RIVERSIDE HIGHLAND WATER COMPANY

2020 IRUWMP – Public Review Draft

Part 2, Chapter 7
RHWC 2020 UWMP

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Prepared by Water Systems Consulting, Inc.

WSC

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RETAIL URBAN WATER MANAGEMENT PLAN

Riverside Highland Water Company

This chapter describes information specific to the Riverside Highland Water Company, 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 Riverside Highland Water Company's reporting requirements for 2020 under the UWMP Act.

IN THIS SECTION

7.1 System Description

Riverside Highland Water Company (RHWC) is a Mutual Water Company, shareholder owned and regulated by the California Corporation Commission and governed by a nine-member Board of Directors. Currently serving the City of Grand Terrace, the Highgrove area of Riverside County and small portions of San Bernardino County and the City of Colton, RHWC provides domestic and irrigation water services. The water service is provided to single and multi-family residential, commercial, industrial and agricultural users. RHWC is a retail public water supplier that meets the definition of an urban water supplier with over 5,300 municipal water service connections in 2020.

Historically, a large portion of the water service has been irrigation water for citrus groves, but rapid urbanization has resulted in a large portion of the citrus groves being removed for land development projects for housing, commercial and industrial use. As a result, irrigation water demand is decreasing and domestic water demand is increasing. Large parks and greenbelt areas are served with irrigation water from non-potable wells with nitrate concentrations in excess of drinking water standards.

The service area is largely developed with the major population center in the service area located in the City of Grand Terrace. The service area is shown in **Figure 7-1.**

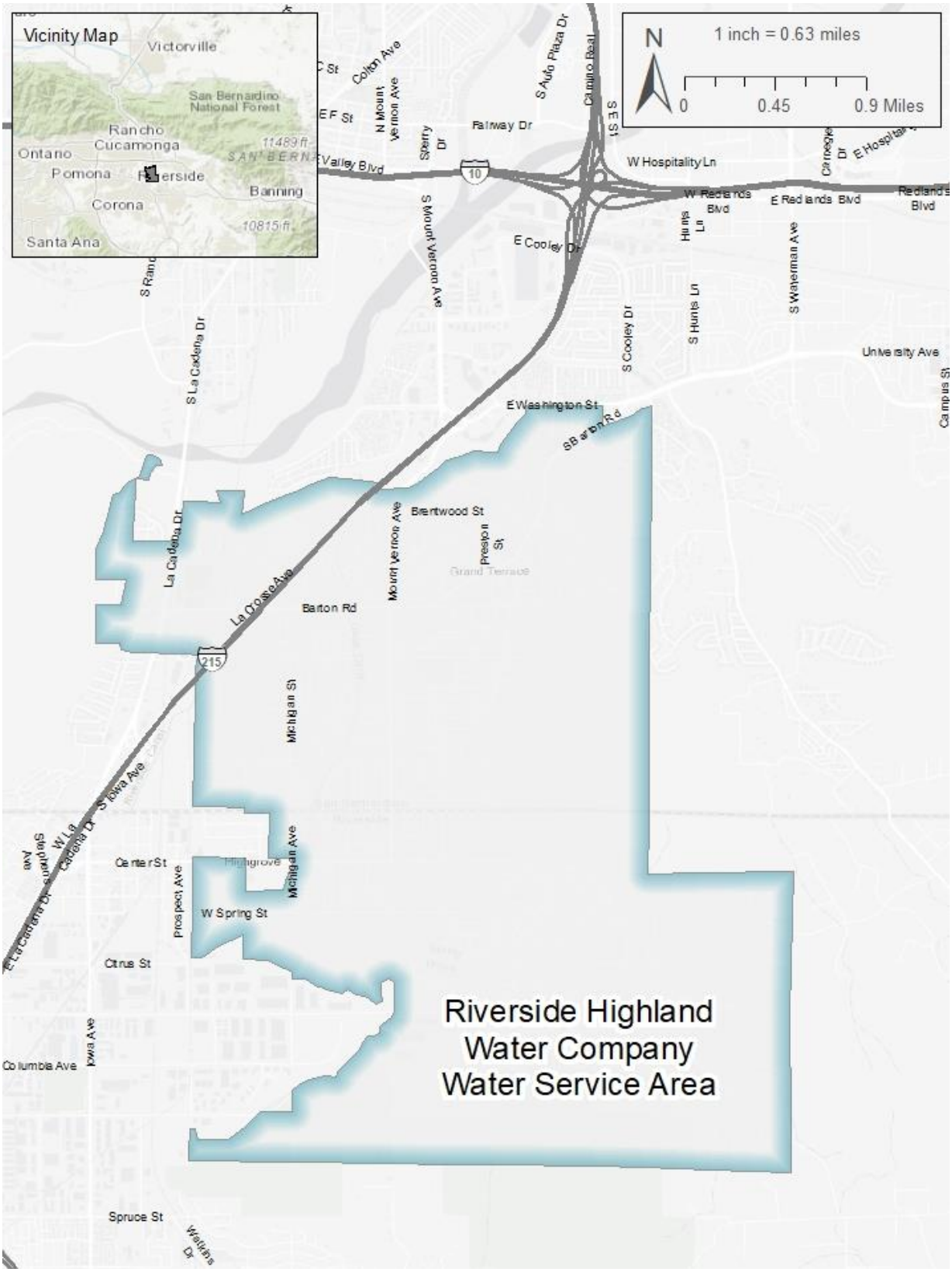

Figure 7-1: Riverside Highland Water Company Service Area Map

7.1.1 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.

