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WATER RATE TRENDS STUDY

DRAFT

May 2022

Riverside Public Utilities

Contents

Tables

Figures

Chapter 1

INTRODUCTION

As part of the overall Cost of Service and Rate Design Study, Carollo was asked to develop a Rate Trend Analysis in collaboration with Riverside Public Utilities (RPU). This analysis provides an evaluation of emerging or expected future rate structures, technologies, and trends that might impact or influence future rates and rate structure considerations for RPU. Specifically, the analysis considers how water is priced and how those influences might affect or apply to RPU. The evaluation also provides an overview of known or potential risks and costs associated with implementation. Given the current water and rate environment within the State of California, this is a critical first step to understanding the potential impact of proposed rate decisions in the immediate, near- and long-term.

1.1 Recent Trends

Throughout California and the country as a whole, factors including climatic uncertainty, aging infrastructure, increased operational costs, and an evolving regulatory environment have impacted rate making for public water agencies. In many cases, water rates have been increasing faster than median household income in the recent years to react to the increased costs driven by the aforementioned factors. In order to understand the trends impacting RPU's upcoming water Cost of Service Analysis and Rate Design Study (COSA), it is critical to examine recent events that provided a catalyst for or underpin the existing conditions. In California, be it weather or a changing legal environment, there are significant events that have shaped how water utilities provide reliable and cost-efficient service and recover the cost of providing this service.

1.1.1 Water Demand

Water demands have become increasingly difficult to predict and require continual investigation, as RPU has done. Demands are further impacted by increasingly stringent regulations over the past decade as well as continued conservation messaging from the State and other entities. Several significant events have influenced demands and demand forecasts in ways that agencies have not experienced in the past:

- **2007-2009 drought -** According to the California Department of Water Resources, water years 2007-2009 were the 12th driest three-year period in recorded climatic history (DWR 2010). While the droughts in the late 1920s, 1970s, and 1980s were more severe, the 2007-2009 drought coincided with a period of increased demands for freshwater, changes in operating rules at reservoirs, and environmental protections that reduced pumping of water from the Sacramento-San Joaquin Delta to state and federal water users south of the Delta (DWR 2010).
- **2012-2016 drought -** The 2012 to 2016 drought was one of the most severe recorded droughts faced by the State. Then Governor Jerry Brown declared a drought State of Emergency in January 2014 and directed state officials to take all necessary actions to prepare for water shortages. With emergency drought conditions persisting throughout California, the State Water Resources Control Board (SWRCB) adopted an emergency regulation requiring an immediate 25-percent reduction in overall potable urban water use statewide in accordance with Governor Jerry Brown's April 1, 2015 Executive Order. Though several wet or normal rainfall years have occurred in the intervening period, the impacts of the 2012-2016 drought and the associated conservation efforts are still being felt by many agencies as demands have not rebounded to the pre-drought levels due to permanent

conservation. The State's Conservation effort has become a permanent way of living to many Californians.

- **Current Drought -** California once again faces drought conditions as the water year then ended on September 30, 2021 was the second driest on record due to extreme heat and lack of rain and snow. Further, the past winter months (January, February, and March) indicated the driest winter months ever recorded in California. These warm, dry months overshadowed gains in precipitation at the end of 2021. Snow melted faster than expected, reducing snowpack to just 38 percent of average by April 1, 2022. In March 2022, Governor Newsom issued an executive order calling on Level 2 shortage response and urging stricter local conservation measures while proposing a ban on decorative turf irrigation. The order encourages taking preparatory actions and mandatory water use reductions of 10 to 20 percent from 2020 levels.
- **The COVID-19 pandemic** and its subsequent economic downturn significantly impacted public water systems throughout the United States, including California. Along with financial and operational challenges during this time, agencies have deferred capital investment and maintenance projects making them more vulnerable to failing infrastructure in the future. For many water agencies, the shift toward remote work has resulted in changing water consumption patterns for residential and commercial customers.
- **Per- and Polyfluoroalkyl Substances (PFAS) Pre- and Polyfluoroalkyl Substances (PFAS) -** The PFAS strategy put forth by the State Water Resources Control Board (SWRCB) in March 2019 ordered water agencies to test for PFAS chemicals in drinking water wells. Later that year, SWRCB lowered the notification levels from 14 ppt to 5.1 ppt for perfluorooctanoic acid (PFOA) and 13 ppt to 6.5 ppt for perfluorooctanoic sulfonic acid (PFOS). RPU is currently studying when, and to what extent, PFAS mitigation may be required.

1.1.2 Conservation Pricing – Fixed & Variable Cost Recovery

Water rates in California are first and foremost governed by the requirements of Proposition 218 which require that rates do not exceed the reasonable and proportionate cost of service. Court cases held that rates cannot be set specifically to drive conservation and penalty tiers or rates are not allowable. However, within the requirements of Proposition 218, agencies do have some flexibility on how rate structures are developed and often times, conservation can be incentivized as a secondary effect of cost of service-based rates. For example, tiered rates that reflect the incrementally higher operational and supply costs of providing water can also incentivize conservation through price signaling. Similarly, seasonal rate structures that reflect increased costs in the peak demand summer months can have a similar effect.

In the past, the California Urban Water Conservation Council developed best management practices to encourage conservation-based pricing through meeting a target of 70-percent of rate revenues to be recovered through variable (consumption-based) rates or through a method based on incremental cost of service or a points-based matrix. However, that guidance is no longer in place.

Prior to the last COSA study, RPU recovered approximately 25-percent of water rate revenues via fixed charges and the remaining 75-percent from variable rates. The rate structure adopted in 2018 with the water five-year rate plan phased in increased fixed revenues over a five-year period to target 39-percent fixed revenues at full implementation. Though the rate structure was modified to collect a greater share of revenues through fixed charges, price signaling was maintained through the tiered rate structure for residential customers and by including seasonally adjusted rates.

In considering conservation-based pricing, it is necessary to review the utility's budget (O&M and capital) and potential revenue sensitivity. Particularly for utilities with significant leverage (debt), conservation pricing must balance funding debt obligations regardless of weather or drought conditions, and affordability. Additionally, some utilities in California have implemented drought rates to help insulate from volatility during droughts. Currently, RPU does not have drought rates implemented.

1.2 Customer Data Findings

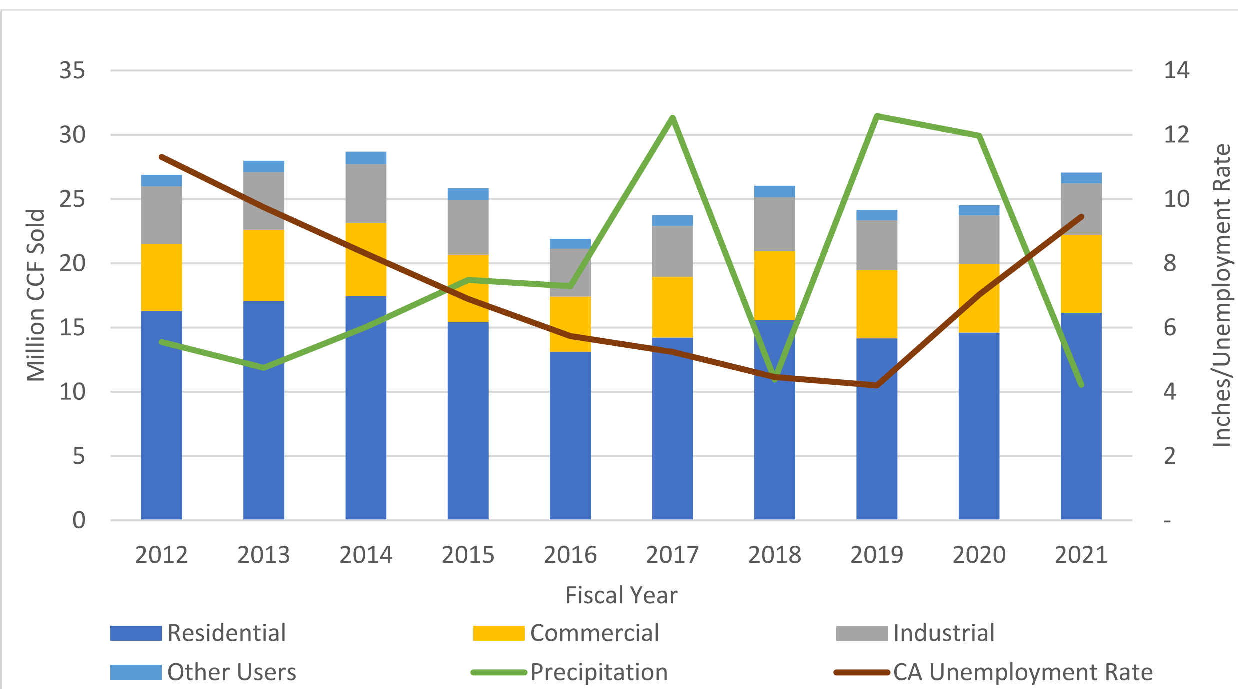
1.2.1 System-wide Trends

Generally, economic, environmental, and rate increase factors have been the primary drivers behind RPU's customer behaviors. Over the last decade, total demand peaked in 2014 at approximately 28.7 million CCF. Beginning in that year, California entered a state of drought emergency and conservation messaging from the State and other entities became more prevalent. In 2015, then Governor Jerry Brown issued an executive order calling for 25-percent reduction in urban water use statewide. Though Riverside successfully petitioned for a decreased conservation target, the prevalence of messaging still led to significant reductions in RPU demands. In 2015, demands declined by 10 percent, followed by a further 15 percent reduction in 2016.

After that period, with the lifting of conservation mandates, consumption rebounded in 2017 and 2018 though not to the 2014 level. Demand again decreased in 2019 and remained relatively flat for 2020 due to wet weather in both years leading to decreased outdoor use. This past fiscal year, 2021, saw demands increase by approximately 10 percent as dry weather led to increased outdoor water use.

Figure 1.1 summarizes the changing demands on the RPU system over the last decade and includes two of the influencing variables on water demand: the economy, and climate. While economic factors do have some degree of influence on demands, demands seem to be most linked to the level of precipitation and the general perception of water scarcity by the customers, as informed by conservation messaging from the state and other entities. Given the current drought and the actions taken by Governor Newsom in response to it, public awareness of water scarcity remains high and could result in further conservation in the future.

Figure 1.1 Residential Monthly Water Use



1.2.2 Customer Class Demand Trends

1.2.2.1 Residential

Fueling the drop in system-wide demands is an increase in efficiency at the residential account level as well as continued conservation messaging from the state and other entities. Since 2007, mean consumption per bill for residential customers has decreased by 21 percent. During the summer months (June through October), mean monthly consumption has dropped by 22 percent, falling from 35.4 CCF in 2000 to 27.6 CCF in 2021. This reduction in demands is likely due to increased efficiency, including outdoor irrigation systems and turf replacement. Because residential accounts make up nearly 85 percent of all accounts for RPU, domestic usage patterns will have a significant impact on overall system demand.

Figure 1.2 outlines this trend, particularly for summer. Mean monthly consumption has shown a steady decline. Figure 1.3 displays a cumulative distribution function of summer residential consumption for 2000, 2005, 2010, and 2014, and the average of 2019 through 2021. Over the years, this line, which plots the proportion of RPU's bills at each usage level, has steadily shifted to the left, indicating that more and more users are decreasing their usage. In 2000, half of all summer bills were for 30 CCF or greater; for 2019 through 2021, that number had fallen to 20 CCF, a decrease of 33 percent.

