



**Arvin Community Services District
Water Rate Study
Final Report
January 2017**

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SECTION 1. PURPOSE AND OVERVIEW OF THE STUDY

A. INTRODUCTION

The Arvin Community Service District (“District”) provides water service within the City of Arvin and the surrounding area. The District contains residential, commercial, and industrial development. The District’s service area has a population of approximately 21,563¹ persons, and as of April, 2016 provided water service to approximately 3,900 potable water service connections.

The District owns, operates, and maintains approximately 59 miles of potable water distribution mains. The District’s water supply is solely provided by local groundwater, recovered via wells managed by the District. The District serves a customer water demand of about 1.7 million gallons per day (MGD), on average.

Updated water quality standards and naturally occurring arsenic require the District to drill at least 5 new wells - a significant capital expense. Two of these wells have already been completed, which has lowered arsenic levels significantly in the District’s water supply. Completing these projects will enable the District to provide safe and reliable water services to its customers. The District relies almost exclusively on rate revenue to fund the operation, maintenance, rehabilitation and improvement of water facilities; no property or sales taxes are used to support the District.

The groundwater basin underlying the District’s service area is the Kern County Subbasin of the San Joaquin Valley Basin (Department of Water Resources (DWR) Bulletin 118-80 “Ground Water Basins in California” Basin No. 11). Identified as a “critical condition of overdraft” by DWR, water supply provided by this basin shall be more closely monitored. Given this additional risk, it is extremely important that the District be in strong financial shape.

B. PURPOSE

The District retained NBS to conduct a comprehensive water rate study for a number of reasons, primarily to ensure sufficient revenue to provide required arsenic mitigation. Other objectives the District had in developing new rates were: providing greater revenue stability in water rates, providing adequate funding for capital improvements, and complying with certain legal requirements (such as California Constitution article XIII D, section 6, which is commonly referred to as Proposition 218 [Prop 218]). The rates resulting from this study were developed in a manner that is consistent with industry standard cost of service principles. In addition to documenting the rate study methodology, this report is provided with the intent of assisting the District to maintain transparent communications with its residents and businesses.

In developing new water rates, NBS worked cooperatively with District staff and the Board of Directors (“Board”) to evaluate various rate alternatives. Based on input from District staff and the Board, NBS proposes the water rates described in this report.

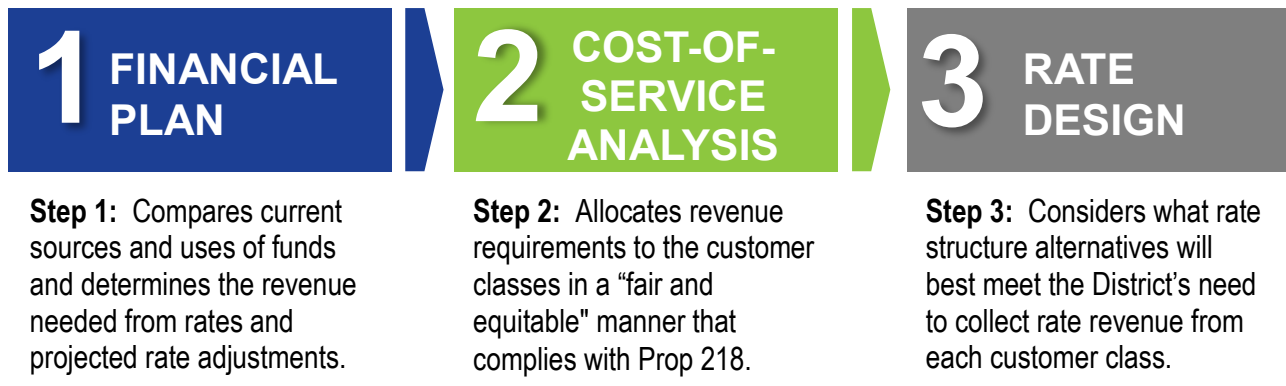
C. OVERVIEW OF THE STUDY

Comprehensive rate studies such as this one typically include three components: (1) preparation of a financial plan which identifies the net revenue requirements for the District; (2) analysis of the cost to serve each customer class, and; (3) the rate structure design. These steps are shown in **Figure 1** and 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 Charges², also referred to as the Manual M1. 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 order they were performed in this Study.

¹ Population number from 2015 Urban Water Management Plan

² Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, sixth edition, 2012.

