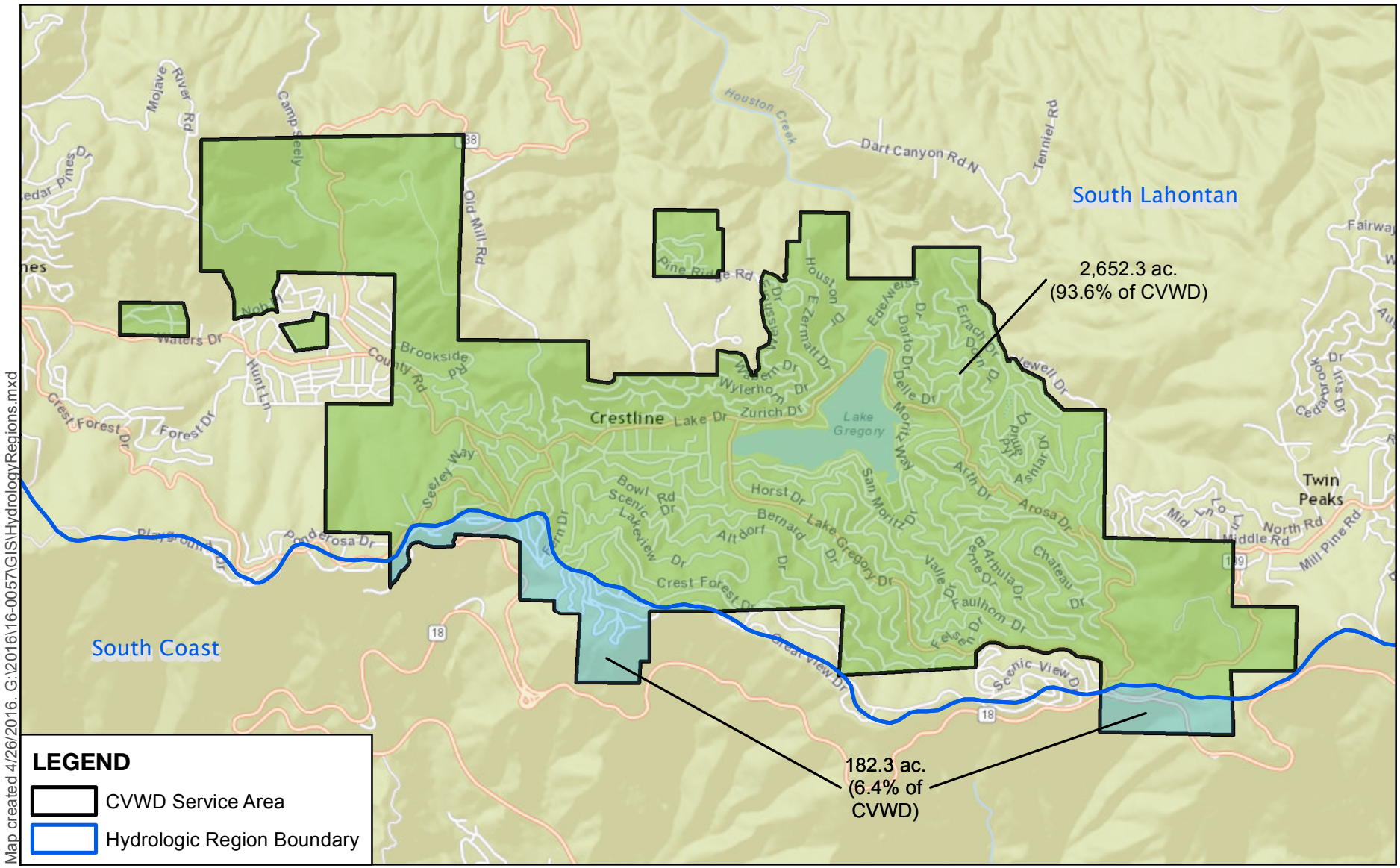


Figure 5-1 – Hydrologic Regions

2015 Urban Water Management Plan

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**SB X7-7 Table 7-E** automatically calculates the Regional Target based on the proportion of service area within each hydrologic region.

| SB X7-7 Table 7-E: Target Method 3 | | | | |
|---|---|---|---|---|
| Agency May Select More Than One as Applicable | Percentage of Service Area in This Hydrological Region | Hydrologic Region | "2020 Plan" Regional Targets | Method 3 Regional Targets (95%) |
| ☐ | | North Coast | 137 | 130 |
| ☐ | | North Lahontan | 173 | 164 |
| ☐ | | Sacramento River | 176 | 167 |
| ☐ | | San Francisco Bay | 131 | 124 |
| ☐ | | San Joaquin River | 174 | 165 |
| ☐ | | Central Coast | 123 | 117 |
| ☐ | | Tulare Lake | 188 | 179 |
| ☑ | 94% | South Lahontan | 170 | 162 |
| ☑ | 6% | South Coast | 149 | 142 |
| ☐ | | Colorado River | 211 | 200 |
| **Target** *(If more than one region is selected, this value is calculated.)* | | | | **161** |

**SB X7-7 Table 7-F** illustrates the next step in the process to verify that the 2020 Water Use Target calculated above will reduce the District's 2020 water use by a minimum of 5 percent from the 5-year baseline. However, for water suppliers with a 5-year baseline at, or below 100 GPCD, the 5 percent required reduction in GPCD from the 5-year baseline does not apply. CVWD's 5-year baseline is 95 GPCD, therefore, the confirmed 2020 Target in **SB X7-7 Table 7-F** is automatically calculated as the hydrologic region target of 161 GPCD.

| SB X7-7 Table 7-F: Confirm Minimum Reduction for | | | |
|---|---|---|---|
| 5 Year Baseline GPCD *From SB X7-7 Table 5* | Maximum 2020 Target[1] | Calculated 2020 Target[2] | **Confirmed 2020 Target** |
| 95 | N/A | 161 | **161** |
| *[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD except for suppliers at or below 100 GPCD.* *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.* | | | |
| NOTES: Volumes in GPCD. | | | |

Next, the 2015 Interim Urban Water Use Target is calculated to determine the District's current compliance status as of 2015. The 2015 Interim Target is the value halfway between the 10-year Baseline GPCD of 101 GPCD (from **SB X7-7 Table 5**) and the confirmed 2020 Target of 161 GPCD (**SB X7-7 Table 7-F**). CVWD's 2015 Interim Target is 131 GPCD as shown in **SB X7-7 Table 8**.

| SB X7-7 Table 8: 2015 Interim Target GPCD | | |
|---|---|---|
| Confirmed 2020 Target *Fm SB X7-7 Table 7-F* | 10-15 year Baseline GPCD *Fm SB X7-7 Table 5* | **2015 Interim Target GPCD** |
| 161 | 101 | **131** |
| NOTES: Volumes in GPCD. | | |

CVWD achieved the water conservation target for 2015 based on the District's 2015 compliance GPCD of 72 (see **Table 5-1**).

| **Table 5-1 Baselines and Targets Summary** *Retail Agency or Regional* | | | | | |
|---|---|---|---|---|---|
| Baseline Period | Start Year | End Year | Average Baseline GPCD* | 2015 Interim Target * | Confirmed 2020 Target* |
| 10-15 year | *2001* | *2010* | *101* | *131* | *161* |
| 5 Year | *2006* | *2010* | *95* | | |
| *All values are in Gallons per Capita per Day (GPCD) | | | | | |
| NOTES: CVWD 5-year baseline water use is less than 100 GPCD. | | | | | |

CVWD has demonstrated water use reductions above and beyond that which is required by the State's SB X7-7 law. Considering their baseline population and gross water use, the District must use no more than 161 GPCD as of 2020, and no more than 131 GPCD as of 2015. The District's GPCD for 2015 is 72, which is 45 percent less than the Interim Target and 55 percent less than the 2020 Target. CVWD is well within compliance and certainly projected to meet the Target for 2020.

# CHAPTER 6: SYSTEM SUPPLIES

This chapter describes and quantifies the sources of water available to CVWD, including its own wells and purchased supplies from the local wholesaler (CLAWA). The District's supply portfolio does not currently include surface water, recycled water, desalinated water, transfers and exchanges, or conjunctive use. Each water source is described below including future actions or projects anticipated to meet future water demands. The water volumes presented in this chapter reflect expectations for "average year" conditions. Single- and multiple-dry year conditions and catastrophic interruptions are considered in the supply reliability discussion in Chapter 7 and the water shortage contingency planning discussion in Chapter 8.

## 6.1 Purchased or Imported Water

CVWD purchases supplemental water supplies from CLAWA, which is a State Water Project (SWP) contractor and acts as wholesaler to the San Bernardino Mountains area. CLAWA began delivering imported water to CVWD in 1972. CLAWA's primary source of supply is surface water from Silverwood Lake, which is part of the East Branch of the SWP. The majority of water delivered to CLAWA's wholesale and retail customers originates from the SWP.

CLAWA is one of 29 agencies authorized to receive direct water deliveries from the SWP pursuant to a contract with DWR. Under that contract, CLAWA's SWP "Table A" allocation is 5,800 acre-feet per year. "Table A" supplies refer to the maximum amount of water that each contractor is entitled to receive on an annual basis from the SWP and that amount is set forth in "Table A" of each contract with DWR. It is an uncommon event that DWR will raise SWP Table A allocations to 100 percent of deliveries. Furthermore, while Table A identifies the maximum amount of SWP supplies that the contractors may receive in a given year, the amount actually available depends on a variety of hydrologic, operational, environmental, regulatory, legal, and other factors. On a bi-annual basis, DWR prepares a SWP Delivery Reliability Report which accounts for the many factors affecting the SWP. The report forecasts the long-term annual availability of SWP supplies during normal, single-dry, and multiple-dry year periods over the next 20-year forecast (CLAWA 2010 UWMP, August 2011).

CLAWA also, indirectly, obtains some of its supply from Houston Creek,[1] which flows into Silverwood Lake when seasonal weather permits. This local water appropriated by CLAWA is in addition to its SWP allotment. Actual diversions vary depending on annual precipitation and are limited to the amount of return flow to the Mojave watershed each year. Average Houston Creek allocations from water year 1989 through 2015 averaged 399 AF per year. Between 2011 and 2015, diversions averaged 189 AF.[2] Diversion of water from Houston Creek is subject to two diversion permits, which combined authorize the appropriation of up to 1,300 AF per year to CLAWA.[3] CLAWA's permits for appropriative rights to Houston Creek together with SWP deliveries creates a more reliable water supply in that Houston Creek is able to supplement CLAWA's total water supply. As an example, in 1992-93 an extended drought in Northern California forced the DWR to reduce its SWP deliveries to CLAWA, who in-turn was able to use water from Houston Creek to supplement its supply. However, due to the unpredictable nature of local hydrology, CLAWA's appropriated water from Houston Creek is not as reliable as SWP deliveries (CLAWA 2010 UWMP, August 2011).

CLAWA's supply portfolio includes a 2005 agreement with Lake Arrowhead Community Services District (LACSD) and San Bernardino Valley Municipal Water District (SBVMWD). During normal years, this arrangement mainly affects LACSD however, during years of low SWP allocation (i.e., drought years) CLAWA has the right to utilize a portion of the water purchased from SBVMWD to satisfy any demands anywhere in CLAWA's service area. The amount purchased from SBVMWD in any year is limited to 15 percent of SBVMWD's SWP allocation (CLAWA 2010 UWMP, August 2011).

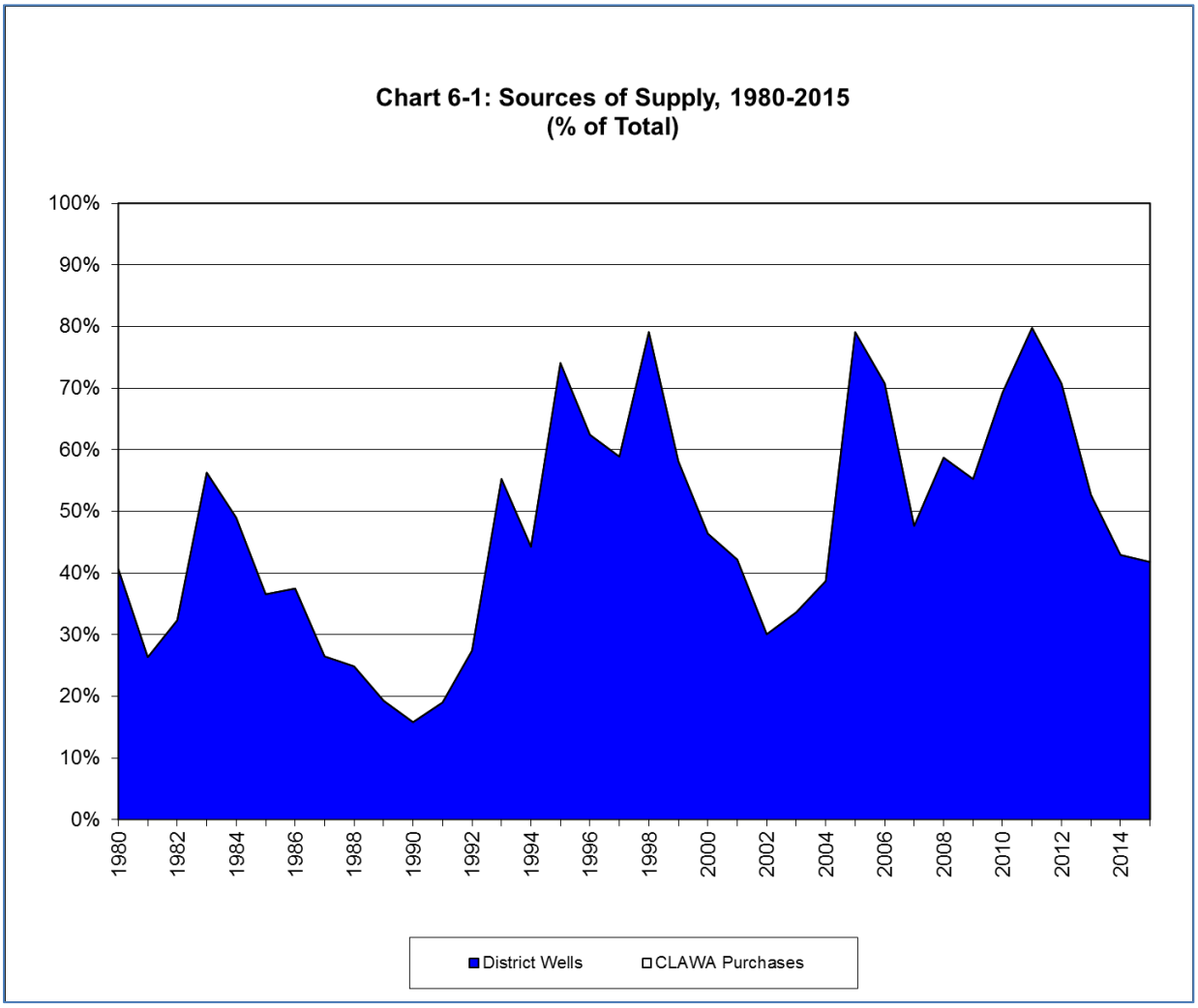
In addition, CLAWA entered into an amendment to a 2008 exchange agreement with SBVMWD which provides that SBVMWD shall deliver to CLAWA, at Silverwood Lake, up to a total of 1,650 AF of water when requested by CLAWA, between the years 2009 and 2018, subject to the conditions of their 2008 and 2009 agreements.