To estimate population for future years, projections from 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 7-1.** 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 7-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**20,755**	**23,225**	**24,199**	**25,213**	**25,755**	**26,309**

7.1.2 Land Use

The City of Grand Terrace makes up the majority of the RHWC service area. For purposes of this report, it is assumed that the distribution of land use within the City of Grand Terrace is representative of land uses within the RHWC service area. Per the City of Grand Terrace 2010

General Plan, land use within the City of Grand Terrace is 54% residential, 9% commercial, 10% industrial, 3% public, 8% open space, and 16% street and railroad rights of way.

7.2 Water Use

This section describes the current and projected water uses within RHWC's service area. RHWC serves potable water to municipal and industrial customers and serves non-potable water to agricultural irrigation customers.

7.2.1 Water Use by Sector

RHWC categorizes its water customers into seven categories for the purposes of billing: Single Family Residential, Multi-Family Residential, Commercial & Institutional, Industrial, Landscape, Agricultural Irrigation, and Other. Water uses classified as Other do not have permanent service connections, and include uses such as fire suppression, bulk water purchases, and construction water. Landscape and Agricultural Irrigation connections include both potable and non-potable connections. The number of active connections in each category from 2016 to 2020 are shown in **Table 7-2**.

Table 7-2: RHWC 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Single Family Residential	4,074	4,265	4,603	4,856	5,070
Multi-Family Residential	81	71	71	71	71
Commercial & Institutional	86	81	79	79	78
Industrial	4	4	4	4	4
Landscape	97	88	92	105	110
Agricultural Irrigation	3	3	3	2	2
TOTAL	**4,345**	**4,512**	**4,852**	**5,117**	**5,335**

7.2.1.1 Past Water Use

RHWC's actual water use by customer class from 2016-2020 is shown in **Table 7-3** and water consumption by customer class in the last five years is shown in **Figure 7-2.** Approximately 74% of RHWC's total deliveries were to single family residential connections, followed by 14% to landscape connections, 6% to multi-family residential connections, and the remainder to commercial & institutional, industrial, agricultural irrigation, and other customers. Landscape and Agricultural Irrigation water use includes both potable and non-potable use.

Table 7-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	2,165	2,393	2,663	2,517	2,959
Multi-Family Residential	262	223	228	252	226
Commercial & Institutional	143	174	181	147	151
Industrial	9	55	64	10	6
Landscape	378	445	524	477	552
Agricultural Irrigation	90	78	91	66	77
Other	33	57	55	92	34
Water Losses	57	193	60	193	241
TOTAL	**3,137**	**3,617**	**3,865**	**3,753**	**4,246**