Figure 1. Primary Components of a Rate Study



As a part of this rate study, NBS projected revenues and expenditures, developed net revenue requirements, performed cost-of-service rate analyses, and prepared new water rates. Rate increases -- or more accurately, increases in the total revenue collected from water rates -- are recommended for the District. The following sections in this report present an overview of the methodologies, assumptions, and data used along with the financial plans and rates developed during this study. Figure 12 provides the rate schedule necessary for Prop 218 notices, and more detailed tables and figures documenting the development of the proposed rates are provided in the Technical Appendix.

Rate Design Criteria – It is important for the District to send proper price signals to its customers about the actual cost of their water usage. This objective is typically addressed through both the magnitude of the rates and the rate structure design. In other words, both the amount of revenue collected and the way in which the revenue is collected from customers are important.

Several criteria are typically considered in setting rates and developing sound rate structures. The fundamentals of this process have been documented in a number of 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*³ 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 rate structure:

- Rates should be easy to understand from the customer's perspective.
- Rates should be easy to administer from the District'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 rate making philosophy over time.
- Rates should address other District policies (for example, encouraging conservation & economic development).
- Rates should provide month-to-month and year-to-year revenue stability.

This section covers basic rate design criteria that NBS and District staff considered as a part of their review of the rate structure alternatives.

Rate Structure Issues – One of the key issues in considering rate structures is the relationship between fixed costs and variable costs. Fixed costs typically do not vary with the amount of water consumed. Debt service payments and personnel costs are examples of fixed costs. In contrast, variable costs such as the

³ 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.

cost of purchased water, chemicals, and electricity tend to change with the quantity of water sold. The vast majority of rate structures contain a fixed or minimum charge in combination with a volumetric charge.

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. For example, a customer with a 2-inch meter has a fixed meter charge that is more than five times greater than the typical residential customer charge (which in the District’s case is a 3/4-inch meter which represents 89% of all meters) based on the meter’s safe operating capacity.⁴ Because a large portion of the District’s costs are typically related to meeting capacity requirements, reflecting individual demands for capacity is an important factor in establishing rates for customers.

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 District’s administration/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 more as more water is consumed; it is generally considered to be a more conservation-oriented rate structure. Tiered water rates are encouraged by state law and regulatory mandates, but are also 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 *higher* tiers 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 an agency’s allocated water rights, additional costs could be incurred for replacement water in order to meet that increased demand. Replacement water typically comes at a higher cost.
- Energy costs: during summer months, the District may pay more in electric charges to pump, treat and deliver water, and have a higher percentage of its energy bill in higher electricity “tiers”.
- Higher maintenance costs: peak periods tend to have higher numbers of service calls, capacity costs, and system maintenance issues when the water system is running at peak demand.

Drought and Water Conservation – On January 17, 2014, Governor Jerry Brown declared a State of Emergency throughout California due to severe drought conditions. On April 1, 2015, the Governor issued Executive Order B-29-15 mandating statewide water conservation of 25 percent. The specific conservation mandate for each community in California varied from 4 to 36 percent. The District was originally mandated to conserve 28 percent. Beginning in June 2016, communities like the District that could “self-certify” that they had sufficient supply to meet customer demand for three years under the current drought conditions, were no longer mandated by the state to achieve a specific conservation target. Although no longer under a mandate, the District continues to ask customers to voluntarily conserve water. While the level of conservation the District is achieving is good from a supply standpoint, it places financial pressure on the District. Rates proposed in this Study are projected to allow the District to continue meeting its financial obligations in the coming years, assuming approximately 25% conservation going forward, compared to 2013 levels.

⁴ *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, sixth edition, 2012, p. 274.*

Key Financial Assumptions – To ensure that future costs are reasonably projected, we made informed assumptions about inflationary factors, growth, and water use. The following are the key financial assumptions used in the water rate analyses:

