



# CABAZON WATER DISTRICT

Final Report

Water Rate Study  
Update

December 2020

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# Section 1. PURPOSE AND OVERVIEW OF THE STUDY

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## A. Purpose

Cabazon Water District (District, CWD) retained NBS to conduct an update of the 2017 water rate study for a number of reasons, including meeting revenue requirements and updating the water rate structure. The rates resulting from this study were developed in a manner that is consistent with industry standard cost of service principles. In addition to documenting the rate study methodology, this report is provided with the intent of assisting the District to maintain transparent communications with its residents and businesses.

In developing new water rates, NBS worked cooperatively with District staff and the District’s Board of Directors (Board) in selecting appropriate rate alternatives. Based on input from District staff and the Board, the proposed water rates are summarized in this report.

## B. Overview of the Study

Comprehensive rate studies such as this one typically include the following three components, as outlined in **Figure 1**:

1. Preparation of a **Financial Plan**, which identifies the net revenue requirements for the utility.
2. **Cost of Service Analysis**, which determines the cost of providing water service to each customer class.
3. **Rate Design Analysis**, which evaluates different rate design alternatives.

**Figure 1. Primary Components of a Rate Study**



These steps are intended to follow industry standards and reflect the fundamental principles of cost-of-service rate making embodied in the American Water Works Association (AWWA) Principles of Water Rates, Fees, and Charges<sup>1</sup>, also referred to as the M1 Manual. They also address requirements under Proposition 218 that rates not exceed the cost of providing the service, and that they be proportionate to the cost of providing service for all customers. In terms of the chronology of the study, these three steps represent the

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<sup>1</sup> Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, seventh edition, 2017.

order they were performed. Detailed tables and figures documenting the development of the proposed rates are provided in the Appendix.

## FINANCIAL PLAN

As a part of this rate study, NBS projected revenues and expenditures on a cash flow basis for the next five years. The amount of rate revenue required that will allow capital projects to be funded and reserves to be maintained at the approved levels, is known as the *net revenue requirement*. Although current rate revenue covers all the net revenue requirements, rate adjustments -- or more accurately, adjustments in the total revenue collected from water rates -- are recommended in order to fund planned capital improvement projects and keep reserve funds at healthy levels. This report presents an overview of the methodologies, assumptions, and data used, along with the financial plans and proposed rates developed in this study<sup>2</sup>.

## RATE DESIGN ANALYSIS

Rate Design is typically the stage in the study where NBS, staff and the Board must work closely together, to develop rate alternatives that will meet the District's objectives. It is important for the District to send proper price signals to its customers about the actual cost of their water usage. This objective is typically addressed through both the magnitude of the rates, and the rate structure design. In other words, both the amount of revenue collected and the way in which the revenue is collected from customers are important to consider.

Several criteria are typically considered in setting rates and developing sound rate structures. The fundamentals of this process have been documented in several rate-setting manuals, such as the AWWA Manual M1. The foundation for evaluating rate structures is generally credited to James C. Bonbright in the *Principles of Public Utility Rates*<sup>3</sup> which outlines pricing policies, theories, and economic concepts along with various rate designs. The following is a simplified list of the attributes of a sound structure:

- Rates should be easy to understand from the customer's perspective.
- Rates should be easy to administer from the utility's perspective.
- Rates should promote the efficient allocation of the resource.
- Rates should be equitable and non-discriminating (that is, cost based).
- There should be continuity in the ratemaking philosophy over time.
- Rates should address other utility policies (for example, encouraging conservation & economic development).
- Rates should provide month-to-month and year-to-year revenue stability.

The following are the basic rate design criteria that were considered in this study:

**Rate Structure Basics** –The vast majority of water rate structures contain a fixed or minimum charge in combination with a volumetric charge. The revenue requirements for each customer class are collected from both fixed monthly meter charges and variable commodity charges. Based on direction from the Board of Directors, the rates proposed in this report are designed to collect 40 percent of rate revenue from the fixed meter charges and 60 percent from the variable commodity charges.

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<sup>2</sup> The complete financial plan is set forth in the Appendix.

<sup>3</sup> James C. Bonbright; Albert L. Danielsen and David R. Kamerschen, *Principles of Public Utility Rates*, (Arlington, VA: Public Utilities Report, Inc., Second Edition, 1988), p. 383-384.

**Fixed Charges** – Fixed charges can be called base charges, minimum monthly charges, customer charges, fixed meter charges, etc. Fixed charges for water utilities typically increase by meter size based on meter equivalent capacity factors.

**Volumetric (Consumption-Based) Charges** – In contrast to fixed charges, variable costs such as purchased water, the cost of electricity used in pumping water, and the cost of chemicals for treatment tend to change with the quantity of water produced. For a water utility, variable charges are generally based on metered consumption and charged on a dollar-per-unit cost (for example, per 100 cubic feet, or hcf).

**Uniform (Single-Tier) Water Rates** – There are significant variations in the basic philosophy of variable charge rate structure alternatives. Under a uniform (single tier) rate structure, the cost per unit does not change with consumption, and provides a simple and straightforward approach from the perspective of customers regarding their understanding of the rates, and for the utility’s administration and billing of the rates.

**Multi-Tiered Water Rates** – In contrast to a uniform tier, an inclining block rate structure attempts to send a price signal to customers that their consumption costs are greater as more water is consumed. Tiered water rates are intended to represent the higher costs for customers that contribute more to peak summertime usage and place greater demands on the system. The types of higher costs reflected, for example, in the *highest* tier of the rate structure may include:

- Conservation program costs: intended to encourage customers to eliminate inefficient and wasteful water use, and otherwise reduce consumption during peak periods.
- Replacement Water costs: when consumption exceeds the amount of the District’s allocated water rights, the agency incurs additional costs for replacement water in order to meet that increased demand. That replacement water comes at a higher cost.
- Energy costs: during summer months, the District may pay more in electric charges to pump, treat and deliver water, and have a higher percentage of its energy bill in higher electricity “tiers”.
- Higher maintenance costs: peak periods tend to have higher numbers of service calls, capacity costs, and system maintenance issues when the water system is running at peak demand.



## Section 2. WATER RATE STUDY

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### A. Key Water Rate Study Issues

The District's water rate analysis was undertaken with a few specific objectives, including:

- Avoiding operational deficits and further depletion of reserves.
- Generating additional revenue needed to meet projected funding requirements.
- Adjusting the rate structure to collect a greater share of revenue from variable charges and less revenue from fixed charges.
- Continuing to encourage water conservation with a tiered rate structure.

NBS developed various water rate alternatives as requested by District staff over the course of this study. All rate structure alternatives relied on industry standards and cost-of-service principles. The rate alternative that will be implemented, is ultimately the decision of the Board. The fixed and volume-based charges were calculated based on the net revenue requirements, number of customer accounts, water consumption, and other District-provided information.

