2020

PART 2: LOCAL AGENCY UWMPs

UPPER SANTA ANA RIVER WATERSHED

INTEGRATED REGIONAL URBAN WATER MANAGEMENT PLAN

CITY OF SAN BERNARDINO

2020 IRUWMP

Part 2 Chapter 8

SBMWD 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

WSC

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8

RETAIL URBAN WATER MANAGEMENT PLAN

SBMWD

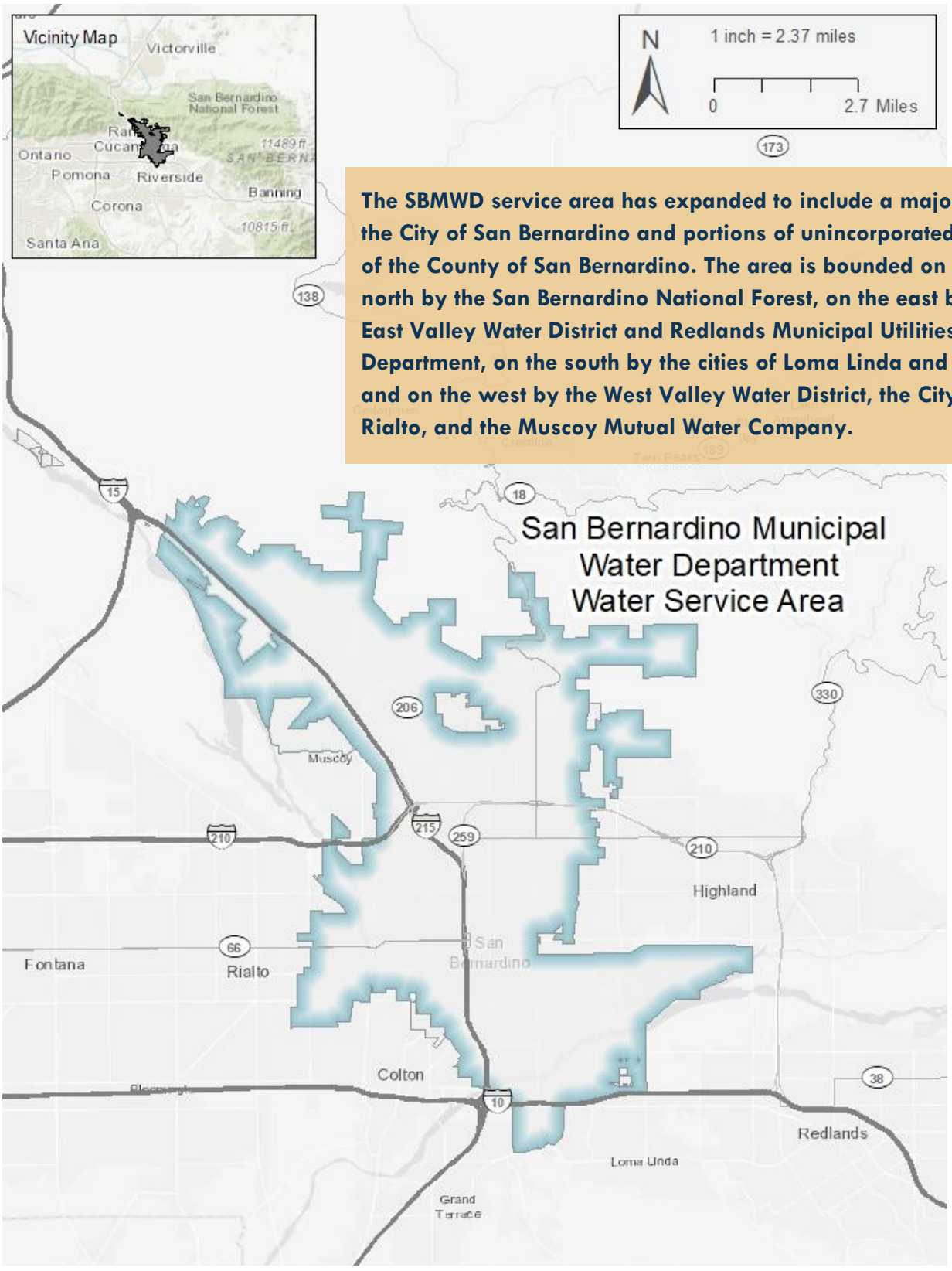
This chapter describes information specific to the San Bernardino Municipal Water Department (SBMWD), its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided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

SBMWD was created as a municipal utility by Article 9 of the City of San Bernardino Charter, as adopted on January 6, 1905. SBMWD is governed by a Board of Water Commissioners appointed by the Mayor and subject to confirmation by the City Council. The first Board of Water Commissioners was appointed May 1905. The initial water distribution system, valued at $160,000 in 1905, covered just one square mile and served a population of only 6,000 people.

SBMWD's service area is shown in **Figure 8-1**.

IN THIS SECTION

- System Description
- Water Use
- SBX7-7 Compliance
- Water Supply
- Water Service Reliability
- Drought Risk Assessment
- Water Shortage Contingency Plan Summary
- Demand Management Measures
- Adoption, Submittal, and Implementation



The SBMWD service area has expanded to include a majority of the City of San Bernardino and portions of unincorporated areas of the County of San Bernardino. The area is bounded on the north by the San Bernardino National Forest, on the east by the East Valley Water District and Redlands Municipal Utilities Department, on the south by the cities of Loma Linda and Colton, and on the west by the West Valley Water District, the City of Rialto, and the Muscoy Mutual Water Company.