- **Funding of Capital Projects**
 - **Arsenic Mitigation** - The most significant capital costs are related to Arsenic Mitigation which the District plans on funding with a State Revolving Fund (SRF) loan from the State Water Resources Control Board. Said loan is also expected to fund the Emergency Generator back up project and the Northside Pressure Zone.
 - **Replacement of CW 1 Well** - The District expects that the Environmental Protection Agency will provide at least partial funding of this replacement.
 - **1, 2, 3 TCP Project** – The District expects that Dow Chemical and Shell Oil Company will fund the costs of this project.
 - **Funding of Remaining District Capital Projects** – The District will fund all other planned capital costs using incoming rate revenues and existing reserves. The capital projects listed in the financial plan are from the District's projection of costs through FY 2020/21.
- **Reserve Targets** – The District maintains unrestricted reserves for operations and capital needs. These reserves consist of the following targets:
 - **Operating Reserve** – equal to approximately 90 days of operating expenses, or \$528,576 for FY 2016/17.
 - **Capital Improvement Reserve** – equal to 3% of Net Capital Assets, or \$168,500 for FY 2016/17 and growing to \$732,300 FY 2020/21, the end of rate period, due to the District's planned investments.
- **Drought Impact and Future Water Consumption** – May 2015 through April 2016 consumption is assumed to be the “new normal,” with approximately 1,950 AF of potable water. Excluding the impact of new customers, no additional consumption is assumed over the five-year rate period.
- **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:
 - Customer growth is based on the number of new connections anticipated by District staff of 1.5 percent annually.
 - General cost inflation is 2 percent annually.
 - Energy cost inflation is 6 percent annually.

The assumptions shown above were incorporated into the five-year financial plan. To develop the financial plan, NBS projected annual expenses and revenues, modeled reserve balances and transfers between funds, capital expenditures, and calculated debt service coverage ratios to estimate the amount of additional rate revenue needed per year.⁵ Except for FY 2016/17, the financial plan modelling assumes the revenue adjustment occurs on January 1 of each year. This means that only half of the planned revenue to be collected from the rate adjustment listed for any given fiscal year will be collected in that year.

For example, there is a 15.5 percent increase in rate revenue planned for FY 2017/18; meaning, the rates are developed to recover \$2.52 million, which is a 15.5 percent increase over the expected \$2.18 million that would be collected without a rate increase. However, because of the timing for when the rates will go into effect, the Financial Plan results in only \$2.35 million in calculated rate revenue for FY 2017/18.

⁵ The complete financial plan is set forth in Appendix B.

SECTION 2. WATER RATE STUDY

A. KEY WATER RATE STUDY ISSUES

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

- Generating sufficient revenue to fund arsenic mitigation.
- Generating additional revenue needed to meet projected funding requirements.
- Improving revenue stability.
- Updating fixed meter charges to reflect AWWA hydraulic capacity factors, and using the hydraulic capacity of a 3/4-inch meter as the base for calculating meter equivalency.

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

- **Developing Classifications of Costs:** Costs were classified using the commodity-demand method which is found in the AWWA M1 Manual⁶. In accordance with this method, budgeted costs were reviewed with regard to their functional purposes (such as administrative, source of supply, pumping, transmission and distribution, etc.) and then "classified" into four categories: (1) commodity (or volume-based) costs; (2) demand (or capacity) costs; (3) customer service costs; and (4) fire protection costs.
- **Rate Design and Fixed vs. Variable Charges:** The revenue requirements for each customer class are collected from both fixed monthly meter charges and variable commodity charges. Based on direction from the District Board, the rates proposed in this report are designed to collect 55 percent of rate revenue from the fixed meter charge and 45 percent from the variable commodity charge⁷.

B. REVENUE REQUIREMENTS

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 sound financial management practices. Rate increases are governed by the need to meet operating and capital costs, maintain adequate debt coverage, and build reasonable reserve funds. The current state of the District, with regard to these objectives, is as follows:

- **Meeting Net Revenue Requirements:** For FY 2016/17 through FY 2020/21, the projected net revenue requirement (that is, total annual expenses plus debt service and rate-funded capital costs, less non-rate revenues) range from approximately \$2 million to \$3.9 million. If no rate adjustments are implemented, the District is projected to run a \$1.9 million annual deficit by FY 2021/22. Rate increases of 16 percent in FY 2016/17 followed by additional annual increases of 15.5 percent through 2021/22 will be needed in order to fully fund all operating expenses, planned capital projects, debt service obligations and approach the established reserve fund targets by FY 2021/22.
- **Building and Maintaining Reserve Funds:** Reserve policies provide a basis for a utility to cope with fiscal emergencies such as revenue shortfalls, asset failure, and natural disasters, among other events. They also provide guidelines for sound financial management, with an overall long-range perspective to maintain financial solvency and mitigate financial risks associated with revenue instability, capital costs, and emergencies. The District plans to achieve a \$1.2 million reserve, which is slightly short of

⁶ *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, sixth edition, 2012, p. 66.*