Figure 1.2 Residential Monthly Water Use

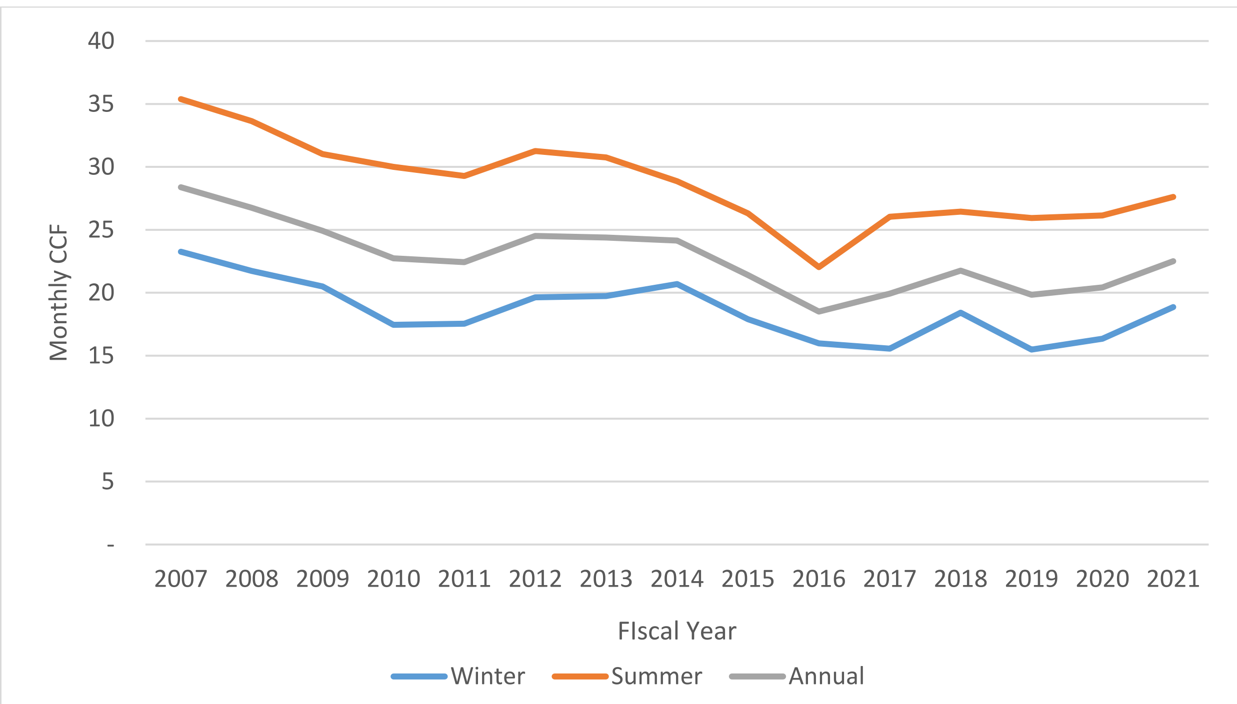
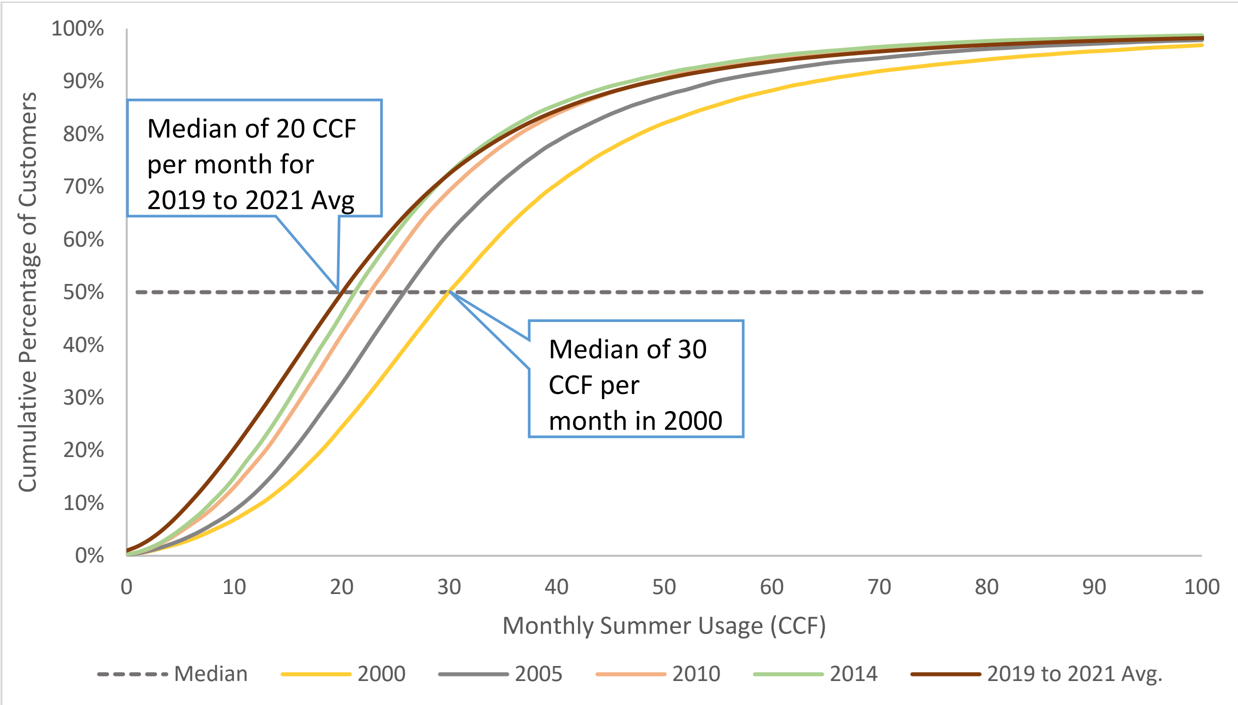


Figure 1.3 Residential Demand Cumulative Distribution Function (Summer Only)



Because RPU uses an increasing block rate structure, it recovers a much greater share of its revenue from high-demand users, than the percent of consumptions from that same block. Grouping single-family residential customers into consumption blocks of 10 CCF increments, 82 percent of all customers had a mean monthly consumption at or below 30 CCF. However, that same group only makes up approximately 57 percent of total SFR revenues. In contrast, users with an average monthly consumption of greater than 70 CCF compose 3 percent of users, but their collective bills equal 16 percent of total SFR revenues. These results are outlined in Figure 1.4 and Figure 1.5.

This consumption profile has significant implications for RPU in the rate design process. Because such a large portion of its revenue is sourced from a relatively small piece of its customers, changes in demand can have substantial impacts on revenue sufficiency. This is especially problematic because often the easiest water conservation savings can be found from high-demand users who are willing to adopt efficient practices. If this happens on a large enough scale, the cutback could have a negative effect of RPU's revenues. Therefore, when designing new rates, it is critical that an accurate projection of demand, particularly for high-demand users, is developed.

Figure 1.4 Single-Family Residential Consumption Profile

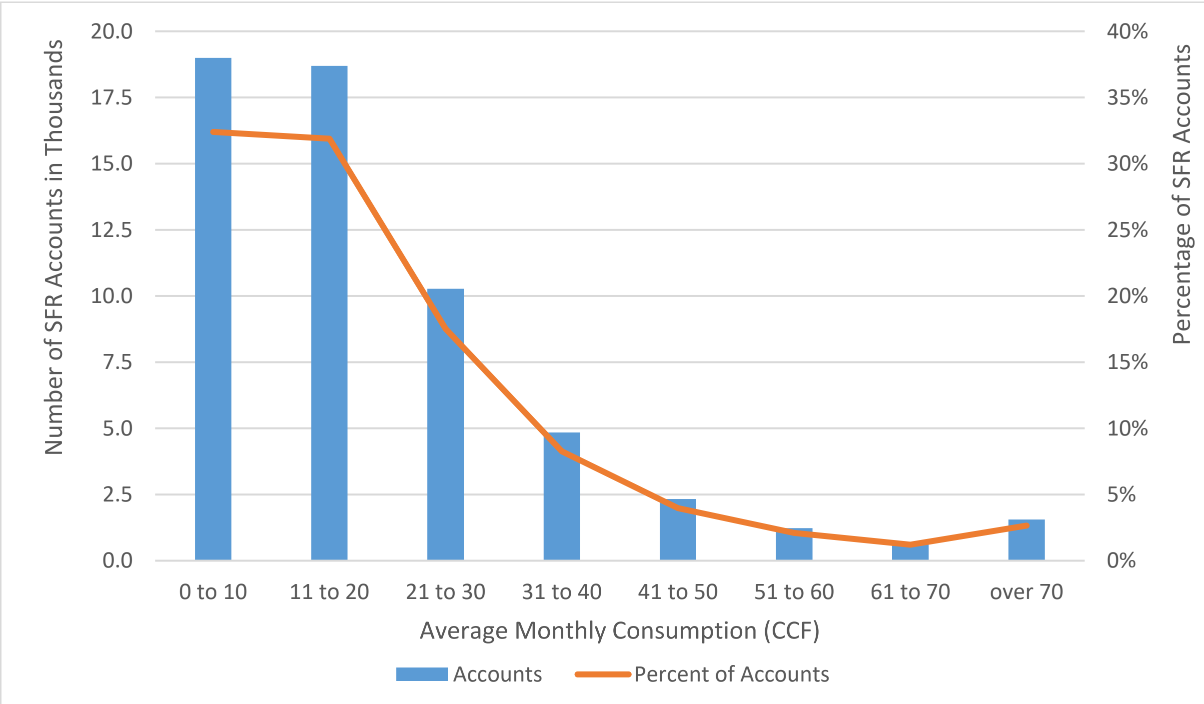
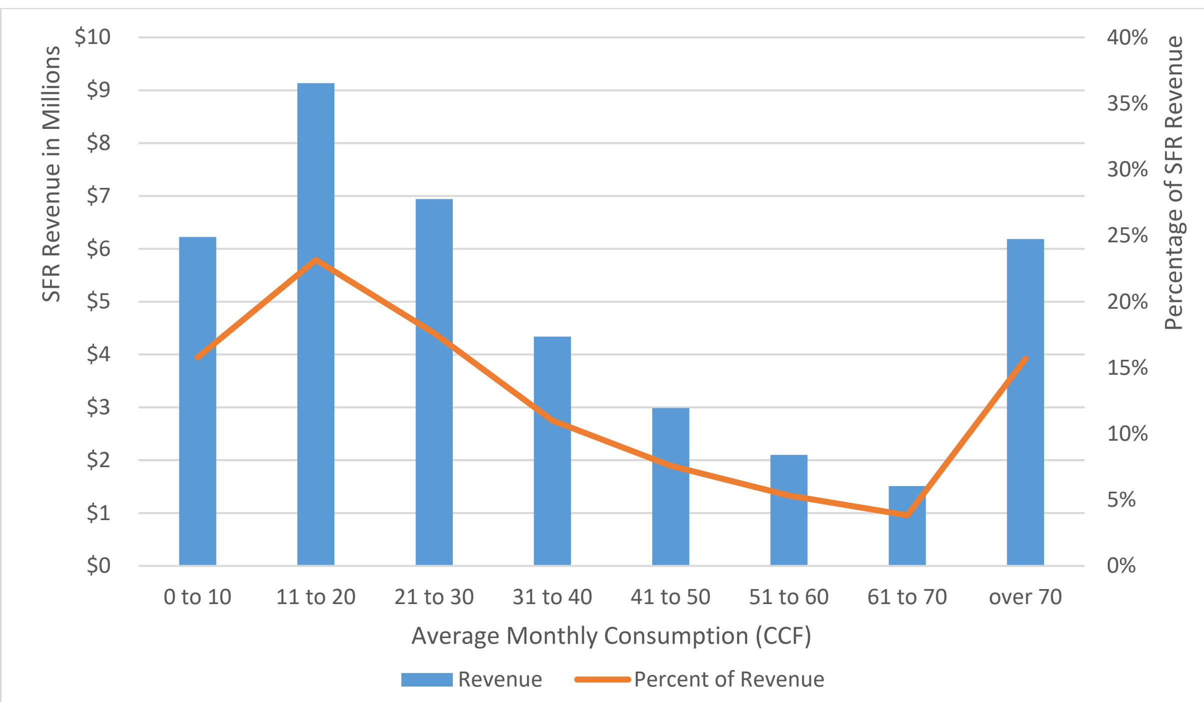