Figure 8-1: SBMWD Water Service Area Map

8.1 Service Area

Elevations of the valley floor range from approximately 1,000 feet above sea level at the southern boundary, to an elevation in excess of 2,100 feet above sea level at its northern-most boundary.

SBMWD is a retail public water supplier that meets the definition of an urban water supplier with over 45,400 municipal water service connections in 2020. The regional climate, which includes SBMWD's service area, is described in **Part 1 Chapter 2** of the 2020 IRUWMP.

8.1.1 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 2000, 2010 and 2020.

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 8-1**.

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 8-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**210,830**	**217,221**	**223,806**	**230,591**	**236,206**	**241,958**

8.1.2 Land Use

Per the 2017 City of San Bernardino General Plan Land Use Element, 39% of the City of San Bernardino is residential, 10% is commercial, 14% is industrial, 10% is flood control, 9% is public facilities, 14% is road right of way, and 4% is public parks, open space, and recreation facilities.

8.2 Water Use

This section describes the current and projected water uses within SBMWD's service area. SBMWD serves potable water for domestic use and uses raw water for irrigation at the San Bernardino Water Reclamation Plant. This section addresses potable water demand and provides for the reporting of raw water demand delivered for urban use for the year 2020. Future recycled water use is discussed in **Section 8.4.5.**

8.2.1 Water Use by Sector

SBMWD categorizes its retail water customers into six categories for the purposes of billing: Residential – Single Family, Residential – Multi-Family, Commercial/Institutional + Government, Industrial, Landscape Irrigation, and Fire Service. SBMWD also intermittently delivers wholesale water to the City of Rialto, West Valley Water District, and Riverside Highland Water Company via the Encanto Booster Station. The number of active connections in each category from 2016 to 2020 are shown in **Table 8-2**.

Table 8-2: SBMWD 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential – Single Family	35,680	35,738	36,970	35,797	35,952
Residential – Multi-Family	2,889	2,898	2,985	2,893	2,917
Commercial/Institutional + Municipal	3,147	3,173	3,282	3,118	3,174
Industrial	-	-	-	-	-
Landscape Irrigation	1,124	1,133	1,205	1,173	1,188
Fire Service	1,875	1,940	2,095	2,099	2,172

Other Agencies	10	10	15	10	10
TOTAL	**44,725**	**44,892**	**46,552**	**45,090**	**45,413**

8.2.1.1 Past Water Use

SBMWD's actual water use by customer class from 2016-2020 is shown in **Table 8-3**. SBMWD's water consumption by customer class in the last five years is shown in **Figure 8-2**.

Approximately 51% of SBMWD's total deliveries were to single Residential – Single Family connections, followed by 17% to Commercial/Institutional + Municipal connections, 17% to Landscape Irrigation connections, 16% to Residential – Multi-Family connections, and the remainder to fire services.

Table 8-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential – Single Family	15,905	16,764	17,199	15,995	18,159
Residential – Multi-Family	5,388	5,392	5,502	5,322	5,661
Commercial/Institutional + Municipal	6,296	6,532	6,492	5,823	6,142
Landscape Irrigation	5,042	5,612	5,891	5,325	5,962
Fire Service	24	24	25	28	27
Other Agencies	1	3	88	2	2
Water Losses	3,648	4,388	3,570	3,474	4,155
Raw Water[1]	973	617	130	1,871	2,075
TOTAL	**37,276**	**39,331**	**38,897**	**37,840**	**42,182**

[1]Dewatering wells used for irrigation and operations at the San Bernardino Water Reclamation Plant.

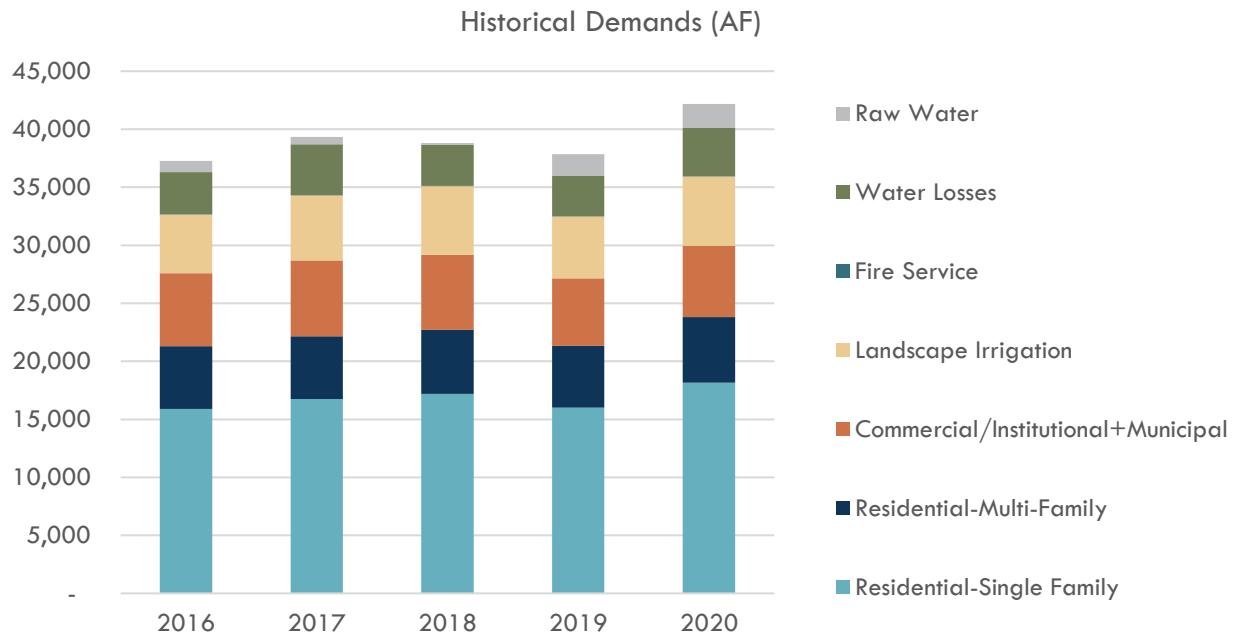


Figure 8-2: SBMWD 2016-2020 Water Consumption by Customer Class (AF)