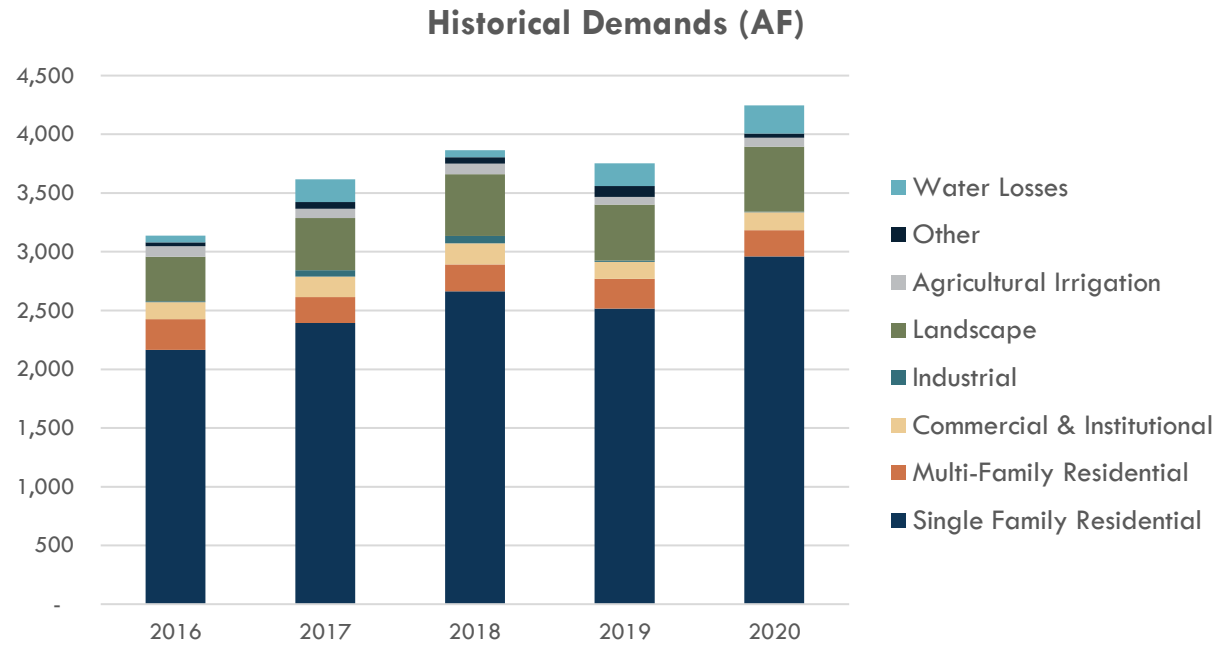

Figure 7-2: RHWC 2016-2020 Water Consumption by Customer Class (AF)

7.2.1.2 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.**

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

RHWC monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix G-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 7-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020.

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

Table 7-4: DWR 4-4R 12 Month Water Loss Audit Reporting

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS*
1	2016	130
1	2017	106
1	2018	77
1	2019	185
1	2020	241 (Estimated)

The 2020 AWWA Water Audit is not yet available. The 2020 water losses are estimated based on the difference between production and consumption in 2020.

In the past 5 years, RHWC's water loss has ranged from 2% - 6% of water sales. For the purposes of future water use projections, water loss is assumed to be 6% of projected water sales.

RHWC 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. A discussion of current and planned water loss management measures is included in **Section 7.8.1.5.**

7.2.2 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 average connection and demand data from calendar years 2016-2020, 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 2020-2025, the SCAG population growth rate projected that 213 new single family residential connections would be constructed, however, RHWC is currently experiencing rapid residential growth and anticipates an additional 500 single family residential connections in addition to the SCAG projection being constructed by 2025. The number of new single family connections in 2025 was adjusted upward to reflect known developments. Furthermore, the SCAG population growth rate anticipated five new dedicated landscape connections to be constructed in each 5-year period following 2020, however based on RHWC's understanding of projected future growth in the service area, nine new dedicated landscape connections are anticipated in each 5-year period after 2020.

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 average 2016-2020 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 7-5**, **Table 7-6**, and **Figure 7-3**.

Table 7-5: DWR 4-2R Projected Demands for Water (AF)

	PROJECTED WATER USE				
ADDITIONAL DESCRIPTION	2025	2030	2035	2040	2045
Single Family Residential	3,211	3,329	3,447	3,507	3,568
Multi-Family Residential	241	251	261	266	271
Commercial & Institutional	160	167	173	176	180
Industrial	30	31	32	33	34
Landscape	576	620	665	688	710
Agricultural Irrigation	65	67	70	71	72
Other	5	5	5	6	6
Nonrevenue	257	268	279	285	290
Total:	**4,545**	**4,738**	**4,932**	**5,031**	**5,131**

Table 7-6: 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	4,246	4,545	4,738	4,932	5,031	5,131
Recycled Water Demand* From Table 6-4R	-	-	-	-	-	-
TOTAL WATER USE:	**4,246**	**4,545**	**4,738**	**4,932**	**5,031**	**5,131**

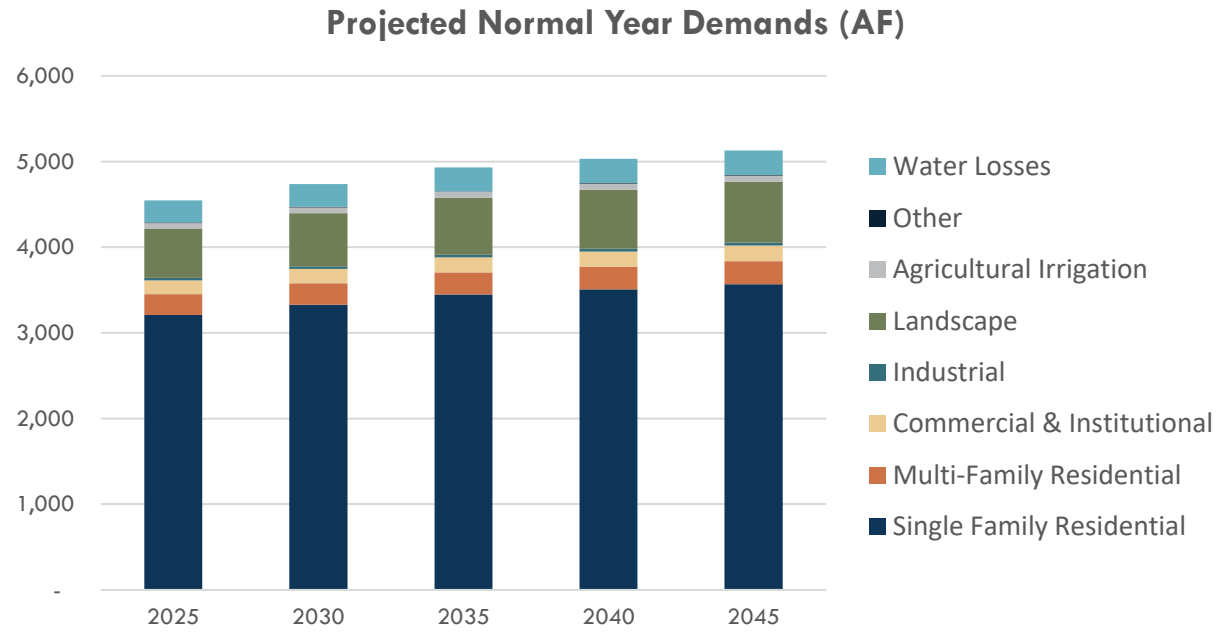

Figure 7-3: RHWC Projected Future Water Consumption by Customer Class (AF)

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

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.