⁷ *The California Urban Water Conservation Council recommends recovering at least 70 percent of rate revenue through volume-based rates. However, water utilities are allowed to develop their own allocations that accurately reflect their actual cost allocations.*

the recommended \$1.35 million target by the end of FY 2021/22. The reserve funds for the District are considered unrestricted reserves and consist of the following:

- **The Operating Reserve** should equal approximately 90 days of operating expenses (approximately \$530,000 for FY 2016/17). An Operating Reserve is intended to promote financial viability in the event of any short-term fluctuation in revenues and/or expenditures, such as those caused by weather patterns, the natural inflow and outflow of cash during billing cycles, natural variability in demand-based revenue streams (such as volumetric charges), and – particularly in periods of economic distress – changes or trends in age of receivables.
- **The Capital Rehabilitation and Replacement Reserve** should equal 3 percent of net capital assets (approximately \$170,000 for FY 2016/17), which is set aside to address long-term capital system replacement and rehabilitation needs. Due to the planned capital contributions (many of which are due to arsenic mitigation, and all of which are required to maintain a safe system), this reserve target is expected to grow to \$736,000 by the end of FY 2021/22.
- **Funding Capital Improvement Projects:** The District must also be able to fund necessary capital improvements for the District in order to maintain current service levels, and ensure a safe and reliable water supply. District staff has identified roughly \$23 million in expected capital expenditures for FY 2016/17 through FY 2021/22. It is projected that with the recommended rate increases and expected SRF financing, these projects can be accomplished.
- **Maintaining Adequate Bond Coverage:** It is expected that the District will be required by its covenants to maintain a debt service coverage ratio of at least 1.25 for the SRF loan. In order for the District to meet reserve fund targets, proposed rate increases are projected to allow the District to exceed the minimum debt coverage ratio beginning in FY 2017/18. The benefit of exceeding the minimum debt coverage ratio is that it strengthens District's credit rating, which can help lower the interest rates for debt-funded capital projects in the future, and in turn reduce annual debt service payments.

Figure 2 summarizes the sources and uses of funds, net revenue requirements, and the recommended annual percent increases in total rate revenue recommended for the next 5 years. It should be noted that based upon the current projections, increases beyond the 5-year rate period should be minimal, at general cost inflation levels.

Figure 2. Summary of Revenue Requirements

Summary of Sources and Uses of Funds and Net Revenue Requirements	Budget			Projected		
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Sources of Water Funds						
Rate Revenue Under Prevailing Rates	\$ 1,856,078	\$ 1,883,919	\$ 1,912,178	\$ 1,940,861	\$ 1,969,974	\$ 1,999,523
Additional Revenue from Rate Increases (1)	123,739	470,791	848,308	1,295,326	1,823,889	2,148,856
Non-Rate Revenues	134,050	136,731	139,466	142,255	145,100	148,002
Interest Earnings	2,000	4,107	6,059	7,668	8,494	16,613
Total Sources of Funds	\$ 2,115,867	\$ 2,495,549	\$ 2,906,011	\$ 3,386,110	\$ 3,947,457	\$ 4,312,994
Uses of Water Funds						
Operating Expenses	\$ 2,114,305	\$ 2,177,550	\$ 2,242,950	\$ 2,310,950	\$ 2,381,950	\$ 2,435,900
Debt Service	43,599	191,337	252,008	674,602	749,285	813,802
Rate-Funded Capital Expenses	-	-	593,073	591,138	659,520	858,993
Total Use of Funds	\$ 2,157,904	\$ 2,368,887	\$ 3,088,031	\$ 3,576,690	\$ 3,790,755	\$ 4,108,695
Surplus (Deficiency) after Rate Increase	\$ 81,701	\$ 597,453	\$ 666,288	\$ 1,104,746	\$ 1,980,590	\$ 2,353,154
Surplus (Deficiency) before Rate Increase	\$ (42,038)	\$ 126,662	\$ (182,020)	\$ (190,580)	\$ 156,701	\$ 204,298
Projected Annual Rate Increase	16.00%	15.50%	15.50%	15.50%	15.50%	1.00%
Cumulative Rate Increases	16.00%	33.98%	54.75%	78.73%	106.44%	108.50%
Net Revenue Requirement (2)	\$ 2,021,854	\$ 2,228,049	\$ 2,942,506	\$ 3,426,767	\$ 3,637,161	\$ 3,944,080

1. Revenue from rate increases assumes an implementation date of February 2017 for new rates, and January for each year thereafter.