Figure 1.5 Single-Family Residential Revenue Profile

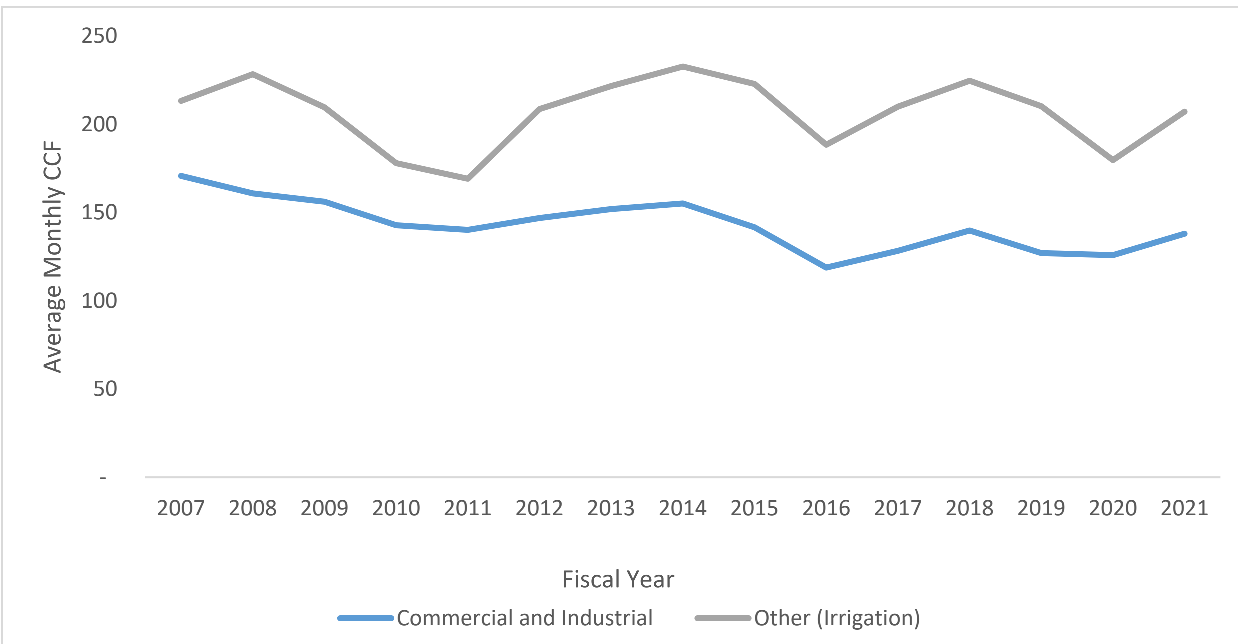


1.2.2.2 Commercial, Industrial, and Irrigation

Commercial and industrial demands on a per account basis exhibit a pattern similar to the system as a whole over the last fifteen years: steep declines from 2008 to 2010, and a slight rebound through 2014 followed by reductions driven by the drought and associated conservation. Since that time, demands have tracked relatively in line with overall demands, however the level of variation for commercial and industrial customers is less dramatic. This likely stems from their lower proportion of outdoor, weather sensitive use as compared to residential and irrigation customers. As shown in Figure 1.6, commercial and industrial demand has held relatively flat with a slight downward trend overall.

Irrigation has shown a demand trend that does not compare well with other non-residential customer classes. On a per account basis, demand varies considerably year-to-year presumable due to weather and precipitation. Like all other customer classes, irrigation customers did cut back demand during the previous drought followed by a rebound through 2018 before decreasing once again due to wet weather. In general, irrigation demands are more volatile than those of other customers.

Figure 1.6 Commercial & Industrial and Other Users (Irrigation) Per Account Demand



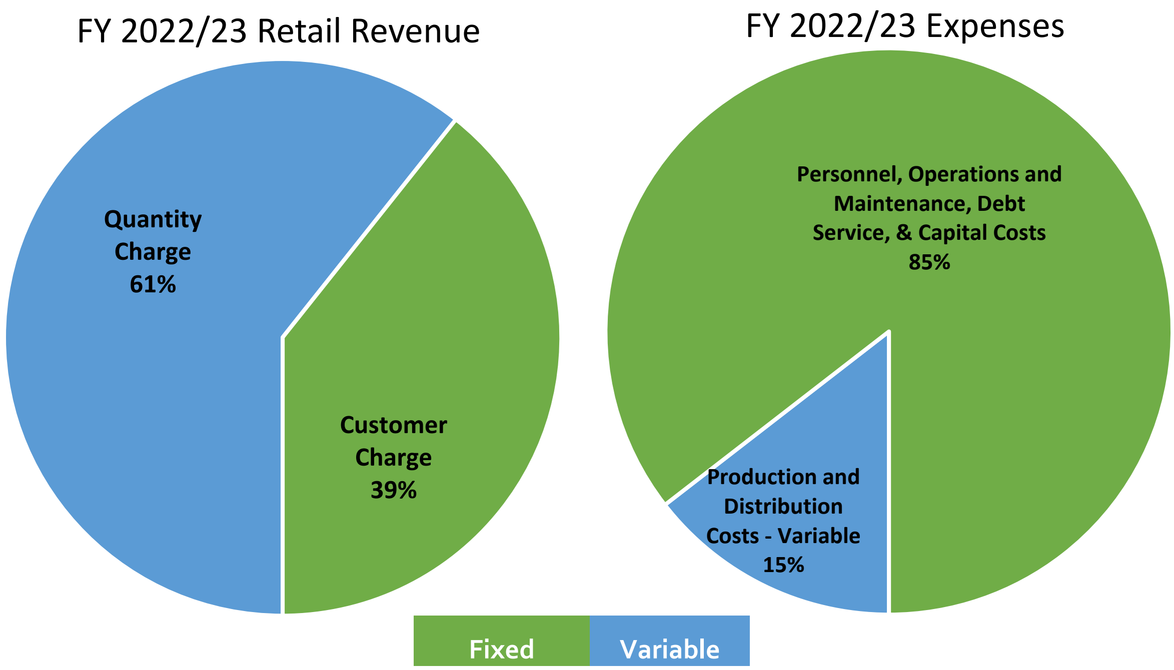
1.3 Revenue Stability and Sufficiency

Revenue stability is integral to the financial health of any utility; especially given that the majority of many water utilities' costs are fixed in a given year. For example, RPU continues to use a combination of debt and rate revenues to fund long-term assets and minimize the cost impacts to water customers. The debt service payments associated with system improvements are projected to increase over time. While the use of debt allows the water fund to maintain a strong financial position, increased conservation may cause revenue reductions and thus affect that financial position.

Continued conservation might force the water utility to increase rates, use reserves, and cut costs to account for these reductions. RPU has already taken measures to achieve cost efficiencies. At some point, however, further cost cuts might not be feasible or they might lead to reduced service levels.

As noted below, RPU's retail revenues are 61 percent variable and 39 percent fixed, while expenses are 85 percent fixed and 15 percent variable. As retail sales decrease causing variable sales to decrease, RPU is at risk of under collecting its fixed costs. Because of this, fixed cost recovery will be considered when designing future rate structures. While rate increases might allow the utility to collect adequate revenues even as consumption declines, there is a practical limit to unit price increases that can be imposed on utility customers. In order to create a strategy for long term fiscal health and conservation stewardship, the effects of price signaling, and price elasticity of demand should be considered.

Figure 1.7 Fixed and Variable Retail Revenues and Expenses



1.3.1 Seasonality of Revenue Collection

Operating expenses and revenues fluctuate throughout the course of the year due to changes in seasonal water demands. These seasonal changes are due to factors such as weather conditions and hours of daylight. Consequently, in establishing a pricing structure, it is important to understand the potential shifts in net revenues to appropriately manage financial impacts.

Utility revenues will fluctuate to a greater extent over the course of a year than utility expenses. This is particularly true for RPU, which has invested in localized groundwater supplies. Additionally, revenues can vary depending on the rate structure. Rate designs that apportion a higher amount of rate revenues to the volumetric charge rather than the fixed charges tend to experience greater fluctuations in revenues due to the seasonal nature of volumetric demands. The financial integrity of a utility requires that the utility's rate structure, along with other financial controls, support the cash flow needs of the utility.

1.3.2 Price Signal

Increases in rates or changes in rate structure send price signals to customers, often leading their consumption behavior to change. With the State's continuing conservation effort and stringent regulation, creating appropriate price signals can be complicated, but critical to minimize revenue losses while promoting conservation. For example, rate structures that reward conservation might further influence customers to reduce water usage. Coupled with price elasticity of demand, price signals become a powerful tool for the utilities to influence and manage the impacts of demand reduction while minimizing revenue losses.

1.3.3 Price Elasticity

The price elasticity of water measures the relationship between the price of water and the quantity demanded. Price elasticity is a way to measure the price signal's effect. While it is impossible to predict exactly what the price elasticity of water will be when setting rates, it is important to have a well-researched estimate to determine the effect a rate increase will have on consumption.

In economic terms, elasticity is not a binary measure. Goods and services fall on a continuum of elasticity. The base tier of water is generally considered to be an inelastic good, meaning a 10-percent increase in price would result in less than a 10-percent decrease in demand. Conversely, with an elastic good, such as jewelry, a 10-percent price increase would result more than a 10-percent decrease in a demand. The concept of price elasticity (E_d) can be illustrated in the following equation:

Price Elasticity Calculation

$$E_d = -\frac{\%\ \text{Change in Quantity Demanded}}{\%\ \text{Change in Price}} = -\frac{\triangle Q_d / Q_d}{\triangle P_d / P_d}$$

Like other inelastic goods, the elasticity of water tends to change over time following a price change. Over longer durations, water is relatively inelastic, but in the short term, price signals can cause immediate changes in behavior for some consumers. Much of this response is dictated by the unique needs of that consumer. For example, residential customers have much greater discretion over their immediate water use than industrial manufacturing or food service customers. Sprinklers can be turned off, high-efficiency appliances can be installed, and other behaviors can be adopted that rapidly decrease domestic demand. In contrast, a bottling plant has a relatively fixed demand for water. Each beverage has a set volume of water, and with few exceptions, demands are unlikely to change in the short term. It is important to note that these changes in behavior tend to occur for only certain customers during significant price increases. It has also been shown that multi-family users are more likely to change their behavior when being sub-metered (rather than master metered), and the price increase is significant. Those who are not sub-metered are not shown how much water they are using and therefore tend to not pay as close attention. However, these customers and their purchasing behavior are more likely change in long term. The residential customer, motivated to save money and water, will ultimately run out of behavioral changes and experience demand hardening. On the other hand, the industrial customer will likely install high-efficiency practices or might retool to produce different products altogether that are less contingent on expensive water.

Numerous studies have been conducted to determine the price elasticity of water. The results of these studies vary because consumer behavior is affected by the numerous variables besides price, including climate, house and lot size, household income, education and outreach, technology, regulations, and etc. While many of these factors are out of RPU's control (*i.e.*, weather, household income), the utility actively plays a role in educating customers on the financial and environmental benefits of conserving water (as well as energy). RPU has an extensive conservation outreach program, including providing rebates for water efficient appliances, efficiency irrigation controllers, and turf removal.

Two consistent observations can be made in general. First, the price elasticity for indoor residential use is initially lower than that of non-residential use. Consumption at lower levels commonly represents non-discretionary water usage (health, sanitation, and cooking) for residential customers. As such, they are generally more difficult to adjust non-discretionary water use as the price of water increases. Second, as the price of water increases, users become more elastic or more sensitive to changes in the price of water as it translates into a higher percentage of monthly spending.

It is also important to note that the type of water usage is an important factor when considering the effects of price elasticity. As previously noted, non-discretionary water usage is inelastic or less affected by changes in price. Conversely, discretionary spending is more elastic and increasingly affected by changes in price. Furthermore, discretionary and non-discretionary spending varies between and within customer classes.

RPU’s internal CCF forecasting equations incorporate variables that account for the historical changes in the water billing rates over time, while simultaneously adjusting for various weather and economic effects. Based on the parameter values associated with these billing rate variables, long-term price elasticity estimates can be derived for RPU’s primary customer classes. Based on the CCF forecasting models calibrated through FY13/14 and assuming a ten percent increase in price, these calculated elasticities were determined to be -3.5 percent for residential customers, -2.1 percent for industrial customers, and -1.6 percent for commercial customers.

1.3.4 Legal & Policy Compliance

In the State of California, utility rates are subject to various legal requirements, such as Proposition 218, which requires the agency to set rates to recover costs from system users proportionate to the cost to provide service. Under Proposition 218 requirements, RPU must issue a public notice of the maximum rate increase to all property owners. Following a minimum 45-day protest period, the Council may approve and implement rates up to the maximum noticed rates.

1.3.5 Equity

Beyond revenue sufficiency and stability, one of the main objectives of a sound utility rate design is developing a structure which promotes equity by having customers pay their fair and proportionate share of costs for service. In addition, Proposition 218 requires rates to be cost based. It is commonplace for a utility to implement a cost of service analysis periodically to confirm that its rate structure meets the requirements of Proposition 218. A cost of service analysis equitably allocates system expenditures based on customer usage patterns and the cost to store and supply water as needed to meet demands. As shown above, usage patterns are often a function of customer class; single-family, multi-family, and commercial/industrial customer classes typically exhibit different demand patterns. Recognizing and recovering the costs associated with different types of demand from the appropriate customer classes avoids subsidies among customer classes. An effective and equitable pricing structure should account for these differing needs.

