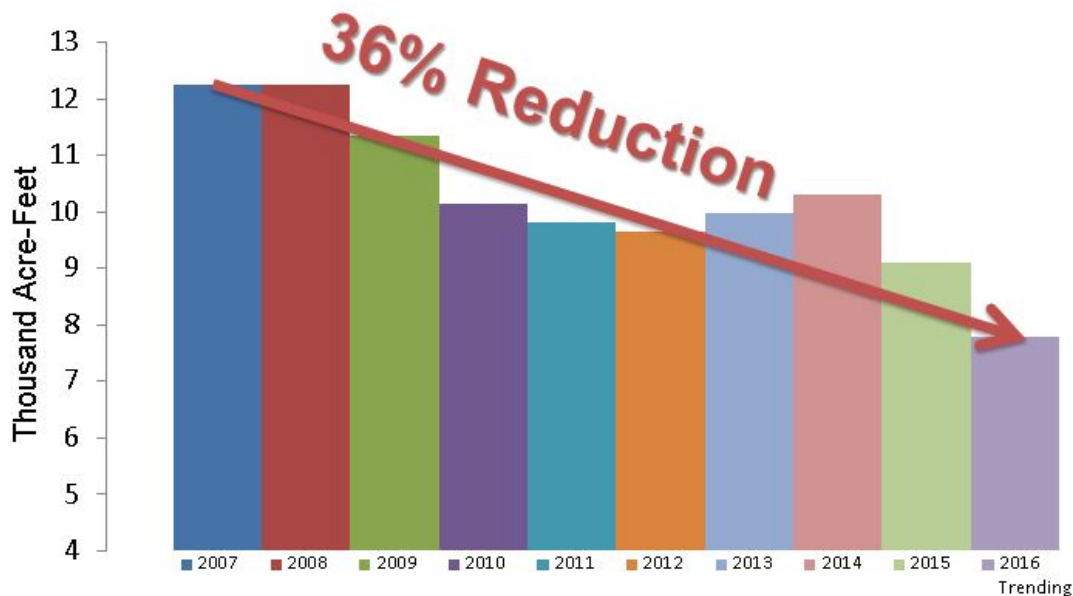


SECTION 3 WATER SYSTEM DEMANDS

3.1 RECENT WATER DEMAND TRENDS

Over the past ten years, Monte Vista Water District’s retail customers have achieved a significant and sustained reduction in demands. As of the writing of this report (May 2016), retail customer demands are 36 percent less than in 2007 (see Figure 3-1).

**Figure 3-1:
District Retail Customer Demand – 2007-2016**



The District has consistently and actively promoted water use efficiency and provided educational and financial resources to assist customers in wise and efficient water use. In 2010 the District adopted mandatory year-round water use efficiency “best practices,” as well as the region’s first budget-based tiered rate structure for single-family residential customers (80 percent of total metered accounts) which incentivizes efficient use. See Sections 6 and 7 below for more information on these programs and activities.

In January 2014, Governor Brown proclaimed a State of Emergency in recognition of record-setting drought conditions across California and the western United States. On April 1, 2015, he issued an executive order requiring a mandatory 25 percent reduction in urban water use across the State – an unprecedented action in California history. In May 2015, the District’s Board of Directors declared a Significant Water Supply Shortage in response to Governor Brown’s order.

Consistent with the Water Conservation Act of 2009, the District is required to reduce water use on a gallons per person per day basis by 20 percent compared to a ten-year baseline average (see Section 3.6 below)—a goal that District customers have already accomplished! While the District expects overall water demands to slowly increase as drought conditions improve and the current emergency order is lifted, the District will work with its customers to maintain and enhance their water use efficiency in order to comply with the State’s requirements and District policy goals.