Similarly in 2010, CLAWA entered into an exchange agreement with San Gorgonio Pass Water Agency (SGPWA) which stipulates that SGPWA shall deliver to CLAWA up to a total of 1,000

[1] Sometimes spelled "Huston."
[2] Source: Email from Elizabeth Martinez, DWR, Nov. 13, 2015, Updated Monthly Breakdown for Houston Creek flow and CLAWA deliveries at Silverwood.
[3] Permits issued by SWRCB in 1991. One permit authorizes the diversion of up to 1,000 AF per year, the other up to 300 AF per year. Prior to issuance of these permits, this water was un-appropriated.

AF of water when requested by CLAWA, between the years 2012 and 2020, subject to the conditions of their 2010 agreement.

A historic representation of the District's fluctuating dependence on imported supplies from CLAWA beginning in 1980 is provided in **Chart 6-1.** As shown, during years of drought, purchased water from CLAWA makes up a considerable difference between District wells and 100 percent of supply (i.e., the area in white). For example, in 1990 more than 84 percent of CVWD supplies came from imported water purchased from CLAWA. On the other hand, local CVWD wells have been able to meet nearly 80 percent of customer demand several times over the past 20 years.




Source: CVWD records. CVWD added several wells between 1994 and 2004.

### 6.1.1 Purchased Water Quality

SWP water is considered high quality water and is used statewide to serve 25 million residents as a supplemental water source. Chemical, physical, and biological parameters are routinely monitored throughout the SWP from the Feather River drainage in the north to Lake Perris in the south including more than 40 sites and over 200 individual chemicals (MWA, 2016). CLAWA's water supplies are treated at the Lake Silverwood Water Treatment Plant. CLAWA maintains consistent compliance with all water quality standards and regulations. The results of each year's water quality sampling are reported in the Agency's annual Consumer Confidence Report (2014 report provided in **Appendix I**).

Since March of 2004, CLAWA has operated 12 granulated activated carbon (GAC) vessels designed to handle the plant's maximum design capacity. The GAC vessels remove trihalomethanes (THMs) that are formed predominantly as a by-product when chlorine is used to disinfect water for human consumption. In addition, the plant has a pH control system to reduce the corrosiveness and improve the taste of water from Silverwood Lake.

## 6.2 Groundwater

Currently, CVWD produces water locally from 39 groundwater wells in a fractured rock aquifer system (2015 CVWD Annual Report to the SWRCB). Historically, the District has had as many as 50 wells (CVWD staff). DWR classifies this portion of the San Bernardino Mountains as 'non-water bearing' and therefore is not included on the California Statewide Groundwater Elevation Monitoring (CASGEM) priority list, or subject to the 2014 Sustainable Groundwater Management Act (SGMA). The area is also not included in DWR "Bulletin 118" list of groundwater basin data. The San Bernardino Mountains consist of a complex of crystalline granitic rocks that have intruded metaplutonic and metasedimentary rocks (IGC, 1997). Thus, there are no unconsolidated sediments or traditional groundwater basins in this mountainous area. Instead, groundwater is confined to open fractures in the hard metamorphic and granitic mountain rocks underlying CVWD's service area. Groundwater is fed by rainfall and snow seeping into fractures along drainage courses, and may discharge down-gradient as a spring, enter the bottom of a drainage feeding a flow, or continue to move down-gradient beneath the surface (USGS, 2002).

The fractured rock aquifers are very different than traditional alluvial groundwater basins in that they produce far smaller volumes, are tightly correlated with precipitation, and there is no "basin" of water to measure in order to calculate things like a "safe yield" or "overdraft". Water is transmitted only through cracks and fractures from the folding and faulting of the rock over time; thus, explaining the difficulty in their ability to collect and store water (Banks & Robins, 2002).

Wells are often placed where groundwater accumulates behind a fault or fracture. Barriers to groundwater flow consist primarily of westerly and northwesterly-trending faults that represent many of the contacts between the different igneous and metamorphic rocks in the San Bernardino Mountains (IGC, 1997). When the flow-path of groundwater is interrupted, for example, due to the presence of a fault, the downslope-moving groundwater accumulates behind the barrier. This causes the water table to rise until it reaches the surface, where it can resume its downslope path as surface water (USGS, 2002). Evidence of groundwater can generally be seen in numerous streams and seeps throughout the area.

### 6.2.1 Groundwater Quality

The water from CVWD's wells is of high quality and requires little treatment. CVWD wells are sampled as required by the SWRCB on a weekly, monthly, and annual basis. The District maintains consistent compliance with all water quality standards and regulations. The results of the water quality sampling in 2014 are reported in the District's Annual Consumer Confidence Reports located in **Appendix I**. The District has four chlorination locations for disinfection and five locations where phosphate is injected for corrosive control purposes. One well, Chamois, has higher levels of uranium, however, it is treated by blending with other water sources at the Chamois tank.

### 6.2.2 Groundwater Management

CVWD is not located within an adjudicated groundwater basin, nor does CVWD have an adopted groundwater management plan. However, groundwater management actions are ongoing; for example, the District continually monitors well production and water quality from its wells. Likewise, water conservation is encouraged as standard practice year-round.

Approximately 94 percent of the CVWD service area is within the South Lahontan Hydrologic Region and therefore within the local jurisdiction of the Lahontan Regional Water Quality Control

Board (RWQCB). The remainder of the District is within the South Coast Hydrologic Region under the local jurisdiction of the Santa Ana RWQCB.

Treated wastewater from CVWD's service area flows into the Upper Mojave River Valley Basin (No. 6-42). This basin has received a High Priority ranking of 21.8 from the CASGEM program, in an effort to begin groundwater elevation monitoring pursuant to Senate Bill X7-6. The Upper Mojave River Valley Groundwater Basin is a portion of an area adjudicated in 1996 setting the Mojave Water Agency as Watermaster.

### 6.2.3 Overdraft Conditions

CVWD obtains its local water supply from fractured rock aquifers and not a groundwater basin. Therefore, overdraft conditions do not apply in this circumstance. However, unlike traditional groundwater basins, fractured bedrock does not typically convey or store large quantities of water. This means that fractured bedrock groundwater supplies are more reliant on local precipitation to recharge. Therefore, CVWD's local water supply will be diminished if drought conditions continue.

### 6.2.4 Historical Groundwater Pumping

The groundwater volumes pumped in the last five years (2011-2015) are shown on **Table 6-1**. As previously indicated, fractured bedrock groundwater supplies are more reliant on local precipitation to recharge. As such, the District's local water supply would be diminished with drought conditions and a greater reliance on CLAWA water would be required.

**Table 6-1 Retail: Groundwater Volume Pumped**

| ☐ | Supplier does not pump groundwater. The supplier will not complete the table below. | | | | | |
|---|---|---|---|---|---|---|
| Groundwater Type *Drop Down List* *May use each category multiple times* | Location or Basin Name | 2011 | 2012 | 2013 | 2014 | 2015 |
| *Add additional rows as needed* | | | | | | |
| Fractured Rock | Crestline/San Bernardino Mountains | 236,383 | 209,927 | 170,884 | 124,266 | 111,117 |
| | **TOTAL (CCF)** | 236,383 | 209,927 | 170,884 | 124,266 | 111,117 |
| | **TOTAL (AF)** | 543 | 482 | 392 | 285 | 255 |
| NOTES: No groundwater basin in the Crestline area. Source: CVWD staff, Annual Report. | | | | | | |

## 6.3 Surface Water

The District currently does not have direct access to, or plans to use self-supplied surface water as part of its water supply portfolio. Lake Gregory is located within the District and is a predominant feature of the Crestline community. CVWD does not have rights to use the lake water, which is fed by Houston Creek and managed by San Bernardino County Special Districts. Lake Gregory is a man-made lake and recreation area created with the construction of Lake Gregory dam in 1936.

## 6.4 Stormwater

Currently, the District does not have direct access to, or plans to use, self-supplied stormwater as part of its water supply portfolio.

## 6.5 Wastewater and Recycled Water

Crestline Sanitation District (CSD) is the wastewater collection and treatment agency within the District's service area as shown in **Figure 6-1.** Treated wastewater generated by CSD is not used within CVWD's service area, but rather piped out of the mountains and down into the Mojave River basin at Las Flores Ranch.

There is relatively low potential for recycled water use within CVWD's service area due to natural conditions and development patterns. The terrain is steep, winters are severe, and preservation of natural forest conditions is preferred, which means that there are few irrigated areas within the service area. In addition, there are no industrial uses within the service area and commercial uses are fairly small; therefore, the dearth of potential major users of recycled water makes use of recycled water not economically feasible at this time.

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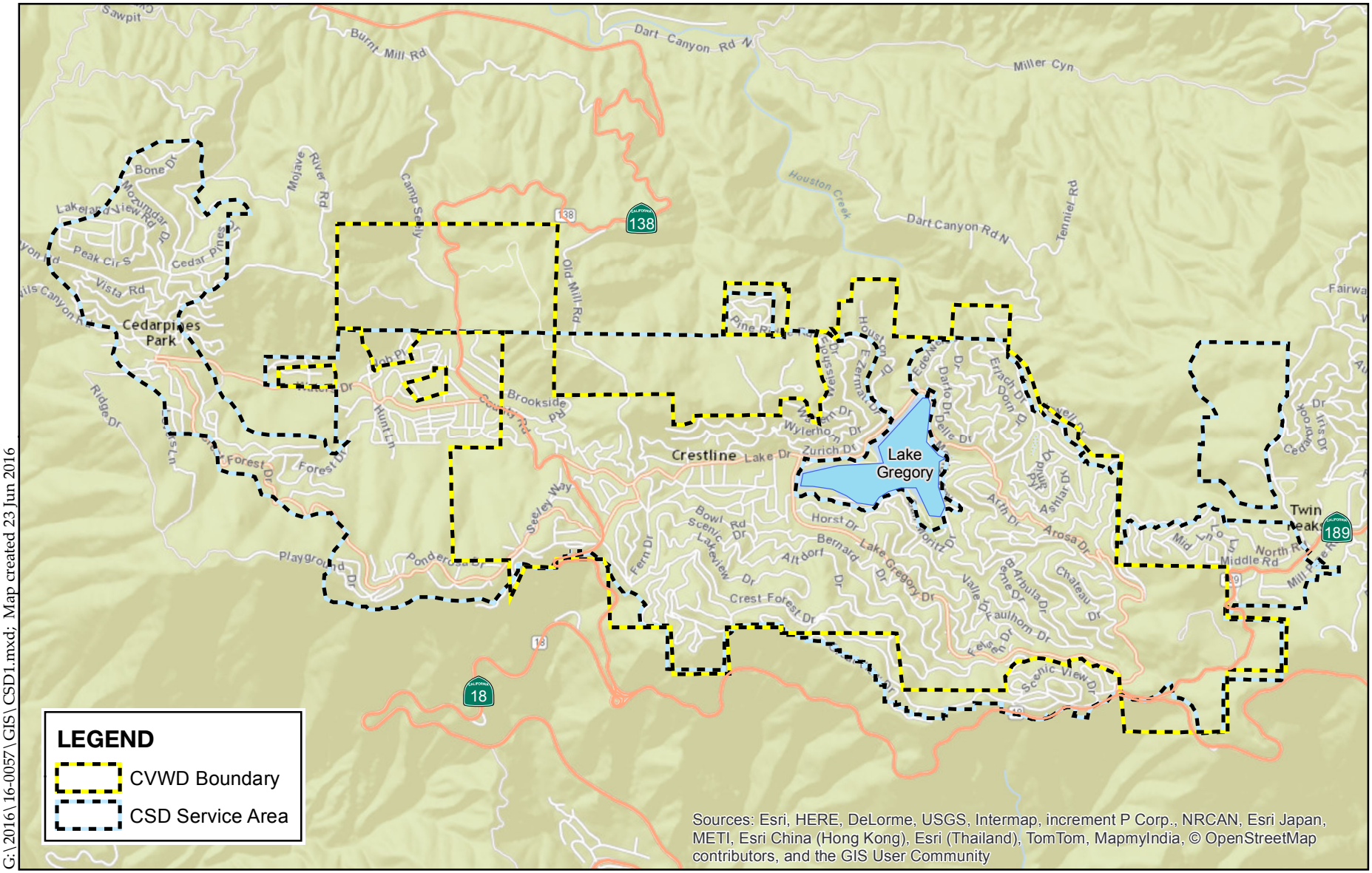


G:\2016\16-0057\GIS\CSD1.mxd; Map created 23 Jun 2016

Sources: San Bernardino Co. ISD, 2015

0 0.5 1 Miles

Figure 6.1 - Crestline Sanitation District Service Area

2015 Urban Water Management Plan

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Additionally, CVWD's service area is subject to several RWQCB prohibitions against recycled water use. The Lahontan RWQCB prohibits any discharge of waste to land or water within the Silverwood Lake watershed (Basin Plan, Ch.4). In addition, discharge of waste to land or water above 3,200 feet elevation (approximate elevation of Mojave Forks Dam) in the Deep Creek and Grass Valley Creek watersheds, or discharge of waste to surface water above 3,200 feet in areas tributary to the West Fork Mojave River or Deep Creek are prohibited.[4] The RWQCB may grant exemptions in situations when the discharge of waste will not individually or collectively, directly or indirectly, result in exceeding the water quality objectives or unreasonably affect the water for its beneficial uses. At this time, CVWD does not plan to apply for exemptions with the RWQCB to use recycled water within its service area.

The area served by CVWD and CSD is subject to these discharge prohibitions. In addition, large areas served by the districts are tributary to Lake Silverwood, which is a source of public drinking water supply. It is not known whether the RWQCB would grant an exemption for discharge of reclaimed wastewater under these circumstances. In the absence of an exemption, no reuse of recycled water is possible.

In consultations related to this plan, the CSD has indicated that it intends to use the reclaimed water from its system in locations outside of CVWD's service area. If CSD's effluent is not used at the Las Flores Ranch, CSD intends to market its reclaimed water elsewhere. Therefore, CVWD assumes that no supply of recycled water will be available from CSD.

There are no other potential sources of reclaimed water in the District's service area. LACSD adjoins CVWD to the east, and produces tertiary-treated wastewater effluent. Conveyance of flows from the LACSD treatment facility to CVWD's service area would probably require extensive pumping and very lengthy pipelines, along with regulatory approvals. Therefore, for the purposes of this plan, it has been assumed that no substantial reclaimed water supply will be available for use within CVWD.