7.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires water use projections in 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 major population center in the RWHC service area is the City of Grand Terrace.

RHWC's accounting system does not track the number of low-income households; therefore, projections were estimated based on SCAG's 6th cycle final regional housing needs allocation (RHNA), it is estimated that approximately 44 percent of all households in the service area are "very-low" or "low" income. In the absence of more detailed information, this percentage was assumed to apply to households across the service area. Water usage by low-income households has been included in future demand projections in **Table 7-5.**

7.2.4 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.

7.3 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 RHWC's calculations are included in **Part 4 Appendix G-7**.

7.3.1 Baseline and Target

RHWC'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 G-7**. RHWC's calculated water use target for 2020 is 191.7 GPCD.

7.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, RHWC has met its Confirmed Water use Target for 2020 of 171 GPCD, as shown in **Table 7-7**. To maintain this level of water use, RHWC intends to continue its current level of outreach and programs for the foreseeable future.

Table 7-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
192	183	Yes

7.4 Water Supply

RHWC's water supply is comprised entirely of local groundwater.

7.4.1 Purchased or Imported Water

RHWC does not currently purchase imported SWP water or other supplies.

7.4.2 Groundwater

RHWC extracts potable water from the San Bernardino Basin (SBB, including the Bunker Hill Basin and Lytle Basin) and the Riverside Arlington Basin (including the Riverside North Basin and Riverside South Basin). Detailed discussions of each basin, water rights and management are included in **Part 1 Chapter 3**.

RHWC currently has 13 wells capable of producing water. Two of these wells, RN-21 and RN-22 are dedicated to providing non potable irrigation water due to high nitrate concentrations. Three wells, FW-2, FW-5 and FW-18 are being used for the groundwater reduction program in the Bunker Hill Basin. These three wells can be converted to domestic water production if required. RHWC recently constructed a new well in the Riverside North Basin, RN-26, which went online in 2021.

RHWC has entered into an agreement with Valley District (SBVMWD Legal Document 1487, approved January 18, 1990) for a maximum flow rate of 1,000 gallons per minute from the Baseline Feeder project. The maximum quantity RHWC can receive in any calendar year is 1,000 acre-feet from this pipeline. Water obtained through this agreement is assessed against RHWC's water right in the SBB. This agreement was made with the understanding that it is a standby agreement and the water delivery is to be made only at RHWC's request.

As described in **Part 1 Chapter 3**, for Riverside North, the base period extraction is set only for that which is used within Riverside County. The Western Judgment established 21,085 AF as the base period export right for the use of Riverside North groundwater in Riverside County. Should extractions exceed the base period extraction over a 5-year period, or by more than 20 percent in a single year, Western is responsible for replenishment in the following year equal to the excess extractions over a 20-percent peaking allowance. Western's replenishment obligation can be reduced through credits that are available from previous years due to importing water into the basin or production below the base period extraction.

For Riverside South, the Western Judgment set a 5-year base period extraction of 29,633 AF for use in Riverside County. In Riverside South, should extractions exceed the base period extraction over a 5-year period, or by more than 20 percent in a single year, Western is responsible for replenishment in the following year equal to the excess extractions over a 20 percent peaking allowance, unless credits are available from previous years due to productions below the base period extraction or to importing water.

As of the 2020 Watermaster Annual Report, Western has total credits of 544,221 AF for the Rialto-Colton and Riverside Basins combined. To avoid confusion, the Watermaster no longer allocates this credit among the different groundwater basins.

RHWC's historical groundwater production for the past five years is shown in **Table 7-8**.

Table 7-8. DWR 6-1R Groundwater Pumped Last Five Years (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Riverside Arlington (Riverside North)	1,756	2,031	1,509	1,050	958
Alluvial Basin	Riverside Arlington (Riverside South)	81	124	158	204	248
Alluvial Basin	SBB (Lytle)	1,300	1,463	1,633	1,886	2,507
Alluvial Basin	SBB (Bunker Hill)	-	-	565	612	533
	Total:	**3,137**	**3,617**	**3,865**	**3,753**	**4,246**

7.4.3 Surface Water

RHWC currently has no plans for future use of surface water supplies.

7.4.4 Stormwater

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

7.4.5 Wastewater and Recycled Water

The City of Colton provides wastewater collection and treatment for the area in which RHWC serves water. Some areas in RHWC's water service area are still served by septic tanks.