1.3.6 Transparency

Effective rate structures should be clearly communicated to and understood by the end customer. A rate design that is easily applied and understood by the public is often more desirable than a complex, opaque rate structure. Furthermore, it is important the utility's customer service representatives understand the nature of the rate structure as a customer representative is a customer's first point of contact with the utility and should be able to clearly articulate how the rate structure works leading to a greater public acceptance of the rate design. Currently, RPU implements a seasonal tiered rate structure for its residential metered accounts and a single seasonal volumetric rate structure for commercial metered accounts. As each class can have a different rate and tier allocations, it is necessary to communicate why these differences exist and show how it impacts the cost of service analysis.

Chapter 2

RATEMAKING PRINCIPLES

Rate design is the process of establishing rates and charges based on the completed cost of service analysis. The rates are designed to recover the revenue requirement of the system in an equitable manner. The rates must be consistent with the cost of service analysis results and applicable standards and/or requirements of local, state, and federal regulations. Rates should be designed to best reflect overall revenue stability, financial health, conservation, competitiveness among neighboring water utilities, and the management and operations policies of the utility.

In rate cases throughout the country, general ratemaking principles proposed by James Bonbright are often referenced. Bonbright's Eight Utility Rate Design Principles, which he first identified in his text titled Principles of Public Utility Rates (released in 1961 and updated in 1988), are as follows:

1. Practical: simple, understandable, acceptable
2. Uncontroversial as to interpretation
3. Should meet revenue requirements
4. Should provide stable revenues
5. Should provide stable rates
6. Fairness among customer classes
7. Avoidance of undue discrimination
8. Should be economically efficient

These ratemaking principles are not concrete or absolute, which has allowed them to stay relevant for so many years. Ratemaking must be flexible as there can be instances where these principles conflict with one another. For municipal utilities, water rates should be based on a rate policy targeting the lowest possible prices consistent with fulfilling customer requirements and providing reliable quality service. In California, this goal was codified into the state constitution through Proposition 218 which holds that public agencies' water rates cannot exceed the proportional cost to provide service to water users.

RPU's ratemaking principles provide that rate structures will be designed to provide rates that align with the transformational changes occurring in California's water sector. RPU's rates shall be designed to achieve the following goals:

- Achieve full recovery of costs
- Equitably allocate costs across and within customer classes
- Encourage efficient use of water
- Provide rate stability
- Offer flexibility and options
- Maintain rate competitiveness in region
- Be simple and easy to understand

The following sections provide a discussion of various ratemaking considerations that will be incorporated into RPU's rate design process.

2.1 Alignment with Policies and Strategic Objectives

The cost of service analysis provides a rational basis for distributing the full cost of the utility's water service to each customer class, in proportion to the demands they place upon the system. It also provides an opportunity to confirm that the rates are aligned with the policies and long-term goals of RPU.

As the policies and objectives of the utility will determine how the utility approaches cost of service analysis and rate design, it is important to understand the driving policies and strategic objectives of the utility. The policies and objectives of RPU consist of five cross-cutting threads discussed in this section and six strategic policies that include community well-being, environmental stewardship, and economic opportunity—to name a few. Building off the eight rate design principles listed earlier in the Study, the following are some objectives that may be considered:

1. **Conservation.** A beneficial outcome to the utility as a result of innovative rate structures and trends such as time-of-use, volumetric rates, and drought surcharges. These cost of service-based rates and structures send price signals to customers to conserve water whether conservation is the rate structure's intent or not.
2. **Revenue Stability.** Common objective that can be achieved by aligning fixed and variable charges with fixed and variable utility costs.
3. **Cost Tracking.** The ability to measure and pass-through costs on a seasonal or peak use time basis. This allows rates to reflect varying water production and delivery costs based on the seasonal level of demand and provides price signals to customers intended to modify behavior to benefit the customers and utility
4. **Support Mandates.** Support from legislative and regulatory bodies as well as other regulations and public policies.

The rate design must have a balance between the economics of operating a utility, the policies and objectives of the utilities and its governing bodies, and the unique needs and preferences of the community. In California specifically, there are a number of state-specific mandates to consider such as Proposition 218, guidance from the State Water Resources Control Board, executive orders on drought response and conservation, and others.

The Cost of Service and Rate Study (Study) supports the City Council Strategic Plan 2025 Priorities and Goals and aligns with the City Council's Strategic Plan 2025 Cross-Cutting Thread themes:

- **Community Trust.** The Study is transparent and developed with our customers' and the community's well-being as a top priority.
- **Equity.** The Study includes an equitable allocation of costs among customer classes which is incorporated into the resulting rate design recommendation.
- **Fiscal Responsibility.** The Study incorporates a forecasted revenue requirement that includes operating and capital expenditures funded by the prudent use of rate revenue, bond proceeds, and reserves.
- **Innovation.** The Study includes this Water Rate Trend Study that evaluates emerging rate structures, technologies, and trends, and how they may apply or be implemented by RPU.
- **Sustainability & Resiliency.** The Study will design future rates for a 5-year period to equitably recover costs while maintaining the financial health of RPU.

2.2 Appropriate Rate Levels

The revenue authorized for a utility to collect through its water rates and charges is the rate revenue requirement. The rate revenue requirement among customer classes differs based on the nature of the customer class. Customer class attributes such as unique costs, usage characteristics, and peak demand requirements define the rate revenue requirements. The utility's overall rate revenue requirement should ensure the revenue adequacy and meet the revenue requirement. In setting appropriate rate revenue requirements, there are trade-offs among the rate design policies and objectives.

2.3 Water Use Efficiency and Conservation

In the past, regulators and rate designers have had a desire to adopt rates that encourage conservation and water use efficiency. As discussed previously, the legal requirements governing water rates in California prohibit RPU from developing rates with the sole or explicit goal of driving water conservation. However, the promotion of water conservation and efficient use is often a secondary effect of cost of service based rate structures such as tiered or seasonal rate structures. As customers receive price signals and continue to monitor and improve their own water use efficiency, water conservation will increase as a result.

2.4 Equity and Fairness

Equity is a term commonly used in state statutes and laws that authorize publicly owned utilities and define utilities' regulatory objectives. Equity can be described or characterized in the water industry as producing no undue discrimination between customers as well as implementing fair rates. Developed rates should be able to demonstrate they are fair and not unduly discriminatory to any customer or customer class. Additionally, California law requires that charges for water service should not exceed the reasonable cost for providing that service.

2.5 Fixed and Variable Costs

An important aspect of the cost of service analysis is the classification of costs into fixed costs and variable costs. Fixed costs are costs associated with labor, equipment, debt service, and infrastructure. They are related to the production, transmission, distribution, and administrative services of the utility with little to no correlation to the amount of water sold. Variable costs are costs associated with some aspects of production, transmission, and distribution, and variable operations and maintenance. These costs vary with the amount of water sold and for RPU primarily consist of energy and chemical costs.

RPU introduced increased fixed cost recovery in the form of increased monthly fixed charges with the approval of the water five-year rate plan effective July 1, 2018.

2.6 Functional Cost Allocation

In the cost of service analysis, costs are divided into production, treatment, transmission, distribution, and customer service costs to help determine the rates for each class of service. The process of functional cost allocation is done to ensure customers are charged for the costs on the system they incur and are not charged for costs on the system they do not incur. This allows the utility to better understand its cost to serve customers for each of its functions or business units. The COS analysis will unbundle the costs of providing water service to functional components and provide RPU with insights for the rate design process.

2.7 Low-Income Rate Programs

Historically, water agencies have tried to keep rates for low-income customers, especially residential customers, as low as possible. The use of targeted low-income rates or rebates for water agencies in California has been complicated by the requirements of Proposition 218 which prohibits the use of rate revenues from other users to fund such programs.

RPU has developed a low-income bill assistance for eligible water customers through its Sharing Households Assist Riverside's Energy (SHARE) program and specifically uses non-rate revenues to fund the water bill credits. The credits provided by the SHARE program are updated periodically to align with RPU's rate increases. Recently, Senate Bill 756 updated the eligibility requirements to extend credits to households at up to 250-percent of the federal poverty line. Under the SHARE program, eligible households receive a fixed monthly benefit which offsets their water bill and has been particularly beneficial in lessening the impact of increasing fixed charges.

Chapter 3

EXISTING RATE STRUCTURES

Water rates are an important and effective tool for encouraging conservation while promoting the fiscal health of the utility. Given the inverse relationship between the price of water and consumption, it is important for RPU to balance conservation and revenue stability. In addition to conservation and revenue stability, RPU's rates must meet the requirements of the Proposition 218, which requires water rates to be based on the cost of providing service to a utility’s customers. When considering alternative rate structures, it is important to review their effects and consistency with existing utility objectives and policies. For instance, rate structures that promote conservation can lead to decreased revenue stability if not properly accounted for. Additionally, pricing and structure alone might not always accomplish the goal of maintaining stable water demand, especially considering the diversity of RPU's customer base. For example, continuing changes in weather and economic conditions might have asymmetric effects on different customer classes.

In addition to policy goals, legal requirements, conservation, and fiscal health, rates should also be analyzed for equity, transparency, and implementation requirements. The following sections will discuss the requirements and impacts of each component in further detail.

3.1 Customer Classes

Developing any rate program is a matter of configuring structures to customer classes based on the usage pattern of each specific class. For example, a tiered rate structure could be applicable to both a single-family residence (SFR) customer and a multi-family residence (MFR) customer. However, tier sizes should be different based on the demand pattern of each class. An SFR customer tends to be homogeneous, whereas MFR customers have accounts that serve multiple dwelling units.

During the previous COSA Study, RPU conducted a thorough review of the customer base, the available customer classes, and how customers were assigned to each class. As a result, RPU refined the customer classes to include multi-family and landscape irrigation rates.

3.1.1 Multi-Family Rates

Prior to the last Cost of Service and Rate Design Study, RPU's multi-family accounts were grouped with either single family residential users or commercial users depending on the number of dwelling units associated with each account. Based on the recommendations of the previous COSA study, on July 1, 2018, RPU implemented a multi-family specific rate class for customers with 2, 3, or 4 dwelling units. The structure employs tiered rates with allotments multiplied by the number of dwelling units, rather than a fixed tier allotment. This rate structure can encourage efficient use of water; as usage per dwelling unit can be the basis for tiering, rather than total demand. Customers with more than 4 dwelling units are grouped with commercial customers as the seasonal demand profile of larger multi-family complexes and commercial customers are similar.

3.1.2 Landscape/Irrigation Rates

Based on the recommendations of the previous COSA study, RPU created a landscape irrigation rate class with specific rates, which were implemented as of July 1, 2018. By implementing this rate structure, RPU was able to identify and recover the cost of irrigation (peaking). Though this change resulted in proportionally higher costs for irrigation users, those costs are justified as they reflect the higher peak demands placed on the system by irrigation users.

3.1.3 Agricultural Water Service Rates

In the past, RPU had several agricultural rate classes to provide specific rates for customers that used potable water for agricultural production or a combination of agricultural and residential uses. During and after the completion of the previous COSA Study, RPU analyzed the customers within those classes and created an Agricultural Rate Task Force to develop an updated agricultural rate class policies and rates. Through that process, RPU implemented the agricultural service rate.

The agricultural service rate is open to customers who meet qualifying criteria including location within the service area, a physical onsite inspection, land use requirements, and have a minimum amount of qualifying crops or livestock. The agricultural service rate provides qualifying customers with a monthly agricultural water allocation at incentivized rates, supported by non-rate revenues.

3.2 Fixed Charges

As shown in the pie chart at the beginning of this memo, approximately 90 percent of RPU's costs are fixed. A well-crafted rate structure should consider which fixed costs should be recovered from a fixed component and from the volumetric component. Once that has been accomplished, further consideration is needed to calculate how to proportionally recover those costs from customers. For example, billing costs are seen as a per account basis, whereas debt service, which represents capacity, is considered on a meter equivalent basis. RPU has the discretion to recover costs between the fixed and commodity portion of the fee and is not required to set the fixed fee to recover all fixed costs, which would likely be unfeasible. Specific fixed costs related to customer service and capacity reservation are recovered through the fixed charges, while other fixed costs related to water supply, system operations and maintenance, and other activities are recovered through the volumetric rates.