### 6.5.1 Recycled Water Coordination

CSD is the wastewater collection and treatment agency in the District's service area and does not contract operation of its plants to a third party. As described previously, all treated effluent from the four treatment plants is conveyed through a single 14-mile outfall pipeline, which flows

[4] Prohibition does not apply to stormwater discharges unless such discharges create a condition of pollution or nuisance.

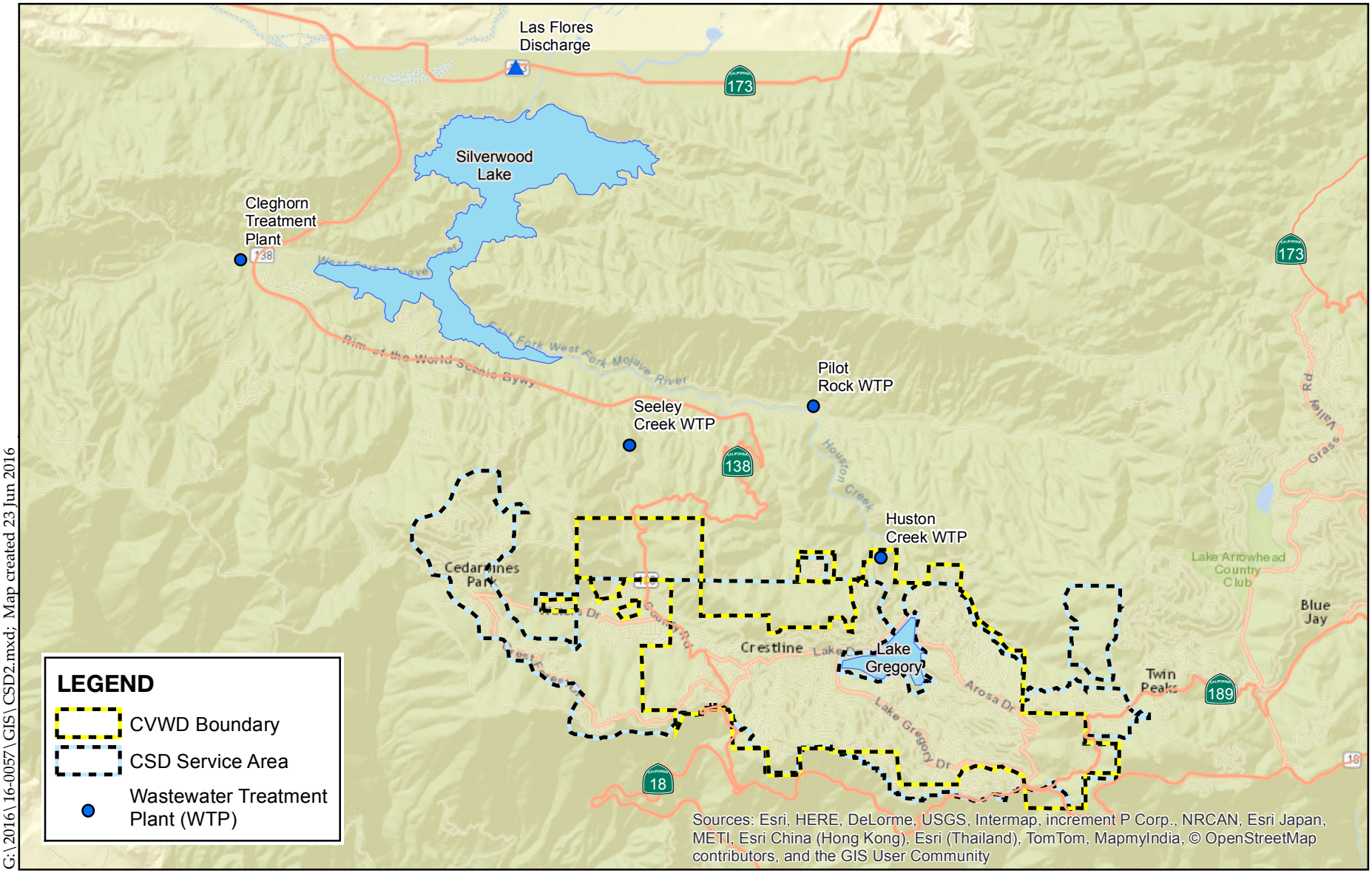
from the Houston Creek treatment plant, down Miller Canyon, to a junction point with the Seeley Creek outfall pipeline. The outfall passes around the south and west boundaries of Silverwood Lake, through Cleghorn Creek, into Summit Valley. The effluent is discharged just below Cedar Springs Dam, near Las Flores Ranch, and used for irrigation of a nearby pasture area.

The Las Flores Ranch, which has been CSD's effluent disposal site for the last 45 years, is proposed for development within the City of Hesperia. The developers of Las Flores Ranch are negotiating to obtain approval for reuse of tertiary-treated effluent. The Las Flores Ranch development, at the magnitude proposed, is dependent upon the use of effluent flows from CSD. CSD is also interested in capturing economic value for its effluent through negotiated sales. Therefore, CSD currently has no interest in pursuing tertiary treatment or reuse in the mountain area. Wastewater generated in the mountain area can be put to use however, due to the ordinance issued by the Lahontan RWQCB prohibiting the use of reclaimed water in the Silverwood Lake watershed and above 3,200 feet in the Mojave Hydrologic Unit, wastewater must be used elsewhere. In addition, CSD staff has indicated that although recycled water is not currently available for use in Crestline, the topic will be discussed in their upcoming Master Plan and 10-Year Strategic Plan. [5]

### 6.5.2 Wastewater Collection, Treatment, and Disposal

CSD operates three small wastewater treatment plants with a combined capacity of 1.4 million gallons per day (MGD) in the San Bernardino National Forest (**Figure 6-2**). The Houston Creek wastewater treatment plant, located north of Lake Gregory, has a treatment capacity of 0.7 MGD. The Seeley Creek treatment plant, located north of Valley of Enchantment, has a 0.5 MGD capacity, and the Cleghorn facility, southwest of Silverwood Lake, has a capacity of 0.2 MGD. CSD also disposes of effluent from the Pilot Rock Treatment Plant, located in Miller Canyon north of Crestline, which is owned by the California Department of Forestry and has a treatment capacity of 0.01 MGD.

[5] WEBB email correspondence with General Manager, Mark Pattison 3/8/16




G:\2016\16-0057\GIS\CSD2.mxd; Map created 23 Jun 2016

Sources: San Bernardino Co. ISD, 2015

Figure 6.2 - Crestline Sanitation District Wastewater Treatment Plants

2015 Urban Water Management Plan

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The wastewater collected within CVWD by CSD in 2015 is provided in **Table 6-2.**

| Table 6-2 Retail: Wastewater Collected Within Service Area in 2015 | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | There is no wastewater collection system. The supplier will not complete the table below. | | | | | |
| | Percentage of 2015 service area covered by wastewater collection system *(optional)* | | | | | |
| | Percentage of 2015 service area population covered by wastewater collection system *(optional)* | | | | | |
| **Wastewater Collection** | | | **Recipient of Collected Wastewater** | | | |
| Name of Wastewater Collection Agency | Wastewater Volume Metered or Estimated? *Drop Down List* | Volume of Wastewater Collected from UWMP Service Area 2015 | Name of Wastewater Treatment Agency Receiving Collected Wastewater | Treatment Plant Name | Is WWTP Located Within UWMP Area? *Drop Down List* | Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List* |
| *Add additional rows as needed* | | | | | | |
| Crestline Sanitation District | Metered | 143,201 | Crestline Sanitation District | Houston Creek | Yes | No |
| Crestline Sanitation | Metered | 65,340 | Crestline Sanitation District | Seeley Creek | No | No |
| **Total Wastewater Collected from Service Area in 2015 (CCF):** | | 208,541 | | | | |
| **(AF):** | | 479 | | | | |
| NOTES: CY 2015. Data from Crestline Sanitation District staff. ~328.4 AF to Houston Creek plant, ~150.4 AF to Seeley Creek plant. | | | | | | |

The Houston Creek and Seeley Creek plants provide primary treatment, fixed-film (i.e. trickling filter), secondary treatment, and chlorine disinfection.[6] The Cleghorn plant provides primary treatment, activated sludge secondary treatment using an extended aeration process (i.e. oxidation ditch), and chlorine disinfection. Sludge thickening and dewatering of solids from all three plants is performed at the Houston Creek facility. The Houston Creek plant also accepts septic tank discharge, treating approximately 160,000 gallons of septage per year. CSD's treated effluent meets the discharge monitoring requirements issued by the Lahontan RWQCB. Crestline Sanitation District currently has no plans to upgrade its facilities to provide tertiary treatment.

The area served by CSD sewer system, as shown in **Figure 6-2,** corresponds to the developed core of CVWD's service area. The Houston Creek plant, which is located within the CVWD service area, treats the wastewater from approximately 50 percent of the sewered area, and the Seeley Creek plant serves the other 50 percent. The Cleghorn and Pilot Rock treatment plants provide treatment service to areas outside of the UWMP whose collection systems are owned and maintained by the California Department of Forestry and the California Department of Parks and Recreation. The wastewater volume treated within the CVWD service area in 2015 is provided in **Table 6-3.** After treatment by CSD, it is discharged outside of the CVWD service area at Las Flores Ranch in Summit Valley to the north, near Hesperia.

[6] Houston and Seeley Creek plants treatment level is "Secondary, Disinfected – 23" (CCR §60301.225).

| Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below. | | | | | | | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level *Drop down list* | 2015 volumes | | | |
| | | | | | | | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |
| *Add additional rows as needed* | | | | | | | | | | |
| Houston Creek | Las Flores Ranch | Discharge for Irrigation | 6B361018001 | Land Disposal | No | Secondary, Disinfected - 23 | 143,201 | 0 | 0 | 143,201 |
| | | | | | | **Total (CCF)** | 143,201 | 0 | 0 | 143,201 |
| | | | | | | **Total (AF)** | 329 | 0 | 0 | 329 |
| NOTES: Data from CSD staff. | | | | | | | | | | |

Although use of recycled water in the Crestline area will be explored in CSD's forthcoming Master Plan and 10-year Strategic Plan, CSD presently has no plans to utilize recycled water in the Crestline area. Because CSD is the only provider within CVWD's service area, there will be no current or planned discharge of treated effluent within CVWD's service area.

### 6.5.3 Recycled Water Systems

There is currently no recycled water use within CVWD's service area. CSD collects and treats wastewater from within CVWD's service area, but this effluent is not distributed to CVWD's service area.

### 6.5.4 Recycled Water Beneficial Uses

Although there are abstractly several beneficial uses of recycled water within the service area, most have a low potential for actual implementation. This is because, as discussed in Section 6.5, there are environmental, developmental, economic, and regulatory barriers to recycled water use. As indicated in **Table 6-4,** recycled water is not used, and is not planned for use in CVWD's service area.

| Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ☑ | Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below. | | | | | | | | |
| Name of Agency Producing (Treating) the Recycled Water: | | | | | | | | | |
| Name of Agency Operating the Recycled Water Distribution System: | | | | | | | | | |
| Supplemental Water Added in 2015 | | | | | | | | | |
| Source of 2015 Supplemental Water | | | | | | | | | |
| Beneficial Use Type | General Description of 2015 Uses | Level of Treatment *Drop down list* | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |
| Agricultural irrigation | | | | | | | | |
| Landscape irrigation (excludes golf courses) | | | | | | | | |
| Golf course irrigation | | | | | | | | |
| Commercial use | | | | | | | | |
| Industrial use | | | | | | | | |
| Geothermal and other energy production | | | | | | | | |
| Seawater intrusion barrier | | | | | | | | |
| Recreational impoundment | | | | | | | | |
| Wetlands or wildlife habitat | | | | | | | | |
| Groundwater recharge (IPR)* | | | | | | | | |
| Surface water augmentation (IPR)* | | | | | | | | |
| Direct potable reuse | | | | | | | | |
| Other *(Provide General Description)* | | | | | | | | |
| | | **Total:** | 0 | 0 | 0 | 0 | 0 | 0 |
| *IPR - Indirect Potable Reuse | | | | | | | | |
| NOTES: | | | | | | | | |

There is also a dearth of potential markets for recycled water because there is little to no agriculture, irrigation, or industrial uses within CVWD's service area. Thus, the economic feasibility is low. It could be possible to apply for exceptions to the RWQCB restrictions on recycled water use; however, as there is no market for recycled water within the service area, this option will not be pursued at this time.

The 2010 UWMP for CVWD also indicated that recycled water is not expected for use in the future, as shown in **Table 6-5.**

| Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 | | | |
|---|---|---|---|
| ☑ | Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below. | | |
| | | **2010 Projection for 2015** | **2015 Actual Use** |
| Agricultural irrigation | | | |
| Landscape irrigation | | | |
| Golf course irrigation | | | |
| Commercial use | | | |
| Industrial use | | | |
| Geothermal and other energy production | | | |
| Seawater intrusion barrier | | | |
| Recreational impoundment | | | |
| Wetlands or wildlife habitat | | | |
| Groundwater recharge (IPR) | | | |
| Surface water augmentation (IPR) | | | |
| Direct potable reuse | | | |
| Other | *Type of Use* | | |
| **Total** | | 0 | 0 |
| NOTES: | | | |

### 6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

There is no current or planned use of recycled water within CVWD's service area. Crestline Sanitation District (CSD) is the only agency producing recycled water within the service area; however, CSD has no current or future plans to sell recycled water to CVWD.

| Table 6-6 Retail: Methods to Expand Future Recycled Water Use | | | |
|---|---|---|---|
| ☑ | Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation. | | |
| Page 6-13 | Provide page location of narrative in UWMP | | |
| Name of Action | Description | Planned Implementation Year | Expected Increase in Recycled Water Use |
| *Add additional rows as needed* | | | |
| | | | |
| | | **Total** | 0 |
| NOTES: | | | |

## 6.6 Desalinated Water Opportunities

The District's service area is remote from any desalinated water supply sources such as the ocean, brackish surface water, and groundwater. As such, there is no need or opportunity to implement desalinization as a water supply source.

## 6.7 Exchanges or Transfers

Due to the geographically disseminated locations of local area water purveyors, coupled with the limited availability of local water supply sources, exchanges and/or transfers are not very feasible. Imported water from the local wholesaler, CLAWA, is the source of supply for many local water purveyors to fill the gap between the difference in local supplies and peak water demands. CLAWA does participate in exchange agreements and water banking as described previously.

## 6.8 Future Water Projects

In 1997, the District commissioned a study entitled "Initial Study Water Resources Evaluation" by Independent Geo-Environmental Consultants (IGC) that identified candidate sites for wells based upon geologic interpretations and geo-hydrologic characterizations of the area within District boundaries. Fifteen candidate sites were identified (IGC, 1997). Subsequently, various other studies have been conducted to further identify locations for local groundwater supply.

Based upon these studies, it is the District's plan to develop two well sites every five years to increase its local water supply component. Due to inherently low production yields of fractured rock wells in the San Bernardino Mountains, a sustainable yield of approximately 25 gallons per minute (gpm, or 40 AF/yr) is the targeted value for each new well based upon previous hydrogeologic studies conducted for the local area (IGC, 1997). Should these targeted yields come to fruition, the increase in supply would easily outpace the estimated growth in water demands shown on **Table 4-3**. However, even with the most hydrogeologic investigative information, the nature of fractured hard rock wells along with their reliance upon annual precipitation makes it very difficult to predict a constant dependable well flow 24 hours a day, 365 days per year.