The City of Colton owns, operates and maintains a wastewater collection, pumping and treatment system. The wastewater treatment plant utilizes a conventional and extended aeration secondary treatment process to product treated effluent in compliance with Regional Water Quality Control Board regulations. Treated effluent from Colton's wastewater treatment plant is conveyed to the Rapid Infiltration-Extraction (RIX) facility, which Colton jointly owns with SBMWD. The RIX facility treats a combined secondary-treated effluent stream of approximately 5 million gallons per day (MGD) from Colton's WWTP and 20 MGD from the San Bernardino Water Reclamation Plant to tertiary standards. The RIX facility utilizes natural biofiltration

through the use of percolation basins, followed by an ultraviolet disinfection system. All of the RIX-treated water is discharged to the Santa Ana River.

The City of Colton currently treats 0.8 to 1.2 MGD of wastewater from RHWC's service area, in addition to the City of Colton's service area. For the purposes of calculations, RHWC assumes an average of 1.0 MGD is conveyed from the City of Grand Terrace.

> It is estimated that approximately 21% or 1 MGD of the wastewater collected at the City of Colton WWTP was generated within Colton's water service area in 2020.

Information about wastewater collected and treated is presented in **Table 7-9**.

7.4.5.1 Potential, Current, and Projected Recycled Water Uses

No recycled water is currently used in the RHWC service area. While RHWC recognizes the value of recycled water, construction of such facilities is cost prohibitive at this time and the City of Colton does not have a recycled water program, so no recycled water use is anticipated during the period covered by this Plan. However, recycled water is utilized by the region for meeting habitat needs in the Santa Ana River (see **Part 1 Chapter 3.4**).

Table 7-9. 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 Colton	Estimated	1,184	City of Colton	Colton Water Reclamation Facility	No	No
-	**TOTAL**	**1,184**				

7.4.6 Water Exchanges and Transfers

RHWC does not 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.

7.4.6.1 Emergency Interties

RHWC has Emergency Interties with the City of San Bernardino, City of Colton and the City of Rialto. In 2018, RHWC received 187 AF of water from the City of San Bernardino and has delivered water to the City of Colton.

In addition, the City of Riverside owns shares of stock in RHWC and obtains their share of water by In-Lieu-Pumping. RHWC's agreement with the City of Riverside is included in **Part 4 Appendix G-4.**

7.4.7 Future Water Projects

RHWC is currently preparing a well siting study to identify potential sites for a new production well in the SBB or Riverside North Basin as part of the SARCCUP project described in **Part 1 Chapter 3.** RHWC does not have any other projects planned to develop additional supplies at this time.

7.4.8 Summary of Existing and Planned Sources of Water

RHWC's water supply is comprised entirely of local groundwater and will continue to be for this plan period. As discussed in **Part 1 Chapter 5**, RHWC 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, RHWC is using the 15% Reliability Factor to establish a supply target of 15% more than total projected demand. The volume of water utilized from each source in 2020 is summarized in **Table 7-10** and projected supply by source is summarized in **Table 7-11**.

Table 7-10. 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)	Riverside North	958	Drinking Water	See note
Groundwater (not desalinated)	Riverside South	248	Other Non-Potable Water	See note
Groundwater (not desalinated)	SBB (Lytle)	2,507	Drinking Water	See note
Groundwater (not desalinated)	SBB (Bunker Hill)	533	Drinking Water	See note
-	**TOTAL**	**4,246**		

See Part 1 Chapter 3 for discussion of Rights and Safe Yield

Table 7-11. 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)	Riverside North	3,176	3,399	3,622	3,736	3,850
Groundwater (not desalinated)	Riverside South	250	250	250	250	250
Groundwater (not desalinated)	SBB (Lytle)	1,800	1,800	1,800	1,800	1,800
Groundwater (not desalinated)	SBB (Bunker Hill)	-	-	-	-	-
	TOTAL	**5,226**	**5,449**	**5,672**	**5,786**	**5,900**

Supplies shown in this table are planned pumping or diversions, except supplies from San Bernardino Basin are increased to meet the Total Supply Target with 15% Reliability Factor.

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

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	5,226	5,449	5,672	5,786	5,900
Demand Totals From Table 4-3R	4,545	4,738	4,932	5,031	5,131
DIFFERENCE	**681**	**711**	**740**	**755**	**769**

