2020

PART 2: LOCAL AGENCY UWMPs

UPPER SANTA ANA RIVER WATERSHED

INTEGRATED REGIONAL URBAN WATER MANAGEMENT PLAN

EAST VALLEY WATER DISTRICT

2020 IRUWMP

Part 2 Chapter 6

EVWD 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

WSC

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RETAIL URBAN WATER MANAGEMENT PLAN

6 East Valley Water District

This chapter describes information specific to the East Valley Water District, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the East Valley Water District's reporting requirements for 2020 under the UWMP Act.

6.1 System Description

East Valley Water District (EVWD or District) is a California Special District, established in 1954, that provides water and wastewater services. EVWD encompasses 30.1 square miles along the foothills of the San Bernardino Mountains and serves the City of Highland, portions of the City and County of San Bernardino, along with the San Manuel Band of Mission Indians. As a district tasked with managing a critical resource, EVWD is committed to innovative leadership and world class public service. The District's service area is shown in **Figure 6-1**. EVWD is a retail public water supplier that meets the definition of an urban water supplier with over 21,600 municipal water service connections in 2020.

IN THIS SECTION

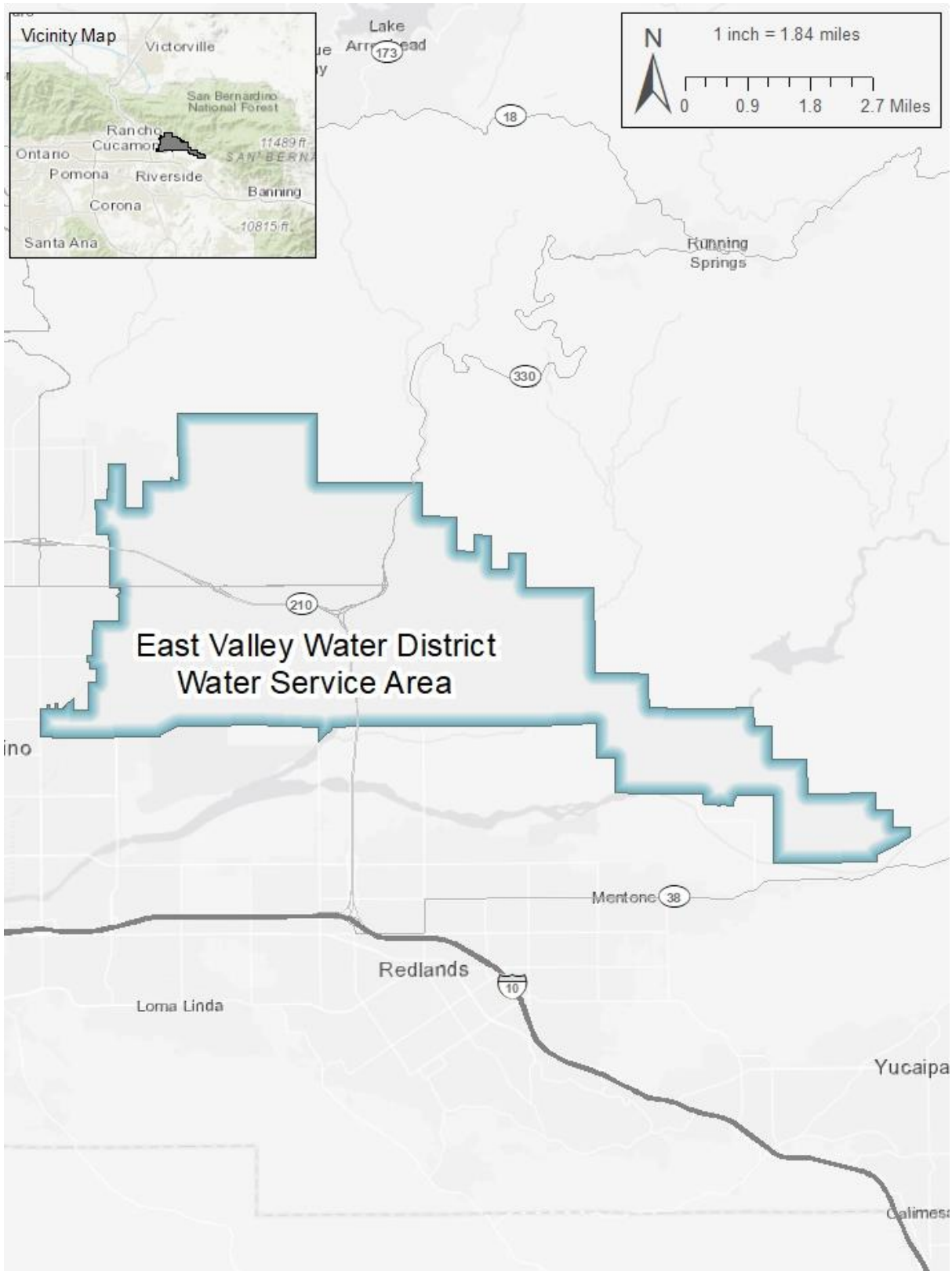


Figure 6-1: EVWD Service Area Map

6.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year. The service area population for 2020 was estimated in the DWR Tool using the number of connections in 2010 and 2020.

Based on a thorough analysis of Census blocks within the service area, EVWD reported an estimated population of 103,000 in their 2019 Consumer Confidence Report. However, for purposes of this report, the DWR Tool output of 99,347 was assumed to be the official estimate of population in 2020 and serves as the basis for SBx7-7 compliance calculations and its future population projections years.

To estimate population for future years, projections from the Southern California Association of Governments (SCAG) were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045. The population growth rates were applied to the 2020 population to estimate future population. Estimated 2020 and future year population is shown in **Table 6-1**. The 2025 population was adjusted upwards to account for known developments planned for construction by 2025, and all subsequent population projections were based on the 2025 population projection.

Per SCAG requirements, it must be noted that this population modeling analysis was performed by Water Systems Consulting, Inc. based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results and the content of the documentation.

SCAG prepares demographic forecasts based on land use data for their region through extensive processes that emphasizes input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Table 6-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**99,347**	**104,500**	**108,224**	**112,080**	**115,792**	**119,626**

6.1.2 Land Use

Per the 2019 EVWD Water System Master Plan, 30% of land within the service area is Single Family Residential, 4% is Multi-Family Residential, 3% is Commercial, 1% is Industrial, 5% is Public, 1% is Parks, 9% is Open Land, 3% is Agricultural, and 44% is Vacant.