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

Figure 3 summarizes the projected reserve fund balances and reserve targets. A summary of the District's proposed 5-year financial plan is included in Tables 1 and 2 of the Technical Appendix. The appendix tables include revenue requirements, reserve funds, revenue sources, proposed rate increases, and the District's capital improvement program. As can be seen in Figure 3, given proposed rate increases, reserves do not

quite meet the minimum target by the end of the five-year rate period; however, it is expected that the District will be well poised to achieve the reserve targets the following year.

Figure 3. Summary of Water Reserve Funds

Beginning Reserve Fund Balances and Recommended Reserve Targets	Budget			Projected		
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Operating Reserve						
Ending Balance	\$ 528,576	\$ 544,388	\$ 362,367	\$ 189,356	\$ 346,059	\$ 550,359
<i>Recommended Minimum Target</i>	<i>528,576</i>	<i>544,388</i>	<i>560,738</i>	<i>577,738</i>	<i>595,488</i>	<i>608,975</i>
Capital Rehabilitation & Replacement Reserve						
Ending Balance	\$ 1,096,539	\$ 649,670	\$ 642,300	\$ 642,300	\$ 642,300	\$ 642,300
<i>Recommended Minimum Target</i>	<i>168,500</i>	<i>505,600</i>	<i>642,300</i>	<i>690,400</i>	<i>732,300</i>	<i>736,200</i>
Debt Reserve						
Ending Balance	\$ 17,739	\$ 17,739	\$ 17,739	\$ 672,913	\$ 747,595	\$ 812,110
<i>Recommended Minimum Target</i>	<i>17,739</i>	<i>189,650</i>	<i>250,320</i>	<i>672,913</i>	<i>747,595</i>	<i>812,110</i>
Total Ending Balance	\$ 1,642,854	\$ 1,211,797	\$ 1,022,407	\$ 1,504,570	\$ 1,735,954	\$ 2,004,769
<i>Total Recommended Minimum Target</i>	<i>\$ 714,816</i>	<i>\$ 1,239,638</i>	<i>\$ 1,453,358</i>	<i>\$ 1,941,051</i>	<i>\$ 2,075,383</i>	<i>\$ 2,157,285</i>

C. COST OF SERVICE ANALYSIS

Once the revenue requirements are determined, as described in Section 2-B of this report, the cost of service analysis proportionately distributes those revenue requirements to components of the rate structure by allocating costs through the functionalization and classification process. Costs are classified corresponding to the function they serve. All costs in the District’s budget are allocated to each component of the rates 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. Ultimately, a cost-of-service analysis is intended to result in rates that are proportional to the cost of providing service to each customer.

This process is described as follows:

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 Manual⁸. In accordance with this method, budgeted potable system costs were reviewed with regard to their functional purposes (such as purchased water, treatment, pumping, etc.) and then “classified” into four categories that are specific to the District’s specific costs and system characteristics: (1) commodity (or volume-based) costs; (2) demand (or capacity) costs; (3) customer service costs; and (4) fire protection costs. The classification of costs provides the basis for allocating costs to fixed and variable charges based on the cost causation components described below:

- **Commodity** related costs are those costs associated with the total consumption of water over a specified period of time (such as annual).
- **Capacity** related costs are those costs associated with sizing facilities to meet the maximum, or peak demand. Since the District’s rate structure is based on meter sizes (vs. single-family, commercial, etc.), both operating costs and capital infrastructure costs incurred to accommodate peak system capacity events are allocated to each meter size according to its potential peak demand placed on the system. This potential demand is reflected in the hydraulic capacity factors for each meter size, which are shown later in this report, in Figure 5 and Figure 6.
- **Customer** related costs are costs associated with having a customer on the water system, such as meter reading, postage and billing.

⁸ *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, sixth edition, 2012, p. 66.*

- **Fire Protection** costs are those costs 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.

Once costs in the District's budget were reviewed, they were allocated to these cost causation (classification) components which are used as the basis for establishing new water rates and translate to fixed and variable charges. Tables 14 through 17 in the Technical Appendix show how the District's expenses were classified and allocated to these cost causation components.

Fixed costs generally consist of costs that a utility incurs to serve customers irrespective of the amount of water they use. These include: (1) the infrastructure (capacity-related facilities) required to provide service to customers; (2) costs associated with the peaking requirements, or maximum demand which affects the maximum size of the water supply system, treatment and delivery system, operations and maintenance costs; and (3) administrative and billing costs associated with meter reading, postage and billing.

Variable 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.