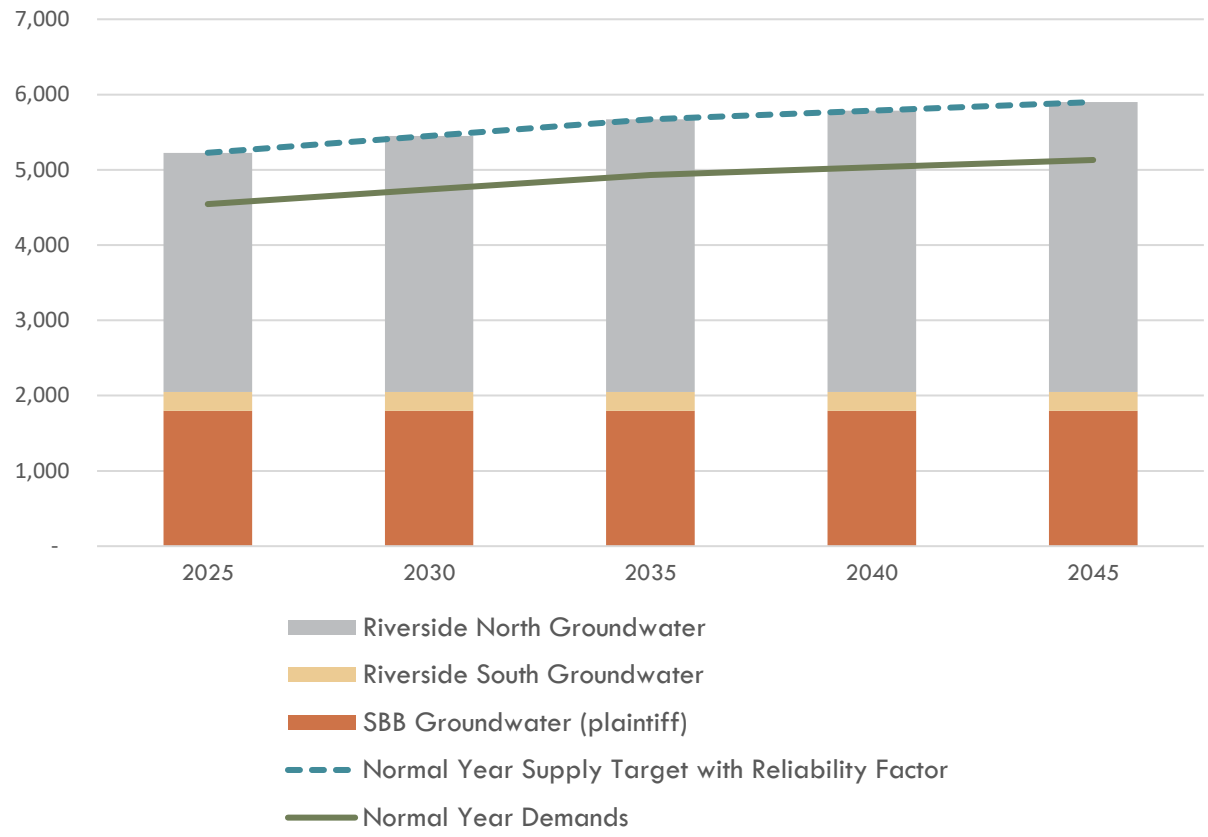

Figure 7-4: RHWC Projected Supply and Demand Comparison (AF)

7.4.9 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, RHWC consumed a total of 3,406,430 kWh of energy for water facilities for an energy intensity of 802 kWh per AF of water delivered.

7.5 Water Service Reliability Assessment

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

7.5.1 Constraints on Water Sources

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 and challenges is included in **Part 1 Chapter 3**.

Based on current conditions, water quality is not expected to affect RHWC's supply reliability. However, water quality issues are constantly evolving. RHWC 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**.

7.5.2 Year Type Characterization

Per UWMP requirements, RHWC 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.

7.5.3 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. RHWC, Valley District, and Western have demonstrated that water supplies will meet the water demands in normal, single dry and multiple dry years, as discussed in **Part 1 Chapter 5**. RHWC has the right to extract 4,435 AFY of water in the SBB with a five-year average representing their water right (see **Part 1 Chapter 3.8** for more information). In the Riverside

North and Riverside South Basins, RHWC is able to pump more water to meet demands in dry years in accordance with the Western Judgment. Although Western has substantial credits according to the 2020 Watermaster Annual Report, RHWC and Western are participating in efforts to replenish the basins with imported and local water through regional recharge programs. RHWC'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, RHWC does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, RHWC participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. RHWC 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 7-13**. The percent of average supply increases in drought years because RHWC's groundwater production will increase to meet an assumed increase in demands.

Table 7-13. 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 7-12**.

The projected supply and demand during a single dry year are shown in **Table 7-14**. RHWC's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins RHWC produces water from have storage for use in dry years so RHWC can produce the volume of water needed to meet 100% of demands in single dry years. RHWC's supplies are 100% reliable during single dry years.

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

	2025	2030	2035	2040	2045
Supply Totals	5,749	5,994	6,239	6,365	6,490
Demand Totals	4,999	5,212	5,425	5,534	5,644
DIFFERENCE	**750**	**782**	**814**	**830**	**847**

The projected supply and demand during five consecutive dry years are shown in **Table 7-15**. RHWC's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins RHWC produces water from have storage for use in dry years so RHWC can produce the volume of water needed to meet 100% of demands in multiple dry years. RHWC's supplies are 100% reliable during multiple dry years.

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

		2025	2030	2035	2040	2045
FIRST	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**
SECOND	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**
THIRD	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**
FOURTH	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**
FIFTH	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**

7.6 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 RHWC 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 7-16**.

