



San Bernardino Local Agency Formation Commission

PLAN OF SERVICE REPORT - ANNEXATION OF PARCEL NO. 0631-071-29

July 2023

Prepared on Behalf of Applicant/Property Owner: Ali Rezaie

By

Bighorn-Desert View Water Agency

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I certify that the information  
contained in this Plan of Service  
Report is accurate to the best of my  
knowledge.

## SUMMARY:

This *Plan for Service* was prepared in accordance with Government Code Section 56653 and is included as an attachment to the application for annexation of Assessor Parcel No. 0631-071-29 (10-acres located south of Napa Road between Alta Avenue and Covelo Avenue, Landers, CA).

The annexation was requested by the property owner, A. Rezaie, MD. Bighorn-Desert View Water Agency will serve as the applicant on behalf of the landowner.

Mr. Rezaie recently purchased this vacant 10-acre parcel with the understanding that the parcel would require annexation from the Agency's Sphere of Influence into its Service Territory in order to access water service from Bighorn-Desert View Water Agency.

The annexation is for one single parcel for one water meter which is the basis for this *Plan for Service* in meeting the minimum requirements for such under the LAFCO guidelines.

A. Level and Range of Service to be Provided: The property owner is seeking access to water service from Bighorn-Desert View Water Agency. To our knowledge, there would be no other entity that would be providing a "service" for which LAFCO would be required to approve (ie. sewer service).

To that end, the level of service would be provision of water through a 1-inch service line and water meter installed at the northern edge of the property connected to an existing 8-inch water main.

B. Discuss When Service can be Feasibly Extended to the Parcel: The parcel lies adjacent to an existing 8-inch transmission mainline. The only additional work needed is to install the 1-inch service line and meter. Once the annexation proceedings are completed to bring the parcel into the service territory of the Agency, the water meter and service line can be installed within two weeks of that request.

C. Identify any Improvements or Upgrades the Agency would Impose on the Territory: None, no additional infrastructure is required to serve this parcel.

D. Fiscal Impact Analysis: The Agency has sufficient capacity to service this additional parcel. The fiscal impact of adding one additional service connection would not be significant and is within the projected annual growth for the Agency. The Agency's 2021 Rate and Capacity Fee Study was designed to adequately fund the Agency's operations going forward. The Rate and Capacity Fee Study includes a 20-year financial model which is used here as the fiscal impact analysis. The Agency is scheduled to begin a new Rate and Capacity Fee Study in early 2025 in anticipation of a Prop. 218 Rate Hearing in late 2025.

The 2020 Water Rate Study and Water Capacity Fee Study reports and associated appendixes were received and filed by the Board of Directors on February 9, 2021 and are submitted as an Appendix to this report.

E. Annexing Parcel to Existing Improvement District: The project would become part of the Improvement District Goat Mountain. A water system dissolved from the County of San Bernardino Special Districts Department and annexed to the Agency thru the formation of an improvement district (LAFCO Proposal No. 3181/Resolution No. 3197).

F. Water Availability to Parcel: Upon finalization of approvals by LAFCO to annex the territory (a single 10-acre parcel) and payment of fees applicable to initiating water service, the Agency can install the needed improvements within approximately two weeks.

## APPENDIXES

1. Final Water Rate Study and Appendix A – Financial Plan and Reserve Summary, NBS Government, February 2021 – Received and filed by the Board of Directors on February 9, 2021
2. Final Capacity Fee Study Report and Appendix with Exhibits 1 to 8, NBS Government, February 2021, Received and Filed by the Board of Directors on February 9, 2021.
3. Resolution No. 21R-08 Adjusting the Basic Service Charge and Water Consumption Charges by Specific Customer Class, adopted April 13, 2021.





# BIGHORN DESERT VIEW WATER AGENCY

**Final Report**

**Water Rate Study**

**February 2021**

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# Table of Contents

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<b>Section 1. Purpose and Overview of the Study</b> .....	<b>1</b>
A. Purpose .....	1
B. Overview of the Study.....	1
<b>Section 2. Water Rate Study</b> .....	<b>4</b>
A. Key Water Rate Study Issues.....	4
B. Financial Plan.....	4
C. Cost of Service Analysis.....	6
D. Rate Design Analysis .....	12
E. Current and Proposed Water Rates .....	14
F. Comparison of Current and Proposed Water Bills .....	15
<b>Section 3. Recommendations and Next Steps</b> .....	<b>18</b>
A. Consultant Recommendations.....	18
B. Next Steps .....	18
C. NBS’ Principal Assumptions and Considerations .....	18
<b>Appendix A: Water Rate Study Tables and Figures</b> .....	
<b>Appendix B: Customer Class Definitions</b> .....	

# Table of Figures

---

Figure 1. Primary Components of a Rate Study .....	1
Figure 2. Summary of Water Revenue Requirements .....	6
Figure 3. Summary of Reserve Funds .....	6
Figure 4. Cost Classification Summary .....	8
Figure 5. Allocation of Water Revenue Requirements .....	8
Figure 6. Cost Allocation Methodology .....	9
Figure 7. Hydraulic Capacity Factors .....	10
Figure 8. Capacity Related Allocation .....	10
Figure 9. Customer Related Cost Allocation .....	11
Figure 10. Commodity Related Costs Allocation .....	11
Figure 11. Allocation of Adjusted Net Revenue Requirements .....	12
Figure 12. Tier Breakpoint Calculation .....	13
Figure 13. Additional Water Supply Costs .....	13
Figure 14. Residential & Agriculture Customer Tiered Rate Calculation .....	13
Figure 15. Calculated Variable Charges for FY 2020/21 .....	14
Figure 16. Current and Proposed Water Rates .....	15
Figure 17. Bi-Monthly Bill Comparison for Single Family Customers .....	16
Figure 18. Bi-Monthly Water Bill Comparison for Commercial Customers .....	17

# Section 1. PURPOSE AND OVERVIEW OF THE STUDY

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## A. Purpose

Bighorn Desert View Water Agency (Agency, BDVWA) retained NBS to conduct a 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 Agency to maintain transparent communications with its residents and businesses.

In developing new water rates, NBS worked cooperatively with Agency staff and the Agency’s Board of Directors (Board) in selecting appropriate rate alternatives. Based on input from Agency 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 Appendix A.

## 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 Agency's objectives. It is important for the Agency 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 60 percent of rate revenue from the fixed meter charges and 40 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. BDVWA refers to this as the Basic Service Charge.

**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 Agency’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 Agency 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 Agency's water rate analysis was undertaken with a few specific objectives, including, but not limited to:

- Avoiding operational deficits and further depletion of reserves.
- Generating additional revenue needed to meet projected funding requirements.
- Continuing to encourage water conservation with a tiered rate structure for residential and agriculture customers.

NBS developed various water rate alternatives as requested by Agency 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 of Directors. The fixed and volume-based charges were calculated based on the net revenue requirements, number of customer accounts, water consumption, and other Agency-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 financial condition of the Agency, 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 Agency is approximately \$1.66 million, annually on average. If no rate adjustments are implemented, the Agency is projected to see a \$131,500 deficit by fiscal year 2024/25. With 4% increases to the net revenue requirement, the Agency will see an annual surplus that grows to \$182,000 in fiscal year 2024/25 that will be used to replenish reserve funds as capital investments are made in the water system.
- **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 Agency plans to accumulate approximately \$3,790,000 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 \$1,000,000 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 Emergency Contingencies Reserve** should equal a minimum of \$200,000. This reserve shall be authorized by the Board should cash be needed immediately for needs such as water system repairs or unforeseen circumstances.
- **The Capital Replacement and Refurbishment Reserve** should equal at least 10 percent of net capital assets plus \$1,500,000 for capital emergencies, totaling approximately \$2,180,000 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. Agency staff has identified roughly \$800,000 (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 over the 5-year rate period is estimated in order to maintain a conservative approach.
  - Electricity cost inflation is 3.5% annually.
  - General cost inflation is 2% annually.
  - Salary cost inflation is 3.3% annually.
  - Benefits cost inflation is 6% annually.
  - Fuel cost inflation is 1% annually.
- **Impact of Annual Rate Adjustment Date:** In the current year, the Agency will only collect two months of the planned revenue increase for FY 2020/21 since rate increases will not be effective until May 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 4 percent adjustment in rate revenue planned for FY 2020/21; meaning, the rates are developed to recover \$1.68 million, which is a 4 percent adjustment over the expected \$1.62 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 \$1.63 million in rate revenue for FY 2020/21.

Rate adjustments of 4 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 keep reserves above the recommended targets through 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 Agency.

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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	Budget	Projected			
	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	\$ 1,618,617	\$ 1,618,617	\$ 1,618,617	\$ 1,618,617	\$ 1,618,617
<i>Additional Revenue from Rate Increases</i> <sup>1</sup>	10,791	98,412	167,093	238,521	312,807
Non-Rate Revenues	289,832	289,832	289,832	289,832	289,832
Interest Earnings	16,000	6,741	6,825	6,981	7,209
<b>Total Sources of Funds</b>	<b>\$ 1,935,240</b>	<b>\$ 2,013,602</b>	<b>\$ 2,082,367</b>	<b>\$ 2,153,952</b>	<b>\$ 2,228,465</b>
<b>Uses of Water Funds</b>					
Operating Expenses	\$ 1,850,115	\$ 1,868,584	\$ 1,926,253	\$ 1,986,073	\$ 2,046,138
Debt Service	25,000	25,000	25,000	-	-
Rate-Funded Capital Expenses	-	-	52,665	-	-
<b>Total Use of Funds</b>	<b>\$ 1,875,115</b>	<b>\$ 1,893,584</b>	<b>\$ 2,003,918</b>	<b>\$ 1,986,073</b>	<b>\$ 2,046,138</b>
<b>Surplus (Deficiency) after Rate Increase</b>	<b>\$ 60,125</b>	<b>\$ 120,018</b>	<b>\$ 78,449</b>	<b>\$ 167,879</b>	<b>\$ 182,327</b>
<b>Projected Annual Rate Increase</b>	<b>4.00%</b>	<b>4.00%</b>	<b>4.00%</b>	<b>4.00%</b>	<b>4.00%</b>
<i>Cumulative Rate Increases</i>	4.00%	8.16%	12.49%	16.99%	21.67%
<b>Surplus (Deficiency) before Rate Increase</b>	<b>\$ 49,334</b>	<b>\$ 21,606</b>	<b>\$ (88,644)</b>	<b>\$ (70,643)</b>	<b>\$ (130,480)</b>
<b>Net Revenue Requirement</b> <sup>2</sup>	<b>\$ 1,569,283</b>	<b>\$ 1,597,011</b>	<b>\$ 1,707,261</b>	<b>\$ 1,689,260</b>	<b>\$ 1,749,097</b>

1. Revenue from rate increases assume an implementation date of May 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 Agency's proposed 5-year financial plan is included in Tables 1 and 2 of Appendix A. The appendix tables include revenue requirements, reserve funds, revenue sources, proposed rate adjustments, and the Agency's capital improvement program. As can be seen in Figure 3, given proposed rate adjustments, reserves meet the minimum target all 5 years of the prop 218 rate period.

**Figure 3. Summary of Reserve Funds**

Beginning Reserve Fund Balances and Recommended Reserve Targets	Budget	Projected			
	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25
<b>Operating Reserve Fund (Current Customer Deposits)</b>					
Ending Balance	\$ 912,385	\$ 921,493	\$ 949,933	\$ 979,433	\$ 1,009,054
<i>Recommended Minimum Target</i>	912,385	921,493	949,933	979,433	1,009,054
<b>Emergency Contingencies Reserve Fund</b>					
Ending Balance	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
<i>Recommended Minimum Target</i>	200,000	200,000	200,000	200,000	200,000
<b>Replacement &amp; Refurbishment Reserve Fund</b>					
Ending Balance	\$ 2,258,258	\$ 2,290,793	\$ 2,340,803	\$ 2,425,132	\$ 2,577,838
<i>Recommended Minimum Target</i>	2,033,750	2,086,438	2,118,390	2,151,935	2,181,602
<b>Total Ending Balance</b>	<b>\$ 3,370,643</b>	<b>\$ 3,412,287</b>	<b>\$ 3,490,736</b>	<b>\$ 3,604,565</b>	<b>\$ 3,786,892</b>
<i>Total Recommended Minimum Target</i>	<i>\$ 3,146,135</i>	<i>\$ 3,207,931</i>	<i>\$ 3,268,323</i>	<i>\$ 3,331,368</i>	<i>\$ 3,390,656</i>

### 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 Agency’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>5</sup>. In accordance with this method, budgeted costs were “classified” into five categories: commodity, additional water supply, capacity, customer and fire protection. The classification process provides 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.
- **Additional water supply related costs** are associated with the additional water purchased by the Agency to serve its customers.
- **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 Agency’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 15 through 18 in Appendix A show how the Agency’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 4**.

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<sup>5</sup> *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, seventh edition, 2017, p. 83.*

**Figure 4. Cost Classification Summary**



Ideally, utilities should recover all 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 Agency’s projected costs, the Cost-of-Service Analysis (COSA) resulted in a distribution that is approximately 65 percent fixed and 35 percent variable. The Agency’s current rate structure collects approximately 41 percent of revenue from fixed charges and 59 percent from variable charges. The Board of Directors has chosen to move forward with a rate structure that will collect approximately 60 percent of revenue from fixed charges and 40 percent from variable charges. However, a share of the Agency’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 5** summarizes the allocation of the net revenue requirements to each cost causation component.

**Figure 5. Allocation of Water Revenue Requirements**

Functional Category	Proposed Rates	
	Adjusted Net Revenue Requirements (2020-21) 60% Fixed / 40% Variable	
Commodity - Related Costs	\$ 532,313	31.6%
Additional Supply Costs	\$ 48,271	2.9%
Capacity - Related Costs (volumetric share)	\$ 92,760	5.5%
Capacity - Related Costs (fixed share)	\$ 811,720	48.2%
Customer - Related Costs	\$ 198,076	11.8%
Fire Protection - Related Costs	\$ 221	0.0%
<b>Total</b>	<b>\$1,683,362</b>	<b>100%</b>

## CUSTOMER CLASSES

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

For Bighorn Desert View Water Agency, six customer classes were analyzed: residential, agriculture, commercial, institutional, private fire and bulk water. 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. Definitions of each customer class are provided in Appendix B.

## 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 6** summarizes how the costs for each cost causation component from Figure 5 are allocated to each customer class.

**Figure 6. 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
Additional Water Supply Costs	•Allocated based on additional water purchased
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 6. This process is shown in the following sections, in Figure 7 through Figure 11.

### Capacity Related Costs

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 of each meter size as established by the AWWA<sup>6</sup>. The meter capacity factors used in this study are shown in the third and fifth columns of **Figure 7**.

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<sup>6</sup> *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, seventh edition, 2017, p. 338.*

A “hydraulic capacity factor” (columns two and four in Figure 10) 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 1-inch meter). For example, Figure 10 shows the hydraulic capacity of a two-inch meter is 3.2 times that of a 1-inch meter and therefore, the capacity component of the fixed meter charge is 3.2 times that of the 1-inch meter.

The actual number of meters by size is multiplied by the corresponding capacity ratios to calculate the total number of equivalent meters. The number of equivalent meters is used as a representation for the potential demand that each customer can place on the water system. The capacity related allocation is summarized in **Figure 8**. Capacity related costs are allocated to each customer class based upon their percentage of peak bi-monthly use.

**Figure 7. Hydraulic Capacity Factors**

Meter Size	Standard Meters <sup>1</sup>		Fire Service Meters <sup>2</sup>	
	Meter Capacity (gpm)	Equivalency to 1 inch	Meter Capacity (gpm)	Equivalency to 1 inch
	<i>Displacement Meters</i>		<i>Displacement Meters</i>	
3/4 inch	30	1.00	30	1.00
1 inch	50	1.00	50	1.00
1.5 inch	100	2.00	100	2.00
2 inch	160	3.20	160	3.20
	<i>Compound Class I Meters</i>		<i>Fire Service Type II</i>	
3 inch	320	6.40	350	7.00
4 inch	500	10.00	700	14.00
6 inch	1,000	20.00	1,600	32.00
8 inch	1,600	32.00	2,800	56.00

1. Meter flow rates are from AWWA M-1 Table B-1.

2. Fire Service meter flow rates are from AWWA M-6 Table 5-3.

**Figure 8. Capacity Related Allocation**

Customer Class	Average Bi-Monthly Use (hcf)	Peak Bi-Monthly Use (hcf) <sup>1</sup>	Peaking Factor	Max 2-Month Capacity Factor
Residential	29,341	44,281	<b>1.51</b>	<b>82.3%</b>
Agriculture	2,716	6,034	<b>2.22</b>	<b>11.2%</b>
Bulk Water	1,760	2,760	<b>1.57</b>	<b>5.1%</b>
Commercial & Institutional	359	707	<b>1.97</b>	<b>1.3%</b>
Fire Meter	0	0	<b>0.00</b>	<b>0.0%</b>
<b>Total</b>	<b>34,176</b>	<b>53,782</b>		<b>100%</b>

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

### Customer Related Costs

The customer related cost allocation is summarized in **Figure 9**. 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 9. Customer Related Cost Allocation**

Customer Class	Number of Meters <sup>1</sup>	Percent of Total
Residential	2,522	93.2%
Agriculture	50	1.8%
Bulk Water	121	4.5%
Commercial & Institutional	12	0.4%
Fire Meter	2	0.1%
<b>Total</b>	<b>2,707</b>	<b>100.0%</b>

1. Meter Count is from July/August 2020. BHDVWA charges monthly rates, but bills bi-monthly  
 Source files: CUSTOMER BILLING DATA 09.18.2020.xlsx

**Fire Protection Related Costs**

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. The percent of revenue collected over the total revenue was used to allocate these costs to fire protection meters. This cost is spread over the fire meters using the meter equivalency factors in Figure 7.

**Commodity Related Costs**

The commodity related cost allocation is summarized in **Figure 10**. 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 10. Commodity Related Costs Allocation**

Customer Class	Volume (hcf) <sup>1</sup>	Percent of Total Volume
Residential	176,045	85.9%
Agriculture	16,297	7.9%
Bulk Water	10,563	5.2%
Commercial & Institutional	2,152	1.0%
Fire Meter	-	0.0%
<b>Total</b>	<b>205,057</b>	<b>100%</b>

1. Consumption is from September 2019 through August 2020. BDVWA charges monthly rates, but bills customers bi-monthly.  
 Source files: CUSTOMER BILLING DATA 09.18.2020.xlsx

**Figure 11** summarizes the costs allocated to each customer class.

**Figure 11. Allocation of Adjusted Net Revenue Requirements**

Customer Classes	Classification Components						Cost of Service Net Rev. Req'ts	% of COS Net Revenue Req'ts
	Commodity-Related Costs	Additional Supply Costs	Capacity-Related Costs <i>Volumetric Share</i>	Capacity-Related Costs <i>Fixed Share</i>	Customer-Related Costs	Fire Protection-Related Costs		
Residential	\$ 457,000	\$ 38,855	\$ 76,373	\$ 668,320	\$ 184,539	\$ -	\$ 1,425,088	84.7%
Agriculture	42,306	8,518	10,406	91,064	3,659	-	155,952	9.3%
Bulk Water	27,420	-	4,761	41,661	8,854	-	82,696	4.9%
Commercial & Institutional	5,587	449	1,220	10,675	878	-	18,809	1.1%
Fire Meter	-	449	-	-	146	221	816	0.0%
<b>Total Net Revenue Requirement</b>	<b>\$ 532,313</b>	<b>\$ 48,271</b>	<b>\$ 92,760</b>	<b>\$ 811,720</b>	<b>\$ 198,076</b>	<b>\$ 221</b>	<b>\$ 1,683,362</b>	<b>100%</b>

## D. Rate Design Analysis

NBS discussed several water rate alternatives and methodologies with Agency 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 Agency 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 60% of the revenue requirement and update volumetric charges to reflect collecting 40% of revenue.
2. Update the volumetric rates for Residential and Agriculture customers as follows:
  - a. Develop a two tier rate structure.
  - b. Establish breakpoint between tier 1 and tier 2 to 25 hcf bi-monthly, which is based on the availability of ground water for customers in the Agency's service area.
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 Agency 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.

### VARIABLE CHARGES

The Agency currently has a uniform volumetric rate for all customers. Based on the Agency's sources of water supply, NBS recommends updating the Residential and Agriculture customers to a two-tiered inclining rate structure.

The goals when setting the tier breakpoint were twofold:

1. The breakpoint for the first tier was set to the 25 hcf<sup>7</sup>, which is the bi-monthly ground water allocated to each customer.
2. The second tier consists of any consumption above 25 hcf and includes the cost of purchased water in addition to base commodity costs.

**Figure 12** shows the calculation for the tier breakpoint with 908 acre feet of free ground water production used as the base water allotment.

**Figure 12. Tier Breakpoint Calculation**

Water Supply Allocation	Based on # of Accounts
Total Water Allocation 2020	908 acre feet
Total Customer Base	2,707 total active accounts
Water Allocated to Each Customer Annual	0.34 acre feet/parcel/year
Conversion to Hundred Cubic Feet	146.1 hcf
HCF Bi-Monthly Allocation Per Customer	24.4 hcf
Bi-Monthly Tier 1 Water	25.00 hcf

**Figure 13** shows the calculation for the additional water supply costs that are added in the calculation for the fee of Tier 2 water consumption.

**Figure 13. Additional Water Supply Costs**

Cost Per Unit for State Water Project Water	Total
Total Cost for Additional Water Supply (70 AF)	\$48,271.27 Total Cost
Cost per Acre Foot	\$689.59 per AF
Cost per HCF	\$1.58 per hcf

**Figure 14** presents the full calculation for the variable tiered charges for residential and agriculture customers. The base rate is calculated by dividing the commodity and volumetric capacity costs by the water consumption for residential and agriculture customers.