8.2.1.2 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.
- Water used for flushing and fire hydrant operations
- Unauthorized uses or theft of water
- Customer Meter Inaccuracies - Customer meters can under-represent actual consumption in the water system.

SBMWD monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix H-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 8-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020.

SBMWD will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 8-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS*
1	2016	3,492
1	2017	4,056
1	2018	3,821
1	2019	3,507
1	2020	4,155 (Estimated)

In the past 5 years, SBMWD's water loss has ranged from 9% - 13% of water sales. For the purposes of future water use projections, water loss is assumed to be 11% of projected water sales.

SBMWD is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. Programs to manage water loss are described in 8.8.1.5. These programs will increase the efficiency of the water distribution system by decreasing future water losses; however, water losses cannot be prevented entirely.

Water mains are replaced to minimize water losses in the Distribution System

8.2.2 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.

> The resulting projection was compared to the City's knowledge of growth patterns within the service area and determined to be a reasonable projection of expected growth.

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. Non-potable water demands at the San Bernardino Water Reclamation Plant were assumed to be equal to average consumption from 2016-2020, however, beginning in 2022 those non-potable demands will be met by recycled water (see **Section 8.4.5**) rather than raw water produced from the dewatering wells at the Water Reclamation Plant. Projected future demands by customer class as well as estimated losses are presented in **Table 8-5**, **Table 8-6**, and **Figure 8-3**.

Table 8-5: DWR 4-2R Projected Demands for Water (AF)

	PROJECTED WATER USE				
CUSTOMER CLASS	2025	2030	2035	2040	2045
Residential-Single Family	18,710	19,260	19,811	20,253	20,695
Residential-Multi-Family	5,832	6,004	6,175	6,313	6,451
Commercial/Institutional + Municipal	6,328	6,514	6,701	6,850	7,000
Landscape Irrigation	6,143	6,323	6,504	6,649	6,795
Fire Service	28	28	29	30	30
Water Losses	4,074	4,194	4,314	4,411	4,507
Raw Water[1]	-	-	-	-	-
TOTAL:	**41,115**	**42,325**	**43,534**	**44,506**	**45,478**

[1]Beginning in 2022, non-potable demands at the San Bernardino Water Reclamation Plant will be met by direct recycled water use rather than the existing dewatering wells. The dewatering wells will remain in standby mode in case needed for dewatering purposes in the high groundwater zone.

Table 8-6: 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	42,218	41,115	42,325	43,534	44,506	45,478
Recycled Water Demand* From Table 6-4R	-	1,133	1,133	1,133	1,133	1,133
TOTAL WATER USE:	**42,218**	**42,248**	**43,458**	**44,667**	**45,639**	**46,661**