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. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in **Section 7.5** and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for RHWC. RHWC 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 RHWC and the region as a whole, even during a 5-year drought (see **Part 1 Chapter 5**), RHWC remains committed to water conservation and to being a good steward of regional water resources to preserve supply for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 7-16: Five-Year Drought Risk Assessment (AF)

	Gross Water Use	4,736
2021	Total Supplies	5,447
	SURPLUS	**711**
	Gross Water Use	4,802
2022	Total Supplies	5,522
	SURPLUS	**720**
	Gross Water Use	4,868
2023	Total Supplies	5,598
	SURPLUS	**730**
	Gross Water Use	4,933
2024	Total Supplies	5,673
	SURPLUS	**740**
	Gross Water Use	4,999
2025	Total Supplies	5,749
	SURPLUS	**750**

7.7 Water Shortage Contingency Plan

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

7.8 Demand Management Measures

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

7.8.1 Existing Demand Management Measures

7.8.1.1 Water Waste Prevention Ordinances

RHWC has adopted a water shortage contingency plan that has a water waste prohibition. RHWC will initiate an aggressive water commodity tiered rate structure to discourage water wasting, if the 20% reduction in per capita use is not met. Large water users have been identified and an aggressive education program for water conservation has been initiated to prevent water waste.

7.8.1.2 Metering

RHWC has implemented a program to completely replace all of its meters with automated meter readers (AMR). The AMR program is in effect with all meters now AMR. RHWC has begun to replace those automated meters that are over 10 years old and will replace older meters continuously.

7.8.1.3 Conservation Pricing

In 1985, RHWC commissioned a “Revenue Requirement Study” to determine the revenue required for each class of service to pay its fair share of monies to operate and maintain the domestic and irrigation water systems. During the study it was noted that a waste of water was occurring by some customers and some irrigation customers were not metered. The rate structure at the time was for assessments to pay for water usage and a declining rate for water in excess of that amount represented by the assessment. In 1986, the RHWC Board of Directors accepted the Revenue Requirement Study and began to implement the new rate structure. Prior to beginning the new water rates, RHWC staff began a public information and education series of talks to the City of Grand Terrace, its largest customer base, service clubs and information centers at community gatherings. When the rates were implemented, public acceptance was overwhelming.

RHWC completed an additional rate study (2019) to further reduce water consumption and match fixed revenue sources to fixed revenue expenditure, along with matching variable revenue sources to variable revenue expenditure. The current rates are shown in **Table 7-17.**

Table 7-17. Domestic Water Rates for RHWC as of 2020

UNITS PER 2 MONTHS	RATE PER UNIT
0 to 4,000	$1.06
4,001 to 7,000	$1.38
7,001 to 11,000	$1.63
Over 11,001	$1.87

The water rate structure is designed as an increasing charge for water as usage increases. Water meter readings are done bi-monthly. By adjusting the tier allotments and tier rates, RHWC has the ability to significantly increase water conservation.

If the 20% per conservation reduction is not met, the tier allotments would decrease and commodity rates for Tiers 2, 3 and 4 would be increased until the mandatory reduction in per capita water use would be met. It has been determined that 20 units (100 cubic feet = 1 unit) of water per 2-month period is the lifeline amount being used by customers for inside water use. Subsequent to 2020, all of the Tier rates will increase to match inflation.

This rate structure, along with the other RHWC programs, is planned to greatly reduce the water running down gutters and other water wasting habits. With agriculture being phased out, irrigation will be for landscaping and open space purposes.

7.8.1.4 Public Education and Outreach

In 1989, RHWC initiated an “In-Home Water Audit Program” to review customers in-house and outdoor uses and habits. The audit is performed at the request of the Customer or, it may be recommended by employees reviewing historic water usage against a high usage meter reading in any particular period of time. Upon completion of the water usage audit, recommendations are made to the homeowner to reduce water usage. RHWC personnel will follow up with the customer to review the recommendations made as a result of the audit. No record of water saved through this program has been maintained. It is believed that a significant reduction of water usage has been realized after an audit has been made and the employee recommendations have been implemented for individual customers.

Annually, the City of Grand Terrace which RHWC provides water service becomes involved with Water Awareness Month, including passing a Water Conservation Resolution and prominently displaying the winning poster from the schools during Water Awareness Month poster contest.

In the past, RHWC has sponsored and manned a booth at the City of Grand Terrace “Annual Merchants Fair”. At this booth, water conservation literature is available to participants and the personnel will answer questions and discuss water matters with the people who are normally RHWC customers. RHWC also has a water conservation booth annually at both the Grand Terrace Days and Highgrove Days.

RHWC maintains a literature rack in the lobby of the Corporate Offices. There are booklets and literature available at the booths sponsored by RHWC. An example of the literature available follows:

- Water Conservation Hints: This is a pamphlet prepared by RHWC as a handout to new customers or interested people.
- Drought Tolerant Plants: This is a handout prepared by RHWC and available in our lobby and upon request for our customers or interested parties.
- The website for IEfficient.com: This a website we refer our customers to for additional information. The Inland Empire's go-to source for information on water-use efficiency. Here you will find tips for increasing conservation and, most importantly, ways to eliminate water waste.