The District has two wells planned for implementation by 2016: the Electra and Valle II wells (**Table 6-7).** As such, the expected increases in water supply shown on **Table 6-7** have been reduced 50 percent to account for the numerous factors affecting production yields from hard rock wells. Estimating future well production with a 50 percent cut (or roughly 12 gpm), as shown in **Table 6-7,** is consistent with average known fractured rock production rates in the general region (South Lahontan Hydrologic Region) of approximately 10 gpm (CWP, 2013).

**Table 6-7 Retail: Expected Future Water Supply Projects or Programs**

| | |
|---|---|
| ☐ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. |
| | Provide page location of narrative in the UWMP |

| Name of Future Projects or Programs | Joint Project with other agencies? | | Description (if needed) | Planned Implementation Year | Planned for Use in Year Type | Expected Increase in Water Supply to Agency |
|---|---|---|---|---|---|---|
| | *Drop Down List (y/n)* | *If Yes, Agency Name* | | | *Drop Down List* | |
| *Add additional rows as needed* | | | | | | |
| Electra well | No | | Replacement vertical water well | 2016 | All Year Types | 8,732 |
| Valle II well | No | | New vertical water well | 2016 | All Year Types | 8,732 |
| NOTES: The District plans to drill and equip two wells every five years. Expected increase in supply per well: 20 AF/year. | | | | | | |

The variable nature of production from the current CVWD wells is illustrated in the monthly well production volumes shown in **Appendix D.**

## 6.9 Summary of Existing and Planned Sources of Water

A summary of the actual sources and volumes of water produced from CVWD wells and purchases from CLAWA for CY 2015 is provided in **Table 6-8**.

| Table 6-8 Retail: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | 2015 | | |
| ***Drop down list*** *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool* | | Actual Volume | Water Quality *Drop Down List* | Total Right or Safe Yield *(optional)* |
| *Add additional rows as needed* | | | | |
| Groundwater | | 111,117 | Drinking Water | |
| Purchased or Imported Water | | 154,756 | Drinking Water | |
| **Total (CCF)** | | 265,873 | | 0 |
| **Total (AF)** | | 610 | | 0 |
| NOTES: From CVWD records and Annual Report. | | | | |

Based upon District records from 1980-2015, District wells have accounted for 46.5 percent of the total water supply with the balance (53.5 percent) being provided by CLAWA (imported water). Notably, the balance is *always* supplied by CLAWA. Over the past 16 years (2000-2015), due to the District's expansion of local groundwater sources, local supplies have averaged approximately 54 percent of total supply. Using these historical averages, it was assumed in projecting future water supplies that 50 percent of total would be provided by local wells and 50 percent would be obtained through CLAWA. However, the percentage of CVWD supply could reasonably increase to as much as 70 percent depending on climatic conditions. CVWD's supply projections are predicated on CLAWA's ability to supply, no matter how the District's wells are producing. CLAWA has provided assurance, pursuant to State requirements, that they have ample supply for the next three years in a continued drought condition, which is provided in **Appendix K**.

An annual supply volume increase of 1 percent was used to forecast future total supply, as shown in **Table 6-9.**

| Table 6-9 Retail: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | Projected Water Supply *Report To the Extent Practicable* | | | | | | | | | |
| ***Drop down list*** *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online* | | 2020 | | 2025 | | 2030 | | 2035 | | 2040 *(opt)* | |
| | | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* |
| *Add additional rows as needed* | | | | | | | | | | | |
| Groundwater | CVWD wells | 139,718 | | 146,845 | | 154,335 | | 162,208 | | | |
| Purchased or Imported Water | CLAWA | 139,718 | | 146,845 | | 154,335 | | 162,208 | | | |
| **Total (CCF)** | | 279,436 | | 293,690 | | 308,670 | | 324,416 | | | |
| **Total (AF)** | | 641 | | 674 | | 709 | | 745 | | | |
| NOTES: Assumes 1% annual growth. Starting with 2015 actual production/purchase volumes. Assumes 50% from CLAWA and 50% from CVWD. | | | | | | | | | | | |

The projections in **Table 6-9** begin with a 2015 actual total supply volume of 265,873 CCF (610 AF). By 2035, total supply has increased by 58,543 CCF (134 AF) to 324,416 (745 AF), or roughly 2,927 CCF (6.7 AF) additional supply each year for the next 20 years.

The District intends to add two wells that potentially provide a combined average of 40 AF per year every five years. Dividing 40 AF by five years gives 8 AF additional supply volume per year potentially from District wells alone. By adding 40 AF (two wells) every five years beginning in 2015, CVWD could potentially produce 160 AF additional supply from eight additional wells by 2035, thus meeting the projected supply of 745 AF and projected demand of 738 AF (Chapter 4). As a result, the District is expected to be capable of decreasing dependence on imported water supplies during normal or “wet years” as their number of local wells increases. A comparison of projected supply and demand is provided in Chapter 7.

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# CHAPTER 7: WATER SUPPLY RELIABILITY

Assessment of water supply reliability is complex and dependent upon a number of factors, such as the number of water sources, regulatory and legal constraints, climate change, and expected growth, among others. CVWD provides in this chapter its best determination of the long term reliability of water supplies available to the District. Shorter term reliability planning that may require immediate action, such as drought or a catastrophic supply interruption, is addressed in Chapter 8, Water Shortage Contingency Planning.

## 7.1 Constraints on Water Sources

The constraints to the two water sources available to CVWD are presented below; first, potential constraints to District well production and secondly, constraints to purchased water supplies from CLAWA, whose primary source of water is from the State Water Project (SWP).

### *District Well Production*

CVWD generally pumps its local wells at maximum capacity and then, if the demand is still not met, purchases additional water from CLAWA. The amount of well water that can be pumped is limited by well capacity, the amount of precipitation that has infiltrated into the fractured rock zone, and the likely limited amount of water stored within the fracture rock aquifer. Due to the highly variable nature of the void spaces within fractured-rock aquifers, wells drawing from fractured-rock aquifers tend to have less capacity and less reliability than wells drawing from alluvial aquifers. On average, wells drawing from fractured-rock aquifers yield 10 gallons per minute (gpm) or less (CWP, p. SL-21). Decreased rainfall and snow pack would constrain District well production.

In the period from 1980 to 2015, water purchased from CLAWA accounted for an average of 53.5 percent of the water used by CVWD customers, with the balance coming from CVWD's wells. However, in the more recent period from 2000 to 2015, water purchased from CLAWA accounted for an average 46.3 percent of the District's total water demand (CVWD records). CVWD intends to develop additional local well sites at a rate of two wells every five years, to reduce its dependence on imported CLAWA water. Two wells are currently in-progress, as described in Chapter 6, Table 6-7.

Although not currently anticipated, other constraints to District well production could arise from water quality concerns; for example, if a water treatment facility became necessary due to degraded well water quality. Regulatory constraints or environmental regulations that would somehow limit construction of future wells or impose some sort of limits on production volumes would challenge the District's supply. Fortunately, none of these constraints are expected.

***Purchased Imported Water from CLAWA***

CLAWA's primary water supply source is the SWP. Therefore, CVWD purchases from CLAWA would be constrained in the event CLAWA could not provide water. This could result from constraints on Houston Creek and the SWP deliveries. Houston Creek deliveries to Silverwood Lake (as described in Chapter 6) could decrease in response to decreased precipitation, or some future regulatory limitation. Limitations to SWP deliveries are discussed below.

The amount of water that CVWD can purchase from CLAWA is dependent upon the delivery capacity of the SWP, the primary source of CLAWA's water. The SWP is a massive statewide water and power conveyance system that includes facilities such as pumping and power plants, reservoirs, storage tanks, canals, tunnels, and pipelines that capture, store, and convey water to 29 different water agencies. CLAWA is one of the authorized contractors to receive direct water deliveries from the SWP pursuant to a contract with DWR. According to that contract, the maximum annual SWP "Table A" water delivery amount to CLAWA is 5,800 AF per year (SWP 2015). "Table A" supplies refer to the maximum amount of water that each contractor is entitled to receive on an annual basis from the SWP and that amount is set forth in "Table A" of each contract with DWR. "Table A" is used in determining each contractor's proportionate share of the total amount of SWP supplies available in a given year. As originally conceived, the SWP was planned to have a delivery capability of 4,171,536 AF per year of "Table A" supplies. Although "Table A" identifies the maximum amount of SWP supplies that the contractors may receive in a given year, the amount actually available depends upon a variety of hydrologic, operational, environmental, regulatory, legal, and other factors. The historical SWP deliveries to CLAWA, and the amount purchased by CVWD from 2005 to 2014 are provided in **Table 7A.** Notably, CLAWA's average water demand during this 10-year period was approximately 1,352 AF, or 23 percent of their Table A allocation.

**Table 7A: Historical SWP Deliveries to CLAWA and CVWD Purchases (AF), 2011-2014**

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| CLAWA SWP Volume Delivered* | 807 | 641 | 1,768 | 1,848 | 1,893 | 1,357 | 474 | 624 | 3,368 | 741 |
| Percent of "Table A" Allocation** | 14% | 11% | 30% | 32% | 33% | 23% | 8% | 11% | 58% | 13% |
| Volume Purchased by CVWD*** | 177 | 247 | 467 | 331 | 332 | 217 | 138 | 199 | 353 | 379 |

* Source: State Water Project Delivery Capacity Report 2015
** CLAWA "Table A" allocation of SWP water is 5,800 AF per year.
*** Source: CVWD data. May include volumes supplied by Houston Creek.

On a bi-annual basis, DWR prepares a SWP Delivery Reliability Report which accounts for the many factors affecting the SWP and forecasts the long-term annual availability of SWP supplies during normal, single-dry, and multiple-dry year periods over the next 20-year forecast. DWR's most recent SWP Delivery Reliability Report (SWP, 2015) finds that, among other things, the estimated dry-year deliveries of SWP Table A water may range from 11 percent to 33 percent of the contractors' Table A amounts.

The availability of SWP water supplies is highly variable. A wet water year may be followed by a dry or critically dry year. Knowing the probability that they will receive a certain amount of SWP water in a given year—whether it be a wet water year, a critical year, or somewhere in between—gives contractors a better sense of the degree to which they may need to implement increased conservation measures or plan for new additional, or back up sources of water supply to meet their needs.

The Delta is the key to the SWP's ability to deliver water to its agricultural and urban contractors in the North Bay, the South Bay, California Central Valley, and Southern California. All but five of the 29 SWP contractors receive water deliveries from the Delta. However, the Delta faces numerous challenges to its long-term sustainability. For example, climate change poses the threat of increased variability in floods and droughts, and sea level rise complicates efforts to manage salinity levels and preserve water quality in the Delta so that the water remains suitable for urban and agricultural uses. Among the other challenges are continued subsidence of Delta

islands, many of which are already below sea level, and the related threat of a catastrophic levee failure as water pressure increases on fragile levees.

Protection of endangered and threatened fish species, such as the delta smelt, is also an important factor of concern for the Delta environment. Ongoing regulatory restrictions, such as those imposed by federal biological opinions on the effects of SWP and Central Valley Project (CVP) operations to special-status species also contribute to the challenges of determining the SWP's water delivery capability. Two large-scale plans for the Delta that are being developed could affect SWP water delivery capability: Cal Water Fix and the California Eco Restore initiative.

***Water Quality Impacts on Reliability and Planned Management Strategies***

Three factors can affect the reliability of water: sufficient source capacity (i.e. wells and pumps); sustainability of the resource to meet demand on a renewable basis; and protection of water sources from known contamination, or provisions for treatment in the event of contamination. As described in Chapter 6, the quality of CVWD well water and water purchased from CLAWA is generally of high quality. Water quality is not expected to affect supply reliability for CVWD. The 2014 Consumer Confidence Reports prepared by CVWD and CLAWA are provided in **Appendix I.**

CVWD is unable to influence the planned management activities of CLAWA and therefore, will continue to pursue the District's planned management strategy of installing two wells every five years. In addition, the District will continue encouraging water conservation measures as described in Chapters 8 and 9.

## 7.2 Reliability by Type of Year

There are typically four different types of precipitation years: a Wet Year, a Normal (or Average) Year,[1] a Single Dry Year,[2] and Multiple Dry Water Years.[3] CVWD has both local and purchased imported supplies to meet demands during Normal, Single Dry, and Multiple Dry years.

[1] Average or Normal Year: A year, or an averaged range of years, that most closely represents the average water supply available to the agency. The UWMP Act uses the term "normal".
[2] Single-Dry Year: The year that represents the lowest water supply available to the agency.
[3] Multiple Dry Year: Represents the lowest average water supply availability to the agency for a consecutive multiple year period (three years or more).

Notably, the District has had sufficient supplies during the ongoing statewide drought, of which the State is in the fourth year.

During "Wet Years", CVWD's local wells have met the majority of water demands. For example during CY 2010, the District recorded an unusually large annual rainfall depth of 82.45 inches and subsequently, well production met nearly 80 percent of demand during CY 2011.

The "Base Years" provided in **Table 7-1** are based upon historic local well production data. CVWD calculates its Normal Year as the average of well production from 1994 to 2015, well production in 2015 for the Single Dry Year, and well production from 2013 to 2015 for the Multiple Dry Year scenario as shown on **Table 7-1**.[4]

**Table 7-1 Retail: Basis of Water Year Data**

| **Crestline Village Water District Year Type** | **Base Year** *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000* | **Available Supplies if Year Type Repeats** | |
|---|---|---|---|
| | | ☐ | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ |
| | | ☑ | Quantification of available supplies is provided in this table as either volume only, percent only, or both. |
| | | **Volume Available (CCF)** | **% of Average Supply** |
| Average Year | 1994-2015 | 192,844 (443 AF) | 100% |
| Single-Dry Year | 2015 | 111,117 (255 AF) | 58% |
| Multiple-Dry Years 1st Year | 2013 | 170,884 (392 AF) | 88% |
| Multiple-Dry Years 2nd Year | 2014 | 124,266 (285 AF) | 64% |
| Multiple-Dry Years 3rd Year | 2015 | 111,117 (255 AF) | 56% |
| Agency may use multiple versions of Table 7-1 if different water sources have different base years and | | | |
| NOTES: CVWD's own wells. Multiple versions of Table 7-1 are being used. | | | |

As shown in **Table 7-1**, CVWD's average year water supply is calculated based upon local well production records from 1994 through 2015. This average is considered representative of the District's current well field because it includes the vertical wells that were drilled from 1994 through 2004. The additional wells drilled during that 10-year period increased the local water supply source and reduced the volume of imported water from CLAWA significantly. Therefore, well production figures from before 1994 would not be useful in this analysis.

[4] In the "Volume Available" column, CVWD specifies the volume of water supply expected if there were to be a repeat of the hydrology from that type of year. The "Percent of Average Supply" is the volume that would be available if the dry year hydrology were repeated.