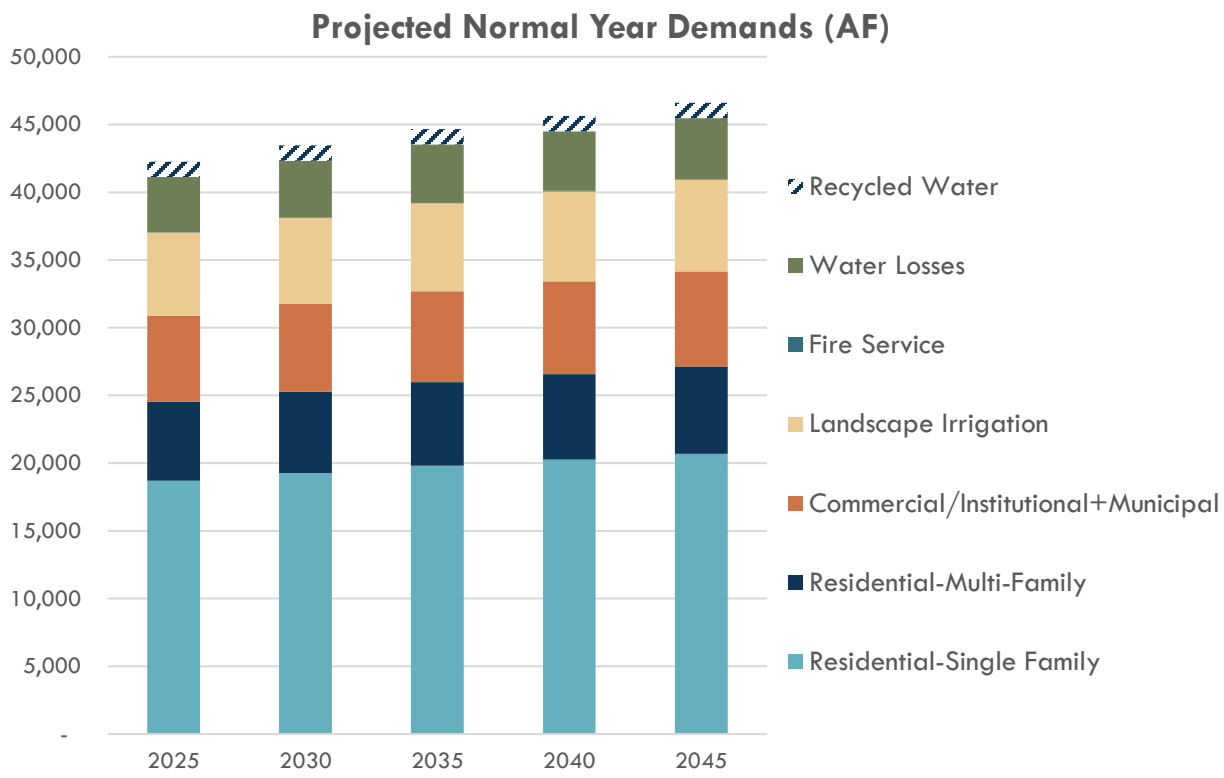


Figure 8-3: SBMWD Projected Future Water Consumption by Customer Class (AF)

8.2.2.1 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 SBMWD or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. SBMWD may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, SBMWD 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 SBMWD's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, SBMWD will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. SBMWD 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.

8.2.3 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. The SBMWD contains two jurisdictions, the City of San Bernardino and unincorporated County of San Bernardino.

Based on the City of San Bernardino's 2013-2011 Housing Element, 50 percent of households are lower-income, which is defined as an income of less than 80% of the City-wide average median income. In the absence of more detailed information, this percentage was applied across the SBMWD service area. These demands have been included in the projections presented in **Table 8-5**.

8.2.4 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.

8.3 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 the City 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 SBMWD's calculations are included in **Part 4 Appendix H-7**.

8.3.1 Baseline and Target

SBMWD'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 H-7**. SBMWD's calculated water use target for 2020 is 203 GPCD.

8.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, SBMWD has met its Confirmed Water use Target for 2020 of 203 GPCD, as shown in **Table 8-7**. To maintain this level of water use, SBMWD intends to continue its current level of outreach and programs for the foreseeable future.

Table 8-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
203	179	Yes

8.4 Water Supply

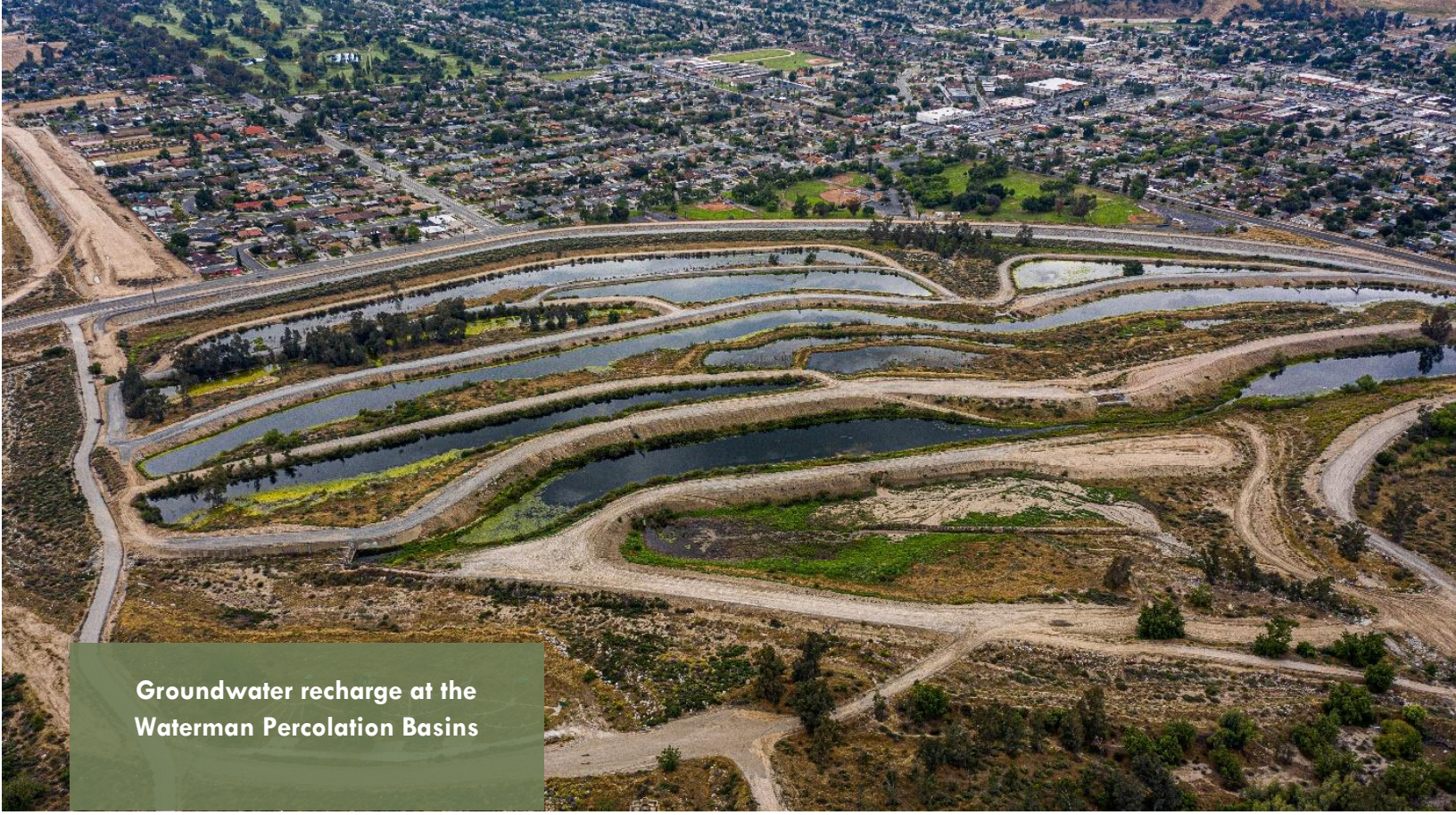
SBMWD's water supply is comprised entirely of groundwater from the Bunker Hill Basin (part of the San Bernardino Basin Area). More information about groundwater basins is included in **Part 1 Chapter 3** of the 2020 IRUWMP.