6.2 Water Use

This section describes the current and projected water uses within EVWD's service area. EVWD serves only potable water for domestic use.

6.2.1 Water Use by Sector

EVWD categorizes its water customers into six categories for the purposes of recording water use and billing: Residential, Multi-Family, Commercial, Irrigation Commercial, Fire Service, and Bulk Water. The number of active connections in each category from 2016 to 2020 are shown in **Table 6-2**. There are no permanent service connections designated as Bulk Water; this is water used for construction purposes from temporary meters.

Table 6-2: EVWD 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	19,500	19,526	19,526	19,883	19,898
Multi-Family	463	463	463	474	475
Commercial[1]	949	988	988	681	694
Irrigation Commercial	275	275	275	322	330
Fire Service[2]	1,330	1,339	361	252	258
TOTAL	**22,517**	**22,591**	**21,613**	**21,612**	**21,655**

[1]Decrease in commercial connections between 2018 and 2019 was due to a change in billing classification, reclassifying these customers as Residential.

[2]Between 2017 and 2018, a change in District policy was made to not bill residential customers that had a separate fire service meter. The actual number of connections did not change.

6.2.1.1 Past Water Use

EVWD's actual water use by customer class from 2016-2020 is shown in **Table 6-3.** EVWD's water consumption by customer class in the last five years is shown in **Figure 6-2.** Approximately 60% of EVWD's total deliveries were to single family residential connections, followed by 19% to multi-family connections, 11% to commercial connections, 10% to commercial irrigation connections, and the remainder to fire service and bulk water sales.

Table 6-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	9,142	9,602	9,944	9,470	10,589
Multi-Family	3,070	3,301	3,452	3,340	3,377
Commercial	1,815	1,900	2,094	1,968	1,873
Irrigation Commercial	1,717	1,812	1,914	1,602	1,725
Fire Service	10	5	3	3	3
Bulk Water	78	85	92	83	143
Water Losses	1,332	1,954	1,197	511	664
TOTAL	**17,164**	**18,660**	**18,695**	**16,977**	**18,374**

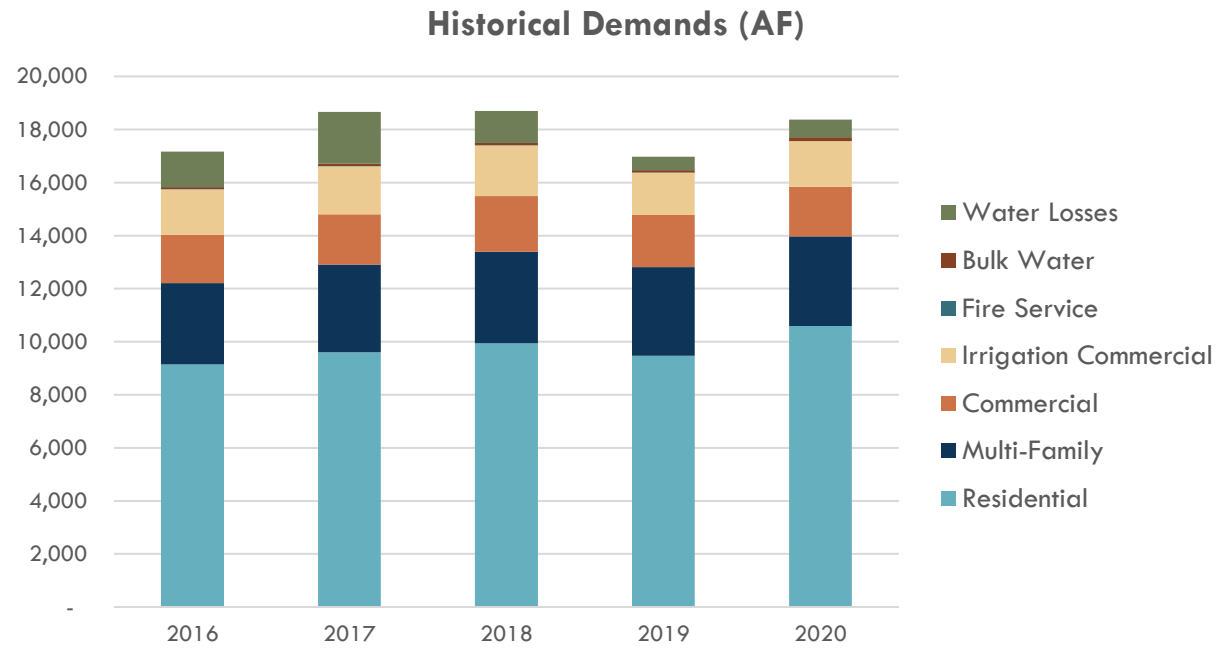


Figure 6-2: EVWD 2016-2020 Water Consumption by Customer Class (AF)

6.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water. Sources of water loss include:

- Leaks from water lines - Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.
- Unauthorized uses or theft of water – includes water used from fire hydrants without a meter or from an unauthorized, unmetered connection to EVWD's water system.

- Customer Meter Inaccuracies - Customer meters can under-represent actual consumption in the water system.