Prior to the previous COSA Study, RPU’s fixed monthly customer charges by meter size were specific to each customer class. For example, a 1-inch meter for residential customers had a different monthly fixed charge than a 1-inch meter for a commercial customer. This led to customer service and rate acceptance issues as customers often questioned the charge discrepancies. While such rate structures can meet cost of service requirements, simpler structures with consistent charges across all classes are more straightforward to develop and more intuitive for customers. Based on the recommendations of the previous COSA study, on July 1, 2018, RPU implemented fixed monthly customer charges by meter size that includes uniform charges among all customer classes.

3.3 Volumetric Rates

RPU currently uses several types of volumetric rates with specific structures used for different customer classes. Non-residential customers including commercial, industrial, and landscape users are charges based on seasonally adjusted uniform rates. Residential customers have inclining block tiered rates. Customers who receive a decreased level of service (interruptible) pay specific rates to reflect the lower level of service.

3.3.1 Uniform Rates

By definition, a uniform rate structure is defined as a constant volumetric rate charged on all metered units of water, generally expressed as a constant cost per thousand gallons or cost per hundred cubic feet. It should be noted that the uniform rate charged to each customer class can vary. Historically, this has been one of the most common rate structures and is easy to implement and understand. With recent regulations and environmental guidelines, more agencies have been abandoning uniform rates in favor of rate structures that promote more efficient water usage.

According to American Water Works Association's (AWWA's), utilities might consider uniform rates when:

- Customer groups or service classes exhibit similarities in usage, or demand characteristics.
- Varying rates by customer or service classification is undesirable from an equity or other perspective.
- Simplicity and customer understanding of the rate structure are valued highly.
- Rate uniformity adequately addresses efficiency and conservation concerns.
- Cost and usage data by customer or service classifications are not available or too costly to develop (*i.e.*, cost outweigh potential benefits).

The first two bullets above relate to uniform rates with a single volumetric rate for all customers, regardless of class. Most often, a uniform rate structure is applied in circumstances where creating or defining tiers would be administratively difficult or generally create inequities within customer classes (small vs large water users).

3.3.2 Increasing Block Rates

An increasing block rate is a type of tiered rate structure where the unit price of water increases in incremental steps as consumption increases. This type of rate structure is considered one of the most conservation-oriented rate designs. However, increasing block rates may result in higher administration and implementation costs than uniform rate structures given the increased complexity of setting and communicating rate features.

Furthermore, the effectiveness of this rate structure is dependent on the number of price blocks, the price difference between the blocks, and the water usage volumes covered by each block. Although AWWA materials note that increasing block structures typically consist of two or three blocks, the Alliance for Water Efficiency (AWE) suggest that three to four blocks are adequate for an effective residential rate design. AWE further recommends selecting the first price blocks such that, at a minimum, it includes water for health, safety, and sanitation purposes to a typical household at a reasonable price. RPU implemented this approach with the residential rate structures implemented on July 1, 2018. RPU's tier 1 assumes four people in the household for single family residential and three people in the household for multi-family at 55 gallons per person per day as a suggested standard by California State Water Resource Control Board's water efficiency guidance. Further, recommendations based on cost of service, include setting price increases between the blocks at or greater than 50 percent, if possible. Under this rate structure, it is anticipated that demand in the higher blocks will be more responsive to price signals (*i.e.*, more elastic) than demand in the first block (*i.e.*, more inelastic).

According to AWWA, increasing block rates should be considered by water utilities when:

- The utility can distinguish separate customer classes for billing, such as single family residential, multi-family residential, commercial, and industrial users.

- Data exists that allows for the analytical capability to design block rate structures, including defining the amount of water sold per block and potential demand responses to differential rate impacts.
- A policy objective is to send a stronger price signal to higher volume users.
- The utility is willing and capable of investing administrative cost to communicate the nature and the rationale of increasing block rates to customers.

Generally, increasing block rates are differentiated by customer class or meter size. This allows the utility to recover customer specific costs and achieve a greater degree of rate equity. If implemented correctly, increasing rates recover class-specific costs while promoting efficient water use.

One potential disadvantage to the current increasing block rate structure that RPU uses is the potential for decreased revenue stability. As customers adjust to the increased cost of consumption at higher levels, the consumption curve may shift further to the left (similar to the cumulative distribution function shown in Figure 1.3) resulting in reduced revenues. Moreover, while uniform rate customers are likely to reduce consumption habits under any metered rate structure, an increasing block rate structure may amplify this effect. Continued efficient water use and conservation might also require tier blocks to be routinely adjusted to match current and forecasted consumption patterns and provide sufficient revenue to the utility.

3.3.3 Seasonal Rates

Seasonal rates are established to recover seasonal system costs which often result in encouraged conservation during peak times of the year. Higher rates are applied during periods of higher consumption, and lower rates are applied during periods of lower consumption. This rate structure requires a greater level of customer information and may result in higher implementation and administrative costs. However, seasonal rate structures recognize fluctuating demand patterns while recovering costs consistent with demand patterns.

For many water agencies, costs increase during summer months due to this need for extra capacity to serve additional outdoor demand. Seasonal rates send a signal to water users that resources costs more during peak seasons and provide an incentive to reduce their consumption during peak-use periods. It should be noted that this structure can be used in combination with any other rate structure. According to AWWA, seasonal pricing can be effective in several situations, including the following:

- There is a substantial and clear variation in demand that exists between peak and off-peak seasons.
- A utility is capacity constrained as a result of seasonal demand.
- A utility experiences seasonal fluctuations in the number or types of customers served.

As peak demand seasons tend to occur in summer months when demand for outdoor water usage is at its highest, seasonal rates can be an effective tool in promoting efficient outdoor water use. Empirical studies have indicated that outdoor water users tend to be more responsive to price signals. As price rises, there are relatively easy changes in irrigation practices that can significantly reduce outdoor water consumption. Given that outdoor water use accounts for nearly two-thirds of residential water demand, implementing seasonal rates is an effective way to promote conservation and more efficient water use.

3.3.4 Interruptible Rates

During water shortages, reducing the quantity of water delivered to certain customers could help RPU achieve water reduction requirements. RPU placed select customers on interruptible service, where water delivery can be reduced during such water shortages. However, such a rate should only be made available to customers when no public health and safety issue is created due to water curtailments, such as for irrigation users.

This potential reduction in water availability should be recognized in the rate charged. Interruptible service allows a utility to reduce the quantity of water delivered to large customers who agree to forgo some measure or reliability in exchange for lower rates.

Interruptible service carries some potential risks to the end users. Users who agree to participate in the interruptible service might not receive water service or could receive a reduced quantity of water during water shortages. The utility should ensure the customers with interruptible service make provisions to deal with potential interruptions.

Based on the recommendations of the previous COSA study, on July 1, 2018, RPU implemented the Interruptible Irrigation Service rate which is applicable only to properties owned or controlled by the City including but not limited to parks, groves, landscaped medians, and reverse frontage, where such water service can be immediately terminated without threat to health and safety and such termination can continue for an indefinite amount of time.

RPU's recycled water users currently receive the same benefits and rate structure as the interruptible rate class as the nature of the recycled water system does not guarantee them the same level of reliability as the potable system.

3.4 Outside City Surcharge

Per the AWWA's definition, surcharge is a separate charge added to existing rate structures to collect either a targeted amount of revenue or to assess an appropriate charge for particular usage characteristics outside of those covered in the basic charge for service.

Surcharges for customers outside the city limits have become common over the years. Because these customers lie outside City limits, RPU incurs additional capital and operating costs to provide them with water service. Currently, RPU computes the outside city surcharge by using multiplier of 1.47 to the inside city rates to recover additional capital and operating costs borne by the City that benefit outside city customers.

3.5 Conservation Surcharge

In April 2014, the City of Riverside Council adopted a Resolution No. 22675 renewing the water conservation surcharge effective for a ten-year period. The water conservation surcharge is a 1.5 percent surcharge applied to the customer's total water consumption including, without limitation, the quantity rates, customer and minimum charge for the applicable billing period. The Water Conservation Surcharge is utilized for 1) conservation, education, and water use efficiency programs, and 2) research, development, and demonstration programs to advance science and technology with respect to water conservation.

Chapter 4

EMERGING AND ALTERNATIVE RATE STRUCTURES

While Chapter 3 of this report detailed the existing rate structures, there are many adaptations of those outlined above. Similar to RPU's combined seasonal and inclining tiered rates, the following structures are simple iterations of how each rate structure can be modified to adapt to the specific needs of the utility and adapting trends.

4.1 Previously Explored Rate Structure Elements

Several rate structure elements were evaluated, to varying degrees, during the previous COSA study but not implemented or adopted. Those elements included cost adjustments, decoupling, and drought and demand reduction rates.

4.1.1 Cost Adjustments

RPU has considered including power and chemical cost adjustments for customers. If implemented, recovering those incurred costs would be more specifically tracked, rather than relying on assumed escalation factors. The cost adjustment mechanism could then be set to recover upcoming qualifying costs and adjusted for cost recovery versus recognized costs in the previous period.

4.1.2 Decoupling of Fixed Charges

While decoupling is more common among gas and electric utilities, RPU could consider implementing this structure. In short, RPU would determine what the fixed cost recovery would be in terms of rates. If sales decrease and RPU cannot recover the revenue, one option would be to add an adjustment for the following year. An advantage to decoupling is improved fixed cost recovery of the utility. However, this could also be difficult to quantify and administer, while also causing rate fluctuations for the customer.

4.1.3 Drought and Demand Reduction Rates

While there are several types of conservation pricing structures, the main objective of a drought rate is to achieve a reduction in consumption proportional to the severity of the drought while maintaining the utility's financial integrity. As stated by the AWWA, drought/demand pricing approaches might be in the form of an overlay to the utility's existing rate structure (such as a surcharge) or may be a separate rate structure implemented during the emergency.

Being prepared for drought conditions through careful planning and customer communication is necessary to promote an effective rate structure during a drought. Having a clearly defined rate structure in place is a powerful communication tool for end water users. Furthermore, a well-planned drought rate structure should provide an incentive to reduce consumption while maintaining revenue neutrality.

While price plays an important role in reducing consumption, it is not the only attribute that affects water demand. An extensive education program which outlines effective methods for reducing water consumption can also be a significant factor in curtailing water demand and is especially relevant in communicating drought conditions.

In addition to educational programs, drought/demand pricing must send a strong price signal to customers. As noted, drought/demand pricing can be implemented in many forms. The following provides several drought/demand pricing options for RPU to consider:

- **General monthly fixed charge -** This approach would identify the fixed costs associated with the drought and apply a monthly fixed charge to all users that would recover the additional costs.
- **General rate surcharge -** Examples may include one volumetric rate applied to all usage or that all volume rates (regardless of rate structure) could be increased by a specific percentage to both yield an acceptable level of demand reduction and generate required revenues.
- **Individualized rate surcharge -** This approach applies surcharges to users whose water demands exceed a specified percentage of their base-period water use.
- **Inclining commodity surcharge -** Applying a surcharge for any water use above a certain quantity, with progressively higher increases for larger quantities used.
- **Class-based rate surcharges -** This approach establishes quantity limits per customer for different classes of users and applies a surcharge to any user exceeding the limit for that class.
- **Targeted rate increases -** A utility could target certain customer classes for rate increases that are considered to be able to reduce water use due to their discretionary consumption levels while generating required revenues.
- **Marginal cost rates -** This pricing method is typically based on the unit cost of the next increment of supply, so pricing water equal to the marginal cost per unit usually reflects the implied unit cost of alleviating or mitigating the water shortage.

Each drought/demand pricing structure offers strong price signals to customers. While this is true, some structures may be more desirable on a policy basis. Additionally, a longer-term customer data analysis may improve the effectiveness of the pricing structure by analyzing consumption patterns over a greater range of weather, economic, and demographic conditions. Finally, when implementing a drought rate structure, it is important for RPU to consider the impact that reduced consumption will have on revenues. Price elasticity factors should be used to set drought rates at a level that still recovers enough revenues to cover cash flow needs and maintain financial health. It should also be noted that once the drought is over, consumption levels do not typically return to pre-drought levels. Instead, there tends to be a level of permanent conservation that should be accounted for when returning to non-drought rates.