3.2 RETAIL DEMAND PROJECTIONS – LAND USE BASED MODEL

In 2015, as part of its regional integrated resource planning effort, Inland Empire Utilities Agency (IEUA) developed a Land Use Based Water Demand Model for projecting water demands through 2040 for each of its retail water agencies, including the District. This model updates the demand projections used in the District’s 2008 Water Master Plan to plan and size future District facilities. For a description of the methodology used by the model to project the District’s future retail water demands, including the extent to which passive savings are considered, please see Appendix G. For existing and future land uses, see Figure 2-2 and Figure 2-3.

3.3 PAST, CURRENT, AND PROJECTED WATER DEMANDS

Table 3-2 provides the District’s existing and projected demands on its water system by customer and water use sector. The projected retail demands are based on Land Use Model projections Section 3.2 and consistent with the demand reduction requirements and urban water use targets described in Section 3.6. Although historical wholesale demand by the City of Chino Hills has been between 8,000 and 14,000 AFY, the District will use its full contractual obligation of 20.22 mgd, or 22,650 AFY, in estimating future potential demands by Chino Hills on the District’s water system.

3.4 SYSTEM WATER LOSS

Beginning in 2015, water suppliers are required to quantify their distribution system losses for the most recent 12-month period using the American Water Works Association’s (AWWA) water system balance methodology. The District has tracked water system loss using AWWA’s methodology since 2009. Table 3-1 provides water loss data for Fiscal Year Ending (FYE) 2015. The District’s FYE 2015 water system audit using AWWA’s Free Water Audit Software (v5.0) is included in Appendix H.

**Table 3-1:
District Water Loss – 2015 (AFY)**

Reporting Period	Volume of Water Loss ¹
FYE 2015	497

Aligns with DWR Standardized Tables 4-4 R and 4-4 W.

¹ Includes both apparent and real losses (Appendix H).

**Table 3-2:
Current and Projected Water Demand by Sector (AFY)**

Sector	2015 Actual ¹	2020 Projected	2025 Projected	2030 Projected	2035 Projected	2040 Projected
Single-family Residential ²	4,521	5,079	5,187	5,447	5,574	5,739
Multi-family Residential ²	1,380	2,116	2,209	2,236	2,270	2,334
Commercial ²	1,543	1,414	1,425	1,437	1,490	1,517
Institutional/governmental ²	265	309	311	315	336	338
Industrial ²	31	338	340	344	361	364
Landscape ²	712	1,067	1,080	1,093	1,129	1,143
Agriculture ²	50	58	51	16	10	0
Hydrant and Fire Service ³	28	30	30	30	30	30
Unbilled Metered Uses ⁴	73	175	175	175	175	175
Unbilled Unmetered Uses ⁴	7	8	8	8	8	8
Water Loss ⁵	497	525	541	560	579	597
Groundwater Recharge (ASR) ⁶	1	400	400	400	400	400
Total Retail Potable Demand	9,110	11,519	11,756	12,060	12,361	12,645
Wholesale Potable Demand ⁷	6,933	22,650	22,650	22,650	22,650	22,650
Total Potable Demand	16,043	34,169	34,406	34,710	35,011	35,295
Recycled Water (Direct Sales) ⁸	308	430	430	430	430	430
Recycled Water (Recharge) ⁸	483	601	560	589	639	639
Total Non-Potable Demand	791	1,031	990	1,019	1,069	1,069
Total Water Demand	16,834	35,200	35,396	35,730	36,081	36,364

Aligns with data in DWR Standardized Tables 4-1 R, 4-1 W, 4-2 R, and 4-2 W.

¹ 2015 demands obtained from District billing, production, distribution, and water loss audit data for fiscal years (July-June) ending in above year.

² Residential, commercial, institutional/governmental, industrial, landscape, and agricultural water demand calculated using the Land Use Based Demand Model, 2015 (Appendix G). Water loss and unbilled metered and unmetered uses subtracted out of total demand factor per customer use category. Single-family residential demands include very low, low, and medium (40 percent) model projected residential demands; multi-family residential demands include medium (60 percent) and high density model projected residential demands. Projected landscape demands include all park and school yard landscape demands, some of which are metered as institutional/governmental.