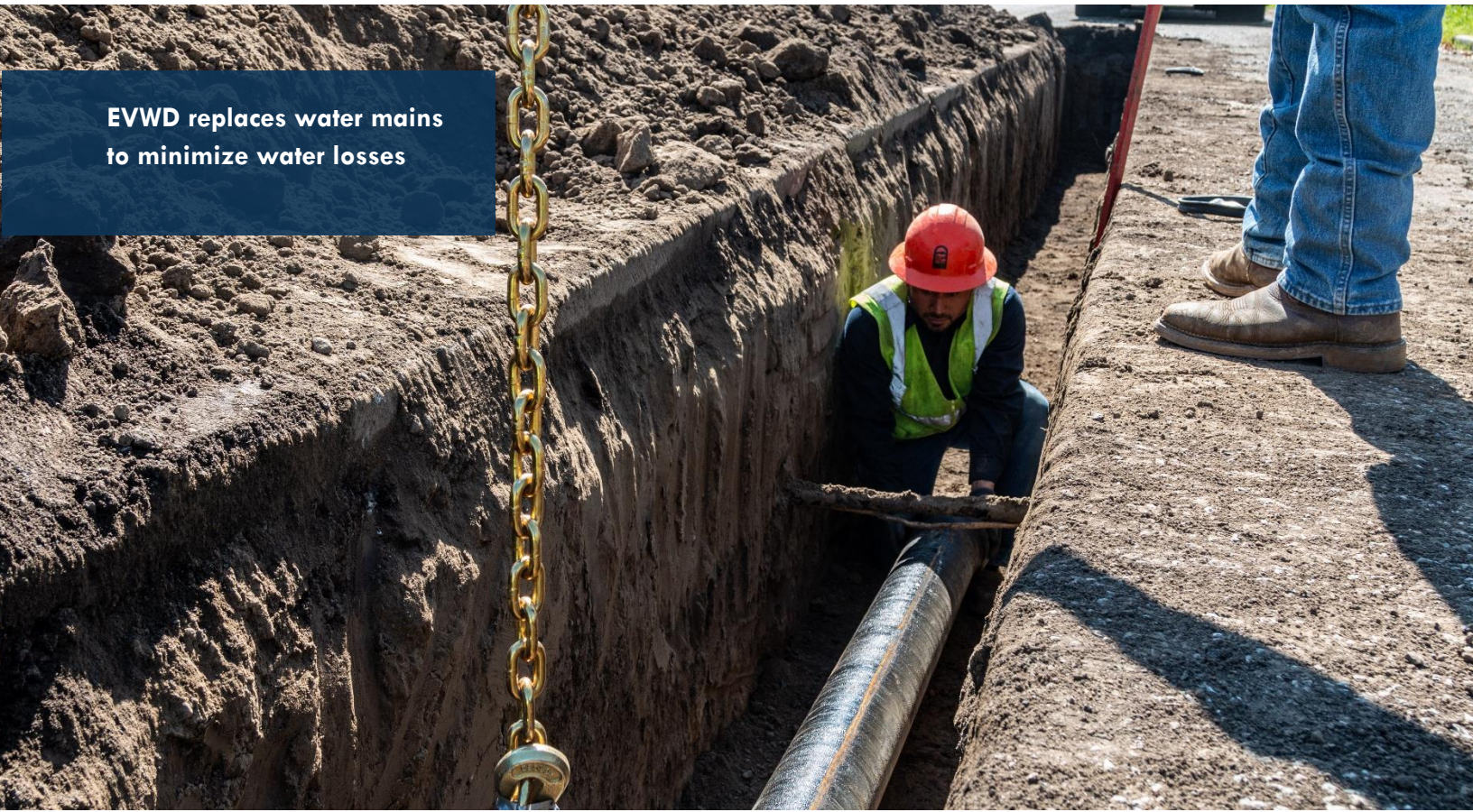
EVWD monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix F-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 6-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020. EVWD will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 6-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS
1	2016	1,518
1	2017	1,854
1	2018	1,082
1	2019	503
1	2020	664 (Estimated)

In the past 5 years, EVWD's water loss decreased from 12% to 3% of water sales.

Over this time period, EVWD completed a meter replacement program in their service area. In addition, EVWD has an aggressive leak repair program and a water main replacement program. Improved metering accuracy and reduced leaks have helped reduce water loss from EVWD's distribution system.



EVWD replaces water mains to minimize water losses

The new meters are equipped with Advanced Metering Infrastructure (AMI) technology, which allows for a consistent stream of water-use history directly to the District's network. It can alert both the District and customers to excess water use caused from pipe breaks, toilet leaks, and broken valves. The meters internally audit a read every 15 minutes and each hour the read is sent to strategically placed collectors within the service area, with a 98% read rate every 3 days. With the detailed usage data available in an AMI system, customer service representatives have near real-time access to consumers' consumption information. EVWD customers also have access to a customer portal where they can view their own water use information. EVWD is developing additional customer education and outreach materials to help promote the use of this information to reduce water losses and increase water use efficiency.

Given the age of pipelines located within the District's service area, investing in replacement of this infrastructure in essential to reducing water losses. Prioritization of leak response is based on estimated water losses, including the number of staff and equipment assigned to the response. The District has an aggressive leak response program, which includes tracking water loss and leak locations. This information is then incorporated into the assessment and prioritization of pipeline replacement projects.

For the purposes of future demand projections in this Plan, EVWD assumed future water losses will be approximately 6% of total customer water use.

EVWD is committed to managing system water losses to reduce water waste and will strive to meet the future water loss performance standard that is being developed by the State Water Board.

6.2.2 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers. The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on connection and demand data from calendar year 2020, which was reviewed against demand factors from other years and determined to be a reasonable representation of average demands. The number of future new connections for each customer category was estimated for each 5-year period through 2045 based on the projected SCAG population growth rate for years 2020-2035 and 2035-2045.

In the period from 2020 to 2025, the SCAG population growth rate projected that 709 new single family residential connections would be constructed. However, based on their development activity records, EVWD anticipates that 1,170 new single family residential connections could be constructed by 2025. To account for known developments, it was assumed that 1,170 new single family residential connections would be constructed by 2025 and 709 new single family residential connections would be constructed in each 5-year period thereafter. Connection growth for all other customer types was set equal to the SCAG population growth rate for the period 2020 through 2045.

To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Projected future demands by customer class as well as estimated losses are presented in **Table 6-5** and **Figure 6-3**.

Table 6-5: DWR 4-2R Projected Demands for Water (AF)

	PROJECTED WATER USE				
CUSTOMER CLASS	2025	2030	2035	2040	2045
Residential	11,211	11,589	11,966	12,316	12,667
Multi-Family	3,497	3,618	3,738	3,850	3,962
Commercial	1,939	2,006	2,073	2,135	2,197
Irrigation Commercial	1,787	1,848	1,910	1,967	2,024
Fire Service	3	3	3	4	4
Bulk Water	148	153	158	163	168
Water Losses	1,115	1,153	1,191	1,226	1,261
TOTAL	**19,702**	**20,371**	**21,040**	**21,661**	**22,283**

Table 6-6: DWR 4-3R Total Gross Water Use (AF)

	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	18,374	19,702	20,371	21,040	21,661	22,283
Recycled Water Demand From Table 6-4R	-	-	-	-	-	-
TOTAL WATER USE:	**18,374**	**19,702**	**20,371**	**21,040**	**21,661**	**22,283**