**Figure 14. Residential & Agriculture Customer Tiered Rate Calculation**

Customer Classes	Tier Break	Est. Water Consumption (hcf/yr.)	% of Consumption in Tier	Base Rate	Plus Additional Supply Cost	Cost Per Unit of Water	Estimated Revenue
Residential							
Tier 1	25	124,215	70%	\$3.03	\$0.00	<b>\$3.03</b>	\$ 376,341
Tier 2	--	53,094	30%	\$3.03	\$1.58	<b>\$4.61</b>	\$ 244,914
Agriculture							
Tier 1	25	4,052	26%	\$3.23	\$0.00	<b>\$3.23</b>	\$ 13,106
Tier 2	--	11,649	74%	\$3.23	\$1.58	<b>\$4.82</b>	\$ 56,120
<b>Total</b>		<b>193,010</b>					<b>\$ 690,481</b>

Due to the varying consumption characteristics, non-residential/agriculture customers will maintain a uniform volumetric rate because it best represents their cost-of-service. Using the commodity, volumetric capacity and additional supply costs allocated to each customer class, **Figure 15** shows the calculation for

<sup>7</sup> HCF is one hundred cubic feet of water.

the per unit volumetric charge for each customer class and tier. It is notable to mention that the base rate for residential and agriculture customers is shown in Figure 17, which filters into the calculation in Figure 16.

**Figure 15. Calculated Variable Charges for FY 2020/21**

Customer Classes	Water Consumption (hcf/yr.)	Commodity Assigned Costs	Capacity Assigned Costs	Additional Supply Costs <sup>1</sup>	Fixed Costs to Recover from Vol. Charges	Target Rev. Req't from Vol. Charges	Base Volumetric Rates (\$/hcf)
Residential	176,045	\$ 457,000	\$ 76,373	<i>See footnote</i>	\$ -	\$ 533,374	\$3.03
Agriculture	16,297	42,306	10,406	<i>footnote</i>	-	52,712	\$3.23
Bulk Water	10,563	27,420	4,761	-	50,515	82,696	\$7.83
Commercial & Institutional	2,152	5,587	1,220	719	-	7,525	\$3.58
Fire Meter	0	-	-	180	-	180	\$3.58
<b>Total</b>	<b>205,057</b>	<b>\$ 532,313</b>	<b>\$ 92,760</b>	<b>\$ 898</b>	<b>\$ 50,515</b>	<b>\$ 676,487</b>	

1. Additional water supply costs for Residential and Agriculture customers shown in Figure 14.

## 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 16** provides a comparison of the current and proposed rates for FY 2020/21 through FY 2024/25. More detailed tables on the development of the proposed charges are documented in Appendix A.

**Figure 16. 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	
<i>Projected Increase in Rate Revenue per Financial Plan:</i>		4.00%	4.00%	4.00%	4.00%	4.00%	
<b>Fixed Meter Charges</b>							
Bi-Monthly Fixed Service Charges:							
3/4 inch	\$66.84	\$61.78	\$64.25	\$66.82	\$69.49	\$72.27	
1 inch	\$66.84	\$61.78	\$64.25	\$66.82	\$69.49	\$72.27	
1.5 inch	\$66.84	\$111.36	\$115.81	\$120.44	\$125.26	\$130.27	
2 inch	\$66.84	\$170.86	\$177.69	\$184.80	\$192.19	\$199.88	
3 inch	\$66.84	\$329.53	\$342.71	\$356.42	\$370.68	\$385.51	
4 inch	--	\$508.03	\$528.35	\$549.48	\$571.46	\$594.32	
6 inch	--	\$1,003.87	\$1,044.02	\$1,085.78	\$1,129.21	\$1,174.38	
Bi-Monthly Fire Service Charges:							
3/4 inch	\$16.00	\$30.62	\$31.84	\$33.11	\$34.43	\$35.81	
1 inch	\$16.00	\$30.62	\$31.84	\$33.11	\$34.43	\$35.81	
2 inch	\$16.00	\$71.14	\$73.99	\$76.95	\$80.03	\$83.23	
3 inch	\$34.43	\$141.14	\$146.79	\$152.66	\$158.77	\$165.12	
4 inch	\$57.38	\$270.09	\$280.89	\$292.13	\$303.82	\$315.97	
6 inch	\$114.75	\$601.66	\$625.73	\$650.76	\$676.79	\$703.86	
8 inch	\$183.60	\$1,043.76	\$1,085.51	\$1,128.93	\$1,174.09	\$1,221.05	
<b>Commodity Charges</b>							
Rate per hcf of Water Consumed:							
Bulk Meters	\$9.57	\$7.83	\$8.14	\$8.47	\$8.81	\$9.16	
Commercial, Institutional, Fire & Other	\$3.38	\$3.58	\$3.72	\$3.87	\$4.02	\$4.18	
Residential, 3/4" and 1" Meters	\$3.38	--	--	--	--	--	
Tiered Rate - Residential Customers:							
<u>Proposed Break</u>							
Tier 1	0-25 hcf	\$3.38	\$3.03	\$3.15	\$3.28	\$3.41	\$3.55
Tier 2	26+ hcf	\$3.38	\$4.61	\$4.80	\$4.99	\$5.19	\$5.40
Tiered Rate - Agriculture Customers:							
<u>Proposed Break</u>							
Tier 1	0-25 hcf	\$3.38	\$3.23	\$3.36	\$3.49	\$3.63	\$3.78
Tier 2	26+ hcf	\$3.38	\$4.82	\$5.01	\$5.21	\$5.42	\$5.64

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

Figure 17 and Figure 18 compare a range of monthly water bills for the current and proposed water rates as a result of the initial rate adjustment for residential customers (with a 1-inch meter) and non-single family residential customers (the bill comparison for a commercial customer is also a 1-inch meter). These monthly bills are based on typical meter sizes at various consumption levels.

Figure 17. Bi-Monthly Bill Comparison for Single Family Customers

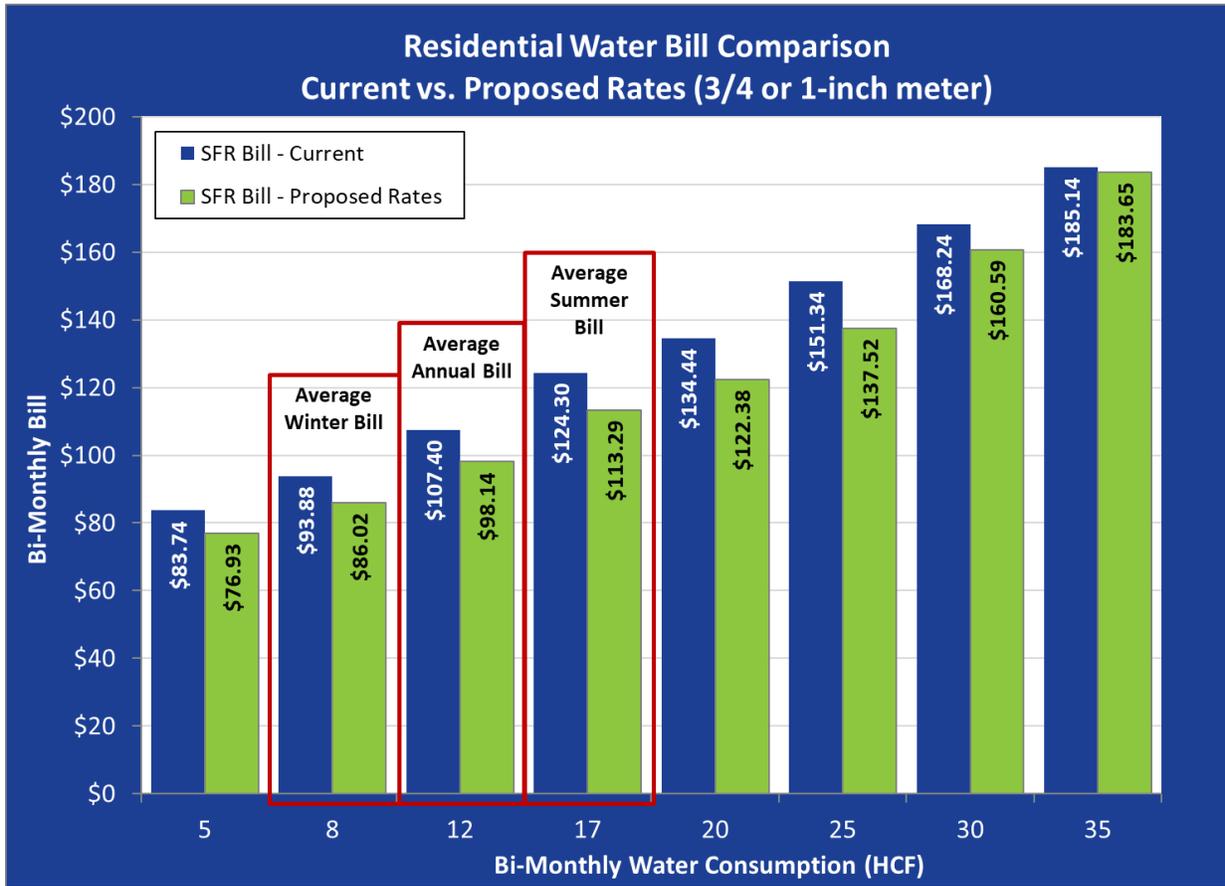
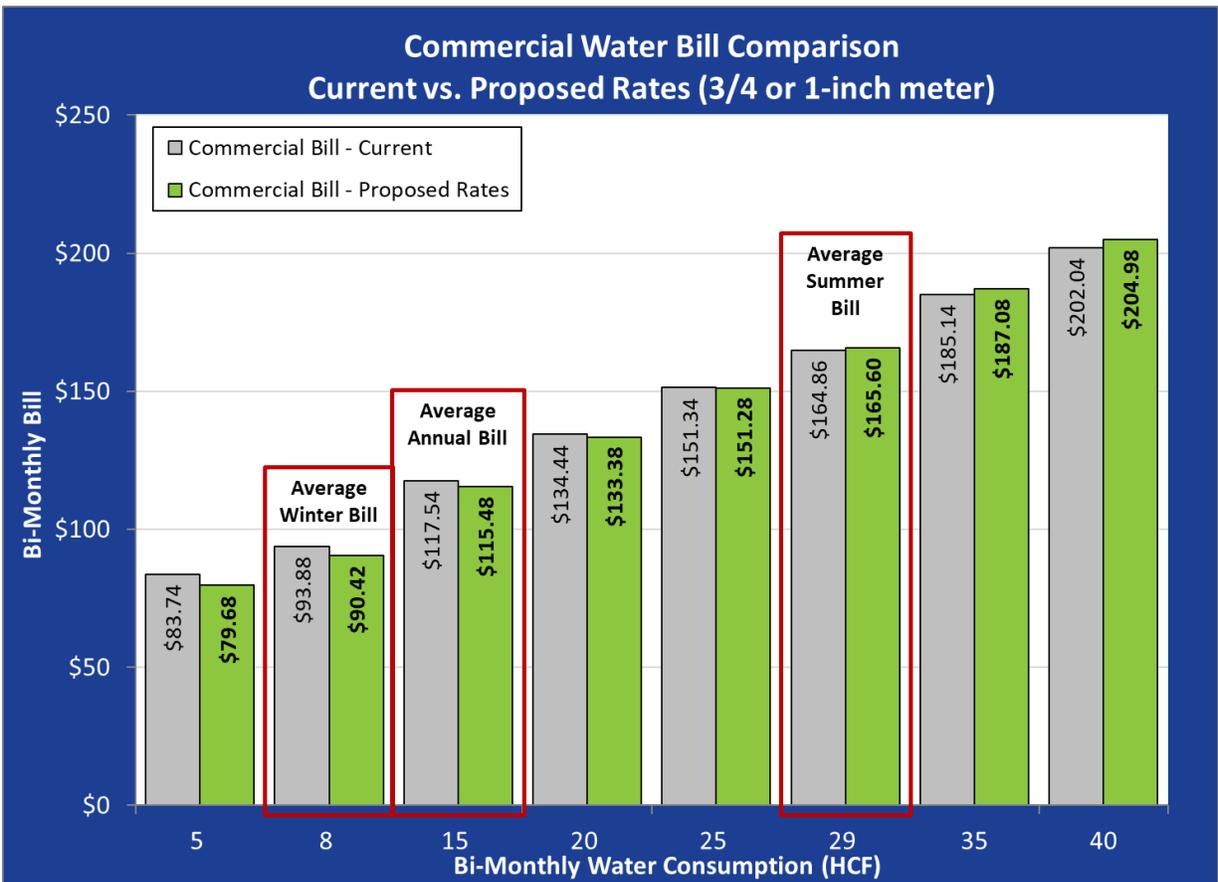


Figure 18. Bi-Monthly Water Bill Comparison for Commercial Customers



## Section 3. RECOMMENDATIONS AND NEXT STEPS

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### A. Consultant Recommendations

NBS recommends the Agency take the following actions:

**Approve and accept this Study:** NBS recommends the Agency 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 Agency should proceed with implementing the 5-year schedule of proposed rates and rate adjustments previously shown in Figure 16. This will help ensure the continued financial health of Agency'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 A 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 Agency's budgets, capital improvement costs, and information from Agency 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 A: WATER RATE STUDY TABLES AND FIGURES

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# APPENDIX B: CUSTOMER CLASS DEFINITIONS (DRAFT)

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This appendix shows the customer class definitions that are currently in progress and subject to change. The definitions will be updated upon final approval of the Board of Directors.

## Customer Classes Served

Any person or entity connected to the water system and immediately able to receive water service from the Agency under these rules and regulations will be placed into a unique customer class.

1. Residential Customer: A place where people reside. A legally permitted dwelling and/or “vacation” parcel (e.g. “inactive”) which has a meter connected to the water system and readily able to receive water service.
2. Bulk Hauling Customer and/or (Temporary) Construction Meters: A bulk hauling customer is one who obtains water from one of the Agency’s “bulk water station” facilities. A construction meter is connected to a fire hydrant to supply water to a project on a temporary basis thru application for such.
3. Commercial/Institutional/Industrial/Non-Agriculture: A facility that is neither residential, bulk, nor agriculture. Such facility may or may not have a cross connection control device (backflow device). Examples of such facilities are restaurants, retail stores, schools and other types of “commercial” businesses.
4. Agriculture (Non-Residential and Non-Commercial/Institutional): Agricultural customer classes will be the default class whenever any of the following are met:
  - Cross connection control device mandated per an analysis by staff of the Water Use Questionnaire completed and signed by the customer at time of application for water service (new or renewed).
  - A property with, or without, a permitted residential dwelling but also with irrigation of non-ornamental landscaping or “vegetable gardens”. For reference, and “ornamental landscape” shall be defined as a permanent landscape designed which serves the primary purpose of adding visually pleasing plants to the landscape. Non-ornamental landscaping or crops are those that are harvested on a routine basis and are not a permanent part of the landscape. Such crops could also be defined as specialized botanicals or otherwise botanicals that are harvested for extraction or consumption.
  - Livestock (horses, pigs, cows, poultry, etc.) that are raised for commercial purposes such as food processing or commercial sales.
5. Fire Service Connections: Parcels which have separate and distinct connections for fire sprinklers or on-site fire hydrants or other fire suppression devices or systems. Such fire service connections are static and only consume water during firefighting efforts.

TABLE 1 : FINANCIAL PLAN AND SUMMARY OF REVENUE REQUIREMENTS

RATE REVENUE REQUIREMENTS SUMMARY <sup>1</sup>	Budget	Projected			
	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25
<b>Sources of Water Funds</b>					
<i>Rate Revenue:</i>					
Water Sales Revenue Under Current Rates	\$ 1,618,617	\$ 1,618,617	\$ 1,618,617	\$ 1,618,617	\$ 1,618,617
Revenue from Rate Increases <sup>2</sup>	10,791	98,412	167,093	238,521	312,807
Subtotal: Rate Revenue After Rate Increases	1,629,408	1,717,029	1,785,710	1,857,138	1,931,424
<i>Non-Rate Revenue:</i>					
Other Operating Revenue	\$ 60,001	\$ 60,001	\$ 60,001	\$ 60,001	\$ 60,001
Non-Operating Revenue	229,831	229,831	229,831	229,831	229,831
Interest Income <sup>3</sup>	16,000	6,741	6,825	6,981	7,209
Subtotal: Non-Rate Revenue	305,832	296,573	296,657	296,813	297,041
<b>Total Sources of Funds</b>	<b>\$ 1,935,240</b>	<b>\$ 2,013,602</b>	<b>\$ 2,082,367</b>	<b>\$ 2,153,952</b>	<b>\$ 2,228,465</b>
<b>Uses of Water Funds</b>					
<i>Operating Expenses <sup>4</sup></i>					
Operating Administrative Expenses	\$ 854,710	\$ 890,584	\$ 925,153	\$ 961,173	\$ 996,638
Non-Operating Administrative Expenses	24,300	24,900	25,500	26,100	26,700
Operations Expense	786,005	806,600	827,600	849,300	871,800
Director Expense	45,100	46,500	48,000	49,500	51,000
Administration Projects	140,000	100,000	100,000	100,000	100,000
Subtotal: Operating Expenses	\$ 1,850,115	\$ 1,868,584	\$ 1,926,253	\$ 1,986,073	\$ 2,046,138
<i>Other Expenditures:</i>					
Existing Debt Service	\$ 25,000	\$ 25,000	\$ 25,000	\$ -	\$ -
New Debt Service	-	-	-	-	-
Rate-Funded Capital Expenses	-	-	52,665	-	-
Subtotal: Other Expenditures	\$ 25,000	\$ 25,000	\$ 77,665	\$ -	\$ -
<b>Total Uses of Water Funds</b>	<b>\$ 1,875,115</b>	<b>\$ 1,893,584</b>	<b>\$ 2,003,918</b>	<b>\$ 1,986,073</b>	<b>\$ 2,046,138</b>
<b>Annual Surplus/(Deficit)</b>	<b>\$ 60,125</b>	<b>\$ 120,018</b>	<b>\$ 78,449</b>	<b>\$ 167,879</b>	<b>\$ 182,327</b>
<b>Net Revenue Req't. (Total Uses less Non-Rate Revenue)</b>	<b>\$ 1,569,283</b>	<b>\$ 1,597,011</b>	<b>\$ 1,707,261</b>	<b>\$ 1,689,260</b>	<b>\$ 1,749,097</b>
<b>Projected Annual Rate Revenue Adjustment</b>	<b>4.00%</b>	<b>4.00%</b>	<b>4.00%</b>	<b>4.00%</b>	<b>4.00%</b>
<i>Cumulative Increase from Annual Revenue Increases</i>	4.00%	8.16%	12.49%	16.99%	21.67%
<i>Debt Coverage After Rate Increase</i>	3.40	5.80	6.24	N/A	N/A

1. Revenue for FY 2019/20 through FY 2020/21 are from source files: Resolution No. 19R-03 Adopting the Agency Budget for FY 2019-20.pdf,

and FY2020.21 Budget adopted 5 26 2020 20R-14.pdf

2. Rate increases assume an implementation date of May 1, 2021 and then January 1st thereafter.

3. Interest earnings for FY 2019/20 through FY 2020/21 from Agency budgets. For all other years, it is calculated based on historical LAIF returns.

4. Expenses for FY 2019/20 through FY 2020/21 are from source files: Resolution No. 19R-03 Adopting the Agency Budget for FY 2019-20.pdf, and FY2020.21 Budget adopted 5 26 2020 20R-14.pdf

TABLE 2 : RESERVE FUND SUMMARY

SUMMARY OF CASH ACTIVITY UN-RESTRICTED RESERVES	Budget	Projected			
	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25
<b>Total Beginning Cash</b> <sup>1, 2, 3</sup>	<b>\$ 3,310,519</b>				
<b>Operating Reserve Fund (Current Customer Deposits)</b>					
Beginning Reserve Balance <sup>1</sup>	\$ 856,666	\$ 912,385	\$ 921,493	\$ 949,933	\$ 979,433
Plus: Net Cash Flow (After Rate Increases)	60,125	120,018	78,449	167,879	182,327
Plus: Transfer of Debt Reserve Surplus	-	-	-	-	-
Less: Transfer Out to Emergency Contingencies Fund	-	-	-	-	-
Less: Transfer Out to Capital Replacement Reserve	(4,406)	(110,910)	(50,010)	(138,379)	(152,706)
<b>Ending Operating Reserve Balance</b>	<b>\$ 912,385</b>	<b>\$ 921,493</b>	<b>\$ 949,933</b>	<b>\$ 979,433</b>	<b>\$ 1,009,054</b>
<b>Target Ending Balance (180-days of O&amp;M)</b> <sup>2</sup>	<b>\$ 912,385</b>	<b>\$ 921,493</b>	<b>\$ 949,933</b>	<b>\$ 979,433</b>	<b>\$ 1,009,054</b>
<b>Emergency Contingencies Reserve Fund</b>					
Beginning Reserve Balance	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
Plus: Transfer of Operating Reserve Surplus	-	-	-	-	-
Less: Use of Reserves for Capital Projects	-	-	-	-	-
<b>Ending Emergencies Contingencies Reserve Balance</b>	<b>\$ 200,000</b>				
<b>Target Ending Balance Set by Board (\$200,000 minimum)</b> <sup>3</sup>	<b>\$ 200,000</b>				
<b>Replacement &amp; Refurbishment Reserve Fund</b>					
Beginning Reserve Balance	\$ 2,253,852	\$ 2,258,258	\$ 2,290,793	\$ 2,340,803	\$ 2,425,132
Plus: Transfer of Operating Reserve Surplus	4,406	110,910	50,010	138,379	152,706
Less: Use of Reserves for Capital Projects	-	(78,375)	-	(54,050)	-
<b>Ending Capital Rehab &amp; Replacement Reserve Balance</b>	<b>\$ 2,258,258</b>	<b>\$ 2,290,793</b>	<b>\$ 2,340,803</b>	<b>\$ 2,425,132</b>	<b>\$ 2,577,838</b>
<b>Target Ending Balance</b> <sup>4</sup>	<b>\$ 2,033,750</b>	<b>\$ 2,086,438</b>	<b>\$ 2,118,390</b>	<b>\$ 2,151,935</b>	<b>\$ 2,181,602</b>
<b>Ending Balance</b>	<b>\$ 3,370,643</b>	<b>\$ 3,412,287</b>	<b>\$ 3,490,736</b>	<b>\$ 3,604,565</b>	<b>\$ 3,786,892</b>
<b>Minimum Target Ending Balance</b>	<b>\$ 3,146,135</b>	<b>\$ 3,207,931</b>	<b>\$ 3,268,323</b>	<b>\$ 3,331,368</b>	<b>\$ 3,390,656</b>
<b>Ending Surplus/(Deficit) Compared to Reserve Targets</b>	<b>\$ 224,508</b>	<b>\$ 204,356</b>	<b>\$ 222,413</b>	<b>\$ 273,197</b>	<b>\$ 396,236</b>
<b>Restricted Reserves:</b>					
<b>Bond Debt Service Reserve Fund</b>					
Beginning Reserve Balance	\$ -	\$ -	\$ -	\$ -	\$ -
Plus: Reserve Funding from New Debt Obligations	-	-	-	-	-
Less: Transfer of Surplus to Operating Reserve	-	-	-	-	-
<b>Ending Debt Reserve Balance</b>	<b>\$ -</b>				
<b>Target Ending Balance</b>	<b>\$ -</b>				
<b>Connection Fee Reserve</b>					
Beginning Reserve Balance	\$ 12,780	\$ 25,586	\$ 38,417	\$ 51,274	\$ 64,156
Plus: Capital Impact Fee Revenue	12,780	12,780	12,780	12,780	12,780
Plus: Interest Revenue	26	51	77	103	128
Less: Use of Reserves for Capital Projects	-	-	-	-	-
<b>Ending Connection Fee Fund Balance</b>	<b>\$ 25,586</b>	<b>\$ 38,417</b>	<b>\$ 51,274</b>	<b>\$ 64,156</b>	<b>\$ 77,064</b>
<b>Annual Interest Earnings Rate</b> <sup>5</sup>	<b>0.20%</b>	<b>0.20%</b>	<b>0.20%</b>	<b>0.20%</b>	<b>0.20%</b>

1. Beginning cash from Audited Financial Statements for 2019/20 source files: BHDVWA\_FINAL-CAFR-FY2018.19-1.pdf, page 30, Note 2; Cash and Cash Equivalents.