³ Includes hydrant meters used during construction and detector check (DC) fire accounts.

⁴ Unbilled metered uses include hydrant flushing, fire flow tests, District facility landscape irrigation, and groundwater well pump to waste. Unbilled unmetered uses include groundwater well water quality analyzers, facility washdown, street sweeping, and local firefighting. All approved but unbilled uses are tracked and reported in the annual water system audit (Section 3.4). Usage can be highly variable year to year. Projections based on average use over the past five years.

⁵ Includes both real losses (leaks) and apparent losses (customer meter inaccuracies, billing errors, and theft) as reported in the annual water system audit (Section 3.4). Projections based on average loss over the past five years.

⁶ The District estimates that available and affordable imported water will be available in one out of five future years for treatment and injection into the Chino Groundwater Basin through the District's Aquifer Storage and Recovery (ASR) wells. During such years, the District estimates it will be able to inject 2,000 AF. As a result, 400 AF is projected as an average annual availability of injection water for conjunctive use (see Section 4.6.2).

⁷ 2020-2040 wholesale demand equals full contractual obligation to the City of Chino Hills.

⁸ Recycled water direct sales are deliveries to the District's recycled water customers through its retail recycled water distribution system. Recycled water groundwater recharge is the District's purchased City of Montclair share of regional recycled water recharge in the Chino Groundwater Basin (see Section 4.6.5).

3.5 LOWER INCOME HOUSING DEMANDS

SB 1087 requires water providers to grant priority service hook-ups to lower income housing developments. The UWMP Act requires documentation of future water demands associated with planned new lower income housing by the local land use planning jurisdiction. A lower income household has an income below 80 percent of area median income, adjusted for family size.

The City of Montclair's updated 2014-2021 Housing Element of the General Plan (adopted February 2014) indicates a quantitative directive for the construction of 278 new low and very low income housing units within the City by 2021. The District is unaware of any lower income housing developments planned for the City of Chino or County of San Bernardino areas of the District service area.

Water demands for planned low income housing by 2021 were based on the average multi-family unit factor from the updated demand projections. New demands associated with planned low income housing are approximately 122 AF by 2020. The District confirms that this demand is included in the projected water demands represented in Table 3-2.

3.6 DEMAND REDUCTION REQUIREMENTS

The Water Conservation Act of 2009 requires all California urban water agencies to set and meet certain demand reduction targets in order to assist the State in reducing urban water use by 20 percent by 2020. This collective goal is commonly known as "20 percent by 2020" or "20x2020." The prescribed way to determine the District's compliance is by measuring the per person (or "per capita") daily water usage by District customers.

The Act requires DWR to develop, in consultation with an Urban Stakeholder Committee (USC) comprised of water agency representatives and water use experts, specific methodologies for determining per capita water use and other information required to meet 20x2020 water use reduction requirements. DWR published its Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (Methodologies) in October 2010 and published an updated version of the Methodologies in February 2016. The District is required to follow the Methodologies when estimating past, current, and projected water system demands in its UWMP in order to establish water use reduction targets for 20x2020 compliance. Additionally, the 2016 Methodologies require the District to update its water use reduction targets using the most recent 2010 U.S. Census data.

This section of the plan outlines the District's process in estimating its system demands and establishing its 20x2020 water use reduction targets. The District's Board of Directors will formally adopt its 2020 water use target as part of its resolution adopting the 2015 UWMP (see Appendix E).

3.6.1 Baseline Gallons Per Capita Per Day

The first step toward achieving 20x2020 compliance is to determine the District’s Base Daily Per Capita Water Use which is used to form a baseline for the agency’s 20 percent reduction in water use target for 2020. The Methodologies require water agencies to identify a continuous 10-year period ending no earlier than 2004 and no later than 2010, and then calculate the gallons per capita per day (GPCD) demands of their customers for each of these years.⁷ The average GPCD over this 10-year period forms the agency’s Base Daily Per Capita Water Use, or Baseline GPCD.