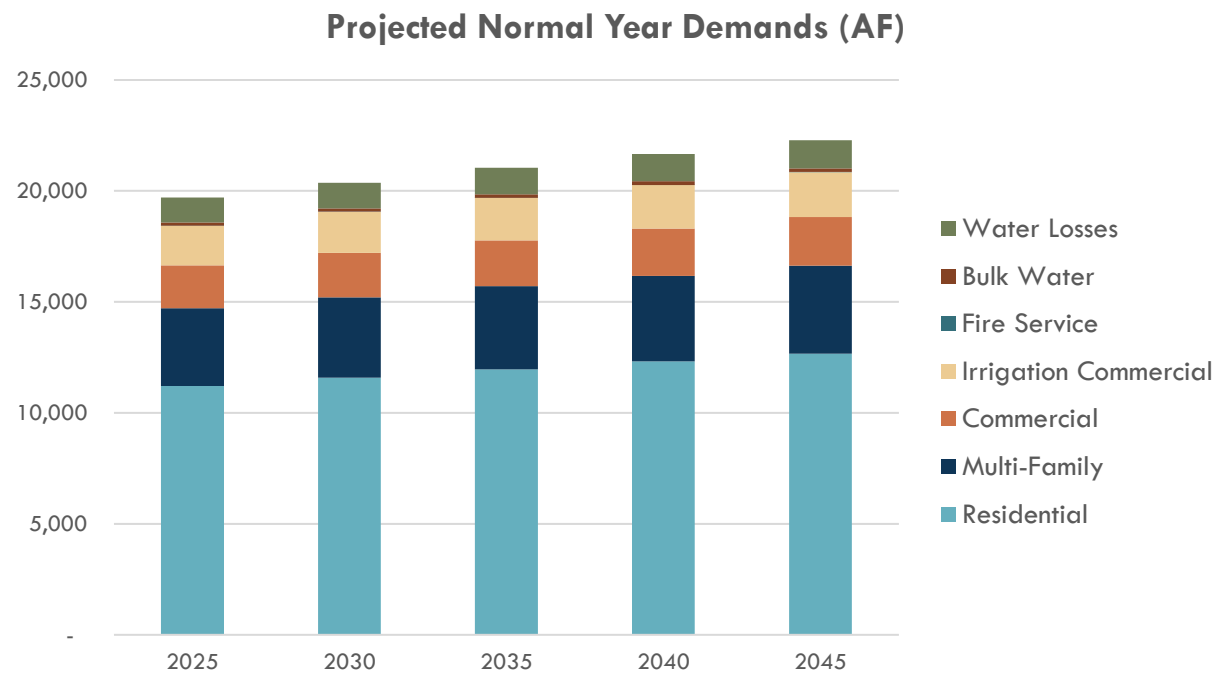


Figure 6-3: EVWD Projected Future Water Consumption by Customer Class (AF)

6.2.2.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by EVWD or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. EVWD may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, EVWD has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of EVWD's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, EVWD will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. EVWD is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

6.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

EVWD serves portions of three jurisdictions, the City of Highland, the City of San Bernardino, and unincorporated County of San Bernardino.

Based on SCAG's 6th cycle final regional housing needs allocation, it is estimated an average of 40 percent of households in the service area are lower income. However, this methodology does not consider that portions of each jurisdiction that are within the EVWD service area may be lower income than the average within that jurisdiction, which may lead to under-projecting the percentage of lower income households. Although the District's analysis has consistently shown that approximately 50% of households are considered to be low income, the SCAG data was used for consistency in this document. These demands are included in the projections presented throughout this report.

6.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

EVWD has identified the need to consider the impacts of Climate Change in the 2020 update of the Emergency Response Plan and Hazard Mitigation Plan. These plans identify potential impacts and mitigation projects that can be implemented to reduce the impacts of this hazard.

6.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets EVWD developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for EVWD's calculations are included in **Part 4 Appendix F-7**.

6.3.1 Baseline and Target

EVWD's baseline and 2020 target was calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4 Appendix F-7**. EVWD's calculated water use target for 2020 is 172 GPCD.

6.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, EVWD has met its Confirmed Water use Target for 2020 of 172 GPCD, as shown in **Table 6-7**. To maintain this level of water use, EVWD intends to continue its current level of outreach and programs for the foreseeable future.

Table 6-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
172	165	Yes

6.4 Water Supply

EVWD's water supply consists primarily of groundwater from wells in the western portion of the service area. These wells, in the San Bernardino Basin (SBB), supply approximately 80% of the total water supply. In addition to groundwater, EVWD provides treated surface water from the Santa Ana River and the SWP by way of Plant 134, an 8-million gallon per day (MGD) water treatment plant. Plant 134 was originally constructed in 1996 and upgraded from 4 MGD to 8 MGD in 2013.

More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2020 IRUWMP.

6.4.1 Purchased or Imported Water

Imported water available to EVWD is SWP purchased from Valley District. EVWD does not have a specific allocation of SWP water from Valley District but expects to receive the projected volumes of SWP water under most conditions. A description of this supply and its reliability is provided in **Part 1 Chapter 3 and Chapter 5**. This supply is not guaranteed so EVWD maintains 100% reliability from other sources.

EVWD currently supplements its local supply with SWP deliveries from Valley District for use at Plant 134. In the past, SWP has made up a small amount of EVWD's water supply. However, in 2018, a hydroelectric generation facility was installed on the SWP turnout that serves Plant 134. EVWD benefits from the energy generation and has shifted to prioritize the use of SWP water at Plant 134 to realize the energy cost savings.

6.4.2 Groundwater

EVWD produces groundwater from the San Bernardino Basin (SBB), described in detail in **Part 1 Chapter 3**. There are 22 wells within EVWD's water system, of which 15 wells are currently active and 7 are inactive. **Table 6-8** summarizes the actual volume of groundwater pumped from 2016-2020. Per the Western-San Bernardino Judgement, EVWD is not limited in the amount of groundwater they can produce from SBB. Relevant portions of the adjudications and judgments that govern groundwater use are provided in **Part 3 Appendix B**.

In 2018, EVWD and other local agencies voluntarily formed the SBB Groundwater Council to coordinate and implement groundwater management activities in the Bunker Hill Sub-basin (part of SBB) and achieve groundwater sustainability throughout the basin.

Table 6-8. DWR 6-1R Groundwater Volume Produced Last 5 Years (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	San Bernardino Basin (Bunker Hill)	12,792	15,217	14,525	12,940	15,169
-	**TOTAL**	**12,792**	**15,217**	**14,525**	**12,940**	**15,169**

6.4.3 Surface Water

As a shareholder of the North Fork Mutual Water Company (NFMWC), EVWD obtains water from the Santa Ana River. Created in 1885, the NFMWC and Bear Valley Land and Water Company (now Bear Valley Mutual Water Company) reached an agreement regarding water deliveries. Water deliveries vary throughout the year based on that agreement with deliveries in December through May equal to 1/4 flow of Santa Ana River, and in June through November equal to a fixed flowrate of water for the month that varies between 5.1 MGD and 7.7 MGD.