Beginning balance for 2020/21 is per client email 9/7/2020.

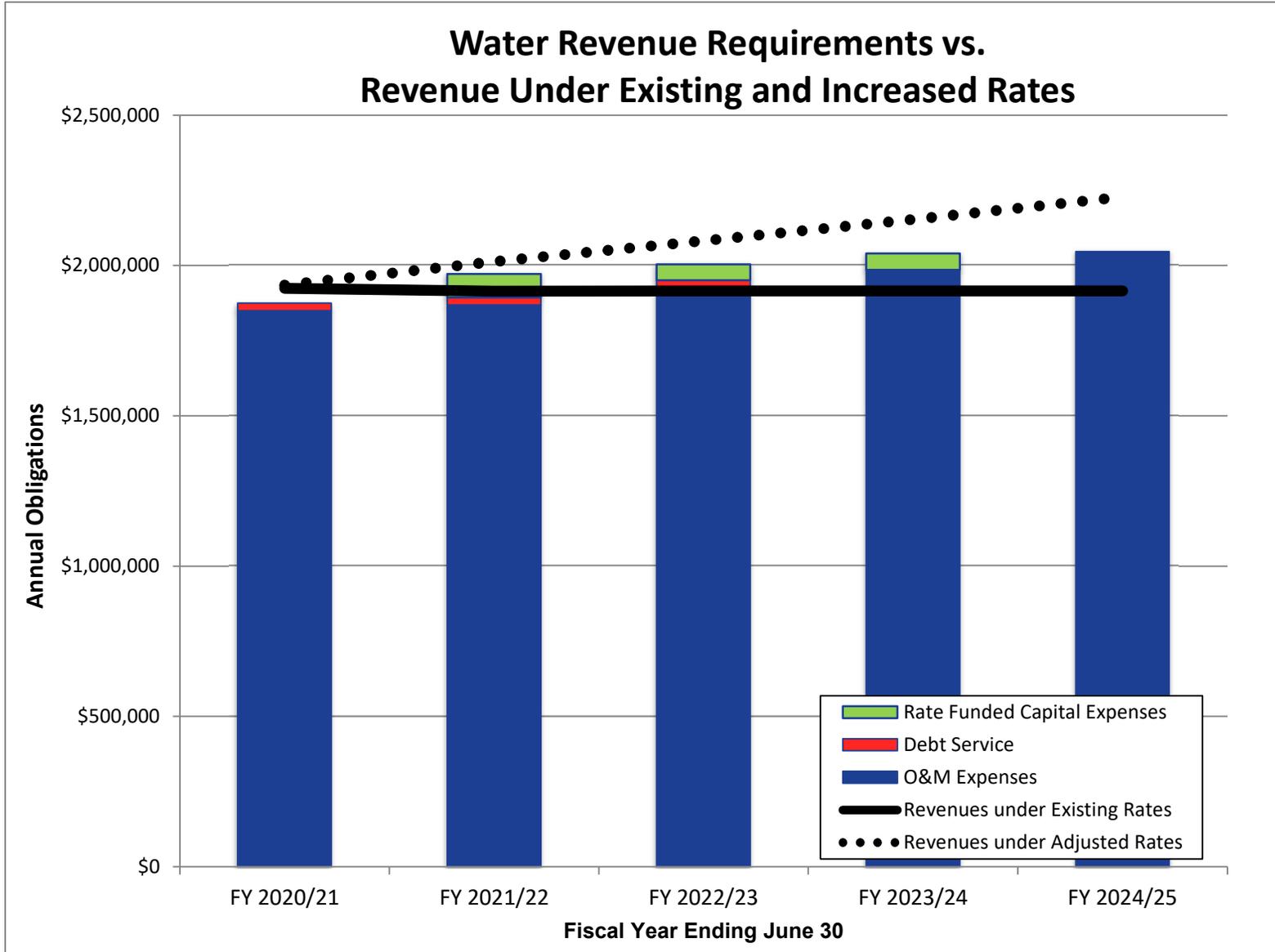
2. Operating Reserve Target set to 180 days (or 6 months) of O&M expenses. Industry standard is 3 to 6 months.

3. Reserve target set by Agency Board. Source file: 16R-11 Establishing Criteria for Agency Financial Reserves.pdf

4. Replacement & Refurbishment Reserve target set to 10% of net assets, plus a \$1.5 million component for capital emergencies (increased by ENR CCI annually of 2.63%). Existing Board adopted policy is a \$300,000 minimum.

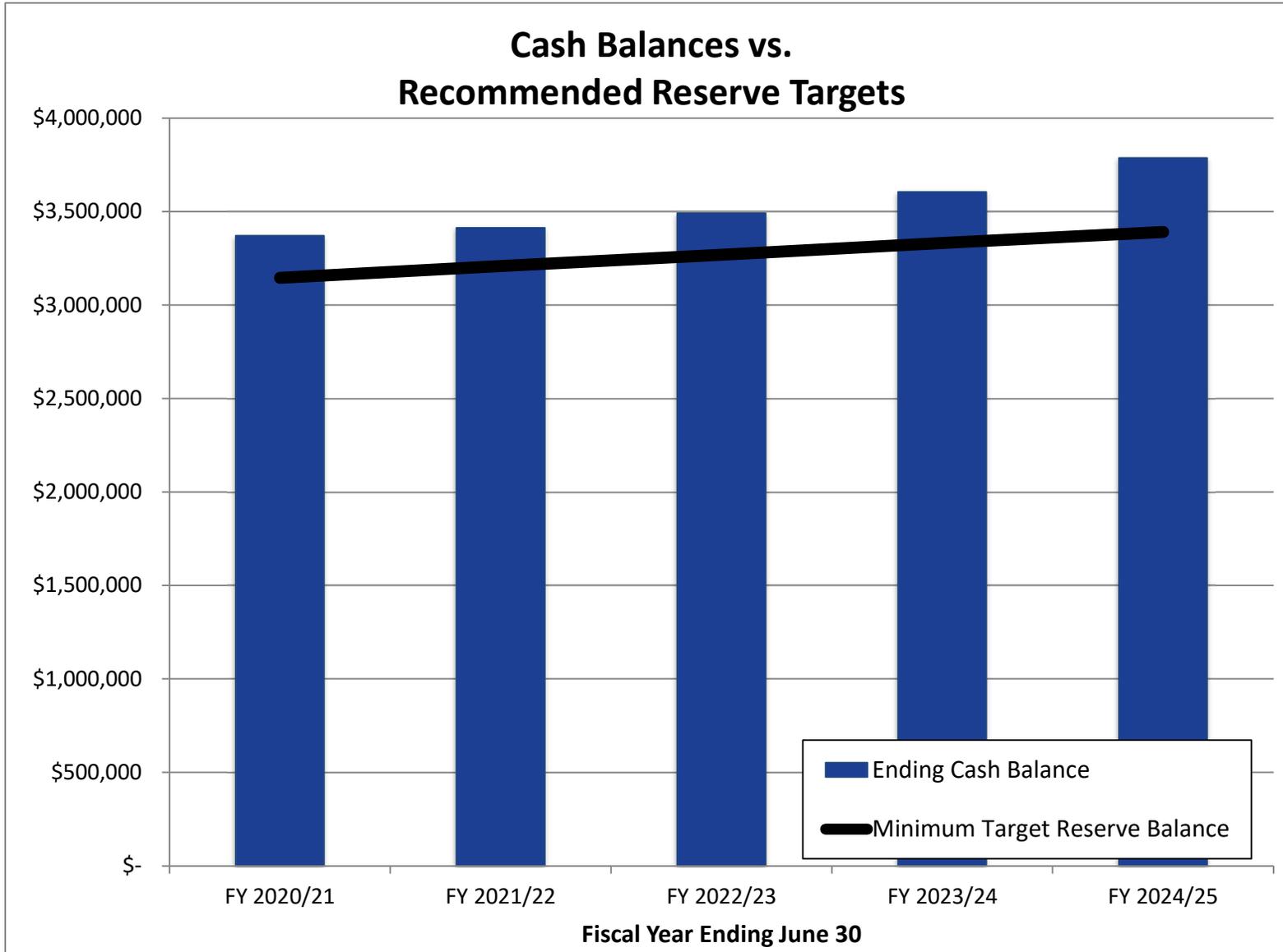
**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Rate Adjustment Charts and Report Tables**

**CHART 1**



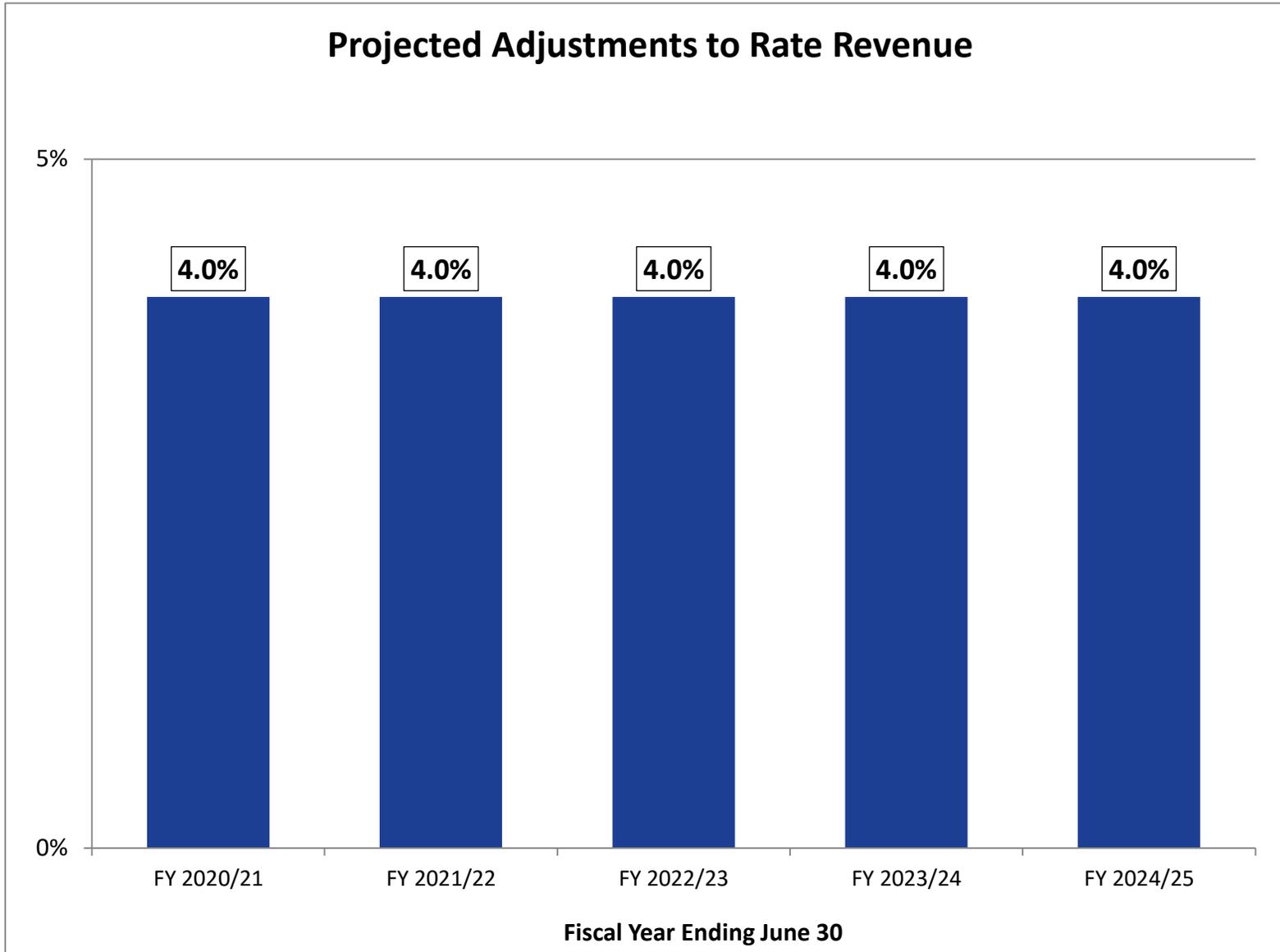
**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
Rate Adjustment Charts and Report Tables

**CHART 2**



**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Rate Adjustment Charts and Report Tables**

**CHART 3**



**BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Operating Revenue and Expenses**

**EXHIBIT 1**

**TABLE 3 : REVENUE FORECAST <sup>1</sup>**

		Budget				
DESCRIPTION	Inflation Basis	2021	2022	2023	2024	2025
<b>Operating Revenue</b>						
Metered Water Sales	1	\$ 678,177	\$ 678,177	\$ 678,177	\$ 678,177	\$ 678,177
Basic Service Charge	1	940,440	940,440	940,440	940,440	940,440
Other Operating Income	1	60,000	60,000	60,000	60,000	60,000
Interest Income Unrestricted	See FP	16,000				
Water Sales from Ames	1	1	1	1	1	1
Subtotal		\$ 1,694,618	\$ 1,678,618	\$ 1,678,618	\$ 1,678,618	\$ 1,678,618
<b>Non-Operating Revenue</b>						
Stand-By Income W-1	1	\$ 65,000	\$ 65,000	\$ 65,000	\$ 65,000	\$ 65,000
Predicted Lien Receipts (DQ, Pen, Int)	1	28,500	28,500	28,500	28,500	28,500
Debt Service BDVWA ID "1"	1	1	1	1	1	1
Debt Service DV	1	-	-	-	-	-
General Tax Income (portion of 1%)	1	136,330	136,330	136,330	136,330	136,330
Subtotal		\$ 229,831	\$ 229,831	\$ 229,831	\$ 229,831	\$ 229,831
<b>Non-Operating Revenue - New Connections</b>						
Meter Connect Fees (SL Install Fees)	1	\$ 3,590	\$ 3,590	\$ 3,590	\$ 3,590	\$ 3,590
Basic Facilities Charge (Buy-In)	1	9,190	9,190	9,190	9,190	9,190
Subtotal		\$ 12,780	\$ 12,780	\$ 12,780	\$ 12,780	\$ 12,780
<b>TOTAL: REVENUE</b>		<b>\$ 1,937,229</b>	<b>\$ 1,921,229</b>	<b>\$ 1,921,229</b>	<b>\$ 1,921,229</b>	<b>\$ 1,921,229</b>

**TABLE 4 : REVENUE SUMMARY**

		Budget				
<b>RATE REVENUE:</b>						
Metered Water Sales		\$ 678,177	\$ 678,177	\$ 678,177	\$ 678,177	\$ 678,177
Basic Service Charge		940,440	940,440	940,440	940,440	940,440
<b>OTHER REVENUE:</b>						
Other Operating Revenue		\$ 60,001	\$ 60,001	\$ 60,001	\$ 60,001	\$ 60,001
Interest Income		16,000	-	-	-	-
Non-Operating Revenue		229,831	229,831	229,831	229,831	229,831
Non-Operating Revenue - New Connections		12,780	12,780	12,780	12,780	12,780
<b>TOTAL: REVENUE</b>		<b>\$ 1,937,229</b>	<b>\$ 1,921,229</b>	<b>\$ 1,921,229</b>	<b>\$ 1,921,229</b>	<b>\$ 1,921,229</b>

**BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Operating Revenue and Expenses**

**EXHIBIT 1**

**TABLE 5 : OPERATING EXPENSE FORECAST <sup>1</sup>**

		Budget				
DESCRIPTION	Inflation Basis	2021	2022	2023	2024	2025
<b>Operating Administrative Expenses</b>						
Administrative Compensation	2	\$ 307,871	\$ 318,000	\$ 328,500	\$ 339,300	\$ 350,500
Contractual Services - Auditor	2	21,165	21,900	22,600	23,300	24,100
Contractual Services - Legal	2	20,000	20,700	21,400	22,100	22,800
Legislative Affairs	4	10,000	10,200	10,400	10,600	10,800
PERS Contribution	3	39,079	41,400	43,900	46,500	49,300
PERS UAL <sup>1</sup>		60,921	67,284	71,053	75,073	77,138
Payroll Tax	2	15,703	16,200	16,700	17,300	17,900
Telephone & Fax	4	9,085	9,300	9,500	9,700	9,900
Mailing Expenses	4	1,500	1,500	1,500	1,500	1,500
Contractual Services - Other	2	78,500	81,100	83,800	86,600	89,500
Property/Liability Insurance	4	67,230	68,600	70,000	71,400	72,800
Workers Comp Insurance	4	12,606	12,900	13,200	13,500	13,800
Dues & Subscriptions & Annual Fees	4	17,850	18,200	18,600	19,000	19,400
Power/Propane - Office & Yards	6	8,200	8,500	8,800	9,100	9,400
Bad Debt Expense	7	1,500	1,500	1,500	1,500	1,500
Bad Debt Expense - Uncollected Liens	7	5,000	5,000	5,000	5,000	5,000
Office Supplies/Printing	4	8,500	8,700	8,900	9,100	9,300
Employee Benefits Insurance	3	155,000	164,300	174,200	184,700	195,800
Employee Education	4	15,000	15,300	15,600	15,900	16,200
<b>Non-Operating Administrative Expenses</b>						
Office Equipment Expense	4	\$ 10,000	\$ 10,200	\$ 10,400	\$ 10,600	\$ 10,800
Customer Relations	4	3,800	3,900	4,000	4,100	4,200
Other Administrative Expenses	4	7,500	7,700	7,900	8,100	8,300
Election Costs	4	2,500	2,600	2,700	2,800	2,900
Misc. Expenses	4	500	500	500	500	500
<b>Operations Expense</b>						
Operations Staff Compensation	2	\$ 326,155	\$ 336,900	\$ 348,000	\$ 359,500	\$ 371,400
Uniforms	4	6,750	6,900	7,000	7,100	7,200
Vehicle, Tractor, Equipment Expense	4	30,000	30,600	31,200	31,800	32,400
Vehicle Expense - Fuel	5	36,750	37,100	37,500	37,900	38,300
Field Materials and Supplies	4	75,000	76,500	78,000	79,600	81,200
Water Testing	4	12,000	12,200	12,400	12,600	12,900
Engineering	4	60,000	61,200	62,400	63,600	64,900
Water System Repairs	4	70,000	71,400	72,800	74,300	75,800
Excavation Permit Fees (CoSB)	4	500	500	500	500	500
Building Maintenance and Repair	4	15,500	15,800	16,100	16,400	16,700
Communications Expense	4	6,700	6,800	6,900	7,000	7,100
Disinfection Expense	4	15,000	15,300	15,600	15,900	16,200
Power - Wells, Booster Pumps	6	75,000	77,600	80,300	83,100	86,000
Other Operations Expense	4	11,650	11,900	12,100	12,300	12,500
Water Purchases	4	45,000	45,900	46,800	47,700	48,700
<b>Sub-Total</b>		<b>\$ 1,665,015</b>	<b>\$ 1,722,084</b>	<b>\$ 1,778,253</b>	<b>\$ 1,836,573</b>	<b>\$ 1,895,138</b>

**BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Operating Revenue and Expenses**

**EXHIBIT 1**

**TABLE 6** Budget

DESCRIPTION	Inflation Basis	2021	2022	2023	2024	2025
<b>Director Expense</b>						
Director - McBride	2	\$ 9,020	\$ 9,300	\$ 9,600	\$ 9,900	\$ 10,200
Director - Corl-Lorono	2	9,020	9,300	9,600	9,900	10,200
Director - J. Burkhart	2	9,020	9,300	9,600	9,900	10,200
Director - Mckenzie	2	9,020	9,300	9,600	9,900	10,200
Director - Coulombe	2	9,020	9,300	9,600	9,900	10,200
<b>Sub-Total</b>		<b>\$ 45,100</b>	<b>\$ 46,500</b>	<b>\$ 48,000</b>	<b>\$ 49,500</b>	<b>\$ 51,000</b>

**TABLE 7** Budget

DESCRIPTION	Inflation Basis	2021	2022	2023	2024	2025
<b>Administration Projects (Approved April 2020)</b>						
Rate and Fee Study	4	\$ 40,000	\$ -	\$ -	\$ -	\$ -
PARS TRUST FY 2020/21 Contribution (No. 2)	7	100,000	100,000	100,000	100,000	100,000
<b>Sub-Total</b>		<b>\$ 140,000</b>	<b>\$ 100,000</b>	<b>\$ 100,000</b>	<b>\$ 100,000</b>	<b>\$ 100,000</b>
<b>GRAND TOTAL: WATER OPERATING EXPENSES</b>		<b>\$ 1,850,115</b>	<b>\$ 1,868,584</b>	<b>\$ 1,926,253</b>	<b>\$ 1,986,073</b>	<b>\$ 2,046,138</b>

**TABLE 8 : FORECASTING ASSUMPTIONS**

INFLATION FACTORS <sup>2</sup>	Inflation Basis	2021	2022	2023	2024	2025
Water Sales	1	0.00%	0.00%	0.00%	0.00%	0.00%
Salaries	2	3.30%	3.30%	3.30%	3.30%	3.30%
Benefits <sup>3</sup>	3	6.00%	6.00%	6.00%	6.00%	6.00%
General Inflation <sup>4</sup>	4	2.00%	2.00%	2.00%	2.00%	2.00%
Fuel <sup>5</sup>	5	1.00%	1.00%	1.00%	1.00%	1.00%
Electricity	6	3.50%	3.50%	3.50%	3.50%	3.50%
No Escalation	7	0.00%	0.00%	0.00%	0.00%	0.00%

- Revenue and expenses for FY 2019/20 through FY 2020/21 are from source files: *Resolution No. 19R-03 Adopting the Agency Budget for FY 2019-20.pdf*, and *FY2020.21 Budget adopted 5 26 2020 20R-14.pdf*. PERS updated by Cindy September 9, 2020 in source file: *V2 9.8.20 BHDWA\_Water Rate Model\_09.08.20 -to client.xlsx*
- Inflation values follow 5-year average from US Bureau of Labor Statistics (BLS).  
Website: <https://data.bls.gov/cgi-bin/surveymost?en+06>
- Benefits inflation set to 6% per Agency staff on September 9, 2020.
- Five-year average CPI for All Urban Consumers for the Los Angeles/Riverside/Orange County areas, per BLS.
- Average cost inflation for Fuel and Utilities for US City Average (2018-2020), per BLS.