According to CVWD's 2010 UWMP Tables 32 and 34, CLAWA had assumed for its Normal Year an average of SWP allocations from 1922 to 2029 modeled conditions. For the Single Dry Year, CLAWA used a base year of 1977 and lastly, for the Multiple Dry Year, CLAWA used a base year range of 1988 to 1991. Because CLAWA is exempt from preparing a UWMP per direction from DWR, this Plan will use the information provided in CVWD's 2010 Plan[5] that pertains to CLAWA, as well as CLAWA's 2010 UWMP[6] until otherwise updated. A second version of **Table 7-1** for CLAWA's source water (**Table 7-1A**) is provided below showing the percent of average supply for CLAWA customers in each year type. Notably, this does not show the proportion of CLAWA's supply that was available to CVWD.

**Table 7-1A Retail: Basis of Water Year Data**

| CLAWA Year Type | Base Year *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000* | Available Supplies if Year Type Repeats | |
|---|---|---|---|
| | | ☐ | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ |
| | | ☑ | Quantification of available supplies is provided in this table as either volume only, percent only, or both. |
| | | Volume Available (AF) | % of Average Supply |
| Average Year | 1922-2029 | | 100% |
| Single-Dry Year | 1977 | | 14% |
| Multiple-Dry Years 1st Year | 1988 | | 36% |
| Multiple-Dry Years 2nd Year | 1989 | | 56% |
| Multiple-Dry Years 3rd Year | 1990 | | 78% |
| Multiple-Dry Years 4th Year *Optional* | 1991 | | 44% |
| Agency may use multiple versions of Table 7-1 if different water sources have different base years and | | | |
| NOTES: Multiple versions of Table 7-1 are being used. Source: Supplier's purchased imported water from CLAWA. (from CVWD 2010 UWMP). | | | |

While **Table 7-1A** shows limited percentages of total average supplies from CLAWA under very conservative assumptions, the following must be noted and reiterated: from 1990-2015, the approved SWP allocations have always met or exceeded CLAWA's historical deliveries.[7]

A dry period affecting Northern California and the SWP does not necessarily mean that the same dry conditions are affecting Southern California and Houston Creek. CLAWA has been able to divert substantial quantities of water from Houston Creek in years when the SWP is experiencing dry year allocations. This relationship and mix of resources available to CLAWA

[5] CVWD 2010 UWMP available here: http://www.cvwater.com/UWMPFinal2010.pdf
[6] CLAWA 2010 UWMP available here: http://www.clawa.org/ssl/docs/umwp/uwmp_2010.pdf
[7] CLAWA 2010 UWMP Figure 9.

described in Chapter 6 provides an added element of reliability to the Agency's overall water supply portfolio.

A good example of water supply reliability during periods of ongoing drought occurred in 2014. Due to persistent dry conditions, DWR reduced SWP "Table A" deliveries to zero percent on January 31, 2014. SWP contractors were able to meet demand by using their "carryover" water, if any was available. CLAWA had access to 1,882 AF of 2014 carryover water, according to the *Notice to SWP Contractors* issued by DWR (Notice 14-02). However, as shown previously in **Table 7A**, the water delivered to CLAWA from SWP in 2014 was 741 AF. CVWD then purchased 51 percent of that volume to meet 57 percent of the demands of CVWD customers. Meanwhile, CVWD wells produced sufficient water for 43 percent of customer demand. By utilizing local wells and significant water conservation in conjunction with purchases from CLAWA, which can access local Houston Creek water, SWP water, and the aforementioned agreements with neighboring wholesalers, CVWD had sufficient supplies to meet the demands of its customers during a significant ongoing dry period.

In addition to the factors discussed above which help ensure a sufficient water supply to CLAWA during potential shortage periods, it should be noted that in critical dry years, DWR has organized a program known as the Drought Water Bank or the Dry Year Water Purchase Program. Under the program, DWR purchases water from willing sellers (primarily from water suppliers upstream of the Delta), and makes those supplies available for purchase by water agencies that are at risk of experiencing water shortages and require supplemental water supplies to meet anticipated demands. Although the Drought Water Bank has not been used since 2009, it is available from DWR as needed in the future.

## 7.3 Supply and Demand Assessment

Per CWC §10635(a): "Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry years. This water supply and demand assessment shall compare the total water supply sources available to the water suppliers with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years."

A comparison of projected normal year supply volumes (from Chapter 6, **Table 6-9**) and projected water demand volumes (from Chapter 4, **Table 4-3**) is shown in **Table 7-2**. Notably,

the table automatically uses volumes from Tables 6-9 and 4-3. The demand volumes in Table 4-3 that are shown below are not from a "normal" year but rather a dry year preceded by three years of drought. Therefore, the scope of supply and demand volumes shown in Table 7-2 should be considered low for a "normal" year. A surplus of supply is projected under these conditions for years 2020, 2015, 2030, and 2035.

| Table 7-2 Retail: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 279,436 | 293,690 | 308,670 | 324,416 | 0 |
| Demand totals *(autofill from Table 4-3)* | 278,735 | 292,253 | 306,460 | 321,391 | 0 |
| Difference (CCF) | 701 | 1,437 | 2,210 | 3,025 | 0 |
| (AF) | 2 | 3 | 5 | 7 | 0 |
| NOTES: Volumes in CCF unless otherwise shown. | | | | | |

The Single Dry Year supply volumes are calculated in **Table 7B** as the projected Single Dry Year water supplies available to CLAWA (per the 2010 UWMP) as the proportion delivered to CVWD during a dry year. This is then combined with CVWD's Single Dry Year water supply from **Table 7-1**.

**Table 7B: Calculation of Single Dry Year Supply Projections for CLAWA and CVWD**

| Single Dry Year (SDY) | | | | |
|---|---|---|---|---|
| | **2020** | **2025** | **2030** | **2035** |
| **CLAWA SDY Supply (SWP only)*** | 464 | 522 | 580 | 638 |
| **CLAWA Average Supply (Houston Creek)**** | 399 | 399 | 399 | 399 |
| **Total CLAWA Supply (AF)** | 863 | 921 | 979 | 1,037 |
| **47.8% of CLAWA Total (AF)***** | 413 | 440 | 468 | 496 |
| **CVWD SDY Supply from Table 7-1 (AF)** | 255 | 255 | 255 | 255 |
| **Total CLAWA and CVWD Supply (AF)** | 668 | 695 | 723 | 751 |
| **(CCF)** | 290,981 | 302,742 | 314,939 | 327,136 |

* Calculated as 8%, 9%, 10% and 11% of SWP "Table A" allocation of 5,800 AF. From CLAWA 2010 UWMP.
** 26-year average of Houston Creek diversion volumes. From DWR, email 11/13/15.
*** Proportion of CLAWA's wholesale deliveries attributable to CVWD in 2007, considered a single dry year. Source: Footnote 2 of Table 4A in CLAWA's 2010 UWMP.

The projected supply and demand totals in a Single Dry Year scenario are compared in **Table 7-3.** The supply projections are derived from the calculations in **Table 7B** and the demand projections are the same used in a Normal Year scenario (from **Table 4-3**).

**Table 7-3 Retail: Single Dry Year Supply and Demand Comparison**

| | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
|---|---|---|---|---|---|
| Supply totals (CCF) | 290,981 | 302,742 | 314,939 | 327,136 | |
| Demand totals (CCF) | 278,735 | 292,253 | 306,460 | 321,391 | |
| Difference (CCF) | 12,246 | 10,489 | 8,479 | 5,745 | 0 |
| (AF) | 28 | 24 | 19 | 13 | |

NOTES: Combination of local wells and purchased water from CLAWA single dry year projections. Supply from Table 7B. Demand from Table 4-2.

In a Single Dry Year, **Table 7-3** shows a net surplus in water supplies. Again, the demand volumes used are from 2015 actual demand, which is under significant conservation after three years of drought. The surplus can be attributed to the contribution of future CVWD wells. Notably, the proportion of CLAWA's wholesale deliveries sold to CVWD can vary substantially, which would affect supplies as calculated in **Table 7B**. The percentage of 47.8 is considered indicative of a dry year scenario, where CVWD would purchase a larger than usual proportion of CLAWA's supply available for purchase.

The Multiple Dry Year supply and demand comparisons are provided in **Table 7-4**. The Multiple Dry Year – first year, second year, and third year supply volumes from CVWD wells comes from **Table 7-1** and are held constant from 2020 to 2035 for each year type. The Multiple Dry Year supply volumes from CLAWA are the same as those assumed in the Single Dry Year (i.e., 47.8 percent of projected supply).

In a Multiple Dry Year situation, net supply and demand comparisons would yield a surplus of supply in all situations, as shown in **Table 7-4**. During the first dry year, CVWD assumes no change in projected demand (same demand totals from **Table 7-3**). During the second dry year, CVWD assumes a decrease in water use of 7.5 percent, using the first year as a baseline. During the third year, CVWD assumes a 10 percent decrease in demand in response to water conservation efforts, measured from the first year as the baseline. Indeed, the baseline for demand used here is based on 2015 data, which is already low after several years of drought and water conservation regulations.

| Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
| First year | Supply totals | 350,787 | 362,548 | 374,745 | 386,942 | |
| | Demand totals | 278,735 | 292,253 | 306,460 | 321,391 | |
| | Difference (CCF) | 72,052 | 70,295 | 68,285 | 65,551 | 0 |
| | (AF) | 165 | 161 | 157 | 150 | |
| Second year | Supply totals | 304,169 | 315,930 | 328,127 | 340,324 | |
| | Demand totals | 257,830 | 270,334 | 283,476 | 297,287 | |
| | Difference (CCF) | 46,339 | 45,596 | 44,651 | 43,037 | 0 |
| | (AF) | 106 | 105 | 103 | 99 | |
| Third year | Supply totals | 291,020 | 302,781 | 314,978 | 327,175 | |
| | Demand totals | 236,925 | 248,415 | 260,491 | 273,182 | |
| | Difference (CCF) | 54,095 | 54,366 | 54,487 | 53,993 | 0 |
| | (AF) | 124 | 125 | 125 | 124 | |
| NOTES: CVWD supply totals for MDY from Table 7-1, CLAWA supply totals from Table 7B (47.8% of Total CLAWA Supply in MDY). Demand totals from Table 4-3. | | | | | | |

This progression of decreasing demand demonstrates the expected time-lag between the first dry year to the second dry year when water conservation efforts start to show an impact in water use. A multiple dry year decrease in demand of more than 20 percent has been demonstrated by CVWD, which has reduced water use by 21.7 percent since 2013, according to SWRCB drought reporting.

## 7.4 Regional Supply Reliability

Although CVWD will continue utilizing local water supplies to the maximum extent practicable following the intent of CWC §10620 to minimize the need to import water from other regions, the water demands of the District since 1972 have required supplemental water purchased from the local SWP wholesaler, CLAWA. As previously discussed, the District's management plan is to drill two wells every five years to increase its local water supply, which is projected to outpace community growth and therefore reduce dependency on imported water during normal and wet years. This increase in local supply in combination with the District's Advanced Metering Infrastructure (AMI) system to minimize water losses, and the community's significant response to water conservation measures will maximize the use of local water resources. Nonetheless, CVWD remains dependent on CLAWA's assurance of available supply (**Appendix K**) to provide the balance between demand and District well production, regardless of climatic conditions, changes in population, or fluctuations in the economy.

# CHAPTER 8: WATER SHORTAGE CONTINGENCY PLANNING

Water shortage contingency planning is a strategic planning process to prepare for, and respond to water shortages. Good planning and preparation helps agencies maintain reliable supplies and reduce the impacts of supply interruptions. Water supplies may be interrupted or reduced significantly in a number of ways, such as an ongoing drought that limits recharge, or a large earthquake that damages water delivery or storage facilities, a regional power outage, or a toxic spill that affects water quality. This Chapter describes how CVWD will implement staged responses to a water shortage that occurs over a period of time, as well as catastrophic supply interruptions which occur suddenly (Chapter 8.8).[1]

California is currently in its fourth year of a significant drought, which impacts California's water supplies and its ability to meet all of the demands for water throughout the state. Thus, the SWRCB formally adopted emergency regulations in spring of 2015 prohibiting certain types of potable water use, ordering all urban water suppliers to implement mandatory conservation measures, and requiring water providers with 3,000 or more service connections to provide monthly data on water production.

The CVWD Board of Directors adopted Ordinance No. 35 on August 19, 2014, which outlines a seven-phase "Water Use Reduction Program" for the District.[2] For the purpose of conforming to the Drought Emergency Water Conservation regulations imposed by the SWRCB, the CVWD Board of Directors adopted Resolution No. 421 to amend the District's Water Conservation Program (Ordinance No. 35) effective May 10, 2015.[3] Resolution No. 421 and Ordinance No. 35 are provided in **Appendix J.**

On May 9, 2016, Governor Brown issued Executive Order B-37-16,[4] which directs DWR to publish draft requirements by January 10, 2017 to strengthen urban Water Shortage Contingency Plans (WSCPs). The Executive Order states, "These updated requirements shall

[1] According to DWR UWMP Guidelines, a WSCP can be created separately from the UWMP and amended as needed without amending the corresponding UWMP. CVWD has updated its WSCP from the 2010 UWMP and provided herein.
[2] The elements contained within the CVWD "Water Conservation Program" and CVWD "Water Use Reduction Program" are considered equivalent to the required elements of a "Water Shortage Contingency Plan" per CWC §10632. Therefore the terms may be used interchangeably.
[3] Resolution 421 had an end date of 12/23/15 and it has not been renewed to date. Once the emergency regulations are issued from the State, the Board of Directors will consider adopting a revised resolution.
[4] https://www.gov.ca.gov/docs/5.9.16_Executive_Order.pdf

include adequate actions to respond to droughts lasting at least five years, as well as more frequent and severe periods of drought." CVWD will review the Water Conservation Plan described herein in light of future regulations.

The District relies on water purchased from CLAWA, the local wholesaler, to supplement approximately half of its average year supply. Although water agencies are only required to submit information in a WSCP that is within their authority, CVWD has opted to include discussion of CLAWA's drought ordinances and emergency preparedness in this chapter. If CLAWA were to experience a water shortage emergency, CVWD would be subject to their Water Supply Allocation Plan per CLAWA Ordinance No. 59 (**Appendix J**).

Water conservation has long been a priority of CVWD. In 1982, the District approved its first Water Waste Prohibition; this was followed by creation of a Water Conservation Program in 1991. This Water Conservation Program has periodically been updated, most recently by Ordinance No. 35 in August 2014. CVWD's conservation efforts have been successful; the District was required by the State to have an 8 percent reduction in water use through December 2015, but use is actually down by nearly 22 percent (Manager's Report to CVWD Board meeting, 2/16/16).

## 8.1 Stages of Action

The number of stages (or "levels" or "phases") of action in a WSCP is at the discretion of each supplier. The stages reflect increasing levels of prohibitions and consumption reduction methods. Notably, the District maintains that Phase 1 is enforced at all times and prohibits water waste.