Following the 2016 Methodologies and using the DWR Population Tool (https://wuedata.water.ca.gov/secure/wue_supplier_tool.asp), the District has recalculated its service area population for the years 1996-2005 using updated 2010 U.S. Census data,⁸ and then divided its population by the total gross potable water supply entering its potable water distribution system. As shown in Table 3-3, the final calculation of the District’s Baseline GPCD, using the 10-year GPCD average of the years 1996-2005, is 209 GPCD.

The following sections describe how the District determined its population and gross potable water supply for these historical periods.

**Table 3-3:
Baseline Gallons Per Capita Per Day Calculation – 10-Year Range**

Calendar Year	Service Area Population	Annual Gross Water Use (AFY)	Daily Per Capita Water Use (GPCD)
1996	47,020	10,708	203
1997	46,778	11,832	226
1998	46,508	10,146	195
1999	48,048	10,612	197
2000	48,996	11,925	217
2001	49,459	11,708	211
2002	49,648	11,990	216
2003	50,189	11,924	212
2004	50,784	12,441	219
2005	50,960	10,871	190
Baseline Gallons Per Capita Per Day (10-Year Average):			209

Aligns with data in DWR Standardized SBX 7-7 Tables 4 and 5.

⁷ Water agencies which met at least 10 percent of their total 2008 demand through recycled water could expand their baseline window to 15 years; the District had just started deliveries of recycled water in 2008.

⁸ Data from the 2010 U.S. Census was not yet available when the District initially calculated its Baseline GPCD in its 2010 UWMP.

Population

DWR's Methodologies provide a specific method for urban water agencies to estimate their past and present service area populations, depending on available information. The District's service area is not contiguous with one municipal incorporated area, and so it is not able to rely solely on California Department of Finance population estimates for individual incorporated cities. Neither does a regional or wholesale agency provide the District with annual population estimates for its service area. The District, therefore, is required to follow the methods outlined in Methodology 2 of the Methodologies, using the DWR Population Tool which matches data from the most recent U.S. Census with the District's active accounts for each year, to come up with annual population estimates. For its 2015 population, the District used an alternative methodology based on local knowledge. For documentation associated with population estimates, see Appendix F.

Gross Potable Water Use

Gross potable water use is defined by DWR's Methodologies as the total amount of water entering the District's potable water system, minus water exports to other agencies, water placed into long-term storage (e.g., water injected into the groundwater basin), and indirect reuse of recycled water through groundwater recharge.

The District directly meters and accounts for water entering into its potable water distribution system. Water production and deliveries to the District's wholesale agency customer, the City of Chino Hills, is separately metered. Since 2002, the District has purchased the City of Montclair's portion of the regional recycled water recharge into the Chino Groundwater Basin (see Section 4.5); the annual amount of indirect recycled water reuse is calculated using the process outlined in DWR's Methodologies and subtracted from its retail potable water supply, resulting in a calculated gross potable water supply. For documentation associated with indirect recycled water reuse calculation, see Appendix I.

3.6.2 Target Gallons Per Capita Per Day

Having established its Baseline GPCD, the District is required by DWR's Methodologies to determine its Urban Water Use Target GPCD for 2020 and its Interim Urban Water Use Target for 2015. The Water Conservation Act of 2009 provides water agencies with four methods for setting its urban water use targets:

- **Method 1:** Reduce total demand on the water system by 20 percent, measured by comparing baseline gallons per capita per day (GPCD) historical usage to GPCD usage in 2020.
- **Method 2:** Meet system-wide water use performance standards for indoor residential water use, landscaped area water use, and other uses.
- **Method 3:** Meet 95 percent of the water agency's hydrologic regional target, as determined by the State's 20x2020 Water Conservation Plan.