TABLE 9 : CAPITAL FUNDING SUMMARY

CAPITAL FUNDING FORECAST	Budget	Projected			
	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25
<b>Funding Sources:</b>					
Grants <sup>1</sup>	\$ 430,030	\$ 194,970	\$ -	\$ -	\$ -
Use of Capacity Fee Reserves	-	-	-	-	-
SRF Loan Funding	-	-	-	-	-
Use of New Revenue Bond Proceeds	-	-	-	-	-
Use of Capital Rehabilitation and Replacement Reserve	-	78,375	-	54,050	-
Rate Revenue	-	-	52,665	-	-
<b>Total Sources of Capital Funds</b>	<b>\$ 430,030</b>	<b>\$ 273,345</b>	<b>\$ 52,665</b>	<b>\$ 54,050</b>	<b>\$ -</b>
<b>Uses of Capital Funds:</b>					
Total Project Costs	\$ 430,030	\$ 273,345	\$ 52,665	\$ 54,050	\$ -
<b>Capital Funding Surplus (Deficiency)</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Bank Loan</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>New Revenue Bond Proceeds</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

1. Grant Funding is per page 14 of the Agency's 2020/21 budget (file: *FY2020.21 Budget adopted 5 26 2020 20R-14.pdf*).

**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Capital Improvement Plan Expenditures**

**EXHIBIT 2**

**CAPITAL IMPROVEMENT PROGRAM**

**TABLE 10 : CAPITAL IMPROVEMENT PROGRAM COSTS (IN CURRENT-YEAR DOLLARS) <sup>1</sup>**

Avg. Life Yrs.	Project Description	2021	2022	2023	2024	2025
<b>Refurbish and Replacement Projects</b>						
15	Well 4 Rehab	\$ 39,425				
15	Well 6 Rehab					
8	Well 7 Rehab	34,030				
8	Well 8 Rehab					
8	Well 9 Rehab					
15	Well 10 Rehab					
15	Well GMW1		24,900			
15	Well GMW2					
15	Well GMW3					
15	Well 13					
15	Pump Well 3	60,575				
15	Pump Well 4	100,000				
15	Pump Well 6					
8	Pump Well 7					
8	Pump Well 8					
8	Pump Well 9					
8	Pump Well 10					
8	Pump Well GMW1		41,440			
15	Pump Well GMW2					
8	Pump Well GMW3					
8	Pump Well 13					
30	New Replacement Well for BH or DV					
7	JV Booster Station Upgrade - VFD's/Pressure Vessels New Storage Tank		15,000			
20	Customer Meter w/ Box & Shutoff, Complete					
20	Utility Billing Software Replacement					
75	Loop Charles Rd.					
75	Shop Building Upgrades - storage and work space		50,000			
20	Replace Generator - 90 KW mobile					
20	Dump truck		85,000			
15	Replace Tractor					
9	Replace Fleet Vehicles (avg life)		50,000	50,000	50,000	
<b>Distribution System Projects</b>						
75	Distribution Valve, 6" avg, both water systems 50%	\$ -	\$ -	\$ -	\$ -	\$ -
75	Fire Hydrants, both water systems 50%	-	-	-	-	-
75	Pipe w/sand bedding, 6" avg. ID Goat Mtn	-	-	-	-	-
75	Pipe w/sand bedding, 6" avg. BDVWA					
<b>Operations Capital Projects (from 2020/21 Budget)<sup>2</sup></b>						
	Water Storage Tank Recoating (B1, B2), May 26, 2020	81,000	-	-	-	-
	Water Storage Tank Recoating (B1, B2), Feb. 2020	80,000	-	-	-	-
	C-Booster Station Upgrades	35,000	-	-	-	-
<b>Total: CIP Program Costs (Current-Year Dollars)</b>		<b>\$ 430,030</b>	<b>\$ 266,340</b>	<b>\$ 50,000</b>	<b>\$ 50,000</b>	<b>\$ -</b>

**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Capital Improvement Plan Expenditures**

**EXHIBIT 2**

**TABLE 11 : CAPITAL IMPROVEMENT PROGRAM COSTS (IN FUTURE-YEAR DOLLARS) <sup>1</sup>**

<b>Project Description</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Refurbish and Replacement Projects</b>					
15 Well 4 Rehab	\$ 39,425	\$ -	\$ -	\$ -	\$ -
15 Well 6 Rehab	-	-	-	-	-
8 Well 7 Rehab	34,030	-	-	-	-
8 Well 8 Rehab	-	-	-	-	-
8 Well 9 Rehab	-	-	-	-	-
15 Well 10 Rehab	-	-	-	-	-
15 Well GMW1	-	25,555	-	-	-
15 Well GMW2	-	-	-	-	-
15 Well GMW3	-	-	-	-	-
15 Well 13	-	-	-	-	-
15 Pump Well 3	60,575	-	-	-	-
15 Pump Well 4	100,000	-	-	-	-
15 Pump Well 6	-	-	-	-	-
8 Pump Well 7	-	-	-	-	-
8 Pump Well 8	-	-	-	-	-
8 Pump Well 9	-	-	-	-	-
8 Pump Well 10	-	-	-	-	-
8 Pump Well GMW1	-	42,530	-	-	-
15 Pump Well GMW2	-	-	-	-	-
8 Pump Well GMW3	-	-	-	-	-
8 Pump Well 13	-	-	-	-	-
30 New Replacement Well for BH or DV	-	-	-	-	-
7 JV Booster Station Upgrade - VFD's/Pressure Vessels	-	15,395	-	-	-
-- New Storage Tank	-	-	-	-	-
20 Customer Meter w/ Box & Shutoff, Complete	-	-	-	-	-
20 Utility Billing Software Replacement	-	-	-	-	-
75 Loop Charles Rd.	-	-	-	-	-
75 Shop Building Upgrades - storage and work space	-	51,315	-	-	-
20 Replace Generator - 90 KW mobile	-	-	-	-	-
20 Dump truck	-	87,236	-	-	-
15 Replace Tractor	-	-	-	-	-
9 Replace Fleet Vehicles (avg life)	-	51,315	52,665	54,050	-
<b>Distribution System Projects</b>					
75 Distribution Valve, 6" avg, both water systems 50%	-	-	-	-	-
75 Fire Hydrants, both water systems 50%	-	-	-	-	-
75 Pipe w/sand bedding, 6" avg. ID Goat Mtn	-	-	-	-	-
75 Pipe w/sand bedding, 6" avg. BDVWA	-	-	-	-	-
<b>Operations Capital Projects (from 2020/21 Budget)2</b>					
-- Water Storage Tank Recoating (B1, B2), May 26, 2020	81,000	-	-	-	-
-- Water Storage Tank Recoating (B1, B2), Feb. 2020	80,000	-	-	-	-
-- C-Booster Station Upgrades	35,000	-	-	-	-
<b>Total: CIP Program Costs (Future-Year Dollars)</b>	<b>\$ 430,030</b>	<b>\$ 273,345</b>	<b>\$ 52,665</b>	<b>\$ 54,050</b>	<b>\$ -</b>

**BIGHORN DESERT WATER AGENCY  
 WATER RATE STUDY  
 Capital Improvement Plan Expenditures**

**EXHIBIT 2**

**TABLE 12 : FORECASTING ASSUMPTIONS**

<b>Economic Variables</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Annual Construction Cost Inflation, Per Engineering News Record <sup>3</sup>	0.00%	2.63%	2.63%	2.63%	2.63%
Cumulative Construction Cost Multiplier from 2020	1.00	1.03	1.05	1.08	1.11

1. Estimated capital improvement project costs found in source files: *BDVWA Replacement Refurbishment CIP and Min Rate Gen 5 1 2017.xlsx*  
 Cindy and Marina confirmed updated costs in source file: *CIP Estimates through 2035-36 V2.xlsx*
2. Operations Capital projects are per page 14 of the Agency's 2020/21 budget (file: *FY2020.21 Budget adopted 5 26 2020 20R-14.pdf*).
3. Construction inflator is based on the most current 10 year average of the Engineering News-Record Construction Cost Index.  
 Source: [www.enr.com/economics](http://www.enr.com/economics) (August 2010 to August 2020).

**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Debt Service**

**EXHIBIT 3**

**TABLE 13**

<b>AGENCY DEBT OBLIGATIONS</b>					
<b>Annual Repayment Schedules:</b>	<b>FY 2020/21</b>	<b>FY 2021/22</b>	<b>FY 2022/23</b>	<b>FY 2023/24</b>	<b>FY 2024/25</b>
<b>Desert View Water Revenue Bonds <sup>1</sup></b>					
Principal Payment	\$ -	\$ -	\$ -	\$ -	\$ -
Interest Payment	-	-	-	-	-
<b>Subtotal: Annual Debt Service</b>	<b>\$ -</b>				
Coverage Requirement (\$-Amnt above annual payment)	100%	100%	100%	100%	100%
Reserve Requirement (total fund balance)	\$ -	\$ -	\$ -	\$ -	\$ -
<b>MWA Pipeline Debt</b>					
Principal Payment <sup>2</sup>	\$ 25,000	\$ 25,000	\$ 25,000	\$ -	\$ -
Interest Payment	-	-	-	-	-
<b>Subtotal: Annual Debt Service</b>	<b>\$ 25,000</b>	<b>\$ 25,000</b>	<b>\$ 25,000</b>	<b>\$ -</b>	<b>\$ -</b>
Coverage Requirement (\$-Amnt above annual payment)	100%	100%	100%	100%	100%
Reserve Requirement (total fund balance)	\$ -	\$ -	\$ -	\$ -	\$ -

1. Water revenue bonds due to mature in 2020. Source file: *Resolution No. 19R-03 Adopting the Agency Budget for FY 2019-20.pdf, page 8.*

2. Per Agency staff, this is in all likelihood going to be reimbursed with a grant. Leaving in model as a conservative approach.

**TABLE 14 : EXISTING ANNUAL DEBT OBLIGATIONS TO BE SATISFIED BY WATER RATES**

<b>Existing Annual Debt Service</b>	<b>\$ 25,000</b>	<b>\$ 25,000</b>	<b>\$ 25,000</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Existing Annual Coverage Requirement</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<b>Existing Debt Reserve Target</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Cost of Service Analysis

*Function & Classification*

TABLE 15

Classification of Expenses											
Budget Categories	Total Revenue Requirements	Commodity	Additional Supply	Capacity	Customer	Fire Protection	Basis of Classification				
	FY 2020/21	(COM)	(ADD SUP)	(CAP)	(CA)	(FP)	COM	ADD SUP	CAP	CA	FP
<b>Operating Administrative Expenses</b>											
Administrative Compensation	\$ 307,871	\$ 92,361	\$ -	\$ 184,676	\$ 30,787	\$ 46	30.0%	0.0%	60.0%	10.0%	0.02%
Contractual Services - Auditor	\$ 21,165	\$ 6,350	\$ -	\$ 12,696	\$ 2,117	\$ 3	30.0%	0.0%	60.0%	10.0%	0.02%
Contractual Services - Legal	\$ 20,000	\$ 6,000	\$ -	\$ 11,997	\$ 2,000	\$ 3	30.0%	0.0%	60.0%	10.0%	0.02%
Legislative Affairs	\$ 10,000	\$ 3,000	\$ -	\$ 5,998	\$ 1,000	\$ 2	30.0%	0.0%	60.0%	10.0%	0.02%
PERS Contribution	\$ 39,079	\$ 11,724	\$ -	\$ 23,442	\$ 3,908	\$ 6	30.0%	0.0%	60.0%	10.0%	0.02%
PERS UAL	\$ 60,921	\$ 18,276	\$ -	\$ 36,543	\$ 6,092	\$ 9	30.0%	0.0%	60.0%	10.0%	0.02%
Payroll Tax	\$ 15,703	\$ 4,711	\$ -	\$ 9,419	\$ 1,570	\$ 2	30.0%	0.0%	60.0%	10.0%	0.02%
Telephone & Fax	\$ 9,085	\$ 2,726	\$ -	\$ 5,450	\$ 909	\$ 1	30.0%	0.0%	60.0%	10.0%	0.02%
Mailing Expenses	\$ 1,500	\$ -	\$ -	\$ -	\$ 1,500	\$ -	0.0%	0.0%	0.0%	100.0%	0.0%
Contractual Services - Other	\$ 78,500	\$ 23,550	\$ -	\$ 47,088	\$ 7,850	\$ 12	30.0%	0.0%	60.0%	10.0%	0.02%
Property/Liability Insurance	\$ 67,230	\$ 20,169	\$ -	\$ 40,328	\$ 6,723	\$ 10	30.0%	0.0%	60.0%	10.0%	0.02%
Workers Comp Insurance	\$ 12,606	\$ 3,782	\$ -	\$ 7,562	\$ 1,261	\$ 2	30.0%	0.0%	60.0%	10.0%	0.02%
Dues & Subscriptions & Annual Fees	\$ 17,850	\$ 5,355	\$ -	\$ 10,707	\$ 1,785	\$ 3	30.0%	0.0%	60.0%	10.0%	0.02%
Power/Propane - Office & Yards	\$ 8,200	\$ 2,460	\$ -	\$ 4,919	\$ 820	\$ 1	30.0%	0.0%	60.0%	10.0%	0.02%
Bad Debt Expense	\$ 1,500	\$ 450	\$ -	\$ 900	\$ 150	\$ 0	30.0%	0.0%	60.0%	10.0%	0.02%
Bad Debt Expense - Uncollected Liens	\$ 5,000	\$ 1,500	\$ -	\$ 2,999	\$ 500	\$ 1	30.0%	0.0%	60.0%	10.0%	0.02%
Office Supplies/Printing	\$ 8,500	\$ 2,550	\$ -	\$ 5,099	\$ 850	\$ 1	30.0%	0.0%	60.0%	10.0%	0.02%
Employee Benefits Insurance	\$ 155,000	\$ 46,500	\$ -	\$ 92,977	\$ 15,500	\$ 23	30.0%	0.0%	60.0%	10.0%	0.02%
Employee Education	\$ 15,000	\$ 4,500	\$ -	\$ 8,998	\$ 1,500	\$ 2	30.0%	0.0%	60.0%	10.0%	0.02%
<b>Non-Operating Administrative Expenses</b>											
Office Equipment Expense	\$ 10,000	\$ 3,000	\$ -	\$ 5,998	\$ 1,000	\$ 2	30.0%	0.0%	60.0%	10.0%	0.02%
Customer Relations	\$ 3,800	\$ -	\$ -	\$ -	\$ 3,800	\$ -	0.0%	0.0%	0.0%	100.0%	0.0%
Other Administrative Expenses	\$ 7,500	\$ 2,250	\$ -	\$ 4,499	\$ 750	\$ 1	30.0%	0.0%	60.0%	10.0%	0.02%
Election Costs	\$ 2,500	\$ 750	\$ -	\$ 1,500	\$ 250	\$ 0	30.0%	0.0%	60.0%	10.0%	0.02%
Misc. Expenses	\$ 500	\$ 150	\$ -	\$ 300	\$ 50	\$ 0	30.0%	0.0%	60.0%	10.0%	0.02%
<b>Sub-Total</b>	<b>\$ 879,010</b>	<b>\$ 262,113</b>	<b>\$ -</b>	<b>\$ 524,095</b>	<b>\$ 92,671</b>	<b>\$ 131</b>	<b>29.8%</b>	<b>0.0%</b>	<b>59.6%</b>	<b>10.5%</b>	<b>0.01%</b>

BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Cost of Service Analysis

*Function & Classification*

TABLE 16

Classification of Expenses, continued											
Budget Categories	Total Revenue Requirements	Commodity	Additional Supply	Capacity	Customer	Fire Protection	Basis of Classification				
	FY 2020/21	(COM)	(ADD SUP)	(CAP)	(CA)	(FP)	COM	ADD SUP	CAP	CA	FP
<b>Operations Expense</b>											
Operations Staff Compensation	\$ 326,155	\$ 97,847	\$ -	\$ 195,644	\$ 32,616	\$ 49	30.0%	0.0%	60.0%	10.0%	0.02%
Uniforms	\$ 6,750	\$ 2,025	\$ -	\$ 4,049	\$ 675	\$ 1	30.0%	0.0%	60.0%	10.0%	0.02%
Vehicle, Tractor, Equipment Expense	\$ 30,000	\$ 9,000	\$ -	\$ 17,995	\$ 3,000	\$ 5	30.0%	0.0%	60.0%	10.0%	0.02%
Vehicle Expense - Fuel	\$ 36,750	\$ 11,025	\$ -	\$ 22,044	\$ 3,675	\$ 6	30.0%	0.0%	60.0%	10.0%	0.02%
Field Materials and Supplies	\$ 75,000	\$ 22,500	\$ -	\$ 44,989	\$ 7,500	\$ 11	30.0%	0.0%	60.0%	10.0%	0.02%
Water Testing	\$ 12,000	\$ 12,000	\$ -	\$ -	\$ -	\$ -	100.0%	0.0%	0.0%	0.0%	0.0%
Engineering	\$ 60,000	\$ 18,000	\$ -	\$ 35,991	\$ 6,000	\$ 9	30.0%	0.0%	60.0%	10.0%	0.02%
Water System Repairs	\$ 70,000	\$ 21,000	\$ -	\$ 41,989	\$ 7,000	\$ 11	30.0%	0.0%	60.0%	10.0%	0.02%
Excavation Permit Fees (CoSB)	\$ 500	\$ 150	\$ -	\$ 300	\$ 50	\$ 0	30.0%	0.0%	60.0%	10.0%	0.02%
Building Maintenance and Repair	\$ 15,500	\$ 4,650	\$ -	\$ 9,298	\$ 1,550	\$ 2	30.0%	0.0%	60.0%	10.0%	0.02%
Communications Expense	\$ 6,700	\$ -	\$ -	\$ -	\$ 6,700	\$ -	0.0%	0.0%	0.0%	100.0%	0.0%
Disinfection Expense	\$ 15,000	\$ 15,000	\$ -	\$ -	\$ -	\$ -	100.0%	0.0%	0.0%	0.0%	0.0%
Power - Wells, Booster Pumps	\$ 75,000	\$ 75,000	\$ -	\$ -	\$ -	\$ -	100.0%	0.0%	0.0%	0.0%	0.0%
Other Operations Expense	\$ 11,650	\$ 3,495	\$ -	\$ 6,988	\$ 1,165	\$ 2	30.0%	0.0%	60.0%	10.0%	0.02%
Water Purchases	\$ 45,000	\$ -	\$ 45,000	\$ -	\$ -	\$ -	0.0%	100.0%	0.0%	0.0%	0.0%
<b>Director Expense</b>											
Director - McBride	\$ 9,020	\$ -	\$ -	\$ -	\$ 9,020	\$ -	0.0%	0.0%	0.0%	100.0%	0.0%
Director - Corl-Lorono	\$ 9,020	\$ -	\$ -	\$ -	\$ 9,020	\$ -	0.0%	0.0%	0.0%	100.0%	0.0%
Director - J. Burkhart	\$ 9,020	\$ -	\$ -	\$ -	\$ 9,020	\$ -	0.0%	0.0%	0.0%	100.0%	0.0%
Director - McKenzie	\$ 9,020	\$ -	\$ -	\$ -	\$ 9,020	\$ -	0.0%	0.0%	0.0%	100.0%	0.0%
Director - Coulombe	\$ 9,020	\$ -	\$ -	\$ -	\$ 9,020	\$ -	0.0%	0.0%	0.0%	100.0%	0.0%
<b>Administration Projects (Approved April 2020)</b>											
Rate and Fee Study	\$ 40,000	\$ 12,000	\$ -	\$ 23,994	\$ 4,000	\$ 6	30.0%	0.0%	60.0%	10.0%	0.02%
PARS TRUST FY 2020/21 Contribution (No. 2)	\$ 100,000	\$ 30,000	\$ -	\$ 59,985	\$ 10,000	\$ 15	30.0%	0.0%	60.0%	10.0%	0.02%
<b>Sub-Total</b>	<b>\$ 971,105</b>	<b>\$ 333,692</b>	<b>\$ 45,000</b>	<b>\$ 463,267</b>	<b>\$ 129,031</b>	<b>\$ 116</b>	<b>34.4%</b>	<b>4.6%</b>	<b>47.7%</b>	<b>13.3%</b>	<b>0.0%</b>
<b>Total Operating Expense</b>	<b>\$ 1,850,115</b>	<b>\$ 595,805</b>	<b>\$ 45,000</b>	<b>\$ 987,362</b>	<b>\$ 221,702</b>	<b>\$ 247</b>	<b>32.2%</b>	<b>2.4%</b>	<b>53.4%</b>	<b>12.0%</b>	<b>0.0%</b>

BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Cost of Service Analysis

*Function & Classification*

TABLE 17

Classification of Expenses, continued											
Budget Categories	Total Revenue Requirements	Commodity	Additional Supply	Capacity	Customer	Fire Protection	Basis of Classification				
	FY 2020/21	(COM)	(ADD SUP)	(CAP)	(CA)	(FP)	COM	ADD SUP	CAP	CA	FP
<b>Debt Service Payments</b>											
Existing Debt Service	\$ 25,000	\$ -	\$ -	\$ 25,000	\$ -	\$ -	0.0%	0.0%	100.0%	0.0%	0.0%
New Debt Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%	0.0%	100.0%	0.0%	0.0%
<b>Total Debt Service Payments</b>	<b>\$ 25,000</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 25,000</b>	<b>\$ -</b>	<b>\$ -</b>	<b>0.0%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>0.0%</b>	<b>0.0%</b>
<b>Capital Expenditures</b>											
Rate Funded Capital Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%	0.0%	100.0%	0.0%	0.0%
<b>TOTAL REVENUE REQUIREMENTS</b>	<b>\$ 1,875,115</b>	<b>\$ 595,805</b>	<b>\$ 45,000</b>	<b>\$ 1,012,362</b>	<b>\$ 221,702</b>	<b>\$ 247</b>	<b>31.8%</b>	<b>2.4%</b>	<b>54.0%</b>	<b>11.8%</b>	<b>0.0%</b>
<i>Less: Non-Rate Revenues</i>											
<b>Operating Revenue</b>											
Metered Water Sales											
Basic Service Charge											
Other Operating Income	\$ (60,000)	\$ (19,533)	\$ -	\$ (33,190)	\$ (7,268)	\$ (8)	32.6%	0.0%	55.3%	12.1%	0.0%
Interest Income Unrestricted	\$ (16,000)	\$ (5,209)	\$ -	\$ (8,851)	\$ (1,938)	\$ (2)	32.6%	0.0%	55.3%	12.1%	0.0%
Water Sales from Ames	\$ (1)	\$ (0)	\$ -	\$ (1)	\$ (0)	\$ (0)	32.6%	0.0%	55.3%	12.1%	0.0%
<b>Non-Operating Revenue</b>							32.6%	0.0%	55.3%	12.1%	0.0%
Stand-By Income W-1	\$ (65,000)	\$ (21,161)	\$ -	\$ (35,956)	\$ (7,874)	\$ (9)	32.6%	0.0%	55.3%	12.1%	0.0%
Predicted Lien Receipts (DQ, Pen, Int)	\$ (28,500)	\$ (9,278)	\$ -	\$ (15,765)	\$ (3,453)	\$ (4)	32.6%	0.0%	55.3%	12.1%	0.0%
Debt Service BDVWA ID "1"	\$ (1)	\$ (0)	\$ -	\$ (1)	\$ (0)	\$ (0)	32.6%	0.0%	55.3%	12.1%	0.0%
Debt Service DV	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	32.6%	0.0%	55.3%	12.1%	0.0%
General Tax Income (portion of 1%)	\$ (136,330)	\$ (44,383)	\$ -	\$ (75,413)	\$ (16,515)	\$ (18)	32.6%	0.0%	55.3%	12.1%	0.0%
<b>Non-Operating Revenue - New Connections</b>											
Meter Connect Fees (SL Install Fees)											
Basic Facilities Charge (Buy-In)											
<b>NET REVENUE REQUIREMENTS</b>	<b>\$ 1,569,283</b>	<b>\$ 496,239</b>	<b>\$ 45,000</b>	<b>\$ 843,185</b>	<b>\$ 184,653</b>	<b>\$ 206</b>					
<i>Allocation of Revenue Requirements</i>	<i>100.0%</i>	<i>31.6%</i>	<i>2.9%</i>	<i>53.7%</i>	<i>11.8%</i>	<i>0.0%</i>					

TABLE 18

Classification of Expenses, continued						
Adjustments to Classification of Expenses						
Adjustment for Current Rate Level:	Total	COM	ADD SUP	CAP	CA	FP
FY 2020/21 Target Rate Rev. After Rate Increases	\$ 1,683,362					
Projected Rate Revenue at Current Rates	\$ 1,618,617					
FY 2020/21 Projected Rate Increase	4.0%					
<b>Adjusted Net Revenue Req'ts</b>	<b>\$ 1,683,362</b>	<b>\$ 532,313</b>	<b>\$ 48,271</b>	<b>\$ 904,480</b>	<b>\$ 198,076</b>	<b>\$ 221</b>
<i>Percent of Revenue</i>	<i>100.0%</i>	<i>31.6%</i>	<i>2.9%</i>	<i>53.7%</i>	<i>11.8%</i>	<i>0.0%</i>

TABLE 19

Development of the COMMODITY Allocation Factor			Average Monthly Statistics			Average Bi-Monthly Statistics		
Customer Class	Volume (hcf) <sup>1</sup>	Percent of Total Volume	Winter	Annual	Summer	Winter	Annual	Summer
Residential	173,074	84.4%	4	6	9	8	12	17
Residential + Backflow	2,971	1.4%	9	14	18	18	28	36
Agriculture	8,593	4.2%	1	31	75	2	62	150
Agriculture + Residence	7,704	3.8%	7	24	48	15	48	95
Bulk Water	10,563	5.2%	4	7	11	7	15	23
Commercial	448	0.2%	4	7	14	8	15	29
Commercial + Backflow	856	0.4%	12	18	27	24	36	53
Fire Meter	-	0.0%	-	-	-	-	-	-
Institutional - Fire Dept.	9	0.0%	-	1	3	-	2	7
Institutional + Backflow	839	0.4%	13	35	86	27	70	172
<b>Total</b>	<b>205,057</b>	<b>100%</b>						

1. Consumption is from September 2019 through August 2020. BDVWA charges monthly rates, but bills customers bi-monthly.  
Source files: CUSTOMER BILLING DATA 09.18.2020.xlsx

**Commodity Related Costs:** These costs are associated with the total consumption (flow) of water over a specified period of time (e.g. annual).

**BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Water Cost of Service Analysis**

**Allocation Factors**

**TABLE 20**

<b>Development of the CAPACITY (MAX MONTH) Allocation Factor</b>				
<b>Customer Class</b>	<b>Average Bi-Monthly Use (hcf)</b>	<b>Peak Bi-Monthly Use (hcf) <sup>1</sup></b>	<b>Peaking Factor</b>	<b>Max 2-Month Capacity Factor</b>
Residential	28,846	43,629	<b>1.51</b>	<b>81.1%</b>
Residential + Backflow	495	652	<b>1.32</b>	<b>1.2%</b>
Agriculture	1,432	3,461	<b>2.42</b>	<b>6.4%</b>
Agriculture + Residence	1,284	2,572	<b>2.00</b>	<b>4.8%</b>
Bulk Water	1,760	2,760	<b>1.57</b>	<b>5.1%</b>
Commercial	75	144	<b>1.92</b>	<b>0.3%</b>
Commercial + Backflow	143	213	<b>1.49</b>	<b>0.4%</b>
Institutional - Fire Dept.	2	7	<b>4.33</b>	<b>0.0%</b>
Institutional + Backflow	140	344	<b>2.46</b>	<b>0.6%</b>
<b>Total</b>	<b>34,176</b>	<b>53,782</b>		<b>100%</b>
Fire Meter	0	0	<b>0.00</b>	<b>0.0%</b>

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

**Capacity Related Costs:** *Costs associated with the maximum demand required at one the maximum size of facilities required to meet this demand.*

**BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Water Cost of Service Analysis**

**Allocation Factors**

**TABLE 21**

<b>Development of the CUSTOMER Allocation Factor</b>		
<b>Customer Class</b>	<b>Number of Meters <sup>1</sup></b>	<b>Percent of Total</b>
Residential	2,504	<b>92.5%</b>
Residential + Backflow	18	<b>0.7%</b>
Agriculture	23	<b>0.8%</b>
Agriculture + Residence	27	<b>1.0%</b>
Bulk Water	121	<b>4.5%</b>
Commercial	5	<b>0.2%</b>
Commercial + Backflow	4	<b>0.1%</b>
Fire Meter	2	<b>0.1%</b>
Institutional - Fire Dept.	1	<b>0.0%</b>
Institutional + Backflow	2	<b>0.1%</b>
<b>Total</b>	<b>2,707</b>	<b>100.0%</b>

1. Meter Count is from July/August 2020. BHDVWA charges monthly rates, but bills bi-monthly.  
Source files: *CUSTOMER BILLING DATA 09.18.2020.xlsx*

**Customer Related Costs** : Costs associated with having a customer on the water system. These costs vary with the addition or deletion of customers on the system. Examples: Meter-reading, Postage and billing.

**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Water Cost of Service Analysis/Rate Design**

**TABLE 22**

Meter Size	Standard Meters <sup>1</sup>		Fire Service Meters <sup>2</sup>	
	Meter Capacity (gpm)	Equivalency to 1 inch	Meter Capacity (gpm)	Equivalency to 1 inch
	<u>Displacement Meters</u>		<u>Displacement Meters</u>	
3/4 inch	30	1.00	30	1.00
1 inch	50	1.00	50	1.00
1.5 inch	100	2.00	100	2.00
2 inch	160	3.20	160	3.20
	<u>Compound Class I Meters</u>		<u>Fire Service Type II</u>	
3 inch	320	6.40	350	7.00
4 inch	500	10.00	700	14.00
6 inch	1,000	20.00	1,600	32.00
8 inch	1,600	32.00	2,800	56.00

1. Meter flow rates are from AWWA M-1 Table B-1.
2. Fire Service meter flow rates are from AWWA M-6 Table 5-3.

**TABLE 23 : ALLOCATION OF WATER REVENUE REQUIREMENTS**

Functional Category	COSA Results		Proposed Rates	
	Unadjusted Net Revenue Requirements (2020-21) 68% Fixed / 32% Variable		Adjusted Net Revenue Requirements (2020-21) 60% Fixed / 40% Variable	
Commodity - Related Costs	\$ 532,313	31.6%	\$ 532,313	31.6%
Additional Supply Costs	\$ 48,271	2.9%	\$ 48,271	2.9%
Capacity - Related Costs (volumetric share)	\$ -	0.0%	\$ 92,760	5.5%
Capacity - Related Costs (fixed share)	\$ 904,480	53.7%	\$ 811,720	48.2%
Customer - Related Costs	\$ 198,076	11.8%	\$ 198,076	11.8%
Fire Protection - Related Costs	\$ 221	0.0%	\$ 221	0.0%
<b>Total</b>	<b>\$1,683,362</b>	<b>100%</b>	<b>\$1,683,362</b>	<b>100%</b>

BIGHORN DESERT WATER AGENCY  
WATER RATE STUDY  
Water Cost of Service Analysis/Rate Design

TABLE 24 : ALLOCATION OF ADJUSTED NET REVENUE REQUIREMENTS - FY 2020/21

Proposed Rates - Net Revenue Requirements (60% Fixed / 40% Variable)								
Customer Classes	Classification Components						Cost of Service Net Rev. Req'ts	% of COS Net Revenue Req'ts
	Commodity-Related Costs	Additional Supply Costs	Capacity-Related Costs <i>Volumetric Share</i>	Capacity-Related Costs <i>Fixed Share</i>	Customer-Related Costs	Fire Protection-Related Costs		
Residential	\$ 449,288		\$ 75,249	\$ 658,483	\$ 183,222	\$ -	\$1,366,243	81.2%
Residential + Backflow	7,713		1,124	9,836	1,317	-	19,990	1.2%
Agriculture	22,307	<i>Direct</i>	5,970	52,239	1,683	-	82,199	4.9%
Agriculture + Residence	19,998	<i>Allocation</i>	4,437	38,825	1,976	-	65,236	3.9%
Bulk Water	27,420	<i>Made based</i>	4,761	41,661	8,854	-	82,696	4.9%
Commercial	1,164	<i>on Tiered</i>	248	2,167	366	-	3,944	0.2%
Commercial + Backflow	2,222	<i>Water</i>	368	3,216	293	-	6,098	0.4%
Fire Meter	-	<i>Usage</i>	-	-	146	221	367	0.0%
Institutional - Fire Dept.	24		12	101	73	-	210	0.0%
Institutional + Backflow	2,177		593	5,190	146	-	8,107	0.5%
<b>Total Net Revenue Requirement</b>	<b>\$ 532,313</b>	<b>\$ 48,271</b>	<b>\$ 92,760</b>	<b>\$ 811,720</b>	<b>\$ 198,076</b>	<b>\$ 221</b>	<b>\$1,683,362</b>	<b>97%</b>

**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Water Cost of Service Analysis/Rate Design**

**TABLE 25 : CALCULATION OF BI-MONTHLY FIXED METER SERVICE CHARGES FOR FY 2020/21**

<b>Proposed Rates - Net Revenue Requirements (60% Fixed / 40% Variable)</b>								
<b>Number of Meters by Class and Size <sup>1</sup></b>	<b>3/4 inch</b>	<b>1 inch</b>	<b>1 1/2 inch</b>	<b>2 inch</b>	<b>3 inch</b>	<b>4 inch</b>	<b>6 inch</b>	<b>Total</b>
Residential	1,628	875	-	1	-	-	-	2,504
Residential + Backflow	7	11	-	-	-	-	-	18
Agriculture	6	17	-	-	-	-	-	23
Agriculture + Residence	12	15	-	-	-	-	-	27
Commercial	3	2	-	-	-	-	-	5
Commercial + Backflow	3	1	-	-	-	-	-	4
Institutional - Fire Dept.	-	1	-	-	-	-	-	1
Institutional + Backflow	1	-	-	1	-	-	-	2
<b>Total Meters/Accounts</b>	<b>1,660</b>	<b>922</b>	<b>-</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2,584</b>
<i>Hydraulic Capacity Factor <sup>2</sup></i>	<i>1.00</i>	<i>1.00</i>	<i>2.00</i>	<i>3.20</i>	<i>6.40</i>	<i>10.00</i>	<i>20.00</i>	
<b>Total Equivalent Meters</b>	<b>1,660</b>	<b>922</b>	<b>-</b>	<b>6</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2,588</b>
<b>Bi-Monthly Fixed Service Charges</b>								
Customer Costs (\$/Acct/2 months) <sup>3</sup>	\$12.20	\$12.20	\$12.20	\$12.20	\$12.20	\$12.20	\$12.20	
Capacity Costs (\$/Acct/2 months) <sup>4</sup>	\$49.58	\$49.58	\$99.17	\$158.67	\$317.34	\$495.84	\$991.68	
<b>Total Bi-Monthly Meter Charge</b>	<b>\$61.78</b>	<b>\$61.78</b>	<b>\$111.36</b>	<b>\$170.86</b>	<b>\$329.53</b>	<b>\$508.03</b>	<b>\$1,003.87</b>	
<b>Annual Fixed Costs Allocated to Bi-Monthly Meter Charges</b>								
Customer Costs	\$ 189,076							
Capacity Costs	770,058							
<b>Total Fixed Meter Costs</b>	<b>\$ 959,134</b>							
<b>Annual Revenue from Bi-Monthly Meter Charges</b>								
Customer Charges	\$ 121,465	\$ 67,464	\$ -	\$ 146	\$ -	\$ -	\$ -	<b>\$ 189,076</b>
Capacity Charges	493,856	274,298	-	1,904	-	-	-	<b>\$ 770,058</b>
<b>Total Revenue from Bi-Monthly Meter Charges</b>	<b>\$ 615,321</b>	<b>\$ 341,763</b>	<b>\$ -</b>	<b>\$ 2,050</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 959,134</b>

1. Number of meters by size and customer class for July-August 2020.

Source file for meters and consumption: CUSTOMER BILLING DATA 09.18.2020.xlsx

2. Source file: AWWA Manual M1, "Principles of Water Rates, Fees, and Charges", Table B-1.

3. Customer costs are allocated to each customer by dividing the total customer costs by the total number of customers.

4. Capacity costs are allocated by meter size and the hydraulic capacity of the meter.

**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Water Cost of Service Analysis/Rate Design**

**TABLE 26 : CALCULATION OF BI-MONTHLY FIXED METER SERVICE CHARGES FOR FY 2020/21**

<b>Proposed Rates - Net Revenue Requirements (60% Fixed / 40% Variable)</b>								
<b>Number of Meters by Class and Size <sup>1</sup></b>	<b>3/4 inch</b>	<b>1 inch</b>	<b>2 inch</b>	<b>3 inch</b>	<b>4 inch</b>	<b>6 inch</b>	<b>8 inch</b>	<b>Total</b>
Fire Protection - Related Costs	-	2	-	-	-	-	-	2
<b>Total Meters/Accounts</b>	-	<b>2</b>	-	-	-	-	-	<b>2</b>
<i>Hydraulic Capacity Factor <sup>2</sup></i>	<i>1.00</i>	<i>1.00</i>	<i>3.20</i>	<i>7.00</i>	<i>14.00</i>	<i>32.00</i>	<i>56.00</i>	
<b>Total Equivalent Meters</b>	-	<b>2</b>	-	-	-	-	-	<b>2</b>
<b>Bi-Monthly Fixed Service Charges</b>								
Customer Costs (\$/Acct/2 months) <sup>3</sup>	\$12.20	\$12.20	\$12.20	\$12.20	\$12.20	\$12.20	\$12.20	
Capacity Costs (\$/Acct/2 months) <sup>4</sup>	\$18.42	\$18.42	\$58.95	\$128.95	\$257.89	\$589.47	\$1,031.56	
<b>Total Bi-Monthly Meter Charge</b>	<b>\$30.62</b>	<b>\$30.62</b>	<b>\$71.14</b>	<b>\$141.14</b>	<b>\$270.09</b>	<b>\$601.66</b>	<b>\$1,043.76</b>	
<b>Annual Fixed Costs Allocated to Bi-Monthly Meter Charges</b>								
Customer Costs	\$ 146							
Fire Protection Costs		221						
<b>Total Fixed Meter Costs</b>	<b>\$ 367</b>							
<b>Annual Revenue from Bi-Monthly Meter Charges</b>								
Customer Charges	\$ -	\$ 146	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 146
Capacity Charges	-	221	-	-	-	-	-	221
<b>Total Revenue from Bi-Monthly Meter Charges</b>	<b>\$ -</b>	<b>\$ 367</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 367</b>

1. Number of meters by size and customer class for July-August 2020.

Source file for meters and consumption: CUSTOMER BILLING DATA 09.18.2020.xlsx

2. Source file: AWWA Manual M6, "Water Meters - Selection, Installation, Testing and Maintenance", Table 5-3.

3. Customer costs are allocated to each customer by dividing the total customer costs by the total number of customers.

4. Capacity costs are allocated by meter size and the hydraulic capacity of the meter.

PROPOSED VOLUMETRIC CHARGES FOR FY 2020/21

TABLE 27

<b>Proposed Rates - Net Revenue Requirements (60% Fixed / 40% Variable)</b>								
Customer Classes	Water Consumption (hcf/yr.) <sup>1</sup>	Commodity Assigned Costs	Capacity Assigned Costs	Additional Supply Costs <sup>2</sup>	Fixed Costs to Recover from Vol. Charges	Target Rev. Req't from Vol. Charges	Cost Per Unit of Water (\$/hcf)	Volumetric Rates (\$/hcf)
Residential	173,074	\$ 449,288	\$ 75,249	<i>Allocated based on water supply costs.</i>	\$ -	\$ 524,537	\$3.03	\$3.03
Residential + Backflow	2,971	7,713	1,124		-	8,837	\$2.97	
Agriculture	8,593	22,307	5,970		-	28,277	\$3.29	\$3.23
Agriculture + Residence	7,704	19,998	4,437		-	24,435	\$3.17	
Bulk Water	10,563	27,420	4,761		50,515	82,696	\$7.83	<b>\$7.83</b>
Commercial	448	1,164	248	898	-	2,310	\$5.15	<b>\$3.58</b>
Commercial + Backflow	856	2,222	368		-	2,589	\$3.03	
Fire Meter	0	-	-		-	-	N/A	
Institutional - Fire Dept.	9	24	12		-	36	\$3.84	
Institutional + Backflow	839	2,177	593		-	2,770	\$3.30	
<b>Total</b>	<b>205,057</b>	<b>\$ 532,313</b>	<b>\$ 92,760</b>	<b>\$ 898</b>	<b>\$ 50,515</b>	<b>\$ 676,487</b>		

1. Consumption by customer class for July-August 2020.

Source file for meters and consumption: CUSTOMER BILLING DATA 09.18.2020.xlsx

2. Additional water supply costs for Residential and Agriculture customers shown in Table 29.

TABLE 28: PROPOSED TIER BREAKPOINTS

Water Supply Allocation	Based on # of Parcels	Based on # of Accounts
Total Water Allocation 2020	908 acre feet	908 acre feet
Total Customer Base	5,286 total parcels	2,707 total active accounts
Water Allocated to Each Customer Annual	0.17 acre feet/parcel/year	0.34 acre feet/parcel/year
Conversion to Hundred Cubic Feet	74.8 hcf	146.1 hcf
HCF Bi-Monthly Allocation Per Customer	12.5 hcf	24.4 hcf
Bi-Monthly Tier 1 Water	13.00 hcf	25.00 hcf
<b>Total Water Allocation in hcf</b>	<b>395,524</b>	

**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Water Cost of Service Analysis/Rate Design**

**TABLE 29: ADDITIONAL WATER SUPPLY COSTS**

<b>Cost Per Unit for State Water Project Water</b>	<b>Ag+Res</b>	<b>Non-Res</b>	<b>Total</b>
Total Cost for Additional Water Supply (70 AF)	\$47,373.11	\$898.16	\$48,271.27 Total Cost
Cost per Acre Foot	\$689.59		\$689.59 per AF
Cost per HCF	\$1.58		\$1.58 per hcf