CVWD Ordinance No. 35 describes the District's seven-phase Water Use Reduction Program to be invoked during declared water shortages. Each Phase of Water Use Reduction is generally divided into three areas: basic allocation of water to each customer, surcharge for water used in excess of the allocation, and prohibited uses of water for each phase. The Water Use Reduction Program includes both voluntary and mandatory rationing depending on the causes, severity, and anticipated duration of the water supply shortage. Therefore, the District may declare a Phase VI (50 Percent Water Use Reduction Program) at any time, without regard to the Drought Response Level previously in effect. The seven-phase program is outlined in **Table 8-1** and detailed in CVWD Ordinance No. 35 in **Appendix J**.

| Table 8-1 Retail Stages of Water Shortage Contingency Plan | | |
|---|---|---|
| Stage | Complete Both | |
| | Percent Supply Reduction[1] *Numerical value as a percent* | Water Supply Condition (*Narrative description*) |
| *Add additional rows as needed* | | |
| 1 | 0% | 1300 cf allocation. Surcharge 1.5x basic rate. |
| 1.a | 5% | 1300 cf allocation. Surcharge 1.5x basic rate. |
| 2 | 10% | 1200 cf allocation. Surcharge 2x basic rate. |
| 3 | 20% | 1100 cf allocation. Surcharge 2.5x basic rate. |
| 4 | 30% | 900 cf allocation. Surcharge 3x basic rate. |
| 5 | 40% | 800 cf allocation. Surcharge 3.5x basic rate. |
| 6 | 50% | 700 cf allocation. Surcharge 4x basic rate. |
| [1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.* | | |
| NOTES: CF = cubic feet. Exceptions to increase the amount of water in the basic allocation may be granted by the District Manager of his designee, upon written request for the following reasons: (i) substantiated medical requirements, (ii) multiple family units served by a single meter, (iii) single family household exceeding 6 residents, (iv) unnecessary and undue hardship to the consumer. | | |

The District will monitor and evaluate projected water supply and demand for its customers to determine the appropriate phase of water use reduction to be implemented. Phase changes will be passed by resolution, and notification will be sent out via mail to affected customers within 10 days after adoption. Each phase will remain in effect until a different phase is initiated and made effective. The District may order more than one phase change at a time.

The phases are designed to achieve a percent reduction of the amount of water used overall, and every consumer is expected to eliminate the waste and non-essential use of potable water in order to aid CVWD in achieving the reduction. In response to statewide drought regulations, the Board of Directors approved Resolution No. 421 to change the District's water conservation level from Phase I to Phase I.a on August 19, 2014.

**Phase I – General Water Use Reduction Program**

The basic allocation for each single-family residential customer is 1,300 cubic feet (CF)[5] per month for Phase I and Phase I.a. A surcharge of 1.5 the basic rate would be billed for use in

[5] One cubic foot equals 7.48 gallons.

excess of the basic allocation.[6] Every consumer shall eliminate the waste of potable water from the District in an effort to conserve supplies.

**Phase I.a – 5 Percent Water Use Reduction Program**

The basic allocation and water waste prohibition from Phase I are still applicable, but in Phase I.a, the District aims to reduce the amount of water used by all consumers during the base calendar year by five percent. In addition, the State emergency drought regulations adopted by the CVWD Board of Directors in Resolution No. 421 are applied in Phase I.a., as listed in **Table 8A**, located below.

**Phase II – 10 Percent Water Use Reduction Program**

The basic allocation is reduced to 1,200 CF per month. For use in excess of the allocation, a surcharge of two times the rate will be billed. Phase II aims to reduce the amount of water used by all consumers by 10 percent over the base calendar year. Beginning with Phase II, irrigation of landscaping (installed after August 19, 2014) is prohibited (see **Table 8A**).

**Phase III – 20 Percent Water Use Reduction Program**

The basic allocation is reduced further to 1,100 CF per month with a District-wide water reduction goal of 20 percent during the base calendar year. The surcharge for use in excess of the allocation is increased to 2.5 times the rate. In addition to the prohibitions of the previous Phases **(Table 8A)**, Phase III also prohibits potable water for the purpose of filling pools, spas, or decorative fountains, lakes, or ponds.

**Phase IV – 30 Percent Water Use Reduction Program**

The basic allocation is reduced further to 900 CF per month with a District-wide water reduction goal of 30 percent over the course of the base calendar year. The surcharge for use in excess of the allocation is increased to 3 times the rate. In addition to the prohibitions of the previous Phases **(Table 8A),** Phase IV also states it shall be unlawful for consumers: (i) to use potable water for sewer or storm system flushing for normal maintenance and fire department

[6] The customer of record may request an increase in the allocation for the following reasons: (i) substantiated medical requirements; (ii) multiple family units served by a single meter; (iii) a single family residential household exceeding six residents; or (iv) unnecessary and undue hardship to the consumer or the public, including but not limited to, adverse economic impacts (Ord. 35, Section 3.3.4.1).

training, except as approved by the District; (ii) use potable water for construction, and (iii) vehicle washing except from a 3 gallon bucket, which excludes commercial vehicle washing facilities that use water recycling systems.

**Phase V – 40 Percent Water Use Reduction Program**

The basic allocation is reduced to 800 CF per month and all water waste and non-essential use of potable water shall be eliminated to achieve a District-wide reduction of 40 percent over the year. The rate for water used in excess of the basic allocation shall be 3.5 times the rate. In addition to the prohibited uses in Phases I, I.a, II, III, and IV, Phase V prohibits the use of potable water for any non-essential[7] outdoor use (**Table 8A**).

**Phase VI – 50 Percent Water Use Reduction Program**

The final phase of the Water Use Reduction Program reduces the basic allocation to 700 CF per month. Everyone is required to eliminate water waste and non-essential water use to achieve a District-wide reduction of 50 percent. The surcharge for excess consumption is 4 times the rate for the basic allowance. In addition to the prohibited uses from the previous phases, Phase VI also prohibits any indoor or outdoor water use that is non-essential. **Table 8A** lists the prohibitions from the District's Water Conservation Program by Phase.

[7] Essential uses of potable water are uses necessary for the health, sanitation, fire protection, or safety of the consumer or public.

**Table 8A: Water Use Prohibitions of CVWD Water Conservation Program**

| Prohibition | Level when prohibition is mandatory | | | | | |
|---|---|---|---|---|---|---|
| | Phase I.a | Phase II | Phase III | Phase IV | Phase V | Phase VI |
| Washing of sidewalks and all hard-surfaced areas by direct hosing is prohibited, except when required for public health. | X | X | X | X | X | X |
| Use of potable water for any non-essential outdoor use is prohibited. | | | | | X | X |
| Use of potable water for any non-essential use. | | | | | | X |
| Each break, leak, or dripping faucet should be corrected within 48 hours of notification. | X | X | X | X | X | X |
| Using a hose to wash vehicles unless it has a spring-release shut-off nozzle is prohibited. | X | X | X | X | X | X |
| Vehicles must be washed either (1) using water contained in a 3 gallon maximum bucket or, (2) at a commercial washing facility with water recycling equipment. | | | | X | X | X |
| Any irrigation which results in runoff or overspray is prohibited. | X | X | X | X | X | X |
| Any irrigation of landscaping installed after the date that this phase is effective is prohibited. | | X | X | X | X | X |
| Sprinkling for dust control is prohibited. | X | X | X | X | X | X |
| Use of potable water for construction is prohibited. | | | | X | X | X |
| Any water use that results in runoff of water is prohibited. | X | X | X | X | X | X |
| Lawn or garden, or any other watering beyond what is required to sustain plant life. | X | X | X | X | X | X |
| Fountains or other decorative features must use a recirculating system. | X | X | X | X | X | X |
| Using potable water for decorative fountains or filling of pools is prohibited. | | | X | X | X | X |

*The District operates in Phase I unless otherwise determined by the Board of Directors.

The CVWD Board of Directors changed the Phase of water conservation from Phase I to Phase I.a. effective September 1, 2014. This action was a result of the Statewide drought conditions and the Emergency Regulations for Statewide Water Conservation adopted August 1, 2014 by the SWRCB. According to District records of daily per capita water use, water use decreased more than 10 percent from 79.8 GPCD in 2014 to 71.6 GPCD in 2015. Although data is available for only the first year of the upgraded Phase, it suggests the CVWD Water Use Reduction Program has been effective.

## 8.2 Prohibitions on End Uses

CVWD Ordinance No. 35 defines and prohibits water waste regardless of the drought Phase. It incorporates the SWRCB Emergency Regulations for Statewide Water Conservation by restricting the following uses:

- Lawn or garden watering, or any other outdoor irrigation is limited to no more than three days per week;
- The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall;
- The serving of drinking water, other than upon request, in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased; and
- Operators of hotels and motels shall provide guests the option of choosing not to have towels and linens laundered daily.

In addition to the above-listed restrictions, **Table 8-2** details the specific prohibitions on end uses associated with each Water Use Reduction Phase.

*Remainder of Page Intentionally Blank.*

**Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses**

| Stage | Restrictions and Prohibitions on End Users *Drop down list* *These are the only categories that will be accepted by the WUEdata online submittal tool* | Additional Explanation or Reference *(optional)* | Penalty, Charge, or Other Enforcement? *Drop Down List* |
|---|---|---|---|
| *Add additional rows as needed* | | | |
| 1 | Other | Every consumer shall eliminate the waste of potable water. | Yes |
| 1a | Other - Prohibit use of potable water for washing hard surfaces | | Yes |
| 1a | Other - Customers must repair leaks, breaks, and malfunctions in a timely manner | Repair leaks within 48 hours of notification. | Yes |
| 1a | Other | Prohibit use of running water during freezing weather to prohibit freezing of waterlines. | Yes |
| 1a | Other - Require automatic shut of hoses | | Yes |
| 1a | Landscape - Restrict or prohibit runoff from landscape irrigation | | Yes |
| 1a | Other - Prohibit use of potable water for construction and dust control | Prohibit sprinkling for dust control. | Yes |
| 1a | Landscape - Other landscape restriction or prohibition | Prohibit any water use that results in the runoff of water in the street, gutters, driveways, or waterways. | Yes |
| 1a | Landscape - Prohibit certain types of landscape irrigation | Prohibt any lawn or garden watering beyond what is needed to sustain plant life. | Yes |
| 1a | Water Features - Restrict water use for decorative water features, such as fountains | Fountains or features must have a recirculating system. | Yes |
| 2 | Landscape - Other landscape restriction or prohibition | Any irrigation, of landscaping installed after the date that this phase is effective. | Yes |
| 3 | Other water feature or swimming pool restriction | Prohibit using potable water for decorative fountains or other water features. | Yes |
| 4 | Other - Prohibit use of potable water for construction and dust control | Prohibit use of potable water for construction. | Yes |
| 4 | Other - Prohibit vehicle washing except at facilities using recycled or recirculating water | Exception: washing vehicles from water contained in a 3 gallon or less bucket. | Yes |
| 5 | Other | Prohibit use of potable water for any non-essential outdoor use. | Yes |
| 6 | Other | Prohibit use of potable water for any non-essential use. | Yes |

NOTES: Phase I reflects normal conditions and does not contain any specific requirements for or prohibitions on water use. Thus, it is not shown in the table below. Customers are always required to eliminate waste of potable water in an effort to conserve water supplies. It is important to note that any prohibited use in each phase is also prohibited in each more restrictive phase.

As detailed in **Table 8-2,** all of the water conservation measures used by CVWD are enforceable or carry some sort of penalty. The rate surcharge system used by CVWD is summarized below in **Table 8B.**

**Table 8B: Surcharges in Excess of Basic Allocation**

| Water Use Reduction Phase | Basic Allocation (CF per month) | Surcharge (Times Basic Rate) |
|---|---|---|
| I | 1,300 | 1.5 |
| I.a | 1,300 | 1.5 |
| II | 1,200 | 2.0 |
| III | 1,100 | 2.5 |
| IV | 900 | 3.0 |
| V | 800 | 3.5 |
| VI | 700 | 4.0 |

## 8.3 Penalties, Charges, Other Enforcement of Prohibitions

The District provides each customer with an allocation of water, and charges a surcharge for any water used in excess of the basic allocation compared to the basic rate. This tiered system encourages water efficiency, particularly at restrictive phases of water conservation. Additionally, when Phase I.a through Phase VI are in effect, any consumer using more than 125 percent of their allocation, for any billing period, may be warned that such use is considered waste of water, and that a reduction in use is required to avoid being subject to the enforcement provisions shown in **Table 8C**.

**Table 8C: Enforcement Provisions of Water Conservation Program**

| | |
|---|---|
| **First Violation** | Written warning |
| **Second Violation** | $50 charge |
| **Third Violation** | Up to $500 for each day in which the violation occurs and may discontinue water service. The reinstatement charge would apply, however a flow restrictor may be required before service is reinstated. The cost of installing the flow restrictor may be charged to the consumer. |

*Reproduced from CVWD Ordinance No. 35, Section 3.3.6.2.

The District Board of Directors may also restrict new service commitments and connections based on current and future water availability predictions, by act of resolution.

## 8.4 Consumption Reduction Methods

In addition to the Water Use Reduction Phases described in Chapter 8.1 and the end-use restrictions described in Chapter 8.2, the District's water conservation program also includes provisions aimed at reducing water demand within the service area. This is described in Chapter 9.1.4, Public Education and Outreach.

The District's consumption reduction methods from the Water Conservation Program in Ordinance No. 35 are listed in **Table 8-3.**

**Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction**

| Stage | Consumption Reduction Methods by Water Supplier *Drop down list* *These are the only categories that will be accepted by the WUEdata online* | Additional Explanation or Reference *(optional)* |
|---|---|---|
| *Add additional rows as needed* | | |
| 4 | Decrease Line Flushing | Ord.35. Prohibit sewer or storm system flushing for normal maintenance or fire department training, except as approved. |
| As needed. | Moratorium or Net Zero Demand Increase on New Connections | Ord. 35. The Board, by resolution, may from time-to-time, restrict new service commitments and connections based on current and future water availability projections. |
| Since 1991. | Increase Frequency of Meter Reading | Ord.35. Changed from bi-monthly billing to monthly billing. |
| As needed. | Implement or Modify Drought Rate Structure or Surcharge | Ordinance 35. |
| NOTES: | | |

A drought rate structure or surcharge that is implemented in times of water shortage differs from a conservation rate structures (described in Chapter 9.1.3), which is in place at all times.[8] CVWD does not utilize a drought rate structure at this time.

## 8.5 Determining Water Shortage Reductions

CWC §10632(a)(9) requires, "A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis." CVWD meets this requirement by relying upon water meters to record the production and consumption of water. Reductions in

[8] When considering a new rate structure, some water suppliers have embedded a drought rate structure within their proposed conservation rate structure. This can help avoid the difficulty and delay of instituting a drought structure during an emergency and streamlines the public process so that all rate structures are reviewed together.

water use are measured by tracking the change in water production. Well production figures are recorded weekly, which are reported weekly to the CVWD Office Manager to be incorporated into the monthly water supply report. Daily demand is determined by water storage tank levels that are read and recorded twice a day by the serviceman on-call. If more or less water is needed, the Field Crew, under the supervision of the Field Supervisor, will place an order for more or less supplemental water from CLAWA. The production reporting process is the same regardless of the District's phase of water conservation.