In 1991, in conjunction with the Colton Unified School District's "Partners in Education Adopt-A-School Program" RHWC adopted Terrace View Elementary School in the City of Grand Terrace. RHWC provides water service to the City of Grand Terrace. RHWC staff provide instruction about water resources, how water gets to the tap in your home, water conservation and the water business operations.

This "Adopt-A-School Program", now in its 30th year, utilizes classroom work by the teacher and RHWC employees, supervised tours to the Western Municipal Water District of Riverside County's "Low Water Use Demonstration Garden", the Metropolitan Water District of Southern California's Mills Water Treatment Plant, Oliver Roemer Water Filtration Plant, a water testing laboratory, an EPA Superfund Site, and the corporate facilities and operation facilities of RHWC.

On May 30, 2002, RHWC adopted a second school, Grand Terrace Elementary School, in the "Partners in Education, Adopt-A-School Program".

Each year, RHWC sponsors a "Water Awareness Poster" contest, which includes both schools during Water Awareness Month. Awards, which are engraved plaques are awarded to two winners in each school grade level. RHWC personnel are requested to judge the Annual Science Fair, both at the local school and district wide level. The Grand Prize Winner in the Poster Contest for each school is presented with a $100.00 U.S. Savings Bond sponsored by RHWC.

RHWC has no large commercial, industrial, or institutional accounts.

7.8.1.5 Programs to Assess and Manage Distribution System Real Losses

RHWC has already replaced all of the water meters with automated meters to help detect both meter leaks and leaks within the customer's property. During the regular reading duties, the meter and joining pipelines are reviewed for water leakage. Where water is noted in the reading of the meter, a service technician is dispatched to the location of the possible leak to evaluate the situation. Any leaks found, whatever the size, are repaired immediately. It has been the experience of RHWC that approximately 5.5% of the meters in the distribution system have small leaks in any one year. The automated water meters will enable RHWC to detect leaks within the customer's system. RHWC plans to initiate this customer leak detection program when the automated meter program is completed.

Meters that are noticeably not providing proper readings during the reading period and in the calculations for water used as compared to historic usage by water billing personnel will be evaluated and replaced or repaired as the situation requires. RHWC's "Water Meter Change-Out Program" commenced in 1981 and is continuing today. RHWC is replacing all of its water meters with new automated water meters. The "Meter Change-Out Program" will continue as an on-going program to ensure proper reading meters are being utilized within the distribution system.

RHWC has had an ongoing leak detection system that has been in place since 1989. RHWC has not keep a detailed accounting of how much water this program has conserved.

RHWC has a Capital Replacement Program that includes the replacement of water mains, valves, fittings and water service connections from the water main to the customer meter. Please note that all water sold is through meters regularly checked for accuracy. After replacing all of its water mains, RHWC has lowered its nonrevenue water.

7.8.1.6 Water Conservation Program Coordination and Staffing Support

RHWC had been experiencing reservoir overflows, water mixing problems in reservoirs and the need for excessive water flushing due to low water in reservoir problems. In response to these problems, RHWC installed a "State-Of-The-Art" Supervisory Control and Data Acquisition System (SCADA) in the water distribution system. Since the installation of the SCADA system, proper water levels in the reservoirs are maintained, and the use of "Time-of-Use" (TOU) electrical energy usage has been practicable, reducing energy bills to RHWC. The proper use of booster stations and the ability to utilize the most efficient and lowest cost water producing wells can be determined and operated by RHWC. In addition, records of operation are stored within the computer files for future reference to evaluate water distribution system. The RHWC distribution superintendent will be the water conservation coordinator.

7.8.1.7 Other Demand Management Measures

RHWC has very few large landscape irrigation areas within its service area. RHWC currently offers non-potable water to a number of parks, open spaces and irrigation areas. RHWC has met with all of the large landscape owners. RHWC has initiated an informal program for water conservation for all of its large landscape customers. RHWC does not have a formal landscape conservation program or incentives, and does not plan to implement this type of program in the near future, but will continue to monitor the large landscape projects for cooperation in conservation.

RHWC does not currently have programs involving residential retrofits, large landscaping conservation programs and incentives, conservation programs for commercial, industrial, and institutional accounts, wholesale agency programs, water waste prohibition, or residential ultra-low flush toilet replacement programs. If RHWC's aggressive water commodity pricing rate schedule and its education programs do not meet the required future water use objectives, RHWC will initiate the above mentioned water conservation programs.

7.9 Adoption, Submittal and Implementation

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

7.9.1 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 RHWC's public hearing. The recipients are identified in Chapter 2 and include all cities and counties within RHWC'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.

RHWC 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 G-2**.

7.9.2 Public Hearing and Adoption

RHWC held a public hearing on June 24, 2021 to hear public comment and consider adopting this 2020 IRUWMP and RHWC's WSCP.

As part of the public hearing, the RHWC 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 RHWC 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.

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

7.9.3 Plan Submittal

RHWC will submit the 2020 IRUWMP and RHWC'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.

7.9.4 Public Availability

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

7.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

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