8.4.1 Purchased or Imported Water

SBMWD does not currently purchase imported SWP water or other supplies for direct use. SBMWD participates in the San Bernardino Basin (SBB) Groundwater Council, which utilizes imported water to recharge the basin.

8.4.2 Groundwater

Groundwater currently supplies the 100% of SBMWD's total supply, and SBMWD will continue to rely on groundwater as its preferred source of supply. SBMWD's production from the Bunker Hill Subbasin (part of SBB) for the past five years is shown in Table 8-8. SBMWD participates in several ongoing water conservation measures and contributes to regional recharge projects through the SBB Groundwater Council to optimize and enhance the use and reliability of local groundwater water resources. Relevant portions of the adjudications and judgments that govern groundwater use are provided in Part 3, Appendix B. Additional discussion of basin rights and management for each basin is included in Part 1, Chapter 3 of the 2020 IRUWMP.



Groundwater recharge at the Waterman Percolation Basins

Table 8-8. DWR 6-1R Groundwater Volume Pumped (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Bunker Hill (part of SBB)	37,276	39,331	38,897	37,840	42,182
	TOTAL	**37,276**	**39,331**	**38,897**	**37,840**	**42,182**

8.4.3 Surface Water

SBMWD currently does not plan to utilize any surface water as a direct source of drinking water.

8.4.4 Stormwater

SBMWD 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**.

8.4.5 Wastewater and Recycled Water

SBMWD operates the sewer collection system within their service area. Collected wastewater from SBMWD, as well as from the County of San Bernardino, City of Loma Linda, and EVWD is treated at the San Bernardino Water Reclamation Plant to a secondary treatment level.

Following treatment at the San Bernardino Water Reclamation Plant, effluent is conveyed to the Rapid Infiltration and Extraction (RIX) facility in the City of Colton for tertiary treatment. This

facility is jointly owned by SBMWD and the City of Colton and is operated under contract solely by the SBMWD. At the RIX facility, tertiary treatment to Title 22 standards consists of a native soil filtration process followed by ultraviolet (UV) disinfection prior to discharge to the Santa Ana River.

Table 8-9 and **Table 8-10** show existing wastewater collection and treatment at the San Bernardino Water Reclamation Plant.

It is estimated that approximately 61% or 12.86 million gallons per day (MGD) of the wastewater collected at the San Bernardino Water Reclamation Plant was generated within SBMWD's water service area in 2020.

8.4.5.1 Potential, Current, and Projected Recycled Water Uses

SBMWD currently does not use recycled water to offset potable demand. SBMWD is planning a recycled water project called the Tertiary Treatment System project, which be a Title-22 compliant tertiary treatment system that will supply recycled water for groundwater recharge in the SBB as well for direct use at the Water Reclamation Plant. Additionally, recycled water is utilized by the region for meeting habitat needs in the Santa Ana River (see **Part 1, Chapter 3.4**).

Table 8-9. 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
City of San Bernardino	Metered	14,415	City of San Bernardino	City of San Bernardino Water Reclamation Plant (WRP)	Yes	No
	TOTAL:	**14,415**				

Table 8-10. DWR 6-3R Wastewater Treatment and Discharge within Service Area in 2020 (AF)

-							2020 VOLUMES				
WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	WASTEWATER DISCHARGE ID NUMBER	METHOD OF DISPOSAL	PLANT TREATS WASTEWATER GENERATED OUTSIDE THE SERVICE AREA	TREATMENT LEVEL	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
San Bernardino Water Reclamation Plant	Rapid Infiltration/Extraction (RIX) Plant	Flow to RIX		Other	Yes	Secondary, Disinfected - 23	23,763	23,763			
						TOTAL:	**23,763**	**23,763**	**-**	**-**	**-**

8.4.6 Water Exchanges and Transfers

SBMWD has water exchange and transfer agreements with several of the surrounding agencies on an as-needed basis. Exchanges occur when SBMWD pumps water for another agency and in turn receives water from that agency at a future time and at a specified ratio to account for pumping and delivery costs. Exchanges in the past have occurred during periods of lowered groundwater levels, loss of water by other agencies due to groundwater contamination, and to facilitate increased pumping in SBMWD's artesian pressure zone to lower groundwater levels that had infiltrated underground utilities. Exchanges are on an as-needed basis and only occur when adequate supplies are available within SBMWD's service area. Therefore, exchanges are not taken into consideration when examining future water supplies

8.4.7 Future Water Projects

As discussed previously, SBMWD is planning a recycled water supply project that will be used to recharge the Bunker Hill Basin and meet non-potable demands at the Water Reclamation Plant.