CVWD issues bills to their customers on a monthly basis. Consumption from the same month in the prior year is included on the bills, which allows comparison of demand from year to year. The Conservation Coordinator (discussed in Chapter 9.1.6) reports the R-GPCD to the SWRCB as required in the Statewide drought regulations. From 2013 to 2015, the District reduced water use by nearly 22 percent.

The District is fully metered utilizing an Automated Meter Infrastructure (AMI) system, which allows staff to track of the amount of water used and to respond more quickly to a leak. The AMI system is described in Chapter 9.1.2.

## 8.6 Revenue and Expenditure Impacts

As previously described in Sections 8.2 and 8.3, CVWD has established a graduated surcharge fee schedule for water use in excess of the basic allocation, as well as enforcement measures for violations of the Water Use Reduction Program. The revenue collected by the District as a result of consumer use in excess of the basic allocation, and the charges added to consumer bills as a result of enforcement actions by the District, are deposited into the operating fund. This reimburses the District's costs and expenses of administration and enforcement of this ordinance, and provides funding to promote, encourage, and implement water conservation programs.

CVWD does not have a written Reserve Policy that specifically addresses revenue fluctuations from water conservation. However, the District does maintain a "Reserve for Purchased Water" fund of up to $700,000 to help balance the fluctuations of purchased water from year to year. The reserve builds in wet years and is used in dry years. Currently, the reserve is at $569,000 (CVWD staff, 5/20/16). While the Reserve for Purchased Water is not specifically designed to

compensate for fluctuations in water use, it has helped to balance the budget during the current drought and water conservation efforts.

## 8.7 Resolution or Ordinance

Water conservation has been a continuing priority for CVWD. The District began taking steps to secure additional water sources in the 1960s and adopted a Water Waste Prohibition (Resolution No. 200) in 1982. In 1991, the Board approved Ordinance No. 29, which established CVWD's Water Conservation Program. Ordinance No. 29 was approved with the following goals:

- Protect the health, safety, and welfare of the District's customers;
- Assure the maximum beneficial use of the District's water supplies; and
- Ensure that there will be sufficient water supplies to meet basic needs of human consumption, sanitation, and fire protection.

This Program has been modified several times, most recently in 2014 when the Board approved Ordinance No. 35 and voted to change the Phase of Water Conservation from Phase I to Phase I.a.

In April 2014, DWR announced that CLAWA's SWP allocation would be reduced to 0 percent, leaving CLAWA to rely on its SWP carryover water and stored water supply to meet customer demands. In response to this determination and in anticipation of continued dry conditions, CLAWA's Board of Directors approved CLAWA Ordinance No. 59 in April 2014 to declare a water emergency shortage and to adopt rules, regulations and restrictions on the use of CLAWA's water.

CLAWA's Water Supply Allocation Plan for wholesale customers uses 2013 as a base year, from which CLAWA will determine the quantity of water that was delivered to each customer during each month of 2013. Each customer will then receive no more than the following percentage of the quantity of water that CLAWA delivered to that wholesale customer during the corresponding month of the base year. The percentage of allocation will depend on the stage of allocation declared by the CLAWA Board, as shown in **Table 8D**.

**Table 8D: CLAWA Water Supply Allocation Plan for Wholesale Customers**

| Stage of Allocation Declared by CLAWA Board | Percentage of Water Delivered during Corresponding Month of Base Year |
|---|---|
| Stage 1 | 95% |
| Stage 2 | 90% |
| Stage 3 | 80% |
| Stage 4 | 70% |
| Stage 5 | 60% |

*Reproduced from CLAWA Ordinance No. 59.

During a Stage 1 Allocation, water taken for any month in excess of the applicable percentage will be charged at twice the standard rate for wholesale water in effect at the time of delivery. For Stages 2 through 5 Allocations, water taken for any month in excess of the applicable percentage will be subject to surcharges set by the CLAWA Board of Directors.

## 8.8 Catastrophic Supply Interruption

CVWD maintains an adopted Emergency Response Plan (ERP, updated March 31, 2016) that provides response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of man-made or natural origin. The ERP also describes how CVWD would respond to potential and actual terrorist threats identified in the District's Vulnerability Assessment, as well as specific Action Plans.[9]

The most likely events that could cause CVWD to sustain a catastrophic interruption in water supply are wildland fires, earthquakes, and widespread system failure. The primary effect of fires and earthquakes on water supply is the interruption of power throughout the San Bernardino Mountains and potential damage to CVWD's storage and distribution facilities. In order to minimize system damage during an earthquake, CVWD's facilities have been designed according to the most current building and safety codes. Facilities have generally been constructed with multiple units to minimize the system disruption if a single unit is damaged. In addition, all of the District's above ground storage tanks have undergone a seismic and structural evaluation based upon current building codes. Each tank has now been upgraded to current building codes to provide maximum safety and system reliability (tank capacities as of 3/31/16 are shown in **Appendix D)**. The CVWD Administrative Office/Maintenance Facility has

[9] The CVWD ERP has been designed to comply with Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV – Drinking Water Security and Safety). The ERP is confidential and therefore not provided in the UWMP.

a fixed back-up generator that also powers the vertical well located at the office property. The District maintains a couple of portable generators that are taken to key sites in the event of a power outage.

The ERP identifies the local supermarket as a source of water during a short-term water supply interruption; however the District does not have standby procurement agreements for bulk purchases of bottled water or potable water tankers for long-term water supply interruption. Instead, the ERP identifies three other utilities within the area that have their own water supply and treatment systems: CLAWA, Valley of Enchantment Mutual Water Company, and Cedarpines Park Mutual Water Company. To enable CVWD to have uninterruptible water service, bypass turnout valve connections from CVWD's water distribution system to CLAWA are in place and currently maintained by CLAWA. In addition, the District has one alternate and independent raw water well that can supplement supply if others are compromised.

CVWD must also consider CLAWA's emergency response plans to an interruption of SWP and/or Houston Creek supplies, because CVWD does not have sufficient tank storage to supply customers during an extended drought period nor does it have direct access to a reservoir of sufficient capacity.

The greatest threats to CLAWA's system are also wildfires and earthquakes. CLAWA has installed permanent natural gas engine-operated standby generators at each of its main treatment, pumping, and operation facilities to avoid water supply interruptions during power outages. In order to minimize potential damages due to earthquakes, CLAWA's facilities have been designed or upgraded in accordance with current building and safety standards and have been conducted with multiple units where feasible to minimize disruption if a single unit is damaged. CLAWA has also stockpiled various materials necessary to repair pipeline breaks and leaks in order to minimize outages during catastrophic events.

According to DWR (Final Delivery Reliability Report, 2015), SWP deliveries could be interrupted for weeks, months, or even years, due to levee failures resulting from floods, earthquakes, erosion, or rising sea levels. The Delta faces numerous challenges to its long-term sustainability. For example, climate change poses the threat of increased variability in floods and droughts, and sea level rise complicates efforts to manage salinity levels and preserve water quality in the Delta so that the water remains suitable for urban and agricultural uses. Among the other challenges are continued subsidence of Delta islands, many of which are

already below sea level, and the related threat of a catastrophic levee failure as water pressure increases on fragile levees.

The Delta Flood Emergency Management Plan is currently in preparation by DWR's Delta Flood Emergency Preparedness, Response and Recovery Program (Delta ER Program) and is expected later this year. It will describe the preparedness, response, and recovery actions that DWR would take for Delta flood emergencies ranging from complex, multiple-failure incidents affecting many Delta islands to an isolated, one-island incident.

In summary, if CLAWA deliveries to CVWD were to stop due to a catastrophic event, then the District would have roughly 50 percent of total supplies unavailable. In this instance, CVWD plans to increase its Demand Management Measures (see Chapter 9) to reduce demand by an equivalent proportion. Essential water use would then be supplied with solely District well production.

## 8.9 Minimum Supply Next Three Years

The minimum supply available during the next three years would occur during a three-year multiple-dry year event. CVWD, like most water suppliers in the State, is operating in the fourth year of a State-wide drought and are subject to water use reduction regulations. The District anticipates drought conditions – both regulatory and environmental - to continue.

On May 9, 2016, Governor Brown issued Executive Order B-37-16 to establish longer-term water conservation measures, including permanent monthly water use reporting, new permanent water use standards in California communities and bans on clearly wasteful practices such as hosing-off sidewalks, driveways and other hardscapes.

The minimum supply available to CVWD from its own wells during each of the next three water years based on the driest three-year historic sequence (i.e., 2013-2015 from **Table 7-1**) is shown in **Table 8-4**. Imported water purchased from CLAWA to balance CVWD water demands over the 2013-2015 period is averaged at 361 AF (**Appendix K**). CLAWA has projected, as of June 15, 2016, that it has sufficient supplies to meet this average demand if the drought conditions were to continue from 2017 to 2019.

| Table 8-4 Retail: Minimum Supply Next Three Years | | | |
|---|---|---|---|
| | 2016 | 2017 | 2018 |
| Available Water Supply (CCF) | 170,884 | 124,266 | 111,151 |
| (AF) | 392 | 285 | 255 |
| NOTES: Volumes in CCF and AF. Correspond to 3-yr Dry Period from Table 7-1. | | | |

As previously stated, CLAWA is exempt from preparation of an UWMP. Therefore, their long-term projections and management plans are unavailable to CVWD. In light of SWP deliveries dropping to zero percent in 2014, which was never considered a possibility in the Agency's 2010 UWMP, CVWD can only make assumptions as to CLAWA's planned strategies. Assuming CLAWA will maintain SWP carryover storage agreements with other SWP contractors, as well as effective water conservation measures, CVWD anticipates continuing to meet customer demands during extended drought periods.

# CHAPTER 9: DEMAND MANAGEMENT MEASURES

This chapter provides a comprehensive description of the water conservation programs that CVWD has implemented, is currently implementing, and plans to implement in the future to continue meeting its urban water use reduction targets. The section of the CWC that addresses Demand Management Measures (DMMs) was significantly modified in 2014, based on recommendations from the Independent Technical Panel to the State Legislature. The Panel was formed by DWR to provide information and recommendations to DWR and the Legislature on new DMMs, technologies, and approaches to water use efficiency. In its report to the Legislature, the Panel recommended, and the legislature enacted, streamlining the retail agency requirements from 14 specific measures to six general requirements plus an "other" category, as discussed below.

## 9.1 Demand Management Measures for Retail Agencies

This section communicates the efforts of CVWD to promote conservation and reduce the demand for water supplies with programs to implement each of the following six DMM categories. As required by CWC §10631, each DMM description includes how the measure has been implemented over the past five years, and how future projects will help the District continue to meet its water use targets described in Chapter 5.

### 9.1.1 Water Waste Prevention Ordinances

Conservation of water supplies has been a priority of the District for decades. The CVWD Board of Directors adopted a Water Waste Prohibition in Resolution No. 200 on March 11, 1982. This Prohibition is still in effect and reads, in part:

> No customer shall knowingly permit leaks or waste of water. Where water is wastefully or negligently used on a customer's premises, and such waste seriously affects the general service, the District may discontinue the service if such conditions are not corrected within five days after giving the customer written notice.

CVWD also adopted a District Water Conservation Program beginning in 1991 (Ordinance No. 29, modified by Ordinance No. 30, codified by Ordinance No. 32, and recently updated by

Ordinance No. 35). The Water Conservation Program contains more specific prohibitions that can be enacted in response to shortages, such as the ongoing drought. CVWD Resolution No. 414 was adopted August 19, 2014 to upgrade the District from Phase 1 of the water conservation plan to Phase 1.a. When the SWRCB adopted the Drought Emergency Water Conservation regulations on March 27, 2015, CVWD adopted Resolution No. 421 to supplement Resolution No. 414 with the mandated water use restrictions (described in Chapter 8.2). The CVWD Water Conservation Program is described in detail in Chapter 8 and Ordinance No. 35 and Resolution No. 421 are provided in **Appendix J**.

- **Implementation Over the Past Five Years**

  CVWD actively pursues incidents of water waste, which are investigated by staff and, depending on the nature of the situation, are noticed to the property owner, repaired, or disconnected in cases of excessive leakage.

  The extent of changing the CVWD water conservation Phases can be evidenced by a change in water use during that time period. According to CVWD records, when the District changed from water conservation Phase I to Phase I.a. in August of 2014, daily per capita water use was 79.84 GPCD. By the end of 2015, daily per capita water use decreased more than 10 percent to 71.64 GPCD.

  CVWD replaced all of the meters in the District between 2010 and 2011 with an Advanced Meter Infrastructure (AMI) system. The largest benefit has been for targeting water waste because the District is notified of leaks within 24 hours in most cases (CVWD Staff, 4/5/16).

- **Planned Implementation for the Future**

  CVWD conducts annual waterline replacement projects as-needed. According to the proposed 2016-2017 Revised Proposed Cash Budget, the District has budgeted $150,000 to replace approximately 2,500 linear feet of mainline pipe. The District performs pipeline replacements with in-house staff to save costs.

### 9.1.2 Metering

CVWD is fully metered and undertook an impressive smart metering effort in 2010. The District replaced all of its meters with Neptune meters, which are part of an Aclara Fixed Network Advanced Metering Infrastructure (AMI) to better monitor water usage throughout the service area. The AMI system relies on data collection units installed throughout the system to process and store diagnostic information and data, which is then transmitted to CVWD's network control computer for further processing. These computers can detect slow leakages throughout the system and more quickly alert CVWD, decreasing system losses and water waste.

- **Implementation Over the Past Five Years**

  Over the past five years, the District upgraded all the meters and the metering system within its service area to "smart" meters and an AMI system, as previously described. District staff receives daily reports on water use throughout the system, and are typically alerted to 10 cases of potential leakages every day.[1]

- **Planned Implementation for the Future**

  CVWD will maintain the AMI system and improve software and features as needed. Additionally, this program will allow for long-term analysis of water use trends throughout the service area.

### 9.1.3 Conservation Pricing

Conservation pricing sends a signal to customers regarding their water use. For example, the rates might be tiered at progressively higher prices to encourage efficient water use. Like a water waste ordinance, a conservation pricing structure is always in place and is not dependent upon a water shortage for implementation; although, a conservation rate structure could include *drought* rate structures.

The current CVWD water rate schedule was approved in July 2004, and consists of two parts: first, a flat monthly minimum charge based on the size of the meter; and second, a quantity rate based on the amount of water consumed. Most of the residences in the District have a

[1] Per conversation with CVWD Staff on April 6, 2016.