**TABLE 30: TIERED WATER RATES**

<b>Proposed Rates - Net Revenue Requirements (60% Fixed / 40% Variable)</b>						
<b>Customer Classes</b>	<b>Est. Water Consumption (hcf/yr.)</b>	<b>% of Consumption in Tier</b>	<b>Base Rate</b>	<b>Plus Additional Supply Cost</b>	<b>Cost Per Unit of Water (\$/hcf)</b>	<b>Estimated Revenue</b>
Residential						
Tier 1	124,215	70%	\$3.03	\$0.00	<b>\$3.03</b>	\$ 376,341
Tier 2	53,094	30%	\$3.03	\$1.58	<b>\$4.61</b>	\$ 244,914
Agriculture						
Tier 1	4,052	26%	\$3.23	\$0.00	<b>\$3.23</b>	\$ 13,106
Tier 2	11,649	74%	\$3.23	\$1.58	<b>\$4.82</b>	\$ 56,120
<b>Total</b>	<b>193,010</b>					<b>\$ 690,481</b>

**BIGHORN DESERT WATER AGENCY**  
**WATER RATE STUDY**  
**Water Cost of Service Analysis/Rate Design**

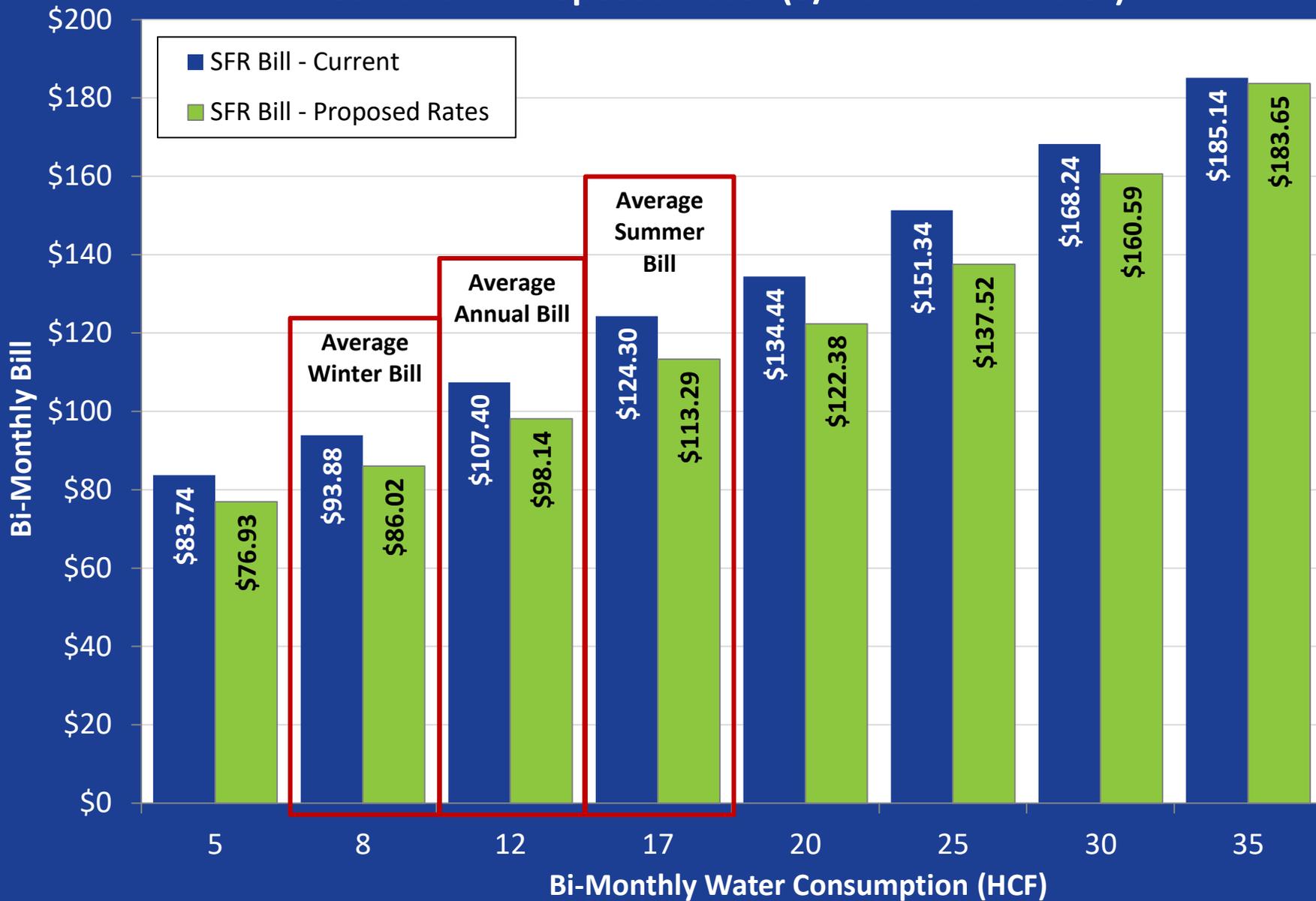
**Current & Proposed Rates**

**CURRENT VS. PROPOSED WATER RATES:**

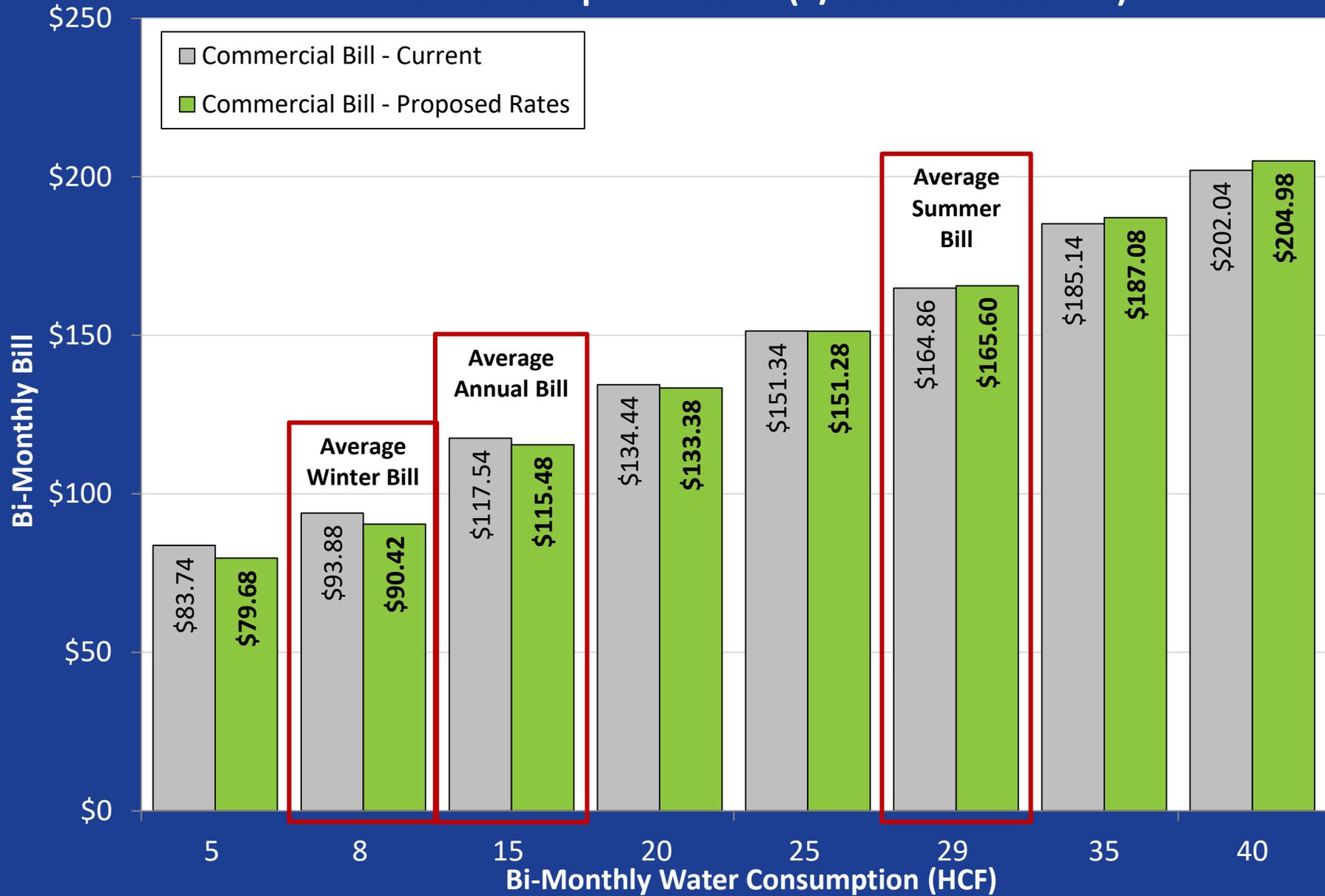
**TABLE 31**

<b>Proposed Rates - Net Revenue Requirements (60% Fixed / 40% Variable)</b>							
<b>Water Rate Schedule</b>	<b>Current Rates</b>	<b>Proposed Rates</b>					
		<b>FY 2020/21</b>	<b>FY 2021/22</b>	<b>FY 2022/23</b>	<b>FY 2023/24</b>	<b>FY 2024/25</b>	
<i>Projected Increase in Rate Revenue per Financial Plan:</i>		4.00%	4.00%	4.00%	4.00%	4.00%	
<b>Fixed Meter Charges</b>							
<b>Bi-Monthly Fixed Service Charges:</b>							
3/4 inch	\$66.84	\$61.78	\$64.25	\$66.82	\$69.49	\$72.27	
1 inch	\$66.84	\$61.78	\$64.25	\$66.82	\$69.49	\$72.27	
1.5 inch	\$66.84	\$111.36	\$115.81	\$120.44	\$125.26	\$130.27	
2 inch	\$66.84	\$170.86	\$177.69	\$184.80	\$192.19	\$199.88	
3 inch	\$66.84	\$329.53	\$342.71	\$356.42	\$370.68	\$385.51	
4 inch	--	\$508.03	\$528.35	\$549.48	\$571.46	\$594.32	
6 inch	--	\$1,003.87	\$1,044.02	\$1,085.78	\$1,129.21	\$1,174.38	
<b>Bi-Monthly Fire Service Charges:</b>							
3/4 inch	\$16.00	\$30.62	\$31.84	\$33.11	\$34.43	\$35.81	
1 inch	\$16.00	\$30.62	\$31.84	\$33.11	\$34.43	\$35.81	
2 inch	\$16.00	\$71.14	\$73.99	\$76.95	\$80.03	\$83.23	
3 inch	\$34.43	\$141.14	\$146.79	\$152.66	\$158.77	\$165.12	
4 inch	\$57.38	\$270.09	\$280.89	\$292.13	\$303.82	\$315.97	
6 inch	\$114.75	\$601.66	\$625.73	\$650.76	\$676.79	\$703.86	
8 inch	\$183.60	\$1,043.76	\$1,085.51	\$1,128.93	\$1,174.09	\$1,221.05	
<b>Commodity Charges</b>							
<b>Rate per hcf of Water Consumed:</b>							
Bulk Meters	\$9.57	\$7.83	\$8.14	\$8.47	\$8.81	\$9.16	
Commercial, Institutional, Fire & Other	\$3.38	\$3.58	\$3.72	\$3.87	\$4.02	\$4.18	
Residential, 3/4" and 1" Meters	\$3.38	--	--	--	--	--	
<b>Tiered Rate - Residential Customers:</b>							
	<u>Proposed Break</u>						
Tier 1	0-25 hcf	\$3.38	\$3.03	\$3.15	\$3.28	\$3.41	\$3.55
Tier 2	26+ hcf	\$3.38	\$4.61	\$4.80	\$4.99	\$5.19	\$5.40
<b>Tiered Rate - Agriculture Customers:</b>							
	<u>Proposed Break</u>						
Tier 1	0-25 hcf	\$3.38	\$3.23	\$3.36	\$3.49	\$3.63	\$3.78
Tier 2	26+ hcf	\$3.38	\$4.82	\$5.01	\$5.21	\$5.42	\$5.64

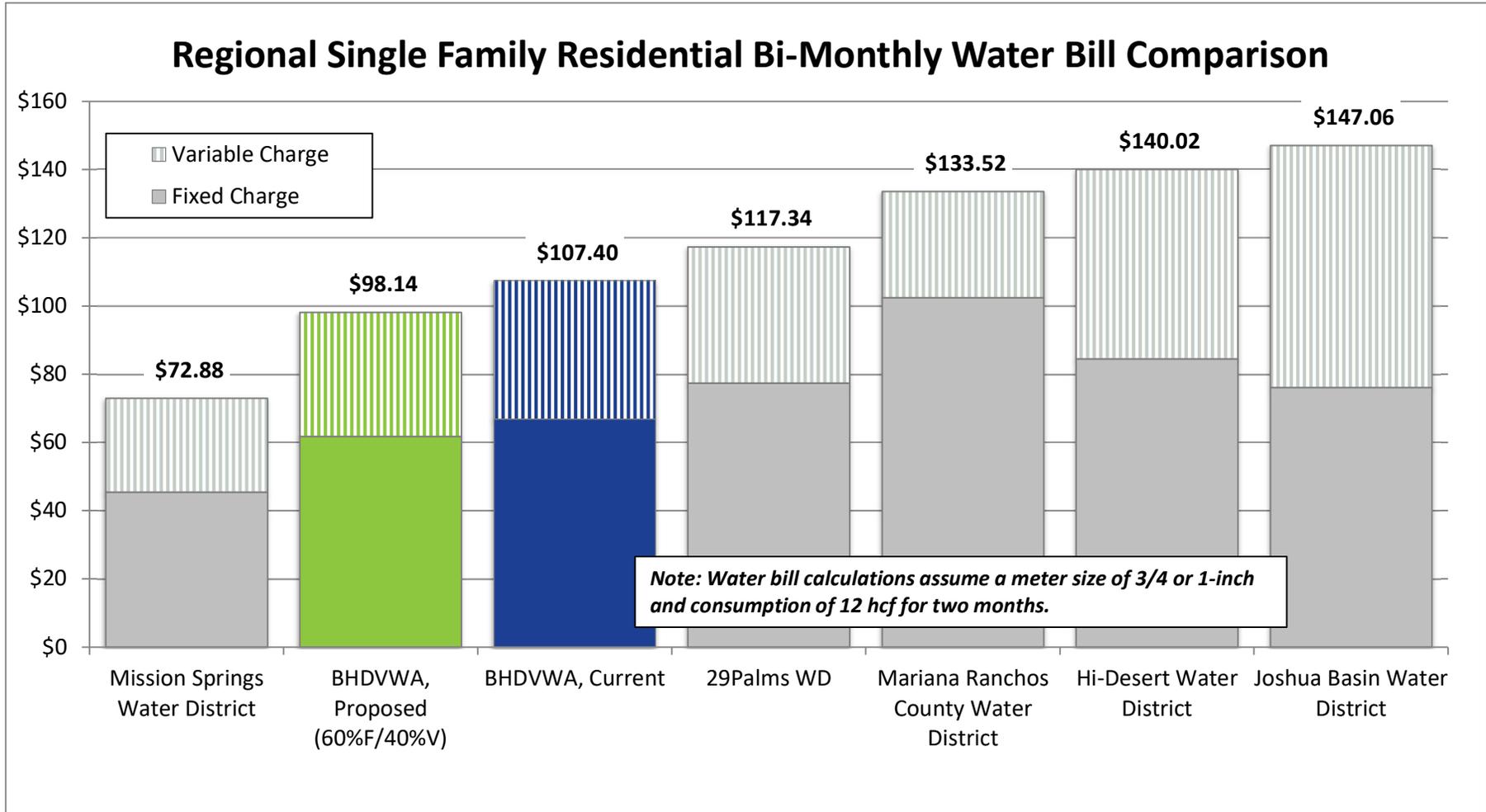
## Residential Water Bill Comparison Current vs. Proposed Rates (3/4 or 1-inch meter)



## Commercial Water Bill Comparison Current vs. Proposed Rates (3/4 or 1-inch meter)



**Water Rate Comparison**  
**Regional Water Rate Comparison**





# Bighorn Desert View Water Agency

Water Capacity Fee Study

**Final Report**

February 2021

**OFFICE LOCATIONS:**

**Temecula – Corporate Headquarters**  
32605 Temecula Parkway, Suite 100  
Temecula, CA 92592

**San Francisco – Regional Office**  
870 Market Street, Suite 1223  
San Francisco, CA 94102

**California Satellite Offices**  
Atascadero, Davis  
Huntington Beach,  
Joshua Tree, Riverside  
Sacramento, San Jose

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**Bighorn Desert View Water Agency  
Water Capacity Fee Analysis  
Demographic Data and Projections**

**EXHIBIT 1**

**TABLE 1 - METER EQUIVALENT UNITS**

Meter Size	Existing Water Meters <sup>1</sup>	Meter Equivalence		1-inch Meter Equivalent Units
		Maximum Flow (gpm) <sup>2</sup>	Equivalency to 1 inch meter	
3/4 inch	1,660	30	1.00	1,660
1 inch	1,019	50	1.00	1,019
1.5 inch	0	100	2.00	0
2 inch	26	160	3.20	83
3 inch	0	320	6.40	0
<b>Total</b>	<b>2,705</b>			<b>2,762</b>

1. Number of meters by size and customer class for July-August 2020. Includes 121 Bulk meters.  
*Source file for meters and consumption: CUSTOMER BILLING DATA 10.13.2020\_v2.xlsx*
2. Source: AWWA M1, Table B-2. Assumes displacement meters for 5/8" through 2", Compound Class I for 3".

**TABLE 2 - EXISTING AND PROJECTED SERVICE NUMBERS**

Demographic Statistics	Existing Total	Projected Service Total <sup>1</sup> (thru FY2037/38)	% Allocation Factors		Cumulative Change	
			Existing Customers	New Customers	Number of Units	% Increase
Equivalent 1-inch meters	2,762	3,525	72.4%	27.6%	763	27.6%

1. Customer growth estimated in 2007 Urban Water Master Plan. Assumes 40 new connections per year.  
*Source file: Water Master Plan 2007.pdf, page 16.*

**Bighorn Desert View Water Agency**  
**Water Capacity Fee Analysis**  
**Existing Capital Facilities and Equipment for Consideration (System Buy-In)**

**EXHIBIT 2**

**TABLE 3 - EXISTING ASSETS, ORIGINAL AND REPLICATION VALUE**

Asset Category <sup>1</sup>	Original Values <sup>1</sup>	Replication Value <sup>2</sup>	System Buy-In Cost Basis <sup>3</sup>
	Asset Cost	Asset Cost	
<b>Water Fund</b>			
Infrastructure	\$ 582,157	\$ 1,416,064	\$ 1,416,064
Land	38,690	38,690	38,690
Large Machinery	595,257	914,242	914,242
Mains and Piping	1,845,242	4,762,862	4,762,862
Meters and Hydrants	257,851	318,347	318,347
Office Equipment	576,474	719,186	719,186
Pumps, Tanks & Wells	3,443,496	8,175,586	8,175,586
Treatment Plant	4,003,823	16,369,245	16,369,245
Vehicle	253,208	265,048	265,048
<b>Total Capital Facilities &amp; Equipment</b>	<b>\$ 11,596,198</b>	<b>\$ 32,979,269</b>	<b>\$ 32,979,269</b>

1. Source file for Bighorn Desert View Water Agency current assets as of August 2020: 2020.09.02-58227744-FA-Asset Listing.xlsx

Fully depreciated assets have been excluded from this analysis.

2. Takes into account estimated cost inflation, noted in Footnote 3.

3. System Buy-In Cost Basis values are calculated by escalating the book values (from Agency's fixed asset report) from service date to current year values using historical cost inflation factors from the Handy-Whitman Index of Public Utility Construction Costs for Water Utility Construction in the Pacific Region.

The percentage change in the asset cost is shown in column M of the Existing Assets Detail tab, labeled "Adjusted % of Original Value".

**TABLE 4 - EXISTING ASSETS, ALLOCATION TO EXISTING AND FUTURE CUSTOMERS**

Asset Category <sup>1</sup>	System Buy-In Cost Basis	Allocation Basis (%) <sup>2</sup>			Distribution of Cost Basis (\$)		
		Exclude from Analysis <sup>3</sup>	Existing Customers	Future Customers	Exclude from Analysis <sup>3</sup>	Existing Customers	Future Customers
<b>Water Fund</b>							
Infrastructure	\$ 1,416,064	0.0%	72.4%	27.6%	\$ -	\$ 1,024,906	\$ 391,158
Land	38,690	0.0%	72.4%	27.6%	-	28,002	10,687
Large Machinery	914,242	0.0%	72.4%	27.6%	-	661,702	252,540
Mains and Piping	4,762,862	0.0%	72.4%	27.6%	-	3,447,221	1,315,641
Meters and Hydrants	318,347	0.0%	93.2%	6.8%	-	296,842	21,505
Office Equipment	719,186	0.0%	72.4%	27.6%	-	520,526	198,660
Pumps, Tanks & Wells	8,175,586	0.0%	72.4%	27.6%	-	5,917,251	2,258,335
Treatment Plant	16,369,245	0.0%	72.4%	27.6%	-	11,847,583	4,521,662
Vehicle	265,048	0.0%	72.4%	27.6%	-	191,834	73,214
<b>Total Capital Facilities &amp; Equipment</b>	<b>\$ 32,979,269</b>	<b>0.0%</b>	<b>72.6%</b>	<b>27.4%</b>	<b>\$ -</b>	<b>\$ 23,935,867</b>	<b>\$ 9,043,402</b>

1. Source file for Bighorn Desert View Water Agency current assets as of August 2020: 2020.09.02-58227744-FA-Asset Listing.xlsx

2. Based on proportionate allocation between existing and future users. See Table 2 in Exhibit 1 for demographic expectations.