8.4.8 Summary of Existing and Planned Sources of Water

SBMWD's water supply is comprised entirely of local groundwater. The volume of water utilized pumped in 2020 is summarized in **Table 8-11** and projected supply is summarized in **Table 8-12**.

East Branch of the California Aqueduct & Devil Canyon Power Plant

Table 8-11. 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)	Bunker Hill (part of SBB)	40,107	Drinking Water	
Groundwater (not desalinated)	Bunker Hill (part of SBB)	2,075	Other Non-Potable Water	
-	**TOTAL:**	**42,182**		**-**

Table 8-12. 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)	Bunker Hill (part of SBB)	42,980	44,371	43,521	42,396	43,514
Recycled Water	Bunker Hill - Recycled Water Recharge	4,472	4,472	6,714	8,956	8,956
Recycled Water	Recycled Water - Direct	1,133	1,133	1,133	1,133	1,133
-	**TOTAL:**	**48,585**	**49,976**	**51,368**	**52,485**	**53,603**

Recycled water recharge supplies shown indicate water that will be extracted from SBB and replaced in-kind with recycled water recharge. Groundwater supplies from SBB are increased to meet the Total Supply Target with 15% Reliability Factor.

Table 8-13. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

-	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	48,585	49,976	51,368	52,485	53,603
Demand Totals From Table 4-3R	42,248	43,458	44,667	45,639	46,661
DIFFERENCE:	**6,337**	**6,519**	**6,700**	**6,846**	**6,992**

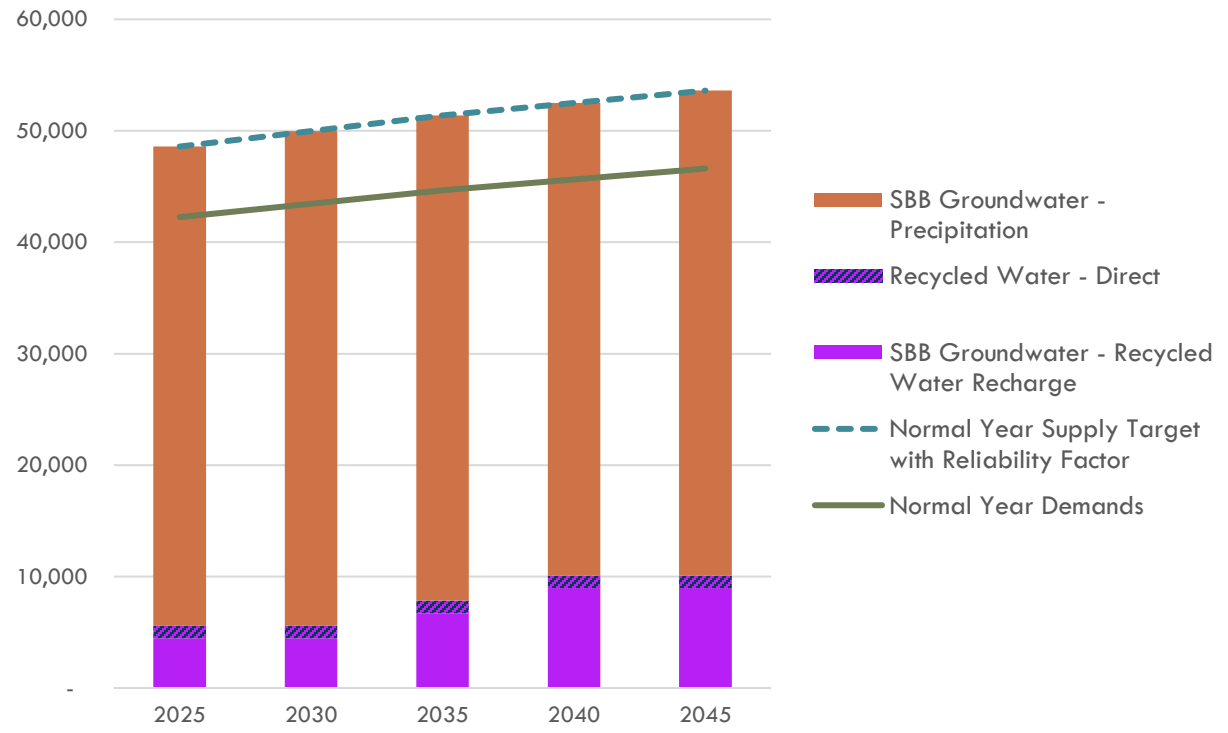


Figure 8-4: SBMWD Projected Supply and Demand Comparison (AF)

8.4.9 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 2020, SBMWD consumed 790.6 kWh of energy on water facilities per AF of water delivered.

8.5 Water Service Reliability Assessment

This section considers SBMWD'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 SBMWD's current source of supply through 2045.

8.5.1 Constraints on Water Sources

Based on current conditions, water quality is not expected to affect SBMWD's supply reliability. However, water quality issues are constantly evolving. SBMWD will take action to protect and treat supplies when needed, though water quality treatment is known to have significant costs. These water quality issues are further discussed at a regional level in **Part 1 Chapter 3**.

8.5.2 Year Type Characterization

In general, groundwater is 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, monitor 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, SBMWD 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.