### B. Financial Plan

It is important for municipal utilities to maintain reasonable reserves in order to handle emergencies, fund working capital, maintain a good credit rating, and generally follow healthy financial management practices. Rate adjustments are governed by the need to meet operating and capital costs, maintain adequate debt coverage, and build reasonable reserve funds. The current state of the District, with regard to these objectives, is as follows:

- **Meeting Net Revenue Requirements:** For FY 2020/21 through FY 2024/25, the projected net revenue requirement (that is, total annual expenses plus debt service and rate-funded capital costs, less non-rate revenues) for the District is approximately \$1.37 million, annually on average. If no rate adjustments are implemented, the District is projected to see a \$280,000 deficit in fiscal year 2020/21. With 3% increases to the net revenue requirement, the deficit drops to \$265,000 for fiscal year 2020/21.
- **Building and Maintaining Reserve Funds:** Reserve funds provide a basis for a utility to cope with fiscal emergencies such as revenue shortfalls, asset failure, and natural disasters, among other events. Reserve policies provide guidelines for sound financial management, with an overall long-range perspective to maintain financial solvency and mitigate financial risks associated with revenue instability, volatile capital costs, and emergencies. The District plans to accumulate approximately \$1,500,000 in reserves by the end of FY 2024/25. These reserve funds for the Utility are considered unrestricted reserves and consist of the following:
  - **The Operating Reserve** should equal approximately 180 days of operating expenses, which is about \$707,000 at the end of FY 2024/25. An Operating Reserve is intended to promote financial viability in the event of any short-term fluctuation in revenues and/or expenditures. Fluctuations in revenue can be caused by weather patterns, the natural inflow and outflow of cash during billing cycles, natural variability in demand-based revenue streams (such as volumetric charges), and – particularly in periods of economic distress – changes or trends in age of receivables.

- **The Capital Rehabilitation and Replacement Reserve** should equal at least 6 percent of net capital assets, totaling approximately \$422,000 in FY 2024/25, which is set aside to address long-term capital system replacement and rehabilitation needs.
- **Funding Capital Improvement Projects:** The District must also be able to fund necessary capital improvements in order to maintain current service levels. District staff has identified roughly \$935,000 (current year dollars) in expected capital expenditures for FY 2020/21 through 2024/25. With the recommended rate adjustments, these expenditures can be funded.
- **Inflation and Growth Projections** – Assumptions regarding cost inflation were made in order to project future revenues and expenses for the study period. The following inflation factors were used in the analysis:
  - No Customer growth is expected over the 5-year rate period.
  - Electricity cost inflation is 3.5% annually.
  - General cost inflation is 2% annually.
  - Salary cost inflation is 3% annually.
  - Field Salary cost inflation is 2% annually.
  - Benefits cost inflation is 6% annually.
  - Fuel and Chemicals cost inflation is 3% annually.
  - Cell Tower Lease revenue inflation is 2% annually.
- **Maintaining Adequate Bond Coverage:** The District is required by its bond covenants to maintain a debt service coverage ratio of at least 1.2. Rate adjustments proposed in this study will allow the district to continue to exceed this ratio. The benefit of exceeding the minimum debt coverage ratio is that it strengthens District’s credit rating, which can help lower the interest rates for debt-funded capital projects in the future.
- **Impact of Annual Rate Adjustment Date:** In the current year, the District will only collect three months of the planned revenue increase for FY 2020/21 since rate increases will not be effective until March 1, 2021. However, in future years of the rate plan, the financial plan modeling assumes that rate adjustments occur starting on the January bill of each year. This means that only six months of the planned revenue to be collected from the rate adjustment listed for one fiscal year will be collected in that year. For example, there is a 3 percent adjustment in rate revenue planned for FY 2020/21; meaning, the rates are developed to recover \$1.42 million, which is a 3 percent adjustment over the expected \$1.38 million that would be collected without a rate adjustment. However, because of the timing for when the rates will go into effect, the Financial Plan results in \$1.39 million in rate revenue for FY 2020/21.

Rate adjustments of 3 percent annually in FY 2020/21 through FY 2024/25 will be needed in order to fully fund all operating expenses, planned capital projects, debt service obligations and build reserves to the recommended targets by the end of FY 2024/25<sup>4</sup>. **Figure 2** summarizes the sources and uses of funds, net revenue requirements, and the recommended annual percent adjustments in total rate revenue recommended for the next 5 years for the District.

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<sup>4</sup> Because of the mid-year adjustment to the rates, the full impact of each year’s adjustment does not affect revenue until the following year.



**Figure 2. Summary of Water Revenue Requirements**

Summary of Sources and Uses of Funds and Net Revenue Requirements	5-Year Prop 218 Rate Period				
	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25
<b>Sources of Water Funds</b>					
Rate Revenue Under Prevailing Rates	\$ 1,375,000	\$ 1,375,000	\$ 1,375,000	\$ 1,375,000	\$ 1,375,000
<i>Additional Revenue from Rate Increases</i> <sup>1</sup>	13,750	62,494	105,619	150,037	195,788
Non-Rate Revenues	240,500	255,800	257,200	258,600	263,600
Interest Earnings	19,600	19,600	19,600	19,600	19,600
<b>Total Sources of Funds</b>	<b>\$ 1,648,850</b>	<b>\$ 1,712,894</b>	<b>\$ 1,757,419</b>	<b>\$ 1,803,237</b>	<b>\$ 1,853,988</b>
<b>Uses of Water Funds</b>					
Operating Expenses	\$ 1,310,100	\$ 1,368,100	\$ 1,384,600	\$ 1,384,000	\$ 1,413,700
Debt Service	137,394	137,394	137,394	48,739	48,691
Rate-Funded Capital Expenses	467,004	365,650	21,218	9,955	-
<b>Total Use of Funds</b>	<b>\$ 1,914,498</b>	<b>\$ 1,871,144</b>	<b>\$ 1,543,212</b>	<b>\$ 1,442,693</b>	<b>\$ 1,462,391</b>
<b>Surplus (Deficiency) after Rate Increase</b>	<b>\$ (265,648)</b>	<b>\$ (158,251)</b>	<b>\$ 214,206</b>	<b>\$ 360,544</b>	<b>\$ 391,597</b>
<b>Projected Annual Rate Increase</b>	<b>3.00%</b>	<b>3.00%</b>	<b>3.00%</b>	<b>3.00%</b>	<b>3.00%</b>
<i>Cumulative Rate Increases</i>	3.00%	6.09%	9.27%	12.55%	15.93%
<b>Surplus (Deficiency) before Rate Increase</b>	<b>\$ (279,398)</b>	<b>\$ (220,744)</b>	<b>\$ 108,588</b>	<b>\$ 210,507</b>	<b>\$ 195,809</b>
<b>Net Revenue Requirement</b> <sup>2</sup>	<b>\$ 1,654,398</b>	<b>\$ 1,595,744</b>	<b>\$ 1,266,412</b>	<b>\$ 1,164,493</b>	<b>\$ 1,179,191</b>

1. Revenue from rate increases assume an implementation date of March 1, 2021 and then January 1st, 2022 through 2025.

2. Total Use of Funds less non-rate revenues and interest earnings. This is the annual amount needed from water rates.

**Figure 3** summarizes the projected reserve fund balances and reserve targets. A summary of the District’s proposed 5-year financial plan is included in Tables 1 and 2 of the Appendix. The appendix tables include revenue requirements, reserve funds, revenue sources, proposed rate adjustments, and the District’s capital improvement program. As can be seen in Figure 3, given proposed rate adjustments, reserves meet the minimum target by FY 2023/24.