**TABLE 5 - Asset Categories for Inflation**

Category	Type of Asset
ENR-LA	<b>Engineering News Record Average Construction Inflation - Los Angeles</b>
ENR-SF	<b>Engineering News Record Average Construction Inflation - San Francisco</b>
	<b>Source of Supply Plant</b>
1	Collecting & Impounding Res.
	<b>Pumping Plant</b>
2	Structures & Improvements
3	Electric Pumping Equipment
	<b>Water Treatment Plant</b>
4	Structures & Improvements
5	Large Treatment Plant Equipment
6	Small Treatment Plant Equipment
	<b>Transmission Plant</b>
7	Steel Reservoirs
8	Elevated Steel Tanks
9	Concrete Reservoirs
10	Cast Iron Mains
11	Steel Mains
12	Concrete Cylinder Mains
	<b>Distribution Plant</b>
13	Mains-Average All Types
14	Cast Iron Mains
15	Cement Asbestos Mains
16	Steel Mains
17	PVC Mains
18	Services Installed
19	Meters
20	Meter Installations
21	Hydrants Installed
	<b>Miscellaneous Items</b>
22	Flocculating Equipment - Installed
23	Clarifier Equipment - Installed
24	Filter Gallery Piping - Installed

Water Capacity Fee Analysis

Allocation of Cash Reserves and Outstanding Debt to Existing and Future Services

TABLE 6 - ALLOCATION OF CASH RESERVES TO EXISTING AND FUTURE USERS

Cash Reserves	Beginning Cash <sup>1</sup>	% Allocation		\$ - Allocation	
		Existing Customers	Future Customers	Existing Customers	Future Customers
<b>Un-restricted Reserves</b>					
Operating Reserve Fund (Current Customer Deposits)					
Emergency Contingencies Reserve Fund	\$ 3,310,519	100.0%	0.0%	\$ 3,310,519	\$ -
Replacement & Refurbishment Reserve Fund					
<b>Restricted Reserves</b>					
Capacity Fee Reserve <sup>2</sup>	\$ 12,780	100.0%	0.0%	\$ 12,780	\$ -
<b>Total Beginning Cash</b>	<b>\$ 3,323,299</b>	<b>100.0%</b>	<b>0.0%</b>	<b>\$ 3,323,299</b>	<b>\$ -</b>

1. Beginning balance for fiscal year 2020/21 is per client email September 7, 2020.
2. Capacity fee cash is excluded as to not double count asset values included in the fee calculation.

TABLE 7 - PLANNED CAPITAL IMPROVEMENT COSTS, ALLOCATED TO EXISTING AND FUTURE CUSTOMERS

Capital Project Description <sup>1</sup>	Future Cost Estimate (2020-2034) <sup>1</sup>	System Development Cost Basis <sup>3</sup>	% Allocation		Distribution of Cost Basis (\$)	
			Existing Customers	Future Customers	Existing Customers	Future Customers
<b>Refurbish and Replacement Projects</b>						
Well 4 Rehab	\$ 78,850	\$ 78,850	100.0%	0.0%	\$ 78,850	\$ -
Well 6 Rehab	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Well 7 Rehab	\$ 68,060	\$ 68,060	100.0%	0.0%	\$ 68,060	\$ -
Well 8 Rehab	\$ 130,310	\$ 130,310	100.0%	0.0%	\$ 130,310	\$ -
Well 9 Rehab	\$ 81,340	\$ 81,340	100.0%	0.0%	\$ 81,340	\$ -
Well 10 Rehab	\$ 69,720	\$ 69,720	100.0%	0.0%	\$ 69,720	\$ -
Well GMW1	\$ 24,900	\$ 24,900	100.0%	0.0%	\$ 24,900	\$ -
Well GMW2	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Well GMW3	\$ 29,299	\$ 29,299	100.0%	0.0%	\$ 29,299	\$ -
Well 13	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Pump Well 3	\$ 60,575	\$ 60,575	100.0%	0.0%	\$ 60,575	\$ -
Pump Well 4	\$ 200,000	\$ 200,000	100.0%	0.0%	\$ 200,000	\$ -
Pump Well 6	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Pump Well 7	\$ 65,120	\$ 65,120	100.0%	0.0%	\$ 65,120	\$ -
Pump Well 8	\$ 129,880	\$ 129,880	100.0%	0.0%	\$ 129,880	\$ -
Pump Well 9	\$ 99,840	\$ 99,840	100.0%	0.0%	\$ 99,840	\$ -
Pump Well 10	\$ 44,000	\$ 44,000	100.0%	0.0%	\$ 44,000	\$ -
Pump Well GMW1	\$ 82,880	\$ 82,880	100.0%	0.0%	\$ 82,880	\$ -
Pump Well GMW2	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Pump Well GMW3	\$ 82,880	\$ 82,880	100.0%	0.0%	\$ 82,880	\$ -
Pump Well 13	\$ 100,000	\$ 100,000	100.0%	0.0%	\$ 100,000	\$ -
New Replacement Well for BH or DV	\$ 500,000	\$ 500,000	0.0%	100.0%	\$ -	\$ 500,000
JV Booster Station Upgrade - VFD's/Pressure Vessels	\$ 15,000	\$ 15,000	100.0%	0.0%	\$ 15,000	\$ -
New Storage Tank	\$ 500,000	\$ 500,000	0.0%	100.0%	\$ -	\$ 500,000
Customer Meter w/ Box & Shutoff, Complete	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Utility Billing Software Replacement	\$ 200,000	\$ 200,000	100.0%	0.0%	\$ 200,000	\$ -
Loop Kickapoo Trail	\$ 702,240	\$ 702,240	0.0%	100.0%	\$ -	\$ 702,240
Shop Building Upgrades - storage and work space	\$ 50,000	\$ 50,000	100.0%	0.0%	\$ 50,000	\$ -
Replace Generator - 90 KW mobile	\$ 50,000	\$ 50,000	100.0%	0.0%	\$ 50,000	\$ -
Dump truck	\$ 85,000	\$ 85,000	100.0%	0.0%	\$ 85,000	\$ -
Replace Tractor	\$ 175,000	\$ 175,000	100.0%	0.0%	\$ 175,000	\$ -
Replace Fleet Vehicles (avg life)	\$ 430,000	\$ 430,000	100.0%	0.0%	\$ 430,000	\$ -

TABLE 8 - PLANNED CAPITAL IMPROVEMENT COSTS, ALLOCATED TO EXISTING AND FUTURE CUSTOMERS

Capital Project Description <sup>1</sup>	Future Cost Estimate (2020-2038) <sup>1</sup>	System Development Cost Basis <sup>3</sup>	% Allocation		Distribution of Cost Basis (\$)	
			Existing Customers	Future Customers	Existing Customers	Future Customers
<b>Distribution System Projects</b>						
Distribution Valve, 6" avg, both water systems 50%	\$ -	\$ -	72.4%	27.6%	\$ -	\$ -
Fire Hydrants, both water systems 50%	\$ -	\$ -	72.4%	27.6%	\$ -	\$ -
Pipe w/sand bedding, 6" avg. ID Goat Mtn	\$ -	\$ -	72.4%	27.6%	\$ -	\$ -
Pipe w/sand bedding, 6" avg. BDVWA	\$ -	\$ -	72.4%	27.6%	\$ -	\$ -
<b>Operations Capital Projects</b>						
Water Storage Tank Recoating (B1, B2), May 26, 2020	\$ 81,000	\$ 81,000	72.4%	27.6%	\$ 58,625	\$ 22,375
Water Storage Tank Recoating (B1, B2), Feb. 2020	\$ 80,000	\$ 80,000	72.4%	27.6%	\$ 57,902	\$ 22,098
C-Booster Station Upgrades	\$ 35,000	\$ 35,000	72.4%	27.6%	\$ 25,332	\$ 9,668
<b>Total</b>	<b>\$ 4,250,894</b>	<b>\$ 4,250,894</b>	<b>58.7%</b>	<b>41.3%</b>	<b>\$ 2,494,513</b>	<b>\$ 1,756,381</b>

- Estimated capital improvement project costs found in source files: *BDVWA Replacement Refurbishment CIP and Min Rate Gen 5 1 2017.xlsx*  
 Cindy and Marina confirmed updated costs in source file: *CIP Estimates through 2035-36 V2.xlsx*  
 Certain projects being built in order to allocate new growth are 100% allocated to future customers.
- Operation Capital projects are per page 14 of the District's 2020/21 budget (file: *FY2020.21 Budget adopted 5 26 2020 20R-14.pdf*).

**Bighorn Desert View Water Agency**  
**Water Capacity Fee Analysis**  
**Unit Cost Calculation**

**EXHIBIT 7**

**TABLE 9 - DEVELOPMENT OF THE COST BASIS FOR NEW CUSTOMERS**

<b>System Asset Values Allocated to Future Development</b>	<b>Replacement Cost</b>
<i>Costs Included in Existing System Buy-In:</i>	
Existing Assets	\$ 9,043,402
Planned, Future Capital Projects	1,756,381
<b>Total Cost Basis for New Development</b>	<b>\$ 10,799,783</b>

**TABLE 10 - DEVELOPMENT OF THE MAXIMUM CAPACITY FEE PER METER EQUIVALENT**

<b>Summary of Capacity Fee Calculation</b>	<b>Adjusted System Cost Basis</b>	<b>Planned Additional Meter Equivalents (thru FY2037/38)</b>	<b>Base Capacity Fee</b>
Proposed Fee -Replacement Cost	\$ 10,799,783	763	\$14,154

1. Refer to Exhibits 2 and 4 for detail of existing assets.
2. Refer to Exhibit 6 for detail related to planned assets.
3. Refer to Exhibit 5 for detail related to cash reserves and outstanding debt.
4. Refer to Exhibit 1 (Demographics) for growth projections.

**Bighorn Desert View Water Agency**  
**Water Capacity Fee Analysis**  
**Water Fee Classification and Calculation of Maximum Fee**

**EXHIBIT 8**

**TABLE 11 - WATER CAPACITY FEE BASED ON METER SIZE**

Meter Size	Equivalency Factor		Capacity Fee Per Meter Size
	Maximum Continuous Flow (gpm) <sup>1</sup>	Equivalency to 1 inch meter	
3/4 inch	30	1.00	<b>\$14,154</b>
1 inch	50	1.00	<b>\$14,154</b>
1.5 inch	100	2.00	<b>\$28,309</b>
2 inch	160	3.20	<b>\$45,294</b>
3 inch	320	6.40	<b>\$90,588</b>
4 inch	500	10.00	<b>\$141,544</b>
6 inch	1,000	20.00	<b>\$283,087</b>
8 inch	2,800	56.00	<b>\$792,645</b>
10 inch	4,200	84.00	<b>\$1,188,967</b>

1. Source: AWWA M1, Table B-2. Assumes displacement meters for 3/4" through 2", Compound Class I for 3" through 6", and Turbine Class II for 8" through 10".

# Table of Contents

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<b>Table of Contents</b> .....	<b>1</b>
<b>Table of Figures</b> .....	<b>1</b>
<b>Section 1. Executive Summary</b> .....	<b>1</b>
A. Background and Purpose .....	1
B. Overview of Capacity Fee Program Methodology .....	1
<b>Section 2. Water Capacity Fee Study</b> .....	<b>3</b>
A. Existing Connections and Projected Future Growth .....	3
B. Existing and Planned Assets .....	4
C. Calculated Capacity Fees – Water Utility .....	8
D. Water Capacity Fee Findings Statements .....	9
<b>Section 3. Recommendations and Next Steps</b> .....	<b>10</b>
A. Consultant Recommendations and Next Steps.....	10
B. Principal Assumptions and Considerations .....	10
<b>Appendix A. Water Capacity Facility Fee Study Summary Tables</b> .....	<b>11</b>

## Table of Figures

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<b><u>Figure</u></b>	<b><u>Page</u></b>
Figure 1. Current Water Customers .....	3
Figure 2. Existing and Projected Service Numbers .....	4
Figure 3. Summary of Existing Asset Values .....	5
Figure 4. Existing Asset Values Allocated to Current & Future Customers .....	6
Figure 5. Planned Assets Allocated to Current & Future Customers .....	7
Figure 6. Planned Assets Allocated to Current & Future Customers, Continued .....	8
Figure 7. Summary of Cost Basis Allocated to Future Customers .....	8
Figure 8. Summary of New Base Capacity Fees.....	8
Figure 9. Updated Water Capacity Fees.....	9

# Section 1. Executive Summary

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## A. Background and Purpose

Bighorn Desert View Water Agency retained NBS to conduct a water capacity fee study in conjunction with the water rate study for two primary reasons: (1) to ensure that the fees are updated to comply with legal requirements and industry standards, and (2) to ensure that these fees reflect the cost of capital infrastructure needed to serve new connections, or any person requesting additional capacity in the Agency’s water system (referred to throughout as “future customers”).

Please note, the fees updated in this study are commonly referred to as “connection fees,” “capital facility fees,” “capacity charges,” or in this case, “capacity fees.” BDVWA refers to this as the Basic Facilities Charge. The terms are often used interchangeably, and California Government Code Section 66013 defines these types of fees (referred to as a “capacity charge”) as a one-time “charge for public facilities in existence at the time a charge is imposed or charges for new public facilities to be acquired or constructed in the future that are of proportional benefit to the person or property being charged, including supply or capacity contracts for rights or entitlements, real property interests, and entitlements and other rights of the local agency involving capital expense relating to its use of existing or new public facilities.” It authorizes public agencies to impose “connection fees” (e.g., capacity fees) which are more appropriately called system capacity charges or capacity fees, on customers connecting to or upsizing their connection to the water system, to ensure that they pay their fair share of existing utility asset costs, plus the costs of new facilities needed to serve them. In its simplest form, capacity fees are the result of dividing the cost (or value) of the Utility’s current system assets plus planned capital improvements, by the expected number of future customers. As a result, future customers connecting to the Agency’s water utility would enter as equal participants, along with current customers, regarding their financial commitment and obligations to the utility.

Whereas water rate increases imposed on existing customers require a protest ballot procedure (under Proposition 218), capacity fees do not because they are an appropriate funding mechanism for facilities that benefit new development agencywide and may be imposed by a majority vote of the governing legislative body, which in this case is the Bighorn Desert View Water Agency’s Board of Directors. This report provides the documentation and findings necessary for the adoption of proposed capacity (system capacity) fees.

## B. Overview of Capacity Fee Program Methodology

Various methodologies have been and are currently used to calculate water capacity fees. The most common methodologies are based on the following from the American Water Works Association’s Principles of Water Rates, Fees and Charges<sup>1</sup>, also referred to as Manual M1:

- The value of existing (historical) system assets, often called a “system buy-in” or “replacement cost” methodology.

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

- The value of planned future improvements, also called the “incremental” or “system development” methodology.
- A combination of these two approaches.

This analysis uses the “Combination Approach,<sup>2</sup>” which requires new customers to pay both their fair share of existing system assets as well as their share of the planned future capital improvements needed to provide them with capacity in the Agency’s water system. As a result, new customers connecting to the Agency’s water system would enter as equal participants with existing customers regarding their financial commitment and obligations to the utility.

In its simplest form, capacity fees (also referred to as connection fees, capacity fees, or system development charges) are calculated by dividing the costs allocated to future development by the number of units of new development anticipated:

- Costs of planned future facilities and improvements required to serve new development are those that can reasonably be allocated to future development.
- The number of new units (i.e., growth) are those units projected to occur within the timeframe covered by the capacity fee analysis.

Capacity fees are one-time fees intended to reflect the cost of existing infrastructure and planned improvements available to new services, and place new utility customers or existing customers requesting an increase in service capacity on equal basis from a financial perspective with existing customers. Once new customers are added to the system, they then incur the obligation to pay the same service charges or water rates that existing customers pay.

This capacity fee study and the recommended fees assume a given level of development activity over the course of the study period based on data available from the Agency’s 2007 Water Master Plan. The development that occurs may result in both different impacts and fee revenues than those that are calculated in this study. For that reason, regular updates are recommended to adjust the fees to match the needs created by the rate of actual development.

In developing the proposed fees, NBS worked cooperatively with Agency staff. The fees presented in this study reflect input provided by Agency staff regarding financial matters, available capacity in the water system, existing asset values, and planned capital improvements.

Section 2 discusses in more detail the development of the water capacity fees and present the updated fees recommended for new and upsized connections.

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<sup>2</sup> Method of calculating capital facility fees (also known as System Development Fees, Connection Fees, Capacity Fees) are set forth in the American Water Works Association’s *Principles of Water Rates, Fees and Charges* Seventh Edition (2017) pages 311 to 347.

## Section 2. Water Capacity Fee Study

### A. Existing Connections and Projected Future Growth

The Agency currently has approximately 2,700 equivalent 1-inch water meter connections to the water system. The Agency has implemented 1-inch meters as the standard (or base) meter size installed, but there are over 1,600 3/4-inch meters connected to the system. For the purpose of this study, 3/4-inch meters are treated the same as 1-inch meters; which is a common industry practice when setting rates and fees for smaller meter sizes. **Figure 1** shows the current number of meters by size connected to the system, meter equivalency factors and meter equivalent units.

**FIGURE 1. CURRENT WATER CUSTOMERS**

Meter Size	Existing Water Meters <sup>1</sup>	Meter Equivalence		1-inch Meter Equivalent Units
		Maximum Flow (gpm) <sup>2</sup>	Equivalency to 1 inch meter	
3/4 inch	1,660	30	1.00	1,660
1 inch	1,019	50	1.00	1,019
1.5 inch	0	100	2.00	0
2 inch	26	160	3.20	83
3 inch	0	320	6.40	0
<b>Total</b>	<b>2,705</b>			<b>2,762</b>

1. Number of meters by size and customer class for July-August 2020. Includes 121 Bulk meters.

Source file for meters and consumption: CUSTOMER BILLING DATA 10.13.2020\_v2.xlsx

2. Source: AWWA M1, Table B-2. Assumes displacement meters for 5/8" through 2", Compound Class I for 3".

Larger meters have the potential to use more of the system’s capacity, compared to smaller meters. The potential capacity demanded by each meter is proportional to the maximum hydraulic flow through each meter size as established by the AWWA<sup>3</sup> hydraulic capacity ratios. The AWWA hydraulic capacity ratios (also known as flow factors, or meter equivalencies) used in this study are shown in the fourth column of Figure 1. The maximum flow rate, in gallons per minute (gpm) for each size meter is used to determine the number of equivalent 1-inch meter units currently connected.

As an example, a 2-inch meter has a greater capacity, or potential peak demand than a 1-inch meter. The “equivalency to a 1-inch meter” is calculated by dividing the maximum capacity or flow of larger meters by the capacity of the base (1-inch) meter size. The meter capacity factors shown in Figure 1 are the ratio of potential flow through each meter size compared to the flow through a 1-inch meter. The 1-inch meter is the base meter size for the utility and is used to compare the capacities of the larger meters. For example, column 4 in Figure 1 shows that a 2-inch meter is equivalent to 3.2 1-inch meters.

The actual number of meters by size is multiplied by the corresponding meter equivalency to calculate the total number of equivalent meters. The number of equivalent meters is used as a proxy for the

<sup>3</sup> “AWWA” is the American Water Works Association.

potential demand that each customer can place on the water system. A significant portion of a water system’s peak capacity, and in turn the utility’s fixed capital costs, are related to meeting system capacity requirements. Therefore, the capacity fee for a new connection will be proportional to the service’s meter equivalence.

The equivalent meter calculation is summarized for standard use meters in Figure 1. Given that the state now requires fire suppression systems in all new single-family home construction, the minimum meter size going forward is a 1-inch meter. This difference has not changed the expected use within the home. Consequently, the District has chosen to treat 3/4-inch meters equivalent to 1-inch meters for the following reasons:

- The desire for a single, fixed meter charge across all customer classes.
- The desire for a single capacity fee for new connections.
- The overwhelming number of meters between 3/4-inch and 1 inch are for residential and non-residential properties.

The result of this analysis, summarized in Figure 1, is that while there are currently 2,705 connections to the water system, there are 2,762 potable water equivalent (i.e., 1-inch) meter units.

**Figure 2** shows existing and projected service numbers for the water system. The anticipated future connections are based on the Agency’s planned customer growth rate of 40 meters added annually, for the next 20 years. Existing capacity in the Agency’s water system is allocated to current and future customers and the percentage assigned to current and future customers is based upon their assigned share of 1-inch meter equivalent units. As shown in Figure 2, new customers will be allocated about 27.6% of existing assets and planned assets. This is calculated by taking the expected number of new units (763) divided by the existing total of equivalent meters (2,762).

**FIGURE 2. EXISTING AND PROJECTED SERVICE NUMBERS**

Demographic Statistics	Existing Total	Projected Service Total <sup>1</sup> (thru FY2037/38)	% Allocation Factors		Cumulative Change	
			Existing Customers	New Customers	Number of Units	% Increase
Equivalent 1-inch meters	2,762	3,525	72.4%	27.6%	763	27.6%

1. Customer growth estimated in 2007 Urban Water Master Plan. Assumes 40 new connections per year.

Source file: Water Master Plan 2007.pdf, page 16.

## B. Existing and Planned Assets

The capital assets addressed in this study include existing assets and planned capital improvements (i.e. the system buy-in and incremental assets). An important aspect of this study is how the value of existing utility assets is determined. For example, the purchase price does not account for wear and tear, and current book value (purchase price less accumulated depreciation) typically underestimates the “true value” of facilities as it does not account for cost increases over time. Therefore, this study uses the replacement cost (RC) approach summarized in **Figure 3** to estimate existing asset values, because it provides an up-to-date asset value that reflects estimated cost inflation.

**FIGURE 3. SUMMARY OF EXISTING ASSET VALUES**

Asset Category <sup>1</sup>	Original Values <sup>1</sup>	Replication Value <sup>2</sup>	System Buy-In
	Asset Cost	Asset Cost	Cost Basis <sup>3</sup>
<b>Water Fund</b>			
Infrastructure	\$ 582,157	\$ 1,416,064	\$ 1,416,064
Land	38,690	38,690	38,690
Large Machinery	595,257	914,242	914,242
Mains and Piping	1,845,242	4,762,862	4,762,862
Meters and Hydrants	257,851	318,347	318,347
Office Equipment	576,474	719,186	719,186
Pumps, Tanks & Wells	3,443,496	8,175,586	8,175,586
Treatment Plant	4,003,823	16,369,245	16,369,245
Vehicle	253,208	265,048	265,048
<b>Total Capital Facilities &amp; Equipment</b>	<b>\$ 11,596,198</b>	<b>\$ 32,979,269</b>	<b>\$ 32,979,269</b>

1. Source file for Bighorn Desert View Water Agency current assets as of August 2020: 2020.09.02-58227744-FA-Asset Listing.xlsx

Fully depreciated assets have been excluded from this analysis.

2. Takes into account estimated cost inflation, noted in Footnote 3.

3. System Buy-In Cost Basis values are calculated by escalating the book values (from Districts fixed asset report) from service date to current year values using historical cost inflation factors from the Handy-Whitman Index of Public Utility Construction Costs for Water Utility Construction in the Pacific Region. The percentage change in the asset cost is shown in column M of the Existing Assets Detail tab, labeled "Adjusted % of Original Value".