8.5.3 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**, 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. SBMWD is able to pump additional groundwater from Bunker Hill Basin to meet total demands in dry years and participates in efforts to replenish the basins with imported and local water through regional recharge programs. As a result, SBMWD's total groundwater supplies are not reduced in dry years so 2020 is considered the base year for all year types. Based on the analysis, SBMWD does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, SBMWD participates in several ongoing water conservation measures and regional recharge projects to optimize and

enhance the use and reliability of regional water resources. SBMWD 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 8-14**. The percent of average supply increases in drought years because SBMWD's groundwater production will increase to meet an assumed 10% increase in demands.

Table 8-14. 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 8-13**.

The projected supply and demand during a single dry year are shown in **Table 8-15**. SBMWD's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins SBMWD produces water from have storage for use in dry years so SBMWD can produce the volume of water needed to meet 100% of demands in single dry years. SBMWD's supplies are 100% reliable during single dry years.

Table 8-15. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

-	2025	2030	2035	2040	2045
Supply Totals	53,444	54,974	56,504	57,734	58,963
Demand Totals	46,473	47,803	49,134	50,203	51,272
DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**

The projected supply and demand during five consecutive dry years are shown in Table 8-16. SBMWD's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins SBMWD produces water from have storage for use in dry years so SBMWD can produce the volume of water needed to meet 100% of demands in multiple dry years. SBMWD's supplies are 100% reliable during multiple dry years.

Table 8-16. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
FIRST YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**
SECOND YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**
THIRD YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**
FOURTH YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**
FIFTH YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**

8.6 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 SBMWD relies on groundwater basins with significant storage, 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 8-17**.

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. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in Section 8.5 and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for SBMWD. SBMWD 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 SBMWD and the Region as a whole, even during a 5-year drought (see **Part 1 Chapter 5**), SBMWD 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 8-17: Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	47,807
	Total Supplies	54,978
	SURPLUS	**7,171**
2022	Gross Water Use	49,216
	Total Supplies	56,599
	SURPLUS	**7,382**
2023	Gross Water Use	50,625
	Total Supplies	58,219
	SURPLUS	**7,594**
2024	Gross Water Use	52,035
	Total Supplies	59,840
	SURPLUS	**7,805**
2025	Gross Water Use	53,444
	Total Supplies	61,460
	SURPLUS	**8,017**

8.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that SBMWD 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 SBMWD 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 SBMWD 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. SBMWD's WSCP is attached as Part 4, Appendix H-9.

8.8 Demand Management Measures

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

8.8.1 Existing Demand Management Measures

8.8.1.1 Water Waste Prevention Ordinances

SBMWD adopted Rule and Regulation Number 21 (Attachment 1 to Part 4, Appendix H-9), which prohibits the waste of water and adopts water shortage conditions in the form of three stages. There are no available estimates on the conservation savings resulting from this DMM or the effects it may have on SBMWD's ability to further reduce demand.

8.8.1.2 Metering

One hundred percent of SBMWD's retail customers are metered and billed with commodity rates. SBMWD has a meter maintenance and replacement plan. SBMWD encourages the use of dedicated landscape meters during development review and through water rates.

8.8.1.3 Conservation Pricing

One hundred percent of SBMWD's retail customers are metered and billed with commodity rates with conservation tiers established per SBMWD Rule and Regulation 21 (provided as Attachment 1 to Part 4, Appendix H-9).

8.8.1.4 Public Education and Outreach

SBMWD is in compliance with this DMM. The programs are implemented by SBMWD's Water Conservation/Public Affairs Coordinator.

8.8.1.4.1 Public Education Programs

SBMWD holds bi-annual water conservation landscape workshops and conservation presentations to neighborhood associations and community groups upon request. SBMWD also coordinates inspections and notifies customers in an attempt to identify sources of high-consumption, water waste issues, potential leaks, and inefficient irrigation and water use practices.

SBMWD's website includes a webpage dedicated to water conservation (https://www.sbmwd.org/205/Conservation) to promote and educate water use efficiency by offering programs and resources including:

- Multiple ways to report water waste
- Lists of indoor/outdoor conservation tips
- Lists of all conservation rebate programs
- Information regarding end user water use efficiency standards, drought and emergency supply conditions, and updates on state mandated regulations
- Calendar of water saving tips and resources including conservation related community events hosted or sponsored by SBMWD
- Home water audit checklist and walk through instructions
- Information about local water sources, "Where Your Water Comes from"
- Posting of the annual Consumer Confidence Reports
- Contact information of Conservation Coordinator
- Virtual water education video lessons with follow-along activity sheets in English and Spanish.
- School classroom presentations and for grades K-12
- Annual Water Conservation Awareness Poster Contest for students grades K-12

Notifications of local conservation related topics and SBMWD sponsored events are posted on the SBMWD public facing website and social media including Nextdoor, Facebook, Instagram, Twitter, and YouTube. Social media is also used to post information on changes in customer services, service alerts, and promotions for conservation programs and incentives.

8.8.1.4.2 School Education Programs

SBMWD provides elementary and middle school conservation presentations with certified educators for schools within the SBMWD service area. SBMWD partners with the Inland Empire Resource Conservation District to provide conservation and water career presentations to local schools including elementary schools, middle schools, high schools and colleges.

SBMWD sponsors and participates on the Inland Solar Challenge committee. SBMWD hosts an annual water awareness poster contest for local students grades k-12. Instructional resources including videos and presentations are also offered to schools participating in the poster contest.