When developing a drought/demand rate structure, not only would RPU recover its ongoing costs, but it can also account for potential water production cost reduction. Additional costs would also be incurred, including outreach, enforcement, and conservation programs. As RPU is required to progressively reduce water demand according to the stages of the Water Conservation Ordinance (Ordinance), the assumed usage and resulting drought rates should be calculated and then be incorporated as RPU moves to different stages within the Ordinance. The demand reduction stages are further defined in RPU's Water Shortage Contingency Plan. If originally approved by the City Council, the drought rates can be automatically implemented as the City Council authorizes or the State mandates moving to different stages within the Ordinance. An important factor is that drought rates should be calculated based on cost of service. When these rates are implemented, RPU must confirm based on water demands that the drought rates will be sufficient based on the current situation.

With growing concerns about drought, there has been much discussion regarding drought surcharges in California. Drought surcharges are often used on an emergency and temporary basis to pay for costs associated with purchasing emergency water supplies during a severe drought or to support drought restrictions. In the recent Eastern Municipal Water District's (EMWD's) Water Shortage Contingency

Plan (WSCP) approved in June 2021, it summarizes water shortage stages and actions in each stage. Although EWMD does not have drought charges in place for customers, the WSCP discusses if a consumer fails to comply with a mandatory reduction, a surcharge will be incrementally added to their water bill based on number of violations.

During periods of drought, water utilities, such as EMWD and WMWD, have the ability to adjust water budgets by reducing the water allocations or possibly eliminating the consumption Tier for excessive use. This is discussed in more detail below in the Neighboring Agency Rate Structure Trends section.

4.2 Water Budgets

This type of rate structure supplies each customer with a personalized increasing block tier structure, designed to meet specific indoor and outdoor watering needs. Given the possibility for tailoring the rate structure to an increased number of customers, utilities implementing it can incur significant administrative costs due to the need for a sophisticated billing system and ongoing communication with the public.

The water budget rate structure defines usage blocks based on individual customer characteristics. These rates have been implemented in agencies and communities like Irvine Ranch Water District, Eastern Municipal Water District, Western Municipal Water District, and other communities facing limited water supplies and shortages. There are several ways to impose water budgets, but the most common method is to determine an allocation made up of indoor and outdoor use. The allocations can be determined based on a number of factors, including:

- The indoor allocation is usually based on number of residents per household.
- The outdoor use can be determined by factors such as lot size, landscaped area, return to sewer factors, and/or estimated plan water needs .
- Charges for exceeding the budgeted water amount can vary. Multiple "excessive" or "wasteful" charges may be established to discourage such water usage by applying increasing punitive rates to each additional unit of water.

A utility usually establishes budgets on a customer-by-customer basis or reorganizes residential customers into multiple subclasses. Each customer is charged based on their allotted water budget and any excess use over their budget volume is charged at an increased rate. The biggest advantage of water budget rates from a customer and utility standpoint is perceived fairness. Utilities can recover class specific costs and consumers have the flexibility to use their allotted water as they see fit. Others argue that linking the amount of water received at a lower price to factors such as persons in the household or lot size is an inequitable rate structure and provides more water at lower prices to those that are more readily able to afford it.

While water budgets for residential customers can be readily established using account and property characteristics, budgets for commercial and industrial customers are more difficult to define due to their greatly varied usage and account characteristics.

Utilities implementing water budget-based rate structures may incur significant costs for additions or modifications made to billing system software, database development, determining each customer's irrigable area, and staff training. Additional customer service personnel may also be required during the transition to assist customers with understanding their new water bills and completing variance requests or adjustment forms. Customer outreach and education is important to assist customers with understanding and staying within their assigned budgets. Customers who have more than the standard number of persons in their household or larger landscaped lot size can often file for variance requests or adjustments, which increase the customer's tier budget allotments. Adjustments include number of persons in household (number of persons over the assumed minimum), irrigable area, swimming pool, spa, and other special circumstances. Since each variance or adjustment factors into each individual customer's water budget, the various components increase the complexity of the bill calculation and the requirements of the billing system. These added costs will need to be explored when considering this water budget rate alternative.

4.2.1 Water Budget Hybrid

As discussed previously in this memorandum, water budgets are designed to provide each customer with a personalized rate structure, intended to meet specific indoor and outdoor watering needs. While this could benefit RPU and customer classes in the long term, implementation within the billing system and increased administrative costs could prove to be difficult in the short term. Should RPU choose to eventually implement a water budget structure, one option could be to develop interim processes that will lead to their desired structure. Some agencies have combined aspects of inclining block tiered rates and water budgets into a simplified water budget structure. Under the hybrid methodology, rather than specific allotments for each user, customers are grouped into subclasses based on lot size.

Water budget hybrid rates have been developed to consider each customer lot size, as well as seasonally specific outdoor water needs. A single-family residential budget hybrid rate structure would be designed to promote efficient water usage, while minimizing administrative impacts.

4.3 Service Charge for Low Volume Users (Lease-Back)

Low volume users have a larger percentage of their bill made up of an existing fixed charge. As with any fixed charge, it reduces the ratepayer's ability to control their own bill. Alongside discussions of fixed versus variable, RPU staff wanted to review possible alternatives to address this challenge. As implemented by other agencies, Carollo presented the concept of providing a "lease-back" conservation credit to those whose use remains in Tier 1, via a fixed service charge reduction. This rate structure could allow RPU to compensate low volume customers, through the lease-back bill credit, for their underutilized capacity which RPU can use to serve other customers.

Most fixed service charges have two components: a customer component that covers costs that are identical for each account, such as reading meters and billing; and a capacity component that covers the reserved capacity in the system that each meter purchases, depending on its size. This second portion goes in large part to the repair and replacement of system infrastructure. The baseline rate is calculated on the meter's maximum flow capacity and thus demand on the system. With a "lease-back" approach, an agency can recognize that a low volume user is not fully using their potential capacity, and therefore, it is reasonable to provide a lease-back credit to users who are underutilizing that flow and effectively "leasing it back" to the system for other users. This could prevent RPU from having to upsize infrastructure as quickly as capacity is exhausted.

Overall, this lease-back credit would have a no impact on RPU's revenue goals, but from a customer standpoint, this would provide a cost of service-based incentive for residents to further conserve, especially if they are just beyond their Tier 1 allocation each month. As this capacity is being utilized by those over their base allocation, their over-allocation revenues would pay for leasing this capacity. If implemented, it is important for RPU to continue to monitor the lease-back credit methodology to confirm its ongoing nexus to cost of service.

4.4 Time of Use Rates

With the use of advanced metering infrastructure (AMI), the water utility industry is moving closer toward the ability to implement rates based on when the water is consumed rather than just based on how much water is consumed. Creating time-of-use periods that are easy to understand, such as on-peak, mid-peak, and off-peak periods, allows customers to react to the varying costs the utility incurs to provide water during times of peak demand and incentivizes customers to shift use to off-peak periods. This structure better aligns peaking costs and those users specifically demanding peak service during peak time of use periods. Time-of-use pricing allows the utility to use existing infrastructure more efficiently as well as to optimize infrastructure to hopefully defer the construction of additional facilities.

RPU does not currently have the ability to offer TOU water rates as AMI has not yet been implemented. In the future, once AMI is in place, RPU could consider TOU rates for water service. While broad use of this structure across all customer classes might not be applicable in the near-term, certain customer classes could be targeted for a pilot program to encourage shifting their behavior from peak hour or day to off-peak timing. For example, large commercial and industrial or agricultural customers with significant demands could be offered a time-of-day usage rate in order to change the diurnal demand patterns on the system and shift operational requirements.

4.5 Interruptible Rates – Non-City Customers

Interruptible rate structures can be used to develop rates that reflect the lower level of service received by customers whose service may be uninterrupted or downgraded during times of drought or otherwise decreased supply availability. Such rate structures should only be applied to customers that can be reasonably expected to curtail demands when required to do so. In return for the ability to curtail, interruptible users pay lowered rates as compared to other similar users.

Since the completion of the previous COSA study, RPU has used interruptible rates to charge properties owned or controlled by the City including but not limited to parks, groves, landscaped medians, and reverse frontage, where such water service can be immediately terminated without threat to health and safety and such termination can continue for an indefinite amount of time.

In general, interruptible service and rates are most appropriate for occasions when maximum-day or maximum-hour water demands consistently approach the physical limitations of supply or treatment capacity, or when peak load growth projections show a rapid increase in peak demands on the utility’s system. In such cases, providing interruptible service to some large customers may allow RPU to postpone investment in new supply, treatment, and delivery facilities. RPU may avoid or defer installing capacity to meet the portion of load that is served on an interruptible basis, which will reduce capital outlays and may also avoid or delay a potential rate increase, thereby providing benefits to all customers.

Interruptible rates are often difficult to implement for private customers as they require the ability for water agencies to enforce curtailments when necessary and monitor that customers are within compliance. If interruptible rates were developed for other non-city customers, RPU would also need establish the authority and control to enforce and monitor curtailments within the rate tariff or by resolution or ordinance.

4.6 Recycled Water Rates

Each of the aforementioned water rate structures can be readily applied to recycled water customers. As with all water rates, recycled water rates must be based on the cost of service analysis. A recent legal ruling (San Juan Decision) provided additional clarity in the pricing of recycled water. The ruling determined that recycled water has both direct and indirect benefits to water utility customers and can therefore be accounted for as a supply cost within the utility's overall water portfolio, rather than being accounted as a separate and distinct supply source wholly benefitting direct users – treating water as water. As such, the recycled water system can be treated as a stand-alone cost center or recycled water users can be treated as any other irrigation user.

Recycled water rate structures depend significantly on whether the recycled system is considered integrated with potable and sewer operations ("One Water" approach) or if it is a self-supporting enterprise. Utilities most often choose the One Water approach with newer constructed recycled water systems, as it would be cost prohibitive to recover recycled water capital projects in a standalone rate. On the other hand, utilities such as Eastern Municipal Water District (EMWD) and City of Carlsbad have historically established recycled water programs whose initial capital projects are paid off and therefore can recover recycled water costs through a separate rate.

For agencies that chose to separate recycled water as a unique service line, one of the challenges could be a high upfront cost of developing the recycled water system. A more common option, recycled water operations can be integrated with potable, but recycled water users are charged a specific rate for recycled water service. Lastly, recycled water users could be treated as irrigation customers and charged the appropriate irrigation rates, regardless of what the sources of supply would be. The challenge of this approach would be to clearly communicate that all users (potable and non-potable) are beneficiaries of this supply regardless of whether or not they receive direct recycled water service. However, the benefits would be a reliable supply and it would free up capacity and potable groundwater supplies that other customers can use.

4.7 Regulatory Pass-Through Charge

Regulatory pass-through charge structures allow water agencies to pass the costs outside of its control to customers using a dedicated rate or as a component of the agencies normal rates and charges. A regulatory pass-through charge could establish a rate component tied to the regulatory requirements of providing water service and be modified or update when changes in those requirements lead to increased costs. For example, the Los Angeles Department of Water and Power's water rates include the Owens Valley Regulatory Cost adjustment to recover expenses for several of their mitigation projects. RPU could establish a regulatory pass-through charge to recover the cost of PFAS treatment that may require additional treatment facilities in the future.

4.8 Supply/Infrastructure Charge

Many water agencies' rate structures include charges related to specific capital investments including supply development or reliability, infrastructure replacement, or other specific capital projects. Such charges allow for agencies to establish dedicated revenue sources to pay for projects without impacting the core service rates and charges. Supply/infrastructure charges can also help to provide bill transparency to customers as they can see how the funds from their rates are used by the agency.

Supply/infrastructure charges can be developed as fixed charges per account or meter; or assessed as variable charges based on water consumption. The most appropriate structure depends on the types of projects to be funded and how those projects benefit the system's customers. Revenue from the charges can be used directly to cash fund projects, accumulated in a sinking fund and utilized once sufficient funds for large projects have been accrued, or used to repay debt service on bonds or loans that funded applicable projects. Example of Supply/Infrastructure charges used by other agencies include:

- Western Municipal Water District's Reliability Charge – a consumption-based charge per CCF used to support the cost of capital expenditures that enhance local water supply reliability.

- Pasadena Water and Power's Capital Improvement Charge – a consumption-based charge per CCF used to support the cost ongoing capital improvement to the Pasadena Water System.
- Eastern Municipal Water District's fixed charges (Daily Service Charges) include a specific Reliability Capital Fee component to fund ongoing rehabilitation and replacement projects.

For RPU to adopt a Supply/Infrastructure charge, it will first need to identify the specific projects or types of projects to be supported by the charge. Once the projects are identified, the charge can be developed to reflect the benefits provided to the customers.