5/8 x 3/4 inch meter, but some meters can be as large as 3 inches. The monthly minimum charge per meter is listed in **Table 9A.**

**Table 9A: CVWD Monthly Minimum Charge**

| Meter Size | Monthly Minimum Charge |
|---|---|
| 5/8 x ¾ inch* | $17.50 |
| ¾ inch | $18.50 |
| 1 inch | $19.50 |
| 1 inch (residential fire service) | $21.75 |
| 1 ½ inch | $23.50 |
| 2 inch | $28.50 |
| 3 inch | $34.50 |

The quantity rate charge is a two-tier rate structure based on an allocation of water depending on the water conservation Phase. Use in excess of the basic allocation is charged a surcharge, which also changes with the current water conservation Phase. For example, during all Phases, the quantity charge is $4.20 per 100 CF up to the specified allocation. During Phase I or I.a., the quantity charge increases to $6.30 per 100 cubic feet used for consuming more than 1,300 CF in the billing period, as shown in **Table 9B.**

**Table 9B: CVWD Quantity Rate Structure**

| | Basic Allocation (CF) | Quantity Charge | Surcharge (per 100 CF) |
|---|---|---|---|
| **Phase I** | 1300 | $4.20 per 100 CF* | $6.30 |
| **Phase I.a.** | 1300 | | $6.30 |
| **Phase II** | 1200 | | $8.40 |
| **Phase III** | 1100 | | $10.50 |
| **Phase IV** | 900 | | $12.60 |
| **Phase V** | 800 | | $14.70 |
| **Phase VI** | 700 | | $16.80 |

*Includes Lake Gregory area beginning July 2013.

Based on the quantity rate system shown in **Table 9B,** some level of conservation pricing structure is always in effect regardless of drought conditions. In addition, as described in Chapter 8, if the CVWD Board determines that water use reductions are necessary, they can vote to change the water conservation phase, which has the effect of decreasing the monthly allocation to each customer, and increasing the surcharges for exceeding the allocation. For example, at the highest water conservation level Phase VI, each customer would receive an

allocation of 700 CF, and be charged a surcharge of 4.0 times the basic rate for any monthly water use exceeding this allocation.

- **Implementation Over the Past Five Years**

  With incorporation of the AMI system discussed previously, the District has charged customers more accurately, with better tracking ability to determine when surcharges are warranted.

  In addition, the debt for infrastructure improvements in the Lake Gregory area was retired in fiscal year 2012-2013. Beginning in 1979, when the District began serving the Lake Gregory area, there were many needed improvements to bring that system into compliance with State regulations, as well as an amount owed to the prior owner of the Lake Gregory water system. The minimum monthly charge was set $4.50 higher than the rate for the rest of the District to fund the acquisition and improvements necessary. Water mains have been replaced and the water storage tanks refurbished or replaced. As of July 2013, the rates for the Lake Gregory area were reduced to match the rest of the District.

- **Planned Implementation for the Future**

  The District periodically reviews its water rates and will consider rate increases as necessary.

### 9.1.4 Public Education and Outreach

CVWD offers residential surveys to customers to identify potential water waste in the home, and to connect customers with resources to repair inefficient appliances or change wasteful habits. CVWD also provides a similar program for large commercial users, involving site visits, evaluation of all water-using apparatuses and processes, and a customer report identifying recommended efficiency measures, paybacks, and agency incentives. The District does not offer a formal school education program; however, it has provided speakers to various classes and groups upon request.

- **Implementation Over the Past Five Years**

  CVWD published a handout titled, "A Landscape Guide for Mountain Homes," which is available at the District headquarters. Additionally, monthly water bills contain messages on water conservation strategies and show previous water usage to educate and encourage customers to reduce water use.

- **Planned Implementation for the Future**

  In terms of public education and outreach for water conservation, CVWD's efforts have been effective, as described in Chapter 5. In addition, according to SWRCB records of March 2016, the District is one of the top three water-saving agencies in the Inland Empire.[2] CVWD will continue to communicate to its customers the message of conservation and wise water use through billing notices, the CVWD Web site, social media, and community outlets.

### 9.1.5 Programs to Assess and Manage Distribution System Real Loss

The District performed a Water Loss Audit as part of this UWMP, which is discussed in Chapter 4 and provided in Appendix F. Also, CVWD installed an AMI system that allows the District to detect and respond to system leaks within 24 hours. The AMI system also facilitates data collection and analysis, allowing the District to better understand water waste and loss throughout the system. The District also conducts annual pipeline replacement projects.

- **Implementation Over the Past Five Years**

  The meter and main repairs performed by CVWD for the past five years are detailed in **Table 9C**, as evidence of the ongoing efforts to repair leaks and minimize water loss.

[2] As reported by KVCR, May 19, 2016. http://kvcrnews.org/post/heres-ies-best-and-worst-saving-water#stream/0.

**Table 9C: CVWD Repairs, 2011-2015**

| Year | Service Connection (Meter) Breaks or Leaks | Main Breaks or Leaks |
|---|---|---|
| **2011** | 26 | 7 |
| **2012** | 20 | 8 |
| **2013** | 19 | 6 |
| **2014** | 29 | 9 |
| **2015** | 36 | 4 |

Source: PWSS/Annual Reports

- **Planned Implementation for the Future**

Staff will continue to check for leaks visually and respond to reports from the public to perform repairs quickly. Staff will continue to monitor the AMI system, as well as consumption and production data to detect a spike in loss and respond accordingly. CVWD will also continue budgeting for annual pipeline replacements to replace aging pipelines.

Executive Order B-37-16 issued by Governor Brown on May 9, 2016 directs the SWRCB, DWR, and the California Energy Commission to develop funding sources, programs, and technology to decrease water system losses. CVWD will review the forthcoming regulations for improving system loss detection.

### 9.1.6 Water Conservation Program Coordination and Staffing Support

Karl B. Drew, General Manager, has served as CVWD's Conservation Coordinator since 1997. He dedicates approximately 5 percent of his time to performing these duties, and can be reached at: 909-338-1727 or kbdrew@cvwater.com. Additional staff support may be provided on an as-needed basis, budget permitting.

- **Implementation Over the Past Five Years**

Over the past five years, the District has communicated effectively to its customers on topics such as water conservation and emergency regulations. Water conservation efforts have been incorporated into the overall work of both the Conservation Coordinator (aka General Manager) and staff members.

- **Planned Implementation for the Future**

  CVWD will continue offering information to customers and speaking engagements as requested. Likewise, the District may investigate participation in grant or rebate programs.

  Executive Order B-37-16 issued by Governor Brown on May 9, 2016 directs the SWRCB and DWR to permanently require urban water suppliers to issue a monthly report on their water usage, amount of conservation achieved, and any enforcement efforts. CVWD will review the requirements of the Order and continue reporting to the State, until determined otherwise.

## 9.2 California Urban Water Conservation Council

CVWD is a voluntary member of the California Urban Water Conservation Council (CUWCC) and a signatory to the Council's Memorandum of Understanding (MOU). The MOU requires rigorous reporting and analysis from agencies when they implement the Best Management Practices (BMPs, aka DMMs). However, some of the BMPs required by the CUWCC are not applicable or useful in this unique, mountainous area than for communities located in the valley. The benefit of current compliance with the MOU is the option of submitting the BMP Annual Report in lieu of, or in addition to, describing the DMMs in the UWMP. CVWD maintains its firm commitment to the implementation of the BMPs (aka DMMs) as a signatory to the CUWCC.

# CHAPTER 10: PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

This chapter provides guidance to address the CWC requirements for a public hearing, the UWMP adoption process, submitting an adopted UWMP, plan implementation, and the process for amending an adopted UWMP.

## 10.1 Inclusion of All 2015 Data

2015 UWMPs must include the water use and planning data for the entire year of 2015. If an agency is reporting on a calendar year basis (January to December), the 2015 UWMP cannot be completed before December 31, 2015. If an agency is reporting on a fiscal year basis (July to June), they may complete their 2015 UWMP at the end of their fiscal year. Since CVWD is reporting on a calendar year basis, the 2015 UWMP was not completed until after the end of the calendar year 2015.

## 10.2 Notice of Public Hearing

A public hearing must be hosted by CVWD prior to adopting the Plan; it may be held at the adoption hearing, but the public hearing must be listed as an agenda item to allow time for public input. DWR guidelines state that all public input shall be considered by the Board of Directors. There are two audiences within the service area that are required to be noticed for the public hearing: cities and counties, and the public. CVWD held a combined public hearing and UWMP adoption hearing on Tuesday, July 19, 2016.

### 10.2.1 Notice to Cities and Counties

#### 10.2.1.1 60 Day Notification

The CWC states that cities and counties must be notified that the supplier will be reviewing the UWMP and considering amendments to the Plan. This notice must be sent at least 60 days prior to the public hearing. Notices were sent to San Bernardino County, since CVWD does not serve a City, on March 2, 2016, which is more than 60 days prior to July 19, 2016.

| Table 10-1 Retail: Notification to Cities and Counties | | |
|---|---|---|
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| n/a | ☐ | ☐ |
| County Name *Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| San Bernardino County | ☑ | ☑ |

**Table 10-1: Notification to Cities and Counties** lists the required notifications. CVWD also notified the following list of interested agencies and organizations:

- County of San Bernardino
- Crestline-Lake Arrowhead Water Agency
- Lake Arrowhead Community Services District
- Running Springs Water District
- Arrowbear Park County Water District
- U.S. Department of Agriculture Forest Service
- Crestline Sanitation District
- San Bernardino County Fire
- Rim of the World Unified School District
- Lahontan Regional Water Quality Control Board
- Save Our Forest Association
- Division of Drinking Water, San Bernardino District
- Sierra Club, Big Bear Group
- Santa Ana Regional Water Quality Control Board
- Mojave Water Agency
- Cedarpines Park Mutual Water Company
- Valley of Enchantment Mutual Water Company
- Valley View Park Mutual Water Company
- Strawberry Lodge Mutual Water Company
- Alpine Water Users Association
- Santa Ana Watershed Project Authority
- Crestline/Lake Gregory Chamber of Commerce

#### 10.2.1.2 Notice of Public Hearing

CVWD also provided notice of the date, time, and place of the public hearing to San Bernardino County, as well as the interested agencies listed above. The notice, provided in **Appendix B**, includes the location where the 2015 UWMP can be viewed, the UWMP revision schedule, and contact information of the UWMP preparer. Notice of the Public Hearing was sent to the county and interested parties on May 20, 2016.

### 10.2.2 Notice to the Public

The public was notified of the public hearing and availability to review the Plan in the local newspapers (*The Alpenhorn News* and *The Mountain News)* once a week for two successive weeks pursuant to Government Code 6066, on July 5, 2016 and July 12, 2016 (Proof of Publications provided in **Appendix B)**. CVWD provided a public draft of the Plan at their offices located at 777 Cottonwood Drive and on their Web site, http://www.cvwater.com/ beginning July 5, 2016.

## 10.3 Public Hearing and Adoption

Before submitting the UWMP to DWR, the CVWD Board of Directors must formally adopt the plan, as prepared or as modified after the public hearing. The hearing and adoption of the UWMP was held on July 19, 2016.

In relation to the "20 percent by 2020" baseline and targets described in Chapter 5, the CWC requires the public hearing to also accomplish the following in order to comply with SB X7-7:

- Allow community input on the implementation plan;[1]
- Consider the economic impacts of the implementation plan; and
- Adopt a method for determining its urban water use target. [2]

[1] The term, "implementation plan" as mentioned in the 20 by 2020 Water Conservation Act of 2009 is not defined. But according to DWR staff, it is meant to suggest the District's plans as described in the UWMP for continuing to meet its water conservation target.
[2] The method chosen by CVWD to calculate the 2020 water use target has been, "Method 3: 95 Percent of Hydrologic Regional Target from the 20 x 2020 Water Conservation Plan, State of California Agency Team, 2010" as defined in CWC Section 10608.20(a)(1).

Therefore, the hearing provided information on the baseline values, water use targets, and implementation plan developed by CVWD as required by the Water Conservation Act of 2009.

### 10.3.1 Adoption

The 2015 UWMP was adopted by the CVWD Board of Directors on July 19, 2016 following a public hearing held prior to the adoption vote, which gave CVWD the opportunity to modify the UWMP in response to public input prior to adoption. A copy of the CVWD adoption Resolution No. 428 is included in **Appendix L**.

## 10.4 Plan Submittal

### 10.4.1 Submitting a UWMP to DWR

2015 UWMPs must be submitted to DWR within 30 days of adoption and by July 1, 2016. UWMP submittal will be done electronically through WUEdata, an online submittal tool developed by DWR.

After the UWMP has been submitted, DWR will review the plan utilizing the checklist provided in Appendix A and make a determination as to whether or not the UWMP addresses the requirements of the CWC. The DWR reviewer will contact CVWD as needed during the review process. Upon completion of the Plan review, DWR will issue a letter to the agency with results of the review.

### 10.4.2 Electronic Data Submittal

DWR developed an online submittal tool, WUEdata, which was used for the 2015 UWMPs. The tool accepts complete UWMPs, as well as tabular data from all the data tables. The WUEdata online submittal tool is online at https://wuedata.water.ca.gov.secure/. CVWD submitted its electronic data via the WUEdata online submittal tool on July 22, 2016.

### 10.4.3 Submitting a UWMP to the California State Library

No later than 30 days after adoption, CVWD shall submit a CD or hardcopy of the adopted 2015 UWMP to California State Library at:

California State Library
Government Publications Section
P.O. Box 942837
Sacramento, CA 94237-0001
Attention: Coordinator, Urban Water Management Plans

Or by courier or overnight carrier to the State Library at:

California State Library
Government Publications Section
914 Capitol Mall
Sacramento, CA 95814

### 10.4.4 Submitting a UWMP to Cities and Counties

No later than 30 days after adoption, the CVWD shall submit a hard or electronic copy of the adopted 2015 UWMP to any city or county to which it provides water including San Bernardino County. This submittal satisfies Water Code Section 10635(b).

## 10.5 Public Availability

The adopted UWMP is available for public review at CVWD, located at 777 Cottonwood Drive, Crestline, CA 92325-3347 during normal business hours, Monday through Friday, 7:30 AM to 4:30 PM. In addition, a copy of the adopted UWMP can be found on CVWD's Web site, (http://www.cvwater.com/) for public viewing anytime.

## 10.6 Amending an Adopted UWMP

If CVWD decides to amend the adopted UWMP, each of the steps for notification, public hearing, adoption, and submittal must also be followed for the amended plan. Notably, the water use target method described in Chapter 5 may not be changed in any amendments to the 2015 Plan or in the 2020 Plan.

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The following documents were referred to as general information sources during preparation of this UWMP. They are referenced by the acronyms shown.

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**Chapter 6**

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USGS United States Geological Survey. *Fractured-Rock Aquifers*. October 2002. (Available at http://toxics.usgs.gov/pubs/FS-112-02/).

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**Chapter7**

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**Chapter 8**

CLAWA Ord. 59 Crestline-Lake Arrowhead Water Agency, *Ordinance No. 59 Declaring a Water Shortage Emergency and Adopting Rules, Regulations and Restrictions on the Use of Agency Water,* April 3, 2016. (Available at http://www.clawa.org/ssl/docs/droughtinformation/droughinformation.pdf)

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