Ideally, utilities should recover all of their fixed costs from fixed charges and all of their variable costs from volumetric charges. When this is the case, fluctuations in water sales revenues would be directly offset by reductions or increases in variable expenses. When rates are set in this manner, they provide greater revenue stability for the District. However, other factors are often considered when designing water rates such as community values, water conservation goals, ease of understanding, and ease of administration.⁹

NBS classified the District's costs into categories that can be more generally grouped into the fixed and variable costs. For FY 2016/17, based on budgeted costs and demand patterns, this analysis resulted in a cost distribution that is approximately 60 percent fixed and 40 percent variable. However, FY 2019/20, is the most appropriate base year to use as it includes the expected first principal payment of the SRF loan that will fund Arsenic mitigation costs. As loan payments are fixed, this increases the cost allocation to approximately 75 percent fixed and 25 percent variable¹⁰.

The District's current rate structure is comprised of a fixed meter charge (which varies by meter size) and a variable commodity charge. The rate for the commodity charge is a uniform rate per unit of metered water consumption. Under the current rate structure, the District collected 34 percent of revenue through its fixed meter charges and 66 percent through its variable commodity charges from May 2015 through April 2016. To improve revenue stability, the District Board has decided to transition to a rate structure that collects 55 percent of revenue from fixed meter charges and 45 percent of revenue from the variable commodity charges. This will more closely match the cost of service analysis than current rates, while still providing savings to those customers who conserve.

⁹ *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, American Water Works Association, Sixth Edition, see pp. 5 and 96.*

¹⁰ *This analysis is presented in Appendix B, Tables 14-16.*

Figure 4 summarizes the percentage and dollar amount of costs allocated to each cost component.

Figure 4. Allocated Percentage Revenue Requirements

Cost Categories	FY 2016/17 Net Revenue Requirements	
	\$-Amount	% of Total
Commodity-Related Costs	\$ 968,873	45.0%
Capacity-Related Costs	1,117,388	51.9%
Customer-Related Costs	46,658	2.2%
Fire Protection (Private Fire)	20,132	0.9%
Net Revenue Requirement	\$2,153,050	100%

D. PROPOSED WATER RATE STRUCTURE

The process of evaluating the water rate structure provides the opportunity to incorporate a number of rate-design objectives and policies, including revenue stability, equity among customers, and water conservation.

NBS discussed several water rate alternatives and methodologies with District staff over the course of this study, such as the percentage of revenue collected from fixed vs. variable charges, differentiating rates by customer class and different methods of implementing tiered rates. Based on direction from District staff, the proposed rate alternative was developed. The following sections describe this process.

Fixed Charges

The fixed meter charge recognizes that the District incurs fixed costs regardless of whether customers actually use water. There are two components which comprise the fixed meter charge: the customer component and the capacity component. The customer component is comprised of those costs relating to reading and maintaining meters, customer billing and collection, and other customer service related costs. Customer service costs do not differ among the various meter sizes, therefore, the rate for this component of the fixed meter charge is the same for each meter size.

The capacity component recovers costs associated with constructing and operating the water system to ensure there is sufficient capacity in the system to meet the demand of each meter connected. Meter sizes have different fixed charges based on their capacity requirements: larger meters have the potential to use more of the system's capacity,¹¹ compared to smaller meters. The potential capacity demanded is proportional to the maximum hydraulic flow through each meter size as established by the AWWA hydraulic capacity ratios¹². The AWWA capacity ratios used for this report are shown in the second column of Figure 5 and Figure 6.

As an example, a 2-inch meter has a greater capacity, or potential peak demand than a 3/4-inch meter; therefore, the fixed charge for a 2-inch meter is larger than a 3/4-inch meter based on their proportionate

¹¹ System capacity is the system's ability to supply water to all delivery points at the time when demanded. Both operating costs and capital related costs incurred to meet the demand of each meter connected to the water system. Costs associated with system capacity are allocated to customers based upon the hydraulic capacity of each size meter connected to the system.

¹² See: American Water Works Association, *Principles of Water Rates, Fees and Charges: Manual of Water Supply Practices M1*, p. 326, (6th ed. 2012) and American Water Works Association, *Water Meters – Selection, Installation, Testing and Maintenance M6*, p. 65 (5th ed. 2012).

capacity requirements¹³. A “hydraulic capacity factor” 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 3/4-inch meter).