4.9 Neighboring Agency Rate Structure Trends

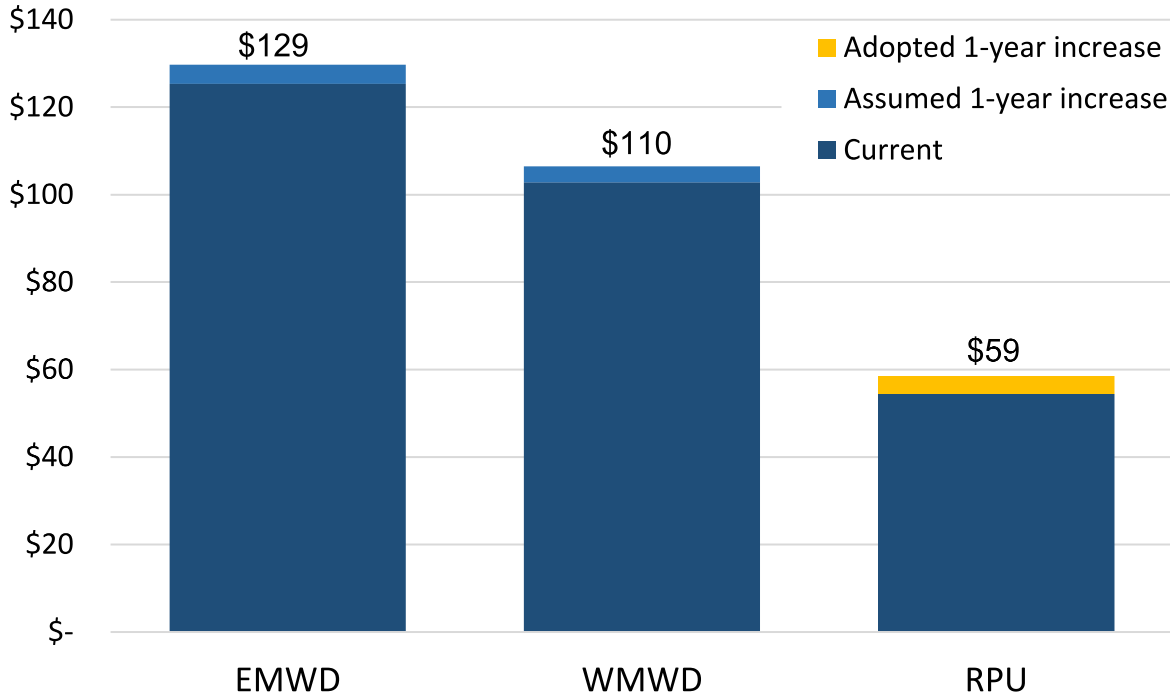
Due to Proposition 218 and metering constraints, many California water utilities have not instituted drought-related surcharges. To address mandatory drought restrictions, a more common trend across water utilities is switching from a set volumetric tier structure to the Water Budget method. For example, Eastern Municipal Water District (EMWD) and Western Municipal Water District (WMWD), among others, use this approach. EMWD calculates its residential bills based on 55 gallons per person, daily weather information, and year in which homes were connected to the system (prior to 2010 receive 80 percent of evapotranspiration rate, after 2015 receive 50 percent). EMWD has four tiers based on percentage of each customer's water budget – Tier 1 is the first 20 percent, Tier 2 is 21 percent to 100 percent; Tier 3 is 101 percent to 150 percent; Tier 4 is over 150 percent. EMWD uniquely ties the water budget to the sewer rate structure, so that households claiming more people will also be responsible for a higher sewer block. WMWD also has four tiers in its residential water budget rate structure. Tier 1 is based on the persons per household at 55 gallons per capita per day, Tier 2 is based on irrigated landscape area, an evapotranspiration rate, and a landscape factor, Tier 3 is based on 54 percent of Tier 2 Outdoor budget, and Tier 4 all usage above Tiers 1 through 3.

For commercial, institutional, and industrial (CII) customers, EMWD has three tiers where Tier 1 covers the full water budget. The calculation also includes a Conservation Factor (CF) up to 1.0 for functional landscape areas based on its water use efficiency.

Lastly, EMWD adopted drought policies that, during Stage 3 Mandatory Waste Reduction, reduces by 50 percent or eliminates Tier 3 Excessive Use. In more extreme droughts, EMWD will reduce customers water budgets based on severity of weather conditions. WMWD adopted drought policies that begin during Stage 3 of its Water Shortage Contingency Plan (WSCP), where drought fines are applied based on meter size and percentage of customer usage occurring in the restricted tier. Additional stages of the WSCP require greater reductions to customer water budget allocations.

While RPU is not dependent on imported water, other utilities are also trending towards more MWD passthroughs as this approach allows the flexibility to adjust to high inflation without going through the Proposition 218 process.

Figure 4.1 Neighboring Agency Single Family Bill Comparison



Note: Assumes average monthly bill with 21 CCF of consumption and rates as of April 20, 2022.

Chapter 5
PROMISING TECHNOLOGICAL TRENDS

Emerging technologies are important to follow and understand for RPU to stay relevant with the surrounding utilities in California. Over the past few decades, these capabilities have rapidly advanced in ways that give utilities multiple ways to collect, interpret, and present data. It is important to research the emerging technological trends to determine how RPU can benefit and improve communication with customers. The water industry anticipates innovative management tools to continuously emerge, including Advanced Metering Infrastructure (AMI), Digital Twins, Intelligent Asset Management, and Artificial Intelligence.

5.1 Advanced Metering Infrastructure (AMI)

AMI is an integrated system of smart meters, communications networks, and data management systems that enables two-way communication between utilities and customers. The system collects the customer's information instantaneously and transmits it on a more frequent basis. This can benefit the customer in multiple ways, including leak detection and providing a better understanding of water usage as AMI allows the customer to review their water demand in real time. In the short term, this could potentially affect the customer's behavior by decreasing their water usage.

Since the last study, RPU recognized the significance of AMI implementation and has explored doing so into its capital planning efforts. The advanced meters could not only improve reliability and manage RPU’s system better, but also allow RPU to generate finite cost allocation and identify diurnal patterns in customer behavior. The AMI project is currently on hold pending implementation.

RPU would also benefit from using this technology in the long term as it would allow them to create finite cost allocation as well as discovering diurnal patterns in customer behavior. From a rate setting point of view, AMI in place will provide sufficient data to eventually give RPU the option to study better correlations between demands, price signals including time of use and real time pricing that reflect utility costs, conservation messaging, and other factors.

5.2 Digital Twins and Advanced Hydraulic Modelling

Digital twins are a virtual copy of the water system that simulates behavior and responses under real and simulated scenarios, providing a holistic view to bolster decision-making. Having in-depth knowledge of the local system in various conditions can help utilities avoid problems and decrease downtime while also simulating the impact of future planning decisions. The technology was originally used for NASA remote systems maintenance and later used for industrial product life cycle. Due to the increasing prevalence of automated and computerized systems, Digital Twins are becoming more frequently applied to infrastructure management – such as the water industry’s distribution systems.

RPU could benefit from integrating this technology into their management practices to help prepare for increasingly frequent drought scenarios. However, implementing digital twins requires significant data and information from the physical system and would depend on the extent of RPU’s AMI, GIS, or Supervisory Control and Data Acquisition (SCADA).

5.3 Intelligent Asset Management

As these innovating technologies continue to emerge, asset management is becoming a more critical component of utilities' maintenance and management of their assets. Utilities would greatly benefit from having reliable and high-functioning asset management programs and would be able to better manage and maintain the data, tracks detailed asset inventories, manage operation and maintenance tasks, and forecast long-term financial planning.

To organize the volume of information received through AMI, SCADA, GIS, etc., utilities have begun integrating intelligent asset management into their processes so that decisions can make full use of available data. Some have applied this technology to extend assets' lifetime, pinpoint problematic materials to facilitate preventative maintenance, or optimize energy consumption by pumps and operations.

An effective asset management program can benefit ratepayers by optimizing investments in the water system. Predictive maintenance can be performed to avoid costly failures and emergency repairs and extend asset life. Further, more refined and informed capital planning can be completed to avoid premature replacement of assets.

5.4 Artificial Intelligence

Like in many industries, utilities are anticipating to integrate Artificial Intelligence (AI) into their service operation in the near future. Broadly, this science replicates human cognitive functions through machines. For water utilities, this can reduce expenditures by automating processes that are costly to manage manually. RPU can potentially apply AI to early leak or fraud detection to further reduce their expenses. Other water utilities have used AI to estimate and anticipate consumption, predict water quality, or optimize energy use in pumping systems while wastewater utilities have applied it to detect overflows, implement preventative cleaning, or detect pathogens, contamination, and scarcity of clean water. If RPU were to integrate this technology with its service system, it should first consider the infrastructure necessary to support this process as well as security issues for storing the information.

5.5 Household Technologies

In addition to the trends listed above, smart home technology continues to be prevalent and proliferate through communities, enabling greater efficiency and utilization of the AMI technology. As consumers better understand and visualize their demands, conservation messaging can be personalized and pin-pointed by the utility to specific users and actions, rather than utilizing general flyers or monthly bill inserts.

Furthermore, technological advances and increased water efficiency standards have led to continued water efficiency improvements of household appliances. As more households install efficient appliances and irrigation controllers, increases in conservation are likely to continue. Additionally, further conservation may be caused by current trends in efficient landscaping practices, most notably the improvements of artificial turf.

Since last Study, the Model Water Efficient Landscape Ordinance (MWELO) has been adopted preventing water from being wasted on irrigated landscapes. With the State's continuing conservation effort, this ordinance is not only intended to increase water efficiency, but also to improve environmental conditions in the built environment. It prohibits installation of turf unless it is used for a specific function such as sports fields or gathering areas, requires the installation of highly efficient sprinkler nozzles, bans turf in street medians and parkways with few exceptions and requires use of compost to improve the water-holding capacity of soil.

5.5.1 Rebate Programs

Rebates can provide an incentive for users to update their household and commercial technologies. Many utilities, including RPU, provide their users multiple rebate options that are relatively easy to implement and reduce water usage upon installation. High-efficiency toilets, washers, and other water-saving devices are given rebates or are even available free of charge in some instances. Outdoor programs also commonly provide mulch coupon programs and rebates for upgrading lawn and irrigation equipment for residential, commercial, and multi-family homes.

Chapter 6

RATE STRUCTURE EVALUATION MATRIX

The following tables were developed in collaboration with RPU staff to provide a general overview and comparison of the different rate structures discussed above. Table 6.1 explains some of the advantages and disadvantages for RPU of each rate structure upon implementation. The table also includes a timeline of when it could be implemented. Table 6.2 explains some of the advantages and disadvantages the customers would have of each rate structure if implemented.

Table 6.3 provides further detail of the timeline. As described below, the one-year timeline addresses the near-term structures and what RPU would like to implement based on the current Cost of Service Analysis and Rate Design Project. Years two through five, known as mid-term, would represent certain rate structures that could be implemented soon thereafter and would continue to address the ability to implement customer understanding and consideration, revenue sufficiency and stability requirements, existing technology, and data constraints. Years two through five will also provide a bridge for implementation of long-term needs. The long-term (over five years) will continue to consider future rate structures that address these objectives.