The replacement cost is calculated by escalating the book value of existing assets to current-day values using inflation factors from the Handy-Whitman Index of Public Utility Construction Costs for Water Utility Construction. Figure 3 summarizes the System Buy-In Cost Basis by Asset Category for the water utility. For this analysis, assets that have exceeded their useful life (as defined in the Agency’s asset records) were considered to have no remaining value.

Most of the replacement costs were allocated to current customers based on the 72.4 percent allocation factor previously shown in Figure 2 (and the 27.6 percent allocation factor for future customers). Meters are allocated 100 percent to current customers since they do not benefit future customers. **Figure 4** shows the allocation of about \$33 million system buy-in costs to current and future customers. Future customers are allocated approximately \$9 million of the existing water utility assets, or about 27.4%, due to meters being allocated to current customers only.

**FIGURE 4. EXISTING ASSET VALUES ALLOCATED TO CURRENT & FUTURE CUSTOMERS**

Asset Category <sup>1</sup>	System Buy-In Cost Basis	Allocation Basis (%) <sup>2</sup>		Distribution of Cost Basis (\$)	
		Existing Customers	Future Customers	Existing Customers	Future Customers
<b>Water Fund</b>					
Infrastructure	\$ 1,416,064	72.4%	27.6%	\$ 1,024,906	\$ 391,158
Land	38,690	72.4%	27.6%	28,002	10,687
Large Machinery	914,242	72.4%	27.6%	661,702	252,540
Mains and Piping	4,762,862	72.4%	27.6%	3,447,221	1,315,641
Meters and Hydrants	318,347	93.2%	6.8%	296,842	21,505
Office Equipment	719,186	72.4%	27.6%	520,526	198,660
Pumps, Tanks & Wells	8,175,586	72.4%	27.6%	5,917,251	2,258,335
Treatment Plant	16,369,245	72.4%	27.6%	11,847,583	4,521,662
Vehicle	265,048	72.4%	27.6%	191,834	73,214
<b>Total Capital Facilities &amp; Equipment</b>	<b>\$ 32,979,269</b>	<b>72.6%</b>	<b>27.4%</b>	<b>\$ 23,935,867</b>	<b>\$ 9,043,402</b>

1. Source file for Bighorn Desert View Water Agency current assets as of August 2020: 2020.09.02-58227744-FA-Asset Listing.xlsx

2. Based on proportionate allocation between existing and future users. See Table 2 in Exhibit 1 for demographic expectations.

The Agency’s capital improvement plans for the water utility extend to FY 2035/36. Some of the cost estimates for planned future improvements used to calculate the system development component of the capacity fees are allocated 100% to future customers, as these projects are needed specifically to serve future customers. There are a few other projects allocated using the same allocations found in Figure 2, as these projects benefit both current and future customers. **Figure 5** and **Figure 6** include a list of future capital improvement projects; where future customers are allocated about \$1.8 million of planned asset costs.

**FIGURE 5. PLANNED ASSETS ALLOCATED TO CURRENT & FUTURE CUSTOMERS**

Capital Project Description <sup>1</sup>	Future Cost Estimate (2020-2034) <sup>1</sup>	System Development Cost Basis <sup>3</sup>	% Allocation		Distribution of Cost Basis (\$)	
			Existing Customers	Future Customers	Existing Customers	Future Customers
<b>Refurbish and Replacement Projects</b>						
Well 4 Rehab	\$ 78,850	\$ 78,850	100.0%	0.0%	\$ 78,850	\$ -
Well 6 Rehab	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Well 7 Rehab	\$ 68,060	\$ 68,060	100.0%	0.0%	\$ 68,060	\$ -
Well 8 Rehab	\$ 130,310	\$ 130,310	100.0%	0.0%	\$ 130,310	\$ -
Well 9 Rehab	\$ 81,340	\$ 81,340	100.0%	0.0%	\$ 81,340	\$ -
Well 10 Rehab	\$ 69,720	\$ 69,720	100.0%	0.0%	\$ 69,720	\$ -
Well GMW1	\$ 24,900	\$ 24,900	100.0%	0.0%	\$ 24,900	\$ -
Well GMW2	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Well GMW3	\$ 29,299	\$ 29,299	100.0%	0.0%	\$ 29,299	\$ -
Well 13	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Pump Well 3	\$ 60,575	\$ 60,575	100.0%	0.0%	\$ 60,575	\$ -
Pump Well 4	\$ 200,000	\$ 200,000	100.0%	0.0%	\$ 200,000	\$ -
Pump Well 6	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Pump Well 7	\$ 65,120	\$ 65,120	100.0%	0.0%	\$ 65,120	\$ -
Pump Well 8	\$ 129,880	\$ 129,880	100.0%	0.0%	\$ 129,880	\$ -
Pump Well 9	\$ 99,840	\$ 99,840	100.0%	0.0%	\$ 99,840	\$ -
Pump Well 10	\$ 44,000	\$ 44,000	100.0%	0.0%	\$ 44,000	\$ -
Pump Well GMW1	\$ 82,880	\$ 82,880	100.0%	0.0%	\$ 82,880	\$ -
Pump Well GMW2	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Pump Well GMW3	\$ 82,880	\$ 82,880	100.0%	0.0%	\$ 82,880	\$ -
Pump Well 13	\$ 100,000	\$ 100,000	100.0%	0.0%	\$ 100,000	\$ -
New Replacement Well for BH or DV	\$ 500,000	\$ 500,000	0.0%	100.0%	\$ -	\$ 500,000
JV Booster Station Upgrade - VFD's/Pressure Vessels	\$ 15,000	\$ 15,000	100.0%	0.0%	\$ 15,000	\$ -
New Storage Tank	\$ 500,000	\$ 500,000	0.0%	100.0%	\$ -	\$ 500,000
Customer Meter w/ Box & Shutoff, Complete	\$ -	\$ -	100.0%	0.0%	\$ -	\$ -
Utility Billing Software Replacement	\$ 200,000	\$ 200,000	100.0%	0.0%	\$ 200,000	\$ -
Loop Kickapoo Trail	\$ 702,240	\$ 702,240	0.0%	100.0%	\$ -	\$ 702,240
Shop Building Upgrades - storage and work space	\$ 50,000	\$ 50,000	100.0%	0.0%	\$ 50,000	\$ -
Replace Generator - 90 KW mobile	\$ 50,000	\$ 50,000	100.0%	0.0%	\$ 50,000	\$ -
Dump truck	\$ 85,000	\$ 85,000	100.0%	0.0%	\$ 85,000	\$ -
Replace Tractor	\$ 175,000	\$ 175,000	100.0%	0.0%	\$ 175,000	\$ -
Replace Fleet Vehicles (avg life)	\$ 430,000	\$ 430,000	100.0%	0.0%	\$ 430,000	\$ -

**FIGURE 6. PLANNED ASSETS ALLOCATED TO CURRENT & FUTURE CUSTOMERS, CONTINUED**

Capital Project Description <sup>1</sup>	Future Cost Estimate (2020-2038) <sup>1</sup>	System Development Cost Basis <sup>3</sup>	% Allocation		Distribution of Cost Basis (\$)		
			Existing Customers	Future Customers	Existing Customers	Future Customers	
<b>Distribution System Projects</b>							
Distribution Valve, 6" avg, both water systems 50%	\$ -	\$ -	72.4%	27.6%	\$ -	\$ -	
Fire Hydrants, both water systems 50%	\$ -	\$ -	72.4%	27.6%	\$ -	\$ -	
Pipe w/sand bedding, 6" avg. ID Goat Mtn	\$ -	\$ -	72.4%	27.6%	\$ -	\$ -	
Pipe w/sand bedding, 6" avg. BDVWA	\$ -	\$ -	72.4%	27.6%	\$ -	\$ -	
<b>Operations Capital Projects</b>							
Water Storage Tank Recoating (B1, B2), May 26, 2020	\$ 81,000	\$ 81,000	72.4%	27.6%	\$ 58,625	\$ 22,375	
Water Storage Tank Recoating (B1, B2), Feb. 2020	\$ 80,000	\$ 80,000	72.4%	27.6%	\$ 57,902	\$ 22,098	
C-Booster Station Upgrades	\$ 35,000	\$ 35,000	72.4%	27.6%	\$ 25,332	\$ 9,668	
<b>Total</b>	<b>\$ 4,250,894</b>	<b>\$ 4,250,894</b>	<b>58.7%</b>	<b>41.3%</b>	<b>\$ 2,494,513</b>	<b>\$ 1,756,381</b>	

1. Estimated capital improvement project costs found in source files: *BDVWA Replacement Refurbishment CIP and Min Rate Gen 5 1 2017.xlsx*

Cindy and Marina confirmed updated costs in source file: *CIP Estimates through 2035-36 V2.xlsx*

Certain projects being built in order to allocate new growth are 100% allocated to future customers.

2. Operation Capital projects are per page 14 of the District's 2020/21 budget (file: *FY2020.21 Budget adopted 5 26 2020 20R-14.pdf*).

### C. Calculated Capacity Fees – Water Utility

The sum of the existing and future planned asset values (that is, the system buy-in and system development costs), defines the total cost basis allocated to future customers. **Figure 7** summarizes this calculation.

**FIGURE 7. SUMMARY OF COST BASIS ALLOCATED TO FUTURE CUSTOMERS**

System Asset Values Allocated to Future Development	Replacement Cost
<i>Costs Included in Existing System Buy-In:</i>	
Existing Assets	\$ 9,043,402
Planned, Future Capital Projects	1,756,381
<b>Total Cost Basis for New Development</b>	<b>\$ 10,799,783</b>

The total adjusted cost basis is then divided by the number of future customers, measured in 1-inch meter equivalents, expected to connect to the water utility (that is, the 763 meter equivalents) in order to determine the base capacity charge for a 1-inch water meter. This calculation is shown in **Figure 8**.

**FIGURE 8. SUMMARY OF NEW BASE CAPACITY FEES**

Summary of Capacity Fee Calculation	Adjusted System Cost Basis	Planned Additional Meter Equivalents (thru FY2037/38)	Base Capacity Fee
Proposed Fee -Replacement Cost	\$ 10,799,783	763	\$14,154

Based on the system buy-in capacity fee methodology, and the assumptions used in this analysis, NBS has calculated the new capacity fees for various water meter sizes, as shown in **Figure 9**. The updated fees represent the maximum that the Agency can charge for new connections.

**FIGURE 9. UPDATED WATER CAPACITY FEES**

Meter Size	Equivalency Factor		Capacity Fee Per Meter Size
	Maximum Continuous Flow (gpm) <sup>1</sup>	Equivalency to 1 inch meter	
3/4 inch	30	1.00	<b>\$14,154</b>
1 inch	50	1.00	<b>\$14,154</b>
1.5 inch	100	2.00	<b>\$28,309</b>
2 inch	160	3.20	<b>\$45,294</b>
3 inch	320	6.40	<b>\$90,588</b>
4 inch	500	10.00	<b>\$141,544</b>
6 inch	1,000	20.00	<b>\$283,087</b>
8 inch	2,800	56.00	<b>\$792,645</b>
10 inch	4,200	84.00	<b>\$1,188,967</b>

1. Source: AWWA M1, Table B-2. Assumes displacement meters for 3/4" through 2", Compound Class I for 3" through 6", and Turbine Class II for 8" through 10".

## D. Water Capacity Fee Findings Statements

The new water capacity fees calculated in this report are based on regulatory requirements and generally accepted industry standards, and are further detailed in *Appendix A*. This study concludes the following:

- The purpose of the Agency’s water capacity fee is to ensure that new and upsized connections reimburse and/or mitigate a reasonable portion of the Agency’s planned capital investment projects. These investments are necessary to accommodate the increased demand for water service.
- The Agency uses capacity fee proceeds to fund capital investments in the water system, which include the future design and construction of planned facilities.
- Capacity fees for new water customers vary depending on the size of the water meter serving the connection. Meter size is generally proportionate to the demands that a parcel places on the water utility system, specifically the peaking requirements related to the meter size.
- Without capital investment in existing facilities, the water system capacity available to serve the needs of future connections would be uncertain. Without planned investments in future facilities, water service would not be sustainable at the level of service received by current users. The total value of planned water system assets that are attributable to serving future connections is identified in *Appendix A*.
- Upon payment of a capacity fee, a new customer incurs the obligation to pay the same ongoing service rates as existing customers, regardless of the date of connection to the system or the actual start of service. These fees ensure that, over time, ongoing service rates are not disproportionately burdened by the accommodation of system growth.

## Section 3. Recommendations and Next Steps

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### A. Consultant Recommendations and Next Steps

NBS recommends the Agency take the following actions:

- **Accept this Study Report:** On January 12, 2021, the Board of Directors implemented the new capacity fees. This report is further documentation of the study and the basis for adopting the new capacity fees.
- **Implement New Water Capacity Fees:** Based on the analysis presented in this report, the Board should implement the new water capacity fee of \$14,154 per 1-inch water meter equivalent unit, as described in this study.
- **Periodically Review Capacity Fees:** Any time an Agency adopts capacity fees, they should be periodically reviewed to incorporate new capital improvement programs, significant repair and replacement projects, or new planning data (i.e. customer growth estimates). This will help ensure the fees generate sufficient revenue to cover the cost of capital projects, support the fiscal health of the Agency, and ensure future customers invest their fair share of infrastructure costs.
- **Annually Update Capacity Fees:** NBS recommends applying an inflation factor to the capacity fees on an annual basis. Annually, the Agency should review the Engineering News Record's Construction Cost Indices and calculate the percentage change in construction costs and apply that change to the capacity fees to ensure they keep pace with cost inflation.

### B. Principal Assumptions and Considerations

In preparing this study and the recommendations included herein, NBS has relied on a number of principal assumptions and considerations with regard to financial matters, number of customer accounts, asset records, planned capital improvements, and other conditions and events that may occur in the future. This information and assumptions 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 Study and its recommendations, some assumptions will invariably not materialize as stated herein or 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 A. Water Capacity Facility Fee Study Summary Tables

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**RESOLUTION NO. 21R-08**  
**RESOLUTION OF THE BOARD DIRECTORS OF THE**  
**BIGHORN-DESERT VIEW WATER AGENCY**  
**ADJUSTING THE BASIC SERVICE CHARGE AND WATER CONSUMPTION**  
**CHARGES BY SPECIFIC CUSTOMER CLASS**

**WHEREAS**, the Bighorn-Desert View Water Agency (“Agency”) is required by law to fix and establish rates, fees and charges which will enable the Agency to cover its debt service payments, operate and maintain its water system, provide for repairs and depreciation, and a reasonable surplus for improvements; and

**WHEREAS**, on July 26, 2016 the Board of Directors adopted Resolution No. 16R-09 Adjusting the Basic Service Charge and Water Consumption Charges across the existing customer classes, residential, bulk and fire service for a four-year period (4 years); and

**WHEREAS**, on the Board of Directors authorized a Professional Services Agreement with NBS Government Financial Group to conduct a focused rate and fee study for the Agency which included a long-range financial plan, development of monthly service charges and water consumption charges and calculation of a new capacity fee (e.g. Basic Facilities Charge or buy-in charge); and

**WHEREAS**, on October 22, 2020 the Finance/ Public Relations/ Education/ Personnel Standing Committee held Pubic Workshop No. 1 where NBS Government Finance Group presented the foundation of the rate and fee study and presented three (3) Rate Alternative tables “A – D” each weighted for base rate versus volume rates (e.g. consumption tiers) and also by unique customer classes including residential, commercial/institutional, agriculture, bulk and fire service and solicited public input; and

**WHEREAS**, on November 10, 2020 the full Board of Directors participated in Public Workshop No. 2 were a total of four (4) weighted Rate Alternatives for fixed and variable charges were presented and public input sought; and

**WHEREAS**, on November 19, 2020 the Finance/ Public Relations/ Education/ Personnel Standing Committee held Pubic Workshop No. 3 where NBS Government Finance Group reviewed the elements of the drat technical report on the Water Rate Study including the four (4) proposed Rate Alternative tables and solicited public input; and

**WHEREAS**, on January 12, 2021 the Board of Directors held Pubic Workshop No. 4 adopted Motion No. 21-006 to select Rate Alternative “D” (i.e. 60% fixed/40% variable weighting) Plan per the Rate and Fee Draft report prepared and presented by NBS Government Finance Group, and

**WHEREAS**, on February 9, 2021 after considering all director input and public comments, the Board of Directors adopted Motion No. 21-013 authorizing filing of Categorical Exemption for a Public Hearing on April 13, 2021 at 6:00 pm during which the

Board of Directors would consider adopting Water Rates, Fees and Charges (aka the Rate Alternative “D” with a 60% fixed/40% variable weighting and the final Water Rate Study Report February 2021 along with the Proposition 218 Public Hearing Notice to be distributed in accordance with Article XIII C and D of the California Constitution was received and filed; and

**WHEREAS**, the Board has determined that it is in the best interest of the Agency, its customers and the public generally, for the Agency to continue to fix the Basic Service Charge and Consumption Charges to more adequately cover its fixed costs of operating and maintaining its water system, providing for repairs and depreciation, and providing a reasonable surplus for capital improvements, including matching funds for federal and state grant funding; and

**WHEREAS**, on February 10, 2021 the Agency distributed the rate increase notice to a total of 2,599 property owners and their tenants with authorized water accounts in accordance with the procedures outlined in CA Proposition 218 at least 45-days prior to the Public Hearing on this matter conducted on April 13, 2021.

**NOW, THEREFORE, BE IT RESOLVED** with the June 2021 billing date the Basic Service Charge (i.e. Fixed Service Charge) and Consumption Charge (i.e. Commodity Charge) by specific customer class and by the current specific billing cycle (bi-monthly or monthly) and billing route and as otherwise classified and/or defined by current Agency Rules and Regulations for Water Service, shall be increased by no more than specified in the Rate Alternatives indicated over a 5-year period as follows:

CURRENT & PROPOSED RATES FOR BI-MONTHLY FIXED SERVICE CHARGE (\$/METER SIZE)						
Meter Size	Current Rates	Proposed Rates and Effective Dates				
		4/14/2021	1/1/2022	1/1/2023	1/1/2024	1/1/2025
3/4 inch	\$66.84	\$61.78	\$64.25	\$66.82	\$69.49	\$72.27
1 inch	\$66.84	\$61.78	\$64.25	\$66.82	\$69.49	\$72.27
1.5 inch	\$66.84	\$111.36	\$115.81	\$120.44	\$125.26	\$130.27
2 inch	\$66.84	\$170.86	\$177.69	\$184.80	\$192.19	\$199.88
3 inch	\$66.84	\$329.53	\$342.71	\$356.42	\$370.68	\$385.51
4 inch	N/A	\$508.03	\$528.35	\$549.48	\$571.46	\$594.32
6 inch	N/A	\$1,003.87	\$1,044.02	\$1,085.78	\$1,129.21	\$1,174.38

CURRENT AND PROPOSED RATES FOR BI-MONTHLY FIXED FIRE SERVICE CHARGE (\$/METER SIZE)						
Meter Size	Current Rates	Proposed Rates and Effective Dates				
		4/14/2021	1/1/2022	1/1/2023	1/1/2024	1/1/2025
3/4 inch	\$16.00	\$30.62	\$31.84	\$33.11	\$34.43	\$35.81
1 inch	\$16.00	\$30.62	\$31.84	\$33.11	\$34.43	\$35.81
2 inch	\$16.00	\$71.14	\$73.99	\$76.95	\$80.03	\$83.23
3 inch	\$34.43	\$141.14	\$146.79	\$152.66	\$158.77	\$165.12
4 inch	\$57.38	\$270.09	\$280.89	\$292.13	\$303.82	\$315.97
6 inch	\$114.75	\$601.66	\$625.73	\$650.76	\$676.79	\$703.86
8 inch	\$183.60	\$1,043.76	\$1,085.51	\$1,128.93	\$1,174.09	\$1,221.05

CURRENT AND PROPOSED RATES FOR BI-MONTHLY COMMODITY CHARGE (\$/HCF)							
Customer Class	Current Rates	Proposed Rates and Effective Dates					
		4/14/2021	1/1/2022	1/1/2023	1/1/2024	1/1/2025	
<b>Residential</b>							
Proposed Tier Break							
Tier 1	0-25 hcf	\$3.38	\$3.03	\$3.15	\$3.28	\$3.41	\$3.55
Tier 2	26+ hcf	\$3.38	\$4.61	\$4.80	\$4.99	\$5.19	\$5.40
<b>Agriculture</b>							
Tier 1	0-25 hcf	\$3.38	\$3.23	\$3.36	\$3.49	\$3.63	\$3.78
Tier 2	26+ hcf	\$3.38	\$4.82	\$5.01	\$5.21	\$5.42	\$5.64
<b>Bulk Water</b>		\$9.57	\$7.83	\$8.14	\$8.47	\$8.81	\$9.16
<b>Commercial, Institutional, Fire &amp; Other</b>		\$3.38	\$3.58	\$3.72	\$3.87	\$4.02	\$4.18

**BE IT FURTHER RESOLVED** Resolution 16R-09 is hereby rescinded and the **Basic Service Charge** on all Agency residential customers ¾-inch, 1-inch meters, 2-inch bulk meters and all temporary construction meters as well as the **Consumption Rates** for residential customers and all Agency 1-inch and 2-inch bulk hauling meters and temporary construction meters shall remain in effect until further action of the Agency's Board, provided, however, that the Board shall review said Basic Service Charge and Consumption Rates during the budget process each fiscal year and the amount of the Basic Service Charge and Consumption Rates shall be adjusted by no more than the amounts set forth in this Resolution; and

**BE IT FURTHER RESOLVED** that the General Manager and staff are hereby authorized and directed to take all actions reasonably necessary to carry out the purpose and intent of this Resolution and to implement these rates, fees and charges in accordance with the time period specified herein.

**PASSED, APPROVED, AND ADOPTED** by the Board of Directors to Bighorn-Desert View Water Agency this 13th day of April 2021.

By John Burkhart  
John Burkhart, President of the Board

ATTEST,

By JoMarie McKenzie

JoMarie McKenzie, Board Secretary

Official Seal