EVWD has current water rights of 5 MGD (5,600 AFY) of Santa Ana River water with the ability to expand to about 6.5 MGD (7,300 AFY) through the conversion of remaining agricultural

properties and water shares of stock. EVWD is currently the majority shareholder in the company and continues to pursue the purchase of additional shares. As agricultural land converts to urban uses, EVWD gains not only the new urban demand but the associated historic water stock shares.

Surface water is treated in conjunction with any SWP water at EVWD's Plant 134. Surface water rights allocated to EVWD but not treated at Plant 134 are used to recharge the SBB. EVWD is also currently evaluating the concept of constructing a second surface water treatment plant on the east side of their service area.

6.4.4 Stormwater

EVWD is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the SBB. These regional projects are discussed in **Part 1 Chapter 3**.

6.4.5 Wastewater and Recycled Water

EVWD provides wastewater collection service to its customers. Wastewater treatment is currently provided by a regional treatment plant, located downstream and outside of EVWD's sphere of influence. A Joint Powers Agreement (JPA) was formed in 1957 between EVWD and the neighboring San Bernardino Municipal Water Department (SBMWD) whereby SBMWD treats all wastewater generated within the EVWD service area.

In 1995, SBMWD began operation of RIX to provide additional treatment of secondary effluent from the existing plants of SBMWD and the City of Colton. The RIX plant is located approximately 6 miles southwesterly and downstream of EVWD's southwesterly boundary.

EVWD is currently constructing a new water recycling facility called the Sterling Natural Resource Center (SNRC). SNRC, which is expected to be completed in 2022, will allow the District to treat wastewater to a point that it can be recharged into the Bunker Hill groundwater basin to supplement the groundwater supply. Initially, the facility will treat up to 8 MGD and will be expandable to treat ultimate buildout of approximately 10 MGD.

EVWD has partnered with Valley District to maximize the regional benefit of the recycled water produced at SNRC to recharge the SBB groundwater. Given the consistent need for groundwater replenishment compared to the potential uses for recycled water, there are currently no plans to use recycled water for any other purposes in the foreseeable future. For the purposes of this plan, projected recycled water supplies were estimated using the per capita wastewater flow projection methodology used in EVWD's 2019 Sewer Master Plan, adjusted to align with the population projection in this UWMP, which are inclusive of long-term growth plus expected near term developments.

It is estimated that approximately 6 MGD of the wastewater collected at the SBMWD treatment plant was generated within EVWD's water service area in 2020. Information about wastewater collected and treated is presented in **Table 6-9.**

Table 6-9. DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
East Valley Water District	Metered	6,815	City of San Bernardino	San Bernardino Water Reclamation Plant	No	No
	TOTAL	**6,815**				

6.4.6 Water Exchanges and Transfers

EVWD does not currently anticipate regular or long-term transfers or exchanges, during the period covered by this Plan. Any transfer or exchanges would be as-needed related to an emergency.

6.4.6.1 Emergency Interties

EVWD has emergency water supply connections to two adjacent water purveyors (SBMWD and the City of Riverside). These interties are intended to be used only as a short-term solution and are not accounted for as additional water supply.

6.4.7 Future Water Projects

EVWD is currently enhancing its ability to utilize its existing water supply sources through several projects that are in various phases of implementation, from planning to preliminary design to construction. Additionally, EVWD is evaluating further projects necessary to meet water demand at build-out conditions. These projects will be implemented as required by development in the service area. Future water projects at various stages of evaluation to maximize existing sources and to meet the demand at build-out include:

- Additional groundwater wells
- New 6 MGD surface water treatment plant in the eastern service area
- Regional conjunctive use projects with Valley District

These projects do not increase water supplies available to EVWD, but rather allow EVWD to increase utilization and optimization of existing supplies and to make deliveries to the different portions of the service area.

Furthermore, as discussed in **Section 6.4.3**, EVWD is actively seeking to purchase additional outstanding shares of the NFMWC.

6.4.8 Summary of Existing and Planned Sources of Water

EVWD's water supply is comprised of local groundwater, local surface water and SWP water. EVWD is also developing a new recycled water supply that will be used to replenish the groundwater basin. These same supplies will be used in the future but may shift toward more surface water if EVWD constructs another surface water treatment plant.

As discussed in **Part 1 Chapter 5**, EVWD is applying a Reliability Factor of 15% to their supply reliability analysis to account for uncertainties in supply and demand projections. The 15% value is recommended in a study by the RAND Corporation that evaluated uncertainty factors in the regional supplies and demands, including population growth, per capita water use, climate change impacts on supplies and demands, SWP project supplies and local surface water supplies. See **Part 1 Chapter 5** for more details on how the Reliability Factor was established.

For the purposes of supply projections in this 2020 IRUWMP, EVWD is using the 15% Reliability Factor to establish a supply target of 15% more than total projected demand. While utilizing as much local surface water and SWP supplies as feasible, EVWD will source all other supplies from the San Bernardino Basin.

As discussed in **Part 1 Chapter 3**, the San Bernardino Basin is a shared resource, and the Western-San Bernardino Judgement does not limit pumping by agencies within the Valley District service area. Each agency can pump as much water as they need and if total pumping by all agencies exceeds the safe yield, Valley District is responsible for replenishing the SBB. As shown in **Part 1 Chapter 5**, the total planned use of San Bernardino Basin groundwater by all agencies in Valley District's service area, including the Reliability Factor, is below the safe yield of the SBB through 2045 so supplemental recharge is not anticipated to be required and is not included in EVWD's supply projection. However, the SBB Groundwater Council, which EVWD is a member of, may elect to recharge the SBB with supplemental water to provide additional supply reliability.

Table 6-10 summarizes the water resources used by EVWD in 2020, and the projected future supplies are summarized in **Table 6-11**.