**Figure 3. Summary of Reserve Funds**

Beginning Reserve Fund Balances and Recommended Reserve Targets	5-Year Prop 218 Rate Period				
	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25
<b>Operating Reserve</b>					
Ending Balance	\$ 334,352	\$ 176,101	\$ 390,307	\$ 692,000	\$ 706,850
<i>Recommended Minimum Target</i>	458,535	684,050	692,300	692,000	706,850
<b>Capital Rehabilitation &amp; Replacement Reserve</b>					
Ending Balance	\$ 443,800	\$ 443,800	\$ 443,800	\$ 490,751	\$ 844,988
<i>Recommended Minimum Target</i>	443,800	453,300	442,400	431,900	421,800
<b>Debt Reserve</b>					
Ending Balance	\$ 60,928	\$ 60,928	\$ 60,928	\$ 60,928	\$ 60,928
<i>Recommended Minimum Target</i>	-	-	-	-	-
<b>Total Ending Balance</b>	<b>\$ 839,080</b>	<b>\$ 680,829</b>	<b>\$ 895,035</b>	<b>\$ 1,243,679</b>	<b>\$ 1,612,766</b>
<i>Total Recommended Minimum Target</i>	<b>\$ 902,335</b>	<b>\$ 1,137,350</b>	<b>\$ 1,134,700</b>	<b>\$ 1,123,900</b>	<b>\$ 1,128,650</b>

**CONTRACT CUSTOMER CHARGES**

In January of 2012, the District entered into a contract agreement which set the initial rates and defined the methodology of future rate adjustments for the Desert Hills Premium Outlets (DHPO). As defined by the

terms of the contract, rates can only be adjusted by increasing the current rates (both the fixed meter charge and usage rate) by the percentage adjustment imposed on residential and commercial customers<sup>5</sup>. To account for this restriction, the revenue projected from the contract customer through FY 2021/22 is calculated and netted from the cost of service analysis. The contracted rates end December 31, 2022, in which this customer will switch to the commercial 10-inch meter rates. The calculation through FY 2021/22 is shown in **Figure 4**. The rates for the 10-inch meter past FY 2021/22 will be shown in later sections of this report.

**Figure 4. Contract Charges and Projected Revenue**

Contract	Current <sup>1</sup>	Proposed Rates	
	FY 2019/20	FY 2020/21	FY 2021/22
<i>Projected Increase in Rate Revenue per Financial Plan:</i>		<b>3.00%</b>	<b>3.00%</b>
Fixed Rate	\$2,233.06	\$2,300.05	\$2,369.05
Variable Rate	\$3.83	\$3.94	\$4.06
Estimated Consumption (hcf)	44,507	44,507	44,507
Estimated Fixed Revenue	\$ 26,797	\$ 27,601	\$ 28,429
Estimated Variable Revenue	170,462	175,576	180,843
<b>Estimated Rate Revenue from Contract Customer</b>	<b>\$ 197,259</b>	<b>\$ 203,176</b>	<b>\$ 209,272</b>
<b>Remaining Rate Revenue</b>	<b>\$1,177,741</b>	<b>\$1,213,074</b>	<b>\$ 1,249,466</b>

1. Current rates found in source file: *10\_Cabazon Water District Water Rate Study (4.13.17) Final.pdf, Page 50.*

Contract rates end December 31, 2022 in which this customer then switches to 10 inch billing for commercial users.

### C. Cost of Service Analysis

Once the net revenue requirements are determined, the cost of service analysis proportionately distributes the revenue requirements to each customer class. The cost of service analysis consists of two major components: (1) the classification of expenses, and (2) the allocation of costs to customer classes. Costs were classified corresponding to the function they serve. All costs in the District’s budget are allocated to each component of the rate structure in proportion to the level of service required by customers. The levels of service are related to volumes of peak and non-peak demand, infrastructure capacity, and customer service. These are based on allocation factors, such as water consumption, peaking factors, and number of accounts by meter size. Ultimately, a cost-of-service analysis is intended to result in rates that are proportional to the cost of providing service to each customer.

#### CLASSIFICATION OF COSTS

Most costs are not typically allocated 100 percent to fixed or variable categories and, therefore, are allocated to multiple functions of water service. Costs were classified using the commodity-demand method which is found in the AWWA M1 Manual<sup>6</sup>. In accordance with this method, budgeted costs were “classified” into four categories: commodity, capacity, customer and fire protection. The classification process provides

<sup>5</sup> Per Section 5c(i) and (ii).

<sup>6</sup> *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, seventh edition, 2017, p. 83.*

the basis for allocating costs to various customer classes based on the cost causation (classification) components described below:

- **Commodity related costs** are those that change as the volume of water produced and delivered changes. These commonly include the costs of chemicals used in the treatment process, energy related to pumping for transmission and distribution, and source of supply.
- **Capacity related costs** are associated with sizing facilities to meet the maximum, or peak demand. This includes both operating costs and capital infrastructure costs incurred to accommodate peak system capacity events.
- **Customer related costs** are associated with having a customer on the water system, such as meter reading, postage and billing.
- **Fire Protection related costs** are associated with providing sufficient capacity in the system for fire meters and other operations and maintenance costs of providing water to properties for private fire service protection.

The District’s budgeted costs were reviewed and allocated to these cost causation components which are used as the basis for establishing new water rates and translate to fixed and variable charges. Tables 16 through 20 in the Appendix show how the District’s expenses were classified and allocated to these cost causation components. Additionally, each cost causation component is considered fixed or variable, as summarized in **Figure 5**.

**Figure 5. Cost Classification Summary**



Ideally, utilities should recover all of their fixed costs from fixed charges and all of their variable costs from volumetric charges. When this is the case, fluctuations in water sales revenues would be directly offset by reductions or increases in variable expenses. When rates are set in this manner, they provide greater revenue stability for the utility. However, other factors are often considered when designing water rates such as community values, water conservation goals, ease of understanding, and ease of administration.