Table 6.1 Rate Structure Advantages and Disadvantages for RPU

	Advantages	Disadvantages	Timeline
Structures Currently used by RPU			
Uniform Rates	Ease of implementation	Does not promote efficient water usage	Short Term
Tiered Block	Recovers class-specific costs	Higher volatility in upper tiers	Short Term
Seasonal	Costs allocated to customers peaking in summer	Customer understanding	Short Term
Increased Fixed Charges	Fixed cost recovery/ revenue stability	Possible large rate increases to low-use customers	Short Term
Multi-Family Rates	Efficiency of water use	Requires additional billing information	Short Term
Landscape/Irrigation Rates	Costs allocated to customer classes peaking in summer	Customer understanding	Short Term
Agricultural Water Allocation Rates	Incentivize qualifying agriculture	Administrative burden	Short Term
Recycled Water Rates	Reliable supply that frees up potable capacity	Additional infrastructure and high upfront cost	Short, Mid and Long Term
Interruptible Rates	Ability to curtail irrigation customers during drought conditions	Customer understanding and administrative burden	Short Term

	Advantages	Disadvantages	Timeline
Potential Structures Reviewed in 2018 COSA, Not Implemented			
Decoupling of Fixed Charges	Possible improvement in fixed cost recovery	Difficult to quantify	Mid Term
Cost Adjustments	Specific cost recovery	Administrative burden	Short Term
Drought/Demand Pricing	Revenue recovery due to decrease in sales from mandatory drought restrictions	Customer understanding and acceptance	Short Term
Other Potential Structures			
Budget-Based Rates	Customized allocation based on customer characteristics	Complexity, administrative costs and information required	Mid to Long Term
Hybrid Budget-Based Rates	Customized allocation based on customer subclasses	Complexity and administrative costs	Short to Mid Term
Lease Back	Delayed infrastructure upgrades	Monitoring lease credit methodology	Short to Mid Term
Demand Charge	Assign costs to peaking and encourage lower system demand	Customer understanding and acceptance, cost of advanced metering	Long Term
Time of Use	Better recover system costs and encourage demand on system during off-peak hours	Assigning system costs by time periods, customer understanding, cost of advanced metering	Long Term
Regulatory Pass-Through Charge	Specific regulatory or mandated cost recovery	Administrative burden	Short Term
Supply/Infrastructure Charge	Specific supply and/or infrastructure cost recovery	Administrative burden	Short Term

Table 6.2 Rate Structure Advantages and Disadvantages for Customers

	Advantages	Disadvantages
Structures Currently used by RPU		
Uniform Rates	Easy to understand	Possible rate increase to lower users
Tiered Block	Increases efficiency awareness	Larger rate increases for higher volume users
Seasonal	Lower costs during off-peak seasons	Higher costs during peak seasons
Increased Fixed Charges	Lower commodity charges and less bill fluctuations	Possible large rate increases to low-use customers
Multi-Family Rates	Increase in equity between housing units	Need to be efficient based on number of units
Landscape/Irrigation Rates	Known rates for specific customers class	Increases cost to irrigate based on peaking factors
Agricultural Water Allocation Rates	Customized allocation for agricultural use	Initial effort to implement
Recycled Water Rates	Reliable supply	Ability for customer to use recycled water
Interruptible Rates	Lower rate for commitment to curtail	End users risk reduced quantities
Potential Structures Reviewed in 2018 COSA, Not Implemented		
Decoupling of Fixed Charges	Possible future credit for over collection	Possible rate increases due to unknown adjustment in future
Cost Adjustments	Possible future credit for over collection	Possible rate increases due to unknown adjustment in future
Drought/Demand Pricing	Reduced rate increases for those who do conserve/reduce demand	Increase in rate for reduced usage
Other Potential Structures		
Budget-Based Rates	Customized allocation based on customer characteristics	Initial confusion; complexity
Hybrid Budget-Based Rates	Personalized rate structure based on subclass characteristics	Initial confusion; complexity
Lease Back	Incentive for low-volume customers	Slightly higher rates for high-volume users
Demand Charge	Customers can control pricing by monitoring demand	Increased charges for increased demand, initial confusion, complexity
Time of Use	Lower rate for off-peak usage	Higher rate for on-peak usage, initial confusion, complexity
Regulatory Pass-Through Charge	Charge specific to cost recovery	Additional charge on customer bill
Supply/Infrastructure Charge	Charge specific to cost recovery	Additional charge on customer bill

Table 6.3 Rate Structure Implementation

	Short-Term (Within 1 Year)	Mid-Term (2-5 Years)	Long-Term (>5 Years)
Structures Currently used by RPU			
Uniform Rates	Review charges and adjust if necessary	Review charges and adjust if necessary	Review charges and adjust if necessary
Tiered Block	Review cost structure and consider continuing with inclining tiers	Review charges and adjust if necessary	Review charges and adjust if necessary
Seasonal	Consider customer peaking factors and seasonal costs. Consider continuing seasonal structure	Review charges and adjust if necessary	Review charges and adjust if necessary
Increased Fixed Charges	Review charges and cost recovery, consider impact to customer and implement as feasible	Review charges and cost recovery, and adjust if necessary	Review charges and cost recovery, and adjust if necessary
Multi-Family Rates	Review charges and adjust if necessary	Review charges and adjust if necessary	Review charges and adjust if necessary
Landscape/Irrigation Rates	Review charges and adjust if necessary	Review charges and adjust if necessary	Review charges and adjust if necessary
Agricultural Water Allocation Rates	Review charges and adjust if necessary	Review charges and adjust if necessary	Review charges and adjust if necessary
Recycled Water Rates	Evaluate allocation of costs, current and alternative rate structures, and customer acceptance	Evaluate allocation of costs, rate structure and customer acceptance	Evaluate allocation of costs, rate structure and customer acceptance
Interruptible Rates	Review charges and adjust if necessary	Review charges and adjust if necessary	Review charges and adjust if necessary
Potential Structures Reviewed in 2018 COSA, Not Implemented			
Decoupling of Fixed Charges	Consider fixed cost recovery and consider implementation	Consider fixed cost recovery and consider implementation	Consider fixed cost recovery and consider implementation
Cost Adjustments	Identify and assess risk of fluctuating costs and consider implementation	Identify and assess risk of fluctuating costs and consider implementation	Identify and assess risk of fluctuating costs and consider implementation
Drought/Demand Pricing	Determine type of surcharge/rate structures and implement	Review charges and adjust if necessary	Review charges and adjust if necessary

	Short-Term (Within 1 Year)	Mid-Term (2-5 Years)	Long-Term (>5 Years)
Other Potential Structures			
Budget-Based Rates	Consider based on nearby agencies and political and regulatory pressures. Consider costs vs. benefit and collect necessary data.	Review Hybrid Budget. Consider costs vs. benefits and collect the necessary data. Consider implementation.	Consider full budget-based implementation
Hybrid Budget-Based Rates	Identify costs and available information, and consider implementing for specific customers	Review budget structures and charges and adjust if necessary. If not implemented, consider implementing.	Consider full budget-based implementation
Lease Back	Determine type of structure and consider implementation	Determine type of structure and consider implementation	Determine type of structure and consider implementation
Demand Charge	Begin assessment of how to implement and identify costs related to charge	Possible implementation on certain customers with pilot AMI program	Consider implementation once AMI has been established
Time of Use	Begin assessment of how to implement and identify costs for time periods	Possible implementation on certain customers with pilot AMI program	Consider implementation once AMI has been established
Regulatory Pass-Through Charge	Identify and assess regulatory or mandated costs and consider implementation	Review charges and adjust if necessary	Review charges and adjust if necessary
Supply/Infrastructure Charge	Identify and assess additional supply and/or infrastructure costs and consider implementation	Review charges and adjust if necessary	Review charges and adjust if necessary

Table 6.4 provides a color-based matrix comparing each rate structure with its ability to provide the following:

- How easily customers would accept the structure
- How easy the customers would change their behavior
- The amount of technology required to implement the structure
- Cost to the customer of implementing required technology
- Cost to the utility of implementing required technology
- Barriers to offering the proposed rates
- The level of risk the utility would face
- Qualitative and/or quantitative costs and benefits of the various pricing models from the perspective of the utility

A green rating in the matrix would indicate a desired outcome (*i.e.*, greater acceptance, lower cost, high benefit, etc.), followed by an orange rating which would possibly be more difficult to implement, and finally a red rating, which would be less desirable. The rate structures that are faded (grayed) background have been identified as structures that will most likely not be considered by RPU. It is important to note that the purpose of this table is to identify the multiple considerations for implementing a rate structure and the foreseeable ease of implementation that can be discussed in further detail.

Table 6.4 Rate Matrix

Rates	Customer Acceptance	Customer Behavior Changes	Technology Required	Customer Technology Cost	Utility Technology Cost	Barriers	Risks
Structures Currently Used by RPU							
Uniform	Easy	Easy	Easy	Low	Low	Low	Low
Tiered Block	Moderate	Easy	Easy	Low	Low	Moderate	Moderate
Seasonal	Moderate	Easy	Easy	Low	Low	Moderate	Moderate
Increased Fixed Charges	Difficult	Easy	Easy	Low	Low	Low	Low
Multi-Family Tiered Rates	Easy	Easy	Moderate	Low	Moderate	Moderate	Moderate
Landscape/ Irrigation Rates	Moderate	Easy	Easy	Low	Low	Moderate	Low
Agricultural Water Allocation Rates	Moderate	Easy	Easy	Low	Low	Moderate	Low
Recycled Water Rates	Moderate	Moderate	Easy	High	High	Moderate	Moderate
Interruptible	Moderate	Difficult	Moderate	Low	Moderate	Moderate	Low
Potential Structures Reviewed in 2018 COSA, Not Implemented							
Decoupling of Fixed Charges	Difficult	Moderate	Easy	Low	Moderate	Moderate	Moderate
Cost Adjustments	Moderate	Moderate	Easy	Low	Low	High	Low
Drought/ Demand Pricing	Moderate	Moderate	Easy	Low	Low	Moderate	Low
Other Potential Structures							
Hybrid Budget-Based Rates	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Moderate
Budget-Based Rates	Difficult	Moderate	Difficult	Moderate	High	Moderate	Moderate

Rates	Customer Acceptance	Customer Behavior Changes	Technology Required	Customer Technology Cost	Utility Technology Cost	Barriers	Risks
Lease Back	**Easy**	**Easy**	**Easy**	**Low**	**Low**	**Low**	**Low**
Demand Charge	**Difficult**	**Moderate**	**Difficult**	**Moderate**	**High**	**High**	**Moderate**
Time of Use (Commercial)	**Difficult**	**Moderate**	**Difficult**	**High**	**High**	**High**	**Moderate**
Regulatory Pass-Through Charge	**Moderate**	**Moderate**	**Easy**	**Low**	**Low**	**Moderate**	**Low**
Supply/ Infrastructure Charge	**Moderate**	**Moderate**	**Easy**	**Low**	**Low**	**Moderate**	**Low**

Notes:
(1) **Green** - More Desirable; **Gray** - Moderate; **Red** - Less Desirable.

Chapter 7

CONCLUSIONS AND RECOMMENDATIONS

RPU's current rate structure was approved in 2018 and the analysis completed for this report indicates that the various rate structure components are performing as intended. The rate structure changes implemented as a result of the previous COSA Study along with the refinements that have been made since that time have addressed past rate structure concerns. However, as technologies, water industry best practices, customer demand patterns, and regulatory and statutory requirements continually evolve RPU should continue to evaluate the water rate structure for further refinements.

Potential refinements and focus areas for the short term include:

1. Customer Rate Classes: While the need for changes is not likely, RPU should evaluate the customer classes during the upcoming COSA study and determine whether refinements to class assignments or additional classes are necessary.
2. Fixed Cost Recovery: RPU should continue to track and evaluate fixed and variable costs and set fixed cost recovery levels to balance the need to minimize potential revenue shortfalls with customer affordability. During the upcoming COSA study, fixed costs, fixed revenues, and variable revenues associated with minimal, hardened demand should be evaluated to assess the sufficiency of fixed revenues, with potential increases to the proportion of fixed revenues if necessary.
3. Volumetric Rate Structures: RPU should evaluate the variable rates applied to each customer class during the upcoming COSA Study and make any necessary refinements. Refinements may include modifications to tier break points to align with current demand patterns, changes to seasonal rate assumptions, and other refinements.
4. Drought and Demand Management Rates: RPU should consider implementing drought and demand management rates to provide a means to adequately recover costs during times of high conservation or otherwise decreased demands. The rates could include a full drought and demand management rate structure with updated rates for all rate components for varied levels of conservation or cutbacks or could be structured as fixed or volumetric surcharges applied equally to all customer classes.
5. Water Budget-Based Rates: RPU should evaluate whether water budget-based rates could be beneficial for RPU and its customers along with the level of effort that would be needed to implement budget-based rates. This evaluation is planned for the upcoming COSA Study.
6. Other Rate Structure Elements: The upcoming COSA Study should evaluate the potential for other rate structure elements such as Supply/Infrastructure charges and Regulatory pass-throughs.
7. Recycled Water Rates: As the recycled water system is expanded and additional customers are connected, RPU should work to refine the recycled water rates and potentially adopt a recycled water specific rate rather than grouping recycled water with interruptible service, once sufficient data is available to do so.

Potential refinements and focus areas for the long-term include:

8. AMI Implementation, Time of Use Rates, and Demand Charges: With the eventual implementation of AMI and additional customer usage information available, RPU should explore whether time of use rates and demand charges would be beneficial for RPU and its customers.