Table 6-10. DWR 6-8R Actual Water Supplies in 2020 (AF)

		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	San Bernardino Basin (Bunker Hill)	15,169	Drinking Water	
Surface water (not desalinated)	Santa Ana River (part of SBB)	997	Drinking Water	~5,600
Purchased or Imported Water	SWP - Direct Deliveries	2,208	Drinking Water	
	TOTAL	**18,374**		

Table 6-11. DWR 6-9R Projected Water Supplies (AF)

		PROJECTED WATER SUPPLY				
		2025	2030	2035	2040	2045
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	San Bernardino Basin (Bunker Hill)	10,257	10,736	11,205	11,620	12,035
Surface water (not desalinated)	Santa Ana River (part of SBB)	1,700	1,700	1,700	1,700	1,700
Purchased or Imported Water	SWP - Direct Deliveries	2,500	2,500	2,500	2,500	2,500
Recycled Water	San Bernardino Basin - Recycled Water Recharge	8,200	8,490	8,790	9,090	9,390
	TOTAL	**22,657**	**23,426**	**24,195**	**24,910**	**25,625**

Recycled water recharge supplies shown indicate water that will be extracted from SBB and replaced in-kind with recycled water recharge. Surface and imported water supplies indicate planned diversions and deliveries. Supplies from San Bernardino Basin are increased to meet the Total Supply Target with 15% Reliability Factor.

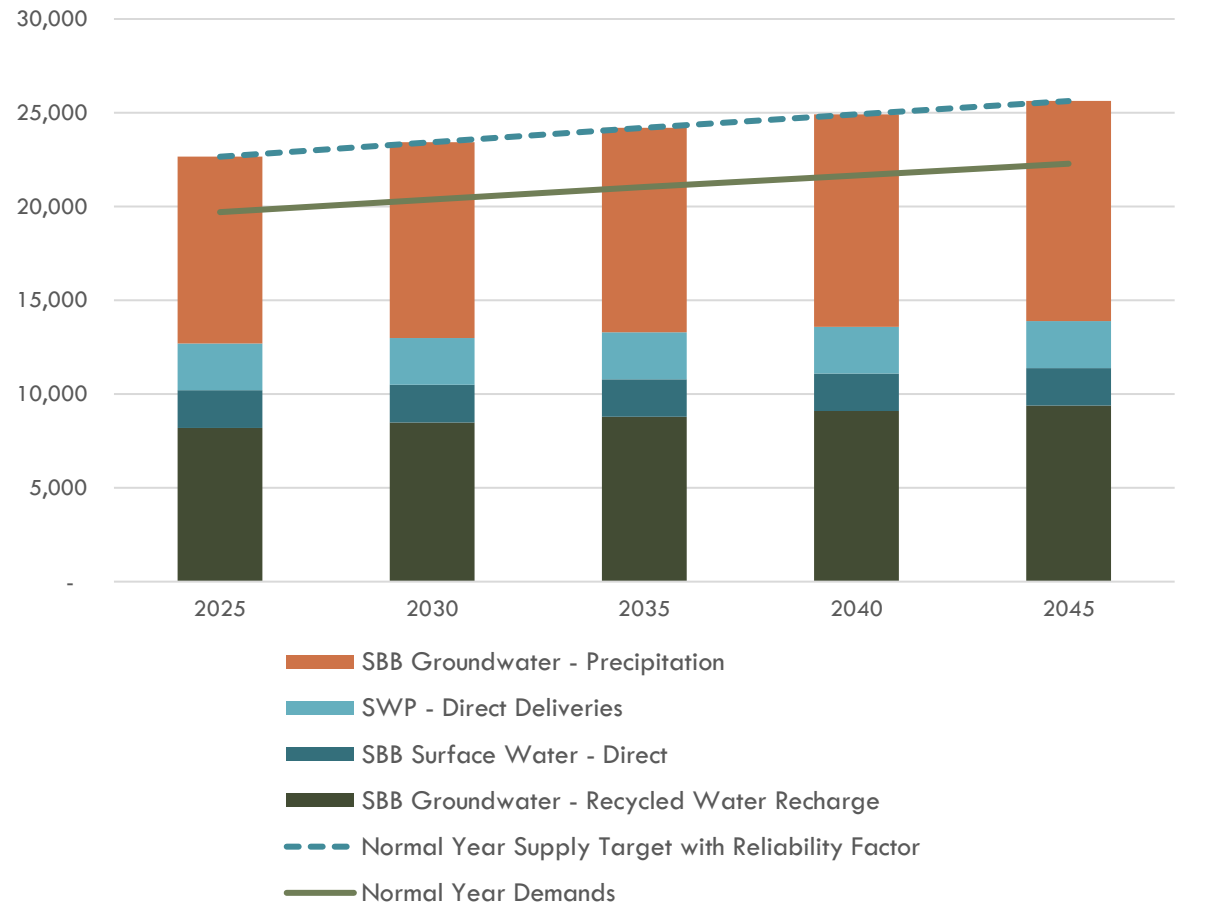


Figure 6-4: EVWD Projected Supply and Demand Comparison (AF)

Table 6-12. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	22,657	23,426	24,195	24,910	25,625
Demand Totals From Table 4-3R	19,702	20,371	21,040	21,661	22,283
DIFFERENCE	**2,955**	**3,056**	**3,156**	**3,249**	**3,342**

6.4.9 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2012 EVWD completed an Energy Optimization Study which identified the 15 largest energy using facilities in the EVWD water system and determined that the total average monthly energy use was 1,373,705 kilowatt-hours (kWh). EVWD also has a 10-year performance contract with Honeywell International Inc. to assess the performance of energy cost reduction measures (ECMs) at EVWD's facilities. It was estimated that EVWD would save 1,055,940 kWh/yr due to these ECMs.

In 2016, EVWD consumed a total of 15,059,699 kWh of energy for water facilities, for an energy intensity of 870 kWh per AF of water delivered.

SNRC under construction

6.5 Water Service Reliability Assessment

This section considers EVWD's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from EVWD's current source of supply through 2045.

6.5.1 Constraints on Water Sources

During times of State-wide drought conditions, the availability of SWP may be reduced. These conditions are normally known in advance, providing EVWD with the opportunity to plan for the reduced supply. During a drought period, it is Valley District's priority to make direct deliveries to the water treatment plants operated by Redlands, WVWD, YVWD, and EVWD. Because EVWD's water treatment plant can use local surface water and imported water, during a single-dry year EVWD may elect to take a small amount of imported water, making more imported water available to other agencies. In this case, EVWD would utilize additional groundwater through groundwater well production from the SBB. In a multiple dry year Valley District expects to fulfill normal direct deliveries to water treatment plants, including EVWD's treatment plant.