Based on the District’s projected costs, the Cost of Service Analysis (COSA) resulted in a distribution that is approximately 79 percent fixed and 21 percent variable. The District’s current rate structure collects approximately 64 percent of revenue from fixed charges and 36 percent from variable charges. The Board of Directors has chosen to move forward with a rate structure that will collect approximately 40 percent of revenue from fixed charges and 60 percent from variable rates. However, a share of the District’s capacity costs will need to be collected from the variable rates in order to reach this rate structure. Thus, capacity related costs (which are normally considered fixed) will be collected from both fixed and variable rates.

**Figure 6** summarizes the allocation of the net revenue requirements to each cost causation component. The projected revenue from the contract customer, as shown in Figure 4, is included Figure 6.

**Figure 6. Allocation of Water Revenue Requirements**

Functional Category	COSA Results		Proposed Rates	
	Unadjusted Net Revenue Requirements (2020-21) 79% Fixed / 21% Variable		Adjusted Net Revenue Requirements (2020-21) 40% Fixed / 60% Variable	
Commodity - Related Costs	\$ 259,786	21.4%	\$ 259,786	21.4%
Capacity - Related Costs (volumetric share)	\$ -	0.0%	\$ 468,058	38.6%
Capacity - Related Costs (fixed share)	\$ 887,808	73.2%	\$ 419,750	34.6%
Customer - Related Costs	\$ 60,386	5.0%	\$ 60,386	5.0%
Fire Protection - Related Costs	\$ 5,093	0.4%	\$ 5,093	0.4%
<b>Total</b>	<b>\$ 1,213,074</b>	<b>100%</b>	<b>\$ 1,213,074</b>	<b>100%</b>
<b>Revenue from Contract Rates</b>	<b>\$ 203,176</b>		<b>\$ 203,176</b>	
<b>Net Revenue Requirement</b>	<b>\$ 1,416,250</b>		<b>\$ 1,416,250</b>	

## CUSTOMER CLASSES

**Customer classes** are determined by combining customers with similar demand characteristics, types of use and, in this case, the constraints of a contract into categories that reflect the cost differentials to serve each type of customer. This process is limited by the desire to not overcomplicate the District’s rate structure.

For Cabazon Water District, four customer classes were analyzed: single-family residential, non-single family residential<sup>7</sup>, private fire and the contract customer<sup>8</sup>. All non-SFR customers (excluding the contract customer) were placed in one customer class because these customers include a wide range of usage characteristics:

1. They are using more water on average per account.
2. They generally have higher peaking factors than single-family residential users.
3. Their water usage varies greatly among these customers based on the specific type of customer and meter size.
4. There are an insufficient number of customers of each specific type to determine general class characteristics.

The amount of consumption, the peaking factors and the number of meters by size are used in the cost-of-service analysis to allocate costs to customer classes and determine the appropriate rate structures for each. The District’s most recent consumption is summarized in **Figure 7**, peaking factors in **Figure 8** and **Figure 9**, and number of customers by customer class is shown in **Figure 10**.

Commodity related costs are costs associated with the total annual consumption of water by customer class, as shown in Figure 7.

<sup>7</sup> Non-SFR class consists of multi-family, government, commercial, construction, industrial and irrigation customers.

<sup>8</sup> The development of rates for the contract customer is described in Section 2-B of this report.

**Figure 7. Water Consumption by Customer Class**

Customer Class	Volume (hcf) <sup>1</sup>	Percent of Total Volume
Single Family Residential	93,915	71.4%
Non-SFR	1,338	1.0%
Government Meters	2,201	1.7%
Commercial Meters	11,562	8.8%
Industrial Meters	-	0.0%
Irrigation Meters	20,531	15.6%
Fire Service Meters	28	0.0%
Construction	1,934	1.5%
<b>Total</b>	<b>131,509</b>	<b>100%</b>
Contract	44,507	

1. Consumption is from 2019. CWD bills monthly.

Peaking factors for each customer class are shown in Figure 8. A “peaking factor” is the relationship of each customer class’ average water use to peak (generally summer) water use.

**Figure 8. Peaking Factors by Customer Class**

Customer Class	Average Monthly Use (hcf)	Peak Monthly Use (hcf) <sup>1</sup>	Peak Monthly Factor	Max Month Capacity Factor
Single Family Residential	7,826	11,521	1.47	66.7%
Multi-Family Residential	112	158	1.42	0.9%
Government Meters	183	320	1.74	1.9%
Commercial Meters	964	1,209	1.25	7.0%
Industrial Meters	0	0	N/A	0.0%
Irrigation Meters	1,711	3,338	1.95	19.3%
Fire Service Meters	2	9	3.86	0.1%
Construction	161	719	4.46	4.2%
<b>Total</b>	<b>10,959</b>	<b>17,274</b>		<b>100%</b>
Contract	3,709	4,921	1.33	

1. Based on peak monthly data (peak day data not available).

Additional capacity factors within the single-family residential class are shown in **Figure 9**. The “additional capacity factor” represents the cumulative peak consumption in each tier. No additional capacity factor is assigned to Tier 1 water use, as this represents a base level of consumption by customers in the lowest tier, therefore no additional capacity costs would be incurred if all customers stayed within the Tier 1 threshold.

**Figure 9. Single-Family Residential Peak Capacity Allocation Factors**

Tier	Tier Breakpoint <sup>1</sup>	Expected Consumption <sup>2</sup> (hcf)	Percentage of Total SFR Consumption
Tier 1	7 hcf	53,666	57%
Tier 2	14 hcf	21,430	23%
Tier 3	--	18,819	20%
<b>Total</b>		<b>93,915</b>	<b>100%</b>

1. Tier 1 break point set to average winter consumption, an estimate of average indoor water consumption in Cabazon. The Tier 2 break point is set to 14 hcf which is average summer consumption.
2. Consumption data is based on the CWD 2019 customer data.

The number of customers for each customer class (also known as customer allocation factors) is shown in Figure 10.

**Figure 10. Number of Meters by Customer Class**

Customer Class	Number of Meters <sup>1</sup>	Percent of Total
Single Family Residential	854	93.0%
Private Fire	5	0.5%
All Other Meters	59	6.4%
<b>Total</b>	<b>918</b>	<b>100.0%</b>

1. Meter Count for December 2019. CWD bills monthly.

## COSTS ALLOCATED TO CUSTOMER CLASSES

Costs are allocated to each customer class based on the customer characteristics of each class in order to reflect the cost differentials to serve each type of customer. **Figure 11** summarizes how the costs for each cost causation component from Figure 6 are allocated to each customer class.