The ratios shown in Figure 5 and Figure 6 are the ratio of potential flow through each meter size compared to the flow through a 3/4-inch meter¹⁴. The 3/4-inch meter is the most common meter size for the District and is used to compare the capacities of the larger meters. For example, column 2 in Figure 5 shows the hydraulic capacity of a two-inch meter is 5.33 times that of a 3/4-inch meter and therefore the capacity component of the fixed meter charge is 5.33 times that of the 3/4 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 proxy for the 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 District’s fixed operating and capital costs, are related to meeting system capacity requirements.

This calculation is summarized for standard use meters in **Figure 5** and for the fire protection meters in **Figure 6**.

Figure 5. Equivalent Meter Calculation - Standard Meters

Meter Size	Hydraulic Capacity	Number of Meters	Total Equivalent
	a	b	c = (a * b)
3/4 inch	1.00	3,422	3,422
1 inch	1.67	238	397
1.5 inch	3.33	20	67
2 inch	5.33	139	741
3 inch	10.67	7	75
4 inch	16.67	10	167
6 inch	33.33	2	67
Total		3,838	4,935

Figure 6. Equivalent Meter Calculation - Fire Protection Meters

Meter Size	Hydraulic Capacity	Number of Meters	Total Equivalent
	a	b	c = (a * b)
3 inch	11.67	0	0
4 inch	23.33	18	420
6 inch	53.33	7	373
8 inch	93.33	2	187
Total		27	980

The two types of meters (standard and fire protection) are kept distinct in this analysis as the District’s existing rates have different fixed meter charges for commercial fire meters than for standard water service customers, and new rates will maintain this same structure. Fire service customers differ from other water service customers because their service is more standby in nature, where a readiness-to-serve charge is

¹³ This is reflected in the fixed charge calculations by using the AWWA hydraulic capacity factors to represent the maximum volume each meter size is capable of delivering.

¹⁴ Table 21 in the Technical Appendix shows potential flow or meter capacity for each meter size, from which the hydraulic capacity factor was derived.

appropriate. Except in the event of a fire, these users are not intended to use water on a regular basis. However, the District still needs to provide sufficient capacity for fire meters and recover other related operations and maintenance costs. Based on the cost of service analysis and the standby nature of fire meters, the overall cost to serve these users is proportionately less than that of a standard service; therefore, the fixed meter charges are less.

For FY 2016/17, **Figure 7** shows how the fixed monthly meter charges were calculated for standard water meters and **Figure 8** shows the same for private fire meters. The customer component of the rate is \$2.31 per meter, and does not vary by meter size because it represents costs to the District for having connections to the water system. Capacity and Fire Protection costs vary by meter size and are based on the hydraulic capacity of each meter size.

Figure 7. Calculation of FY 2016/17 Standard Fixed Meter Charge

Category	Revenue Requirement	Allocation Methodology	Allocation	Charge
	a		b	c = (a / b) / 12
Capacity Related Costs	\$ 1,117,388	Equivalent Meters	4,935	\$18.87
Customer Related Costs	\$ 46,332	Meters	3,838	\$1.01

Figure 8. Calculation of FY 2016/17 Private Fire Protection Meter Fixed Charge

Category	Revenue Requirement	Allocation Methodology	Allocation	Charge
	a		b	c = (a / b) / 12
Fire Protection & Capacity Related Costs	\$ 20,132	Equivalent Meters	980	\$1.71
Customer Related Costs	\$ 326	Meters	27	\$1.01

The Capacity and Fire Protection charges developed in Figure 7 and Figure 8 are the monthly charge for the base meter size (3/4 inch), which is multiplied by the Hydraulic Capacity Factor for larger meters shown in Figure 5 and Figure 6. These calculations are shown in **Figure 9** for Standard Meters and **Figure 10** for Fire Protection meters.

Figure 9. FY 2016/17 Standard Fixed Meter Charges

Meter Size	Number of Meters	Hydraulic Capacity	Customer Component	Capacity Charge	Capacity Component	Total Fixed Meter Charge	Estimated Revenue
	a	b	c	d	e = b * d	f = c + e ¹	a * f * 12
3/4 inch	3,422	1.00	\$1.01	\$18.87	\$18.87	\$19.88	\$ 816,175
1 inch	238	1.67	\$1.01	\$18.87	\$31.45	\$32.46	92,693
1.5 inch	20	3.33	\$1.01	\$18.87	\$62.90	\$63.90	15,337
2 inch	139	5.33	\$1.01	\$18.87	\$100.64	\$101.64	169,543
3 inch	7	10.67	\$1.01	\$18.87	\$201.28	\$202.28	16,992
4 inch	10	16.67	\$1.01	\$18.87	\$314.50	\$315.50	37,860
6 inch	2	33.33	\$1.01	\$18.87	\$628.99	\$630.00	15,120
Total							\$1,163,720