SBMWD distributes an annual calendar which features the winners of the Water Conservation Awareness Poster Contest and also includes the following resources:

- Conservation incentive information
- Conservation staff contact information
- Tips for efficient indoor/outdoor water use

8.8.1.5 Programs to Assess and Manage Distribution System Real

SBMWD operates a meter replacement program which includes replacing meters on a 19-year rotation. Source meters are tested annually. About half of the system has older water mains which the City is aggressively replacing. Additionally, SBMWD operates a leak detection program. To achieve full compliance with the DMM, SBMWD will perform a water loss audit using the AWWA Manual 36. SBMWD will determine the economic value of recovering the water loss, based on the avoided cost of water. SBMWD will perform an analysis of components of apparent and real losses identified per AWWA Manual 36 model, and will determine actions to reduce loss where cost-effective. A comparison of the year-to-year trend of nonrevenue water will be used to evaluate the effectiveness of this DMM. If SBMWD were to reduce nonrevenue water by even one percent this would result in a water savings of 500 AF or more each year. Continued implementation of water loss control practices and procedures is not anticipated to have an effect on SBMWD's ability to further reduce demand.

8.8.1.6 Water Conservation Program Coordination and Staffing Support

To be in compliance with this DMM, SBMWD designated a full time water conservation coordinator in 2015. There are no available estimates on the conservation savings resulting from the DMM or the effects of this DMM on SBMWD's ability to further reduce demand.

8.8.1.7 Other Demand Management Measures

SBMWD offers several indoor and outdoor water conservation rebate programs to promote water use efficiency. Each SBMWD residential account holder is eligible for up to $2,000 in water conservation rebates. CII and Multi-family properties are also eligible for rebates on a project by project basis. SBMWD annually budgets approximately $100,000 for both residential and CII rebate programs. Conservation programs and incentives can be found on the Department's website at **https://www.sbmwd.org/205/Conservation** and **https://www.sbmwd.org/249/Rebate-Information**.

8.8.1.7.1 Irrigation Controller Rebate

Customers can get up to a $250 rebate for installing a weather-based controller or $100 for a standard controller.

8.8.1.7.2 High-Efficiency Sprinkler Nozzle Rebate

Customers can qualify for a 50-percent rebate, up to $200, for installing High-Efficiency sprinkler heads.

8.8.1.7.3 Garden Hose Shut-Off Nozzle Rebate

Customers who purchase up to 2 automatic shut-off nozzles for their garden hoses can receive a rebate of up to $10.

8.8.1.7.4 Drip Irrigation System Rebate

Customers purchasing and installing a drip system in their landscaping or garden may qualify for a 50% rebate, up to $150.

8.8.1.7.5 Drought Tolerant Plant Rebate

Customers who incorporate drought tolerant trees, plants, and shrubs into their landscaping can receive a 50% rebate, up to $300.

8.8.1.7.6 Turf Replacement / Removal Rebates

Customers who replace grass turf with mulch or gravel can receive up to a 50% rebate, up to $300. Customers who replace grass turf with artificial turf can receive up to $2 per square foot, up to $400. Customers who replace grass turf with other approved materials can receive a rebate of $2 per square foot, up to $2,000.

8.8.1.7.7 High-Efficiency Toilet Rebate

Customers can get a rebate of up to $100 when they purchase and install high-efficiency toilets that use 1.28 gallons per flush or less (dual flush toilets that use more than this for any flush, do not qualify). These high-efficiency water-saving toilets can be purchased at nearly any hardware or home improvement store. SBMWD is offering up to four toilet rebates per residence.

8.8.1.7.8 High-Efficiency Showerhead Rebate

Customers are eligible for a $20 rebate for the purchase and installation of a low flow shower head. These shower heads use 1.6 gallons per minute or less. Maximum of four per residence.

8.8.1.7.9 High-Efficiency Washing Machine Rebate

SBMWD offers customers a $100 rebate for the purchase and installation of a high-efficiency washing machine that has a CEE rating of Tier 1 or greater. Limit one per residence.

8.8.1.7.10 High-Efficiency Dishwasher Rebate

Customers are eligible for a $75 rebate for the purchase and installation of a single high-efficiency dishwasher that has a CEE Rating of Tier 1 or greater. Limit one per residence.

8.8.1.7.11 Household Conservation Kits

SBMWD has put together a household conservation kit to assist their residential water customers. In this packet customers get an easy-to-install kitchen aerator, two bathroom aerators, a shower timer, and two leak detecting dye tabs. By installing these simple items, customers can see substantial water savings over time. The kit is free, but supplies are limited and offered on a first come first serve basis (limit of 1 per household). Kits can be picked up at SBMWD offices at 1350 S. “E” Street, San Bernardino, CA 92408. The customer’s name must appear on an SBMWD residential account. These kits are available only while supplies last.

8.9 Adoption, Submittal and Implementation

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

8.9.1 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 SBMWD's public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within SBMWD'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.

SBMWD 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 H-2.

8.9.2 Public Hearing and Adoption

SBMWD held a public hearing on June 22, 2021 to hear public comment and consider adopting this 2020 IRUWMP and SBMWD's WSCP.

As part of the public hearing, the SBMWD 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 SBMWD 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.

SBMWD's adoption resolution for the 2020 IRUWMP and SBMWD's WSCP is included in Part 4, Appendix H-3.

8.9.3 Plan Submittal

SBMWD will submit the 2020 IRUWMP and SBMWD'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.

8.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, SBMWD will make the plan available for public review during normal business hours by placing a copy of the 2020

IRUWMP and SBMWD's WSCP at the front desk of the City's office, and by posting the plans on the City's website for public viewing.

8.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

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