**Figure 11. Cost Allocation Methodology**

Capacity Related Costs (fixed share)	• Allocated based on the hydraulic capacity of each meter size
Customer Related Costs	• Allocated based on the total number of meters
Fire Protection Related Costs	• Allocated based on the hydraulic capacity of fire meters
Commodity Related Costs	• Allocated based on water consumption by customer class
Capacity Related Costs (volumetric share)	• Allocated based on peak consumption by customer class



The costs allocated to each causation component are assigned to each customer class using the cost allocation methodology described in Figure 11. This process is shown in the following sections, in Figure 12 through Figure 16.

### Capacity Related Costs

The capacity related costs (fixed share) allocation is summarized in **Figure 12**. Capacity related costs are those costs associated with constructing and operating the water system to ensure there is enough capacity in the system to meet the demand of each meter connected. Larger meters have the potential to use more of the system’s capacity, compared to smaller meters. The potential capacity demanded is proportional to the maximum safe meter capacity each meter size as established by the AWWA<sup>9</sup>. The meter capacity factors used in this study are shown in the second column of Figure 12.

A “hydraulic capacity factor” (column *a* in Figure 12) is calculated by dividing the maximum capacity or flow of large meters by the capacity of the base meter size, which is typically the most common residential meter size (in this case a 5/8-inch meter). For example, Figure 12 shows the hydraulic capacity of a two-inch meter is 8 times that of a 5/8-inch meter and therefore, the capacity component of the fixed meter charge is 8 times that of the 5/8-inch meter.

The actual number of meters by size (column *b* in Figure 12) is multiplied by the corresponding capacity ratios to calculate the total number of equivalent meters (column *c* in Figure 12). The number of equivalent meters is used as a representation for the potential demand that each customer can place on the water system and the percentage of capacity related costs (fixed share) distributed to each meter size by the Percent of Total Hydraulic Capacity.

**Figure 12. Capacity Related Costs (fixed share) Allocation**

Meter Size	Meter Capacity (gpm) <sup>1</sup>	Hydraulic Capacity Factor	Number of Meters	Total Equivalent Meters	Percent of Total Hydraulic Capacity	Allocated Costs
		<i>a</i>	<i>b</i>	<i>c=a*b</i>		
<b>Standard Meters</b>						
5/8 inch	20	1.00	845	845	67%	\$282,473
3/4 inch	30	1.50	21	32	3%	\$10,530
1 inch	50	2.50	13	33	3%	\$10,864
1.5 inch	100	5.00	5	25	2%	\$8,357
2 inch	160	8.00	17	136	11%	\$45,463
3 inch	320	16.00	10	160	13%	\$53,486
4 inch	500	25.00	1	25	2%	\$8,357
<b>Total</b>			<b>912</b>	<b>1,255</b>	<b>100%</b>	<b>\$419,531</b>

1. Per the Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1 AWWA, 7th edition, 2017, page 338.

<sup>9</sup> Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, seventh edition, 2017, p. 338.

## Customer Related Costs

The customer related cost allocation is summarized in **Figure 13**. Customer related costs are comprised of those costs relating to reading and maintaining meters, customer billing and collection, and other customer service related costs. The customer service costs do not differ among the various meter sizes; therefore, these costs are spread equally among all meters. Each customer class is allocated customer related costs based upon the percentage of total meters that are in that class.

**Figure 13. Customer Related Cost Allocation**

Customer Class	Number of Meters <sup>1</sup>	Percent of Total	Allocated Costs
<b>Standard Meters</b>			
5/8 inch	845	92.1%	\$55,645
3/4 inch	21	2.3%	\$1,383
1 inch	13	1.4%	\$856
1.5 inch	5	0.5%	\$329
2 inch	17	1.9%	\$1,119
3 inch	10	1.1%	\$659
4 inch	1	0.1%	\$66
<b>Fire Protection</b>			
6 inch	3	0.3%	\$198
8 inch	2	0.2%	\$132
<b>Total</b>	<b>917</b>	<b>100%</b>	<b>\$60,386</b>

1. Meter Count as of December 2019.

## Fire Protection Related Costs

The fire protection cost allocation is summarized in **Figure 14**. Only Fire Protection meters are allocated this cost component. A direct allocation is made in the functionalization and classification step in the cost of service analysis to represent their share of system capacity and other related operations and maintenance costs. This cost is spread over the fire meters using the same methodology as used in Figure 12.

**Figure 14. Fire Protection Cost Allocation**

Meter Size	Meter Capacity (gpm) <sup>1</sup>	Hydraulic Capacity Factor	Number of Meters	Total Equivalent Meters	Percent of Total Hydraulic Capacity	Allocated Costs
		<i>a</i>	<i>b</i>	<i>c=a*b</i>		
<b>Fire Protection</b>	<i>Fire Service Type I &amp; II</i>					
6 inch	1,600	80.00	3	240	46%	\$2,351
8 inch	2,800	140.00	2	280	54%	\$2,742
<b>Total</b>			<b>5</b>	<b>520</b>	<b>100%</b>	<b>\$5,093</b>

1. Per the Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1 AWWA, 7th edition, 2017, page 338.

## Commodity Related Costs

The commodity related cost allocation is summarized in **Figure 15**. Commodity related costs are those costs related to the amount of water sold and commonly include the costs of chemicals used in the treatment process, energy related to pumping for transmission and distribution, and source of supply. Each customer class is allocated commodity related costs based upon the percentage of total consumption by that class.

**Figure 15. Commodity Related Costs Allocation**

Customer Class	Volume (hcf) <sup>1</sup>	Percent of Total Volume	Allocated Costs
Single Family Residential	93,915	71.4%	\$185,522
Other Non-SFR/Commercial	37,594	28.6%	\$74,264
<b>Total</b>	<b>131,509</b>	<b>100%</b>	<b>\$259,786</b>

1. Consumption is from 2019. CWD bills monthly.

## Capacity Related Costs (variable share)

The capacity related costs allocated to variable rates for each customer class are shown in **Figure 16**. Capacity related costs collected from the volumetric rate are allocated to each customer class based upon their percentage of peak monthly use.

**Figure 16. Capacity Related Costs (variable share)**

Customer Class	Average Monthly Use (hcf)	Peak Monthly Use (hcf) <sup>1</sup>	Percent of Total	Allocated Costs
Single Family Residential	7,826	11,521	67%	\$312,174
Other Non-SFR/Commercial	3,133	5,753	33%	\$155,884
<b>Total</b>	<b>10,959</b>	<b>17,274</b>	<b>100%</b>	<b>\$468,058</b>

1. Based on peak monthly data (peak day data not available).

## D. Rate Design Analysis

NBS discussed several water rate alternatives and methodologies with District Staff over the course of this study, such as the percentage of revenue collected from fixed vs. variable charges and differentiating rates by customer class. Based on input provided by District staff and the Board of Directors, the proposed rates were developed. The following sections describe this process.