- **Method 4:** An additional compliance option, developed by DWR in consultation with the USC, based on water use sector performance standards and past conservation activity.

The District has evaluated each method and reconfirms that Method 1 is the most feasible for the District to use in setting its urban water use targets. Following Method 1, the District’s Target GPCD for 2020 must be 80 percent of its Baseline GPCD, or 167 GPCD. The District’s Interim Target GPCD for 2015 is calculated by adding the Baseline GPCD and the Target GPCD together, and dividing by two; the result is an Interim Target GPCD of 188 GPCD (see Table 3-4).

**Table 3-4:
District Urban Water Use Targets**

Baseline GPCD	2020 Urban Water Use Target ¹	2015 Interim Urban Water Use Target ²
209	167	188

Aligns with data in DWR Standardized Table 5-1 and SBX 7-7 Tables 7-A, 7-F, and 8.

¹ 80% of Baseline GPCD.

² (Baseline GPCD + 2020 Urban Water Use Target) / 2

Confirm Urban Water Use Targets

The District’s final step in setting its urban water use targets is to confirm that its target meets the minimum threshold set by the Water Conservation Act of 2009 of a five percent reduction from the average GPCD of a five-year contiguous base period between 2003-2010. As demonstrated in Table 3-5, a five percent reduction from the baseline average GPCD for the years 2003-2007 provides a maximum target of 192 GPCD. The District’s urban water use target of 167 GPCD is well below this maximum target.

**Table 3-5:
Baseline Gallons Per Capita Per Day Calculation – 5-Year Range**

Calendar Year	Service Area Population	Annual Gross Water Use (AFY)	Daily Per Capita Water Use (GPCD)
2003	50,189	11,924	212
2004	50,784	12,441	219
2005	50,960	10,871	190
2006	51,578	11,423	198
2007	52,416	11,101	189
Baseline Gallons Per Capita Per Day (5-Year Average):			202
95% of Baseline Gallons Per Capita Per Day:			192

Aligns with data in DWR Standardized SBX 7-7 Tables 5 and 7-F.

3.6.3 Compliance with 2015 Interim Urban Water Use Target

The District is required to report in its 2015 UWMP whether it has achieved its 2015 Interim Urban Water Use Target as required by SBX7-7. As shown in Table 3-6, District customers used 137 GPCD in 2015, which is 34 percent below the Baseline GPCD of 209, far exceeding the 10 percent reduction requirement.

**Table 3-6:
Compliance with 2015 Interim Urban Water Use Target**

Calendar Year	Service Area Population	Annual Gross Water Use (AFY)	Daily Per Capita Water Use (GPCD)
2015	55,581	8,532	137
Interim Urban Water Use Target			188
Did the District Achieve Targeted Reduction for 2015?			Yes

Aligns with data in DWR Standardized Table 5-2 and SBX 7-7 Table 9.

3.6.4 Wholesale Agency Assistance in Meeting Urban Water Use Target

The City of Chino Hills's Base Daily Per Capita Water Use (average of 1995-2004) is 217 GPCD, resulting in a 2020 Urban Water Use Target of 173 GPCD and a 2015 Interim Urban Water Use Target of 195 GPCD. Chino Hills's actual 2015 GPCD was 164 GPCD, which is 24 percent below its Baseline GPCD and well below its 10 percent reduction requirement.⁹

Chino Hills, at this time, has not requested and does not appear to need assistance from the District in achieving its 20x2020 reduction requirements. The District has in the past, and at the request of the city, provided general assistance in meeting California Urban Water Conservation Council Best Management Practices reporting requirements (see Section 6.1.1). The District and Chino Hills also collaborate in various regional conservation programs (Section 6.3.1) and through the Regional Alliance (Section 1.2.3).

⁹ City of Chino Hills, May 12, 2016.