Some of EVWD's wells are impacted by nitrate, perchlorate, fluoride, uranium, and/or VOCs. EVWD has suspended operation at Well 12A. EVWD has plans in place that will allow these wells to come back on-line. EVWD continues to monitor for groundwater contamination and the movement of groundwater contaminant plumes. In response to water quality concerns EVWD has altered operations at other wells to compensate for the reduced capacity and the following actions have been put into place to protect EVWD supply:

- A wellhead treatment facility has been implemented to treat VOCs from Well 28A using granulated activated carbon.
- EVWD blends water from Well 39 to address high fluoride levels.
- EVWD continues to monitor for nitrates in Wells 25A and 28A.

These past and ongoing groundwater treatment projects have demonstrated that treatment is an economically viable alternative for handling volatile organic compounds, perchlorate, nitrates, and uranium. To manage the long-term potential for continued groundwater contamination, EVWD has an on-going land acquisition program. EVWD has vacant land available for future facilities. Sites are selected for the development of new wells based on knowledge of the plumes' movement, land availability and engineering feasibility. Based on current conditions water quality is not anticipated to affect EVWD supply reliability. However, water quality issues are constantly evolving. EVWD will take action to protect and treat supplies when needed, but it is recognized that water treatment can have significant costs.

As described in **Part 1 Chapter 3**, the SBB is adjudicated on a safe yield basis. EVWD therefore can develop additional wells and over-extract groundwater under specified conditions contained in the stipulated judgment and participates in the SBB GC to contribute to maintaining basin sustainability. The wells in general have provided a stable source of water supply. Past

records show that EVWD has not removed any well from its supply source during drought conditions, although, some wells had to be lowered to continue extraction of groundwater. In recent droughts, EVWD has maintained full capability to use all wells within its system. As described in **Part 1 Chapter 3**, extensive modeling has been used to examine groundwater recharge, groundwater pumping, basin storage, groundwater flow, and groundwater plume location and plume migration.

6.5.2 Year Type Characterization

In general, groundwater and recycled water are less vulnerable to seasonal and climatic changes than surface water (i.e. local and imported) supplies. The Western-San Bernardino Watermaster, in collaboration with the BTAC, monitors groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in Part 1, Chapter 3.

Per UWMP requirements, EVWD has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

6.5.3 Water Service Reliability

The results of the reliability assessment are summarized in the tables below.

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. Although water use may decrease in the later years of a multiple year drought due to implementation of conservation measures and drought messaging, the assessment is based on a 10% increase throughout the 5-year drought to be conservative.

As described in **Part 1 Chapter 3 and Chapter 5**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. While SWP water and local surface water supplies may be reduced in dry years, EVWD is able to pump additional groundwater from Bunker Hill to meet total demands in dry years and participates in the SBB GC to replenish the basins with imported and local water through regional recharge programs. Since EVWD's total supplies are not reduced in dry years, 2020 is considered the base year for all year types. Based on the analysis, EVWD does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, EVWD participates in several

ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. EVWD also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 6-13**. The percent of average supply increases in drought years because EVWD's groundwater production will increase to meet an assumed increase in demands.

Table 6-13. DWR 7-1R Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 6-12**.

The projected supply and demand during a single dry year are shown in **Table 6-14**. EVWD's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basin EVWD produces water from has storage for use in dry years, so EVWD can produce the volume of water needed to meet 100% of demands in single dry years. EVWD supplies are 100% reliable during single dry years.

Table 6-14. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals	24,923	25,769	26,615	27,401	28,188
Demand Totals	21,672	22,408	23,143	23,827	24,511
DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**

The projected supply and demand during five consecutive dry years are shown in **Table 6-15**. EVWD's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basin EVWD produces water from has storage for use in dry years, so EVWD can produce the volume of water needed to meet 100% of demands in multiple dry years. EVWD's supplies are 100% reliable during multiple dry years.

Table 6-15. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
FIRST	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**
SECOND	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**
THIRD	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**
FOURTH	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**
FIFTH	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**

6.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because EVWD relies on a groundwater basin with significant storage, total available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis. Projected demands and supplies from 2021-2025 are shown in **Table 6-16**.

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. The DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in **Section 6.5** and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for EVWD. EVWD can produce additional groundwater to meet any increases in demand in dry years. As shown in **Part 1 Chapter 5**, the region as a whole has sufficient supplies to meet demands plus the 15% Reliability Factor, even in a 5-year drought. As shown in **Part 1 Chapter 5 Figure 5-1**, the SBB had over 4.8 million acre-feet in storage as of 2020 due to regional efforts to store water in wet years for use during dry years.

Although projections in this Plan show that the regional water supplies are sufficient to meet the demands of EVWD and the Region as a whole, even during a 5-year drought (see **Part 1**

Chapter 5), EVWD remains committed to water conservation and to being a good steward of regional water resources to preserve supplies for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 6-16: Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	20,503
	Total Supplies	23,579
	SURPLUS	**3,076**
2022	Gross Water Use	20,796
	Total Supplies	23,915
	SURPLUS	**3,119**
2023	Gross Water Use	21,088
	Total Supplies	24,251
	SURPLUS	**3,163**
2024	Gross Water Use	21,380
	Total Supplies	24,587
	SURPLUS	**3,207**
2025	Gross Water Use	21,672
	Total Supplies	24,923
	SURPLUS	**3,251**

6.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that EVWD uses to prepare for and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when water supply available is insufficient to meet the normally expected customer water use at a given point in time. A shortage may occur due to a number of reasons, such as water supply quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demands, as occurred in 2014. The WSCP serves as the operating manual that EVWD will use to prevent catastrophic service disruptions through proactive, rather than reactive, mitigation of water shortages. The WSCP provides a process for an annual water supply and demand assessment and structured steps designed to respond to actual conditions. The level of detailed planning and preparation provide accountability and predictability and will help EVWD maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. EVWD's WSCP is attached as **Part 4 Appendix F-9**.

6.8 Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that EVWD has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. EVWD's current per-capita consumption is less than its 2020 compliance target. EVWD expects to continue to implement conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

6.8.1 Existing Demand Management Measures

Consistent with the requirements of the California Water Code, this section describes the required demand measurement measures (DMM) that have been implemented in the past five years and will continue to be implemented into the future. Through the implementation of its active water conservation programs, EVWD has met its Confirmed Water use Target for 2020. To maintain efficient water use, EVWD intends to continue its current demand management measures for the foreseeable future to consider future water use requirements that may be implemented.

6.8.1.1 Water Waste Prevention Ordinances

As detailed in Section 15 of Ordinance 401 EVWD restricts water waste through its Water Conservation Ordinance. Section 15 of Ordinance 401, adopted on May 12, 2021, prohibits excessive irrigation runoff from a meter service area, irrigation after measurable rainfall, hosing of hard surfaces, and using potable water to irrigate turf and high water use plant materials in medians and bordering parkways during times of threatened supply conditions and water emergency supply conditions (Ordinance 401 is included in **Part 4 Appendix F-9**).