The rates proposed in this study make the following modifications to the water rate structure:

1. Update monthly fixed meter charges to collect 40% of the revenue requirement and update volumetric charges to reflect collecting 60% of revenue.
2. Maintain the volumetric rates for Single Family Residential customers as follows:
  - a. Keep three tier rate structure
  - b. Keep current tier breakpoints
3. Keep all non-residential customers on a uniform volumetric rate, and impose a single charge for all water consumed.

## FIXED CHARGES

The fixed meter charge recognizes that the District incurs fixed costs regardless of whether customers use water. There are two components that comprise the fixed meter charge: the customer component and the capacity component, as described in the previous section. Using the costs allocated to each meter size from Figure 12 through Figure 14; **Figure 17** calculates the monthly charge for each meter size.

**Figure 17. Fixed Meter Charges FY 2020/21**

Customer Class	Number of Meters <sup>1</sup>	Allocated Capacity Costs	Allocated Customer Costs	Allocated Fire Protection Costs	Total Costs	Monthly Charge
	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = b+c+d</i>	<i>f=e/a/12</i>
<b>Standard Meters</b>						
5/8 inch	845	\$282,473	\$55,645	\$0	\$338,118	\$33.34
3/4 inch	21	\$10,530	\$1,383	\$0	\$11,913	\$47.27
1 inch	13	\$10,864	\$856	\$0	\$11,720	\$75.13
1.5 inch	5	\$8,357	\$329	\$0	\$8,686	\$144.77
2 inch	17	\$45,463	\$1,119	\$0	\$46,583	\$228.35
3 inch	10	\$53,486	\$659	\$0	\$54,145	\$451.20
4 inch	1	\$8,357	\$66	\$0	\$8,423	\$701.92
<b>Fire Protection</b>						
6 inch	3	\$0	\$198	\$2,351	\$2,548	\$70.78
8 inch	2	\$0	\$132	\$2,742	\$2,874	\$119.76
<b>Total</b>	<b>917</b>	<b>\$419,531</b>	<b>\$60,386</b>	<b>\$ 5,093</b>	<b>\$ 485,011</b>	

1. Meter Count as of December 2019.

## VARIABLE CHARGES

The District currently has a three-tiered volumetric rate for single family residential customers, and one uniform rate for non-SFR customers.

Tier breakpoints remain the same as current rates and were set in the last rate study in 2017. The goals when setting the tier breakpoints were twofold:

1. The breakpoint for the first tier was set to the 7 hcf<sup>10</sup>, which is the average winter consumption for a typical single-family residential customer. Given the limited irrigation that occurs in the winter, this approximates average indoor use.
2. The breakpoint for the second tier was set to 14 hcf, which is equal to average summer consumption for a single-family residential customer. Average summer consumption is when water consumption is highest for a two-month billing period.
3. The third tier includes anything above 14 hcf.

<sup>10</sup> HCF is one hundred cubic feet of water.

The commodity costs (from Figure 15) within the single-family residential class are further allocated to the expected consumption by tier, as shown in **Figure 18**.

**Figure 18. Single Family Residential Commodity Related Costs**

Tier	Tier Breakpoint <sup>1</sup>	Expected Consumption <sup>2</sup> (hcf)	Percentage of Total SFR Consumption	Allocated Costs
Tier 1	7 hcf	53,666	57%	\$106,013
Tier 2	14 hcf	21,430	23%	\$42,333
Tier 3	--	18,819	20%	\$37,176
<b>Total</b>		<b>93,915</b>	<b>100%</b>	<b>\$185,522</b>

1. Tier 1 break point set to average winter consumption, an estimate of average indoor water consumption in Cabazon. The Tier 2 break point is set to 14 hcf which is average summer consumption.
2. Consumption data is based on the CWD 2019 customer data.

The Capacity Related Costs (variable share) (from Figure 16) within the single-family residential class are further allocated to expected consumption by tier, as shown in **Figure 19**. The “additional capacity required” represents the cumulative peak consumption in each tier. No additional capacity factor is assigned to Tier 1 water use, as this represents a base level of consumption by customers in the lowest tier, therefore no additional supply costs would be incurred if all customers stayed within the Tier 1 threshold.

**Figure 19. Single Family Residential Capacity Related Costs (variable share)**

Tier	Description	Monthly Consumption (hcf) <sup>1</sup>	Additional Capacity Required (hcf) <sup>4</sup>	Percent of Total	Allocated Costs
Tier 1	Max Tier 1 Capacity <sup>2</sup>	5,978	0	0.0%	\$0
Tier 2	Peak up to Tier 2 <sup>3</sup>	7,891	1,913	34.5%	\$107,738
Tier 3	Peak up to Tier 3 <sup>3</sup>	11,521	3,630	65.5%	\$204,437
<b>Total</b>			<b>5,543</b>	<b>100.0%</b>	<b>\$312,174</b>

1. Consumption data is based on the CWD 2019 customer data.  
Source files: *Cabazon\_FINAN ACCTS SUMMARY\_CO1CO2.xlsx* and *Cabazon\_USAGEREPORT\_CO1CO2\_Manipulated.xlsx*
2. Capacity allocated to the first tier represents the tier break multiplied by the number of customers.
3. This is the cumulative peak consumption up to the tier break; it represents capacity required to provide service to a given tier.
4. This is the additional cumulative capacity to meet peak consumption at each tier.

Due to the varying consumption characteristics, non-SFR customers will maintain a uniform volumetric rate because it best represents their cost-of-service. Using the costs allocated to each customer class in Figure 15 – 16 and Figure 18 – 19, **Figure 20** calculates the per unit volumetric charge for each customer class and tier.

**Figure 20. Calculated Variable Charges for FY 2020/21**

Customer Class	Expected Consumption (hcf)	Allocated Commodity Costs	Allocated Capacity Costs	Total Costs	Charge per Unit Sold (\$/hcf)
	<i>a</i>	<i>b</i>	<i>c</i>	<i>d = b+c</i>	<i>e=d/a</i>
<b>Single Family Residential</b>					
Tier 1	53,666	\$ 106,013	\$ -	\$ 106,013	\$1.98
Tier 2	21,430	\$ 42,333	\$ 107,738	\$ 150,071	\$7.00
Tier 3	18,819	\$ 37,176	\$ 204,437	\$ 241,612	\$12.84
<b>All Other Customers</b>	37,594	\$ 74,264	\$ 155,884	\$ 230,148	\$6.12
<b>Total</b>	<b>131,509</b>	<b>\$ 259,786</b>	<b>\$ 468,058</b>	<b>\$ 727,844</b>	

### CONSTRUCTION METER FEES

NBS also analyzed the District’s construction rates and updated the meter deposit fee, admin fee and the recalibration fee on top of the monthly meter and water charges. **Figure 21** shows the updated construction meter fees. The meter deposit fee is based on the actual cost of the meter. The admin fee was calculated from labor hours needed for application processing, account opening and delivery of the construction meter. Lastly, the meter recalibration fee was also calculated based on labor hours needed to travel and repair the construction meter. These fees are all inflated 3% annually after 2020/21.

**Figure 21. Updated Fee Schedule for Construction Customers**

Updated Construction Customer Fee Schedule	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	Explanation of Fee
<b>One-Time Fees</b>						
Construction Meter Deposit	\$1,965.14	\$2,024.09	\$2,084.82	\$2,147.36	\$2,211.78	[1]
Administrative Fee	\$152.50	\$157.08	\$161.79	\$166.64	\$171.64	[2]
Meter Recalibration Fee	\$244.00	\$251.32	\$258.86	\$266.63	\$274.62	[3]
<i>Monthly Fees shown in Current &amp; Proposed Rates</i>						

Explanation of Fee:

- [1] Based on cost of replacing the meter in the current year, if it is not returned.
- [2] Based on labor time and cost for: processing application, opening account and installing meter. Assumes 3% inflation per year.
- [3] Based on labor time and cost for repairing a malfunctioning meter. Assumes 3% inflation per year.

### E. Current and Proposed Water Rates

The Cost of Service analysis is used to establish the rates for FY 2020/21. In the subsequent four years of the rate study, proposed charges are simply adjusted by the proposed adjustment in total rate revenue needed, to meet projected revenue requirements. **Figure** provides a comparison of the current and proposed rates for FY 2020/21 through FY 2024/25. More detailed tables on the developed of the proposed charges are documented in the Appendix. It is notable to mention that after the Contract rates are over in 2022, this customer will then switch to the 10-inch fixed meter charge and the uniform commodity rate. Since the



Contract customer uses a large amount of water, the proportion of the variable rate will decrease when this customer joins the other non-SFR customers in FY 2022/23.

**Figure 22. Current and Proposed Water Rates**

Water Rate Schedule	Current Rates	Proposed Rates					
		FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	
<b>Fixed Meter Charges</b>							
Monthly Fixed Service Charges:							
5/8 inch	\$68.10	\$33.34	\$34.35	\$35.38	\$36.44	\$37.53	
3/4 inch	\$98.24	\$47.27	\$48.69	\$50.15	\$51.66	\$53.21	
1 inch	\$158.51	\$75.13	\$77.38	\$79.71	\$82.10	\$84.56	
1.5 inch	\$309.21	\$144.77	\$149.12	\$153.59	\$158.20	\$162.94	
2 inch	\$490.04	\$228.35	\$235.20	\$242.25	\$249.52	\$257.01	
3 inch	\$972.27	\$451.20	\$464.74	\$478.68	\$493.04	\$507.84	
4 inch	\$1,514.77	\$701.92	\$722.98	\$744.67	\$767.01	\$790.02	
Contract (10 inch)	\$2,233.06	\$2,300.05	\$2,369.05	\$6,212.13	\$6,398.49	\$6,590.45	
Construction Meters (3 inch)	\$286.73	\$473.21	\$487.41	\$502.03	\$517.09	\$532.61	
Monthly Fire Service Charges:							
4 inch	\$61.54	\$34.05	\$35.08	\$36.13	\$37.21	\$38.33	
6 inch	\$130.62	\$70.78	\$72.91	\$75.09	\$77.35	\$79.67	
8 inch	\$212.11	\$119.76	\$123.35	\$127.05	\$130.86	\$134.79	
<b>Commodity Charges</b>							
Rate per hcf of Water Consumed:							
Uniform Rate (Non-SFR + Construction)	\$2.96	\$6.12	\$6.31	\$5.06	\$5.21	\$5.37	
Contract Rate	\$3.83	\$3.94	\$4.06	N/A	N/A	N/A	
Tiered Rate (SFR Customers):							
	<u>Proposed Break</u>						
Tier 1	0-7 hcf	\$1.53	\$1.98	\$2.03	\$2.10	\$2.16	\$2.22
Tier 2	8-14 hcf	\$3.35	\$7.00	\$7.21	\$7.43	\$7.65	\$7.88
Tier 3	14+ hcf	\$5.12	\$12.84	\$13.22	\$13.62	\$14.03	\$14.45

**F. Comparison of Current and Proposed Water Bills**

Figure 3 and Figure 4 compare a range of monthly water bills for the current and proposed water rates as a result of the initial rate adjustment for single-family residential customers (with a 5/8-inch meter) and non-single family residential customers (the bill comparison for a commercial customer is also a 5/8-inch meter). These monthly bills are based on typical meter sizes at various consumption levels.