6.8.1.2 Metering

All of EVWD's customer connections are metered. EVWD has a meter maintenance and replacement plan and recently completed implementation of AMI technology for all meters, which enables two-way communication between EVWD's customer billing system and the customer meters for over 20,000 connections. This allows for near real-time notifications of potential inefficient water use concerns. With the detailed usage data available in an AMI system, customer service representatives have immediate access to consumers' consumption information. EVWD customers also have access to a customer portal where they can view their own water use information in near real-time.

6.8.1.3 Conservation Pricing

Conservation pricing is designed to discourage wasteful water habits and encourage conservation. EVWD charges its Residential customers using a budget-based structure which

consists of three separate pricing tiers for potable water. The first tier is a customized estimate of indoor water use for each household based on average household sizes identified by the 2010 U.S. Census. The second tier is an estimate of efficient outdoor irrigation. Tiers one and two are considered in-budget water use and tier three represents inefficient water usage. EVWD allows for specific variances which may require higher allocations of water for circumstances such as medical need, in-home childcare, and livestock.

EVWD charges its Commercial customers differently in that their water budget is based on the customer's historic use for the same billing periods of the prior two years. EVWD calculates an average year demand for a billing period based on the same billing period of the past two years. Commercial customers' water budget may be adjusted by EVWD. Usage in excess of the water budget is billed at inefficient use Tier 3 pricing.

Landscaping measurements were developed using lidar technology personalized for each parcel. Given that the District is located in the foothills of the San Bernardino Mountains, EVWD ensured accuracy of irrigated slopes. Additionally, irrigation accounts are not allocated water use within Tier 1.

Metering with commodity rates, in particular budget-based rates, is an effective conservation measure that directly associates cost with the amount of water used.

6.8.1.4 Public Education and Outreach

EVWD consistently works to educate the public and increase awareness of the District's projects and programs in the local and regional community. Effective communication is provided through a number of methods including: bill inserts; informative flyers; direct mail pieces; newspaper advertisements; bus shelter advertisements; news releases; social media outreach; and website content. District staff participate in career day and school events, offer tours of District facilities and support community events with information booths. Yard signs, fact sheets, rebate programs, monthly conservation tips, vehicle magnets, banners, educational workshops, and regular staff communication are also part of the District's comprehensive outreach program.

EVWD continues to prioritize community education over strict enforcement. Through the development of positive relationships with community-based organizations and residents alike, the District can serve as a trusted resource in wet and dry years. Outreach efforts are used to establish a connection with customers, increase District visibility, promote a transparent operation, and foster an environment of enhanced public service. EVWD also provides school visits and presentations when requested by the school.

6.8.1.5 Programs to Assess and Manage Distribution System Real Losses

EVWD has an active water loss control program and is in the process of conducting a water audit for FY2020-2021. EVWD uses Cityworks work order program to track leaks, flushing, and other non-revenue water sources. Through Cityworks and staying proactive in reviewing water mains throughout the service area, EVWD identifies problem areas in the distribution system

that need to be repaired or upgraded. EVWD uses preventative maintenance to ensure safe delivery of water to all of its customers.

6.8.1.6 Water Conservation Program Coordination and Staffing Support

EVWD has a full-time conservation coordinator, conservation/public affairs manager, and a member of the executive team, in addition to shared time for outreach staff, and empowers all District staff to take an active role in the drought response. The program's budget is funded through budget-based rates. During times of drought where additional resources are needed to minimize inefficient water use, all District staff are actively engaged in notifying customers of observed violations of the Conservation Ordinance. Though not required in wet years, the District has historically utilized part-time personnel to address the increased enforcement requirements during times of drought.

6.8.1.7 Other Demand Management Measures

To encourage the efficient use of water in the residential sector, EVWD currently offers rebates as shown in **Table 6-17**.

Table 6-17. Residential Rebate Program Summary

TITLE	DESCRIPTION
High-Efficiency Washing Machine	Up to $150, for the purchase of a clothes washer with a water factor of 5 or less and is recognized as an EnergyStar appliance.
High-Efficiency Showerhead	Up to $30, per showerhead that uses 2 gallons or less per minute and is recognized by the WaterSense program.
High-Efficiency Toilets	Up to $100, per toilet installed that uses 1.28 gallons or less per flush and is recognized by the WaterSense program.
Direct Installation Program-Weather Based Irrigation Controllers	Weather based irrigation controllers (WBIC) use the weather to set your irrigation schedule instead of a traditional sprinkler controller. To help customers be water efficient outdoors, the District will replace your old irrigation controller with a new WBIC through a new direct installation program at no cost to the customer.
Weather-Based Irrigation Controller	Up to $150, per weather-based irrigation controller installed that automatically adjust irrigation schedules for sprinkler systems in response to changing weather or environmental conditions
High-Efficiency Sprinkler Nozzles	Up to $4, per High-Efficiency Sprinkler nozzle installed that uses less water per minute than conventional nozzles.
Water Efficient Landscaping	Up to $200, for water efficient landscaping that uses native plants, efficient irrigation systems and other landscaping elements that thrive using less water than traditional grass lawns.

EVWD currently offers multiple residential rebate programs to help customers achieve water use efficiency. For more information about this DMM, visit: **https://www.eastvalley.org/275/Rebate**.

6.9 Adoption, Submittal and Implementation

This section describes EVWD's process for adopting, submitting, and implementing the 2020 IRUWMP and EVWD's WSCP.

6.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to EVWD's public hearing. The recipients are identified in Part 1 Chapter 1 and include all cities and counties within EVWD's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

EVWD provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4 Appendix F-2**.

6.9.2 Public Hearing and Adoption

EVWD held a public hearing on June 23, 2021, to hear public comment and consider adopting this 2020 IRUWMP and EVWD's WSCP.

As part of the public hearing, the EVWD provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed EVWD the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

EVWD's adoption resolution for the 2020 IRUWMP and EVWD's WSCP is included in **Part 4 Appendix F-3**.

6.9.3 Plan Submittal

EVWD will submit the 2020 IRUWMP and EVWD's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

6.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, EVWD will make the plan available for public review during normal business hours by placing a copy of the 2020 IRUWMP and EVWD's WSCP at the front desk of the District's office, and by posting the plans on the District's website for public viewing.

6.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or EVWD's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.