Figure 23. Monthly Bill Comparison for Single Family Customers

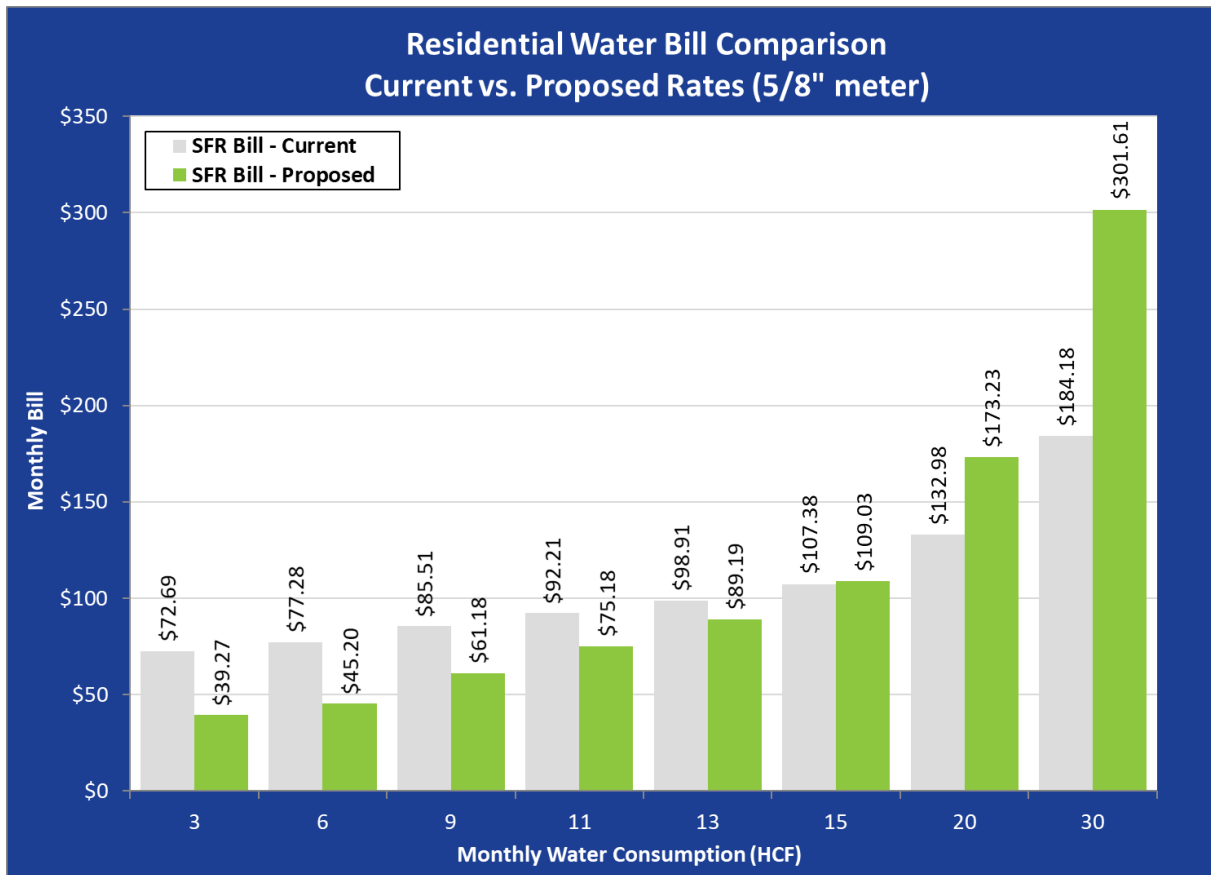
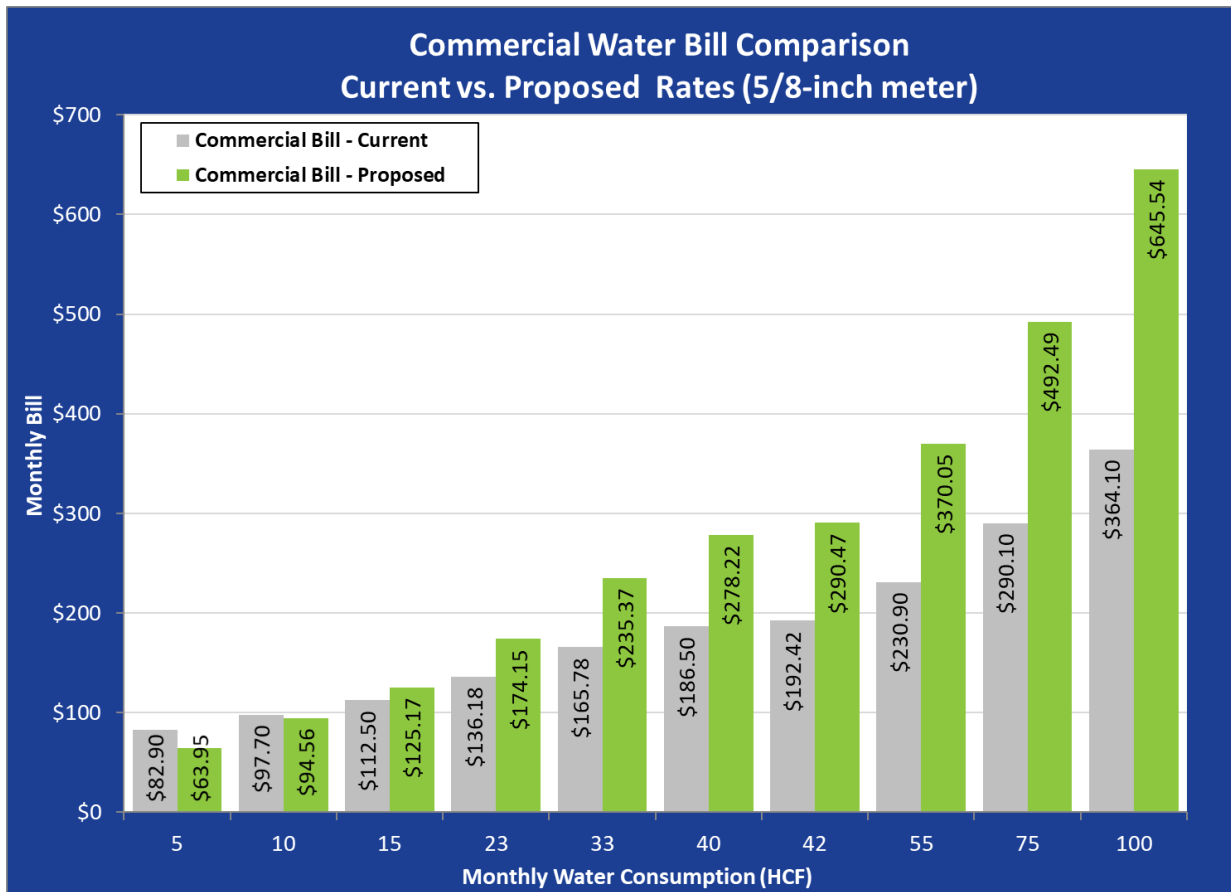


Figure 24. Monthly Water Bill Comparison for Commercial Customers



## Section 3. RECOMMENDATIONS AND NEXT STEPS

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### A. Consultant Recommendations

NBS recommends District take the following actions:

**Approve and accept this Study:** NBS recommends the District Board formally approve and adopt this Study and its recommendations and proceed with the steps required to implement the proposed rates. This will provide documentation of the rate study analyses and the basis for analyzing potential changes to future rates.

**Implement Recommended Levels of Rate Adjustments and Proposed Rates:** Based on successfully meeting the Proposition 218 procedural requirements, the District should proceed with implementing the 5-year schedule of proposed rates and rate adjustments previously shown in Figure 22. This will help ensure the continued financial health of District's water utility.

### B. Next Steps

Annually Review Rates and Revenue – Any time an agency adopts new utility rates or rate structures, those new rates should be closely monitored over the next several years to ensure the revenue generated is sufficient to meet the annual revenue requirements. Changing economic and water consumption patterns underscore the need for this review, as well as potential and unseen changing revenue requirements—particularly those related to environmental regulations that can significantly affect capital improvements and repair and replacement costs.

*Note: The attached Technical Appendix provides more detailed information on the analysis of the water revenue requirements, cost-of-service analysis and cost allocations, and the rate design analyses that have been summarized in this report.*

### C. NBS' Principal Assumptions and Considerations

In preparing this report and the opinions and recommendations included herein, NBS has relied on a number of principal assumptions and considerations with regard to financial matters, conditions, and events that may occur in the future. This information and these assumptions, including District's budgets, capital improvement costs, and information from District staff were provided by sources we believe to be reliable, although NBS has not independently verified this data.

While we believe NBS' use of such information and assumptions is reasonable for the purpose of this report and its recommendations, some assumptions will invariably not materialize as stated herein and may vary significantly due to unanticipated events and circumstances. Therefore, the actual results can be expected to vary from those projected to the extent that actual future conditions differ from those assumed by us or provided to us by others.

# Appendix: Detailed Water Rate Study Tables and Figures

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