1. Total Fixed Meter Charge rounded to nearest penny.

Figure 10. FY 2016/17 Private Fire Protection Meter Fixed Charges

Meter Size	Number of Meters	Hydraulic Capacity	Customer Component	Capacity Charge	Capacity Component	Total Fixed Meter Charge	Estimated Revenue
	a	b	c	d	e = b * d	f = c + e ¹	a * f * 12
3 inch	0	11.67	\$1.01	\$1.71	\$19.97	\$20.98	\$ -
4 inch	18	23.33	\$1.01	\$1.71	\$39.94	\$40.95	8,845
6 inch	7	53.33	\$1.01	\$1.71	\$91.30	\$92.31	7,754
8 inch	2	93.33	\$1.01	\$1.71	\$159.78	\$160.78	3,859
Total							\$ 20,458

1. Total Fixed Meter Charge rounded to nearest penny.

Volumetric Commodity Charge Rates

Currently, the District uses a uniform volumetric rate for all other customers. The proposed volumetric rates maintain this structure. Using expected consumption along with the costs allocated to the volumetric rates, the charge per unit of water sold were calculated as show in **Figure 11**.

Figure 11. Volumetric Commodity Rates FY 2016/17

Revenue Requirement	Consumption	Charge
a	b	c = (a / b)
\$ 968,873	846,329	\$1.14

E. CURRENT AND PROPOSED WATER RATES

Figure 12 provides a comparison of the current and proposed rate structure for FY 2016/17 through 2020/21 for each meter size¹⁵. More detailed tables on the development of the proposed water rates are documented in the Technical Appendix.

Figure 12. Current and Proposed Water Rates

Water Rate Schedule	Current Rates	Proposed Rates				
		FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Fixed Service Charge						
Monthly Fixed Service Charges:						
3/4 inch	\$11.00	\$19.88	\$22.96	\$26.51	\$30.62	\$35.37
1 inch	\$14.00	\$32.46	\$37.49	\$43.30	\$50.01	\$57.76
1.5 inch	\$20.00	\$63.90	\$73.81	\$85.25	\$98.46	\$113.73
2 inch	\$26.00	\$101.64	\$117.40	\$135.60	\$156.61	\$180.89
3 inch	\$38.00	\$202.28	\$233.64	\$269.85	\$311.68	\$359.99
4 inch	\$50.00	\$315.50	\$364.40	\$420.89	\$486.12	\$561.47
6 inch	\$74.00	\$630.00	\$727.65	\$840.43	\$970.70	\$1,121.16
Monthly Fire Service Charges:						
3 inch	\$27.00	\$20.98	\$24.23	\$27.99	\$32.32	\$37.33
4 inch	\$33.00	\$40.95	\$47.30	\$54.63	\$63.10	\$72.88
6 inch	\$45.00	\$92.31	\$106.61	\$123.14	\$142.23	\$164.27
8 inch	\$57.00	\$160.78	\$185.70	\$214.49	\$247.73	\$286.13
Commodity Charges for All Water Consumed						
Rate per hcf of						
Water Consumed	\$1.25	\$1.14	\$1.32	\$1.53	\$1.76	\$2.04

In summary, the increases in rate revenue, shown in Figure 2 will be accomplished by implementing the proposed water rates shown above in Figure 12. The primary change is the increased percentage of rate revenue that will be collected from the fixed charges. For fixed charges, the hydraulic capacity factors were updated to be consistent with industry standards as described in Section 2-D of this report, and shown previously in Figure 5 and Figure 6. This has resulted in a greater spread in monthly fixed charges between small and large meter sizes.

¹⁵ Following the initial adjustment which is schedule to be effective February 1st, 2017, all rate future adjustments are scheduled to be effective on January 1st.

F. COMPARISON OF CURRENT AND PROPOSED WATER BILLS

Figure 13 and Figure 14 compare a range of monthly water bills for the current and proposed water rates as a result of the initial rate adjustment for single-family residential (SFR) customers and non-single family residential customers (the bill comparison for a commercial customer with a 2-inch meter is used as an example in Figure 14). These monthly bills are based on typical meter sizes, and the average consumption levels for each customer class are highlighted.

Figure 13. Monthly Water Bill Comparison for Single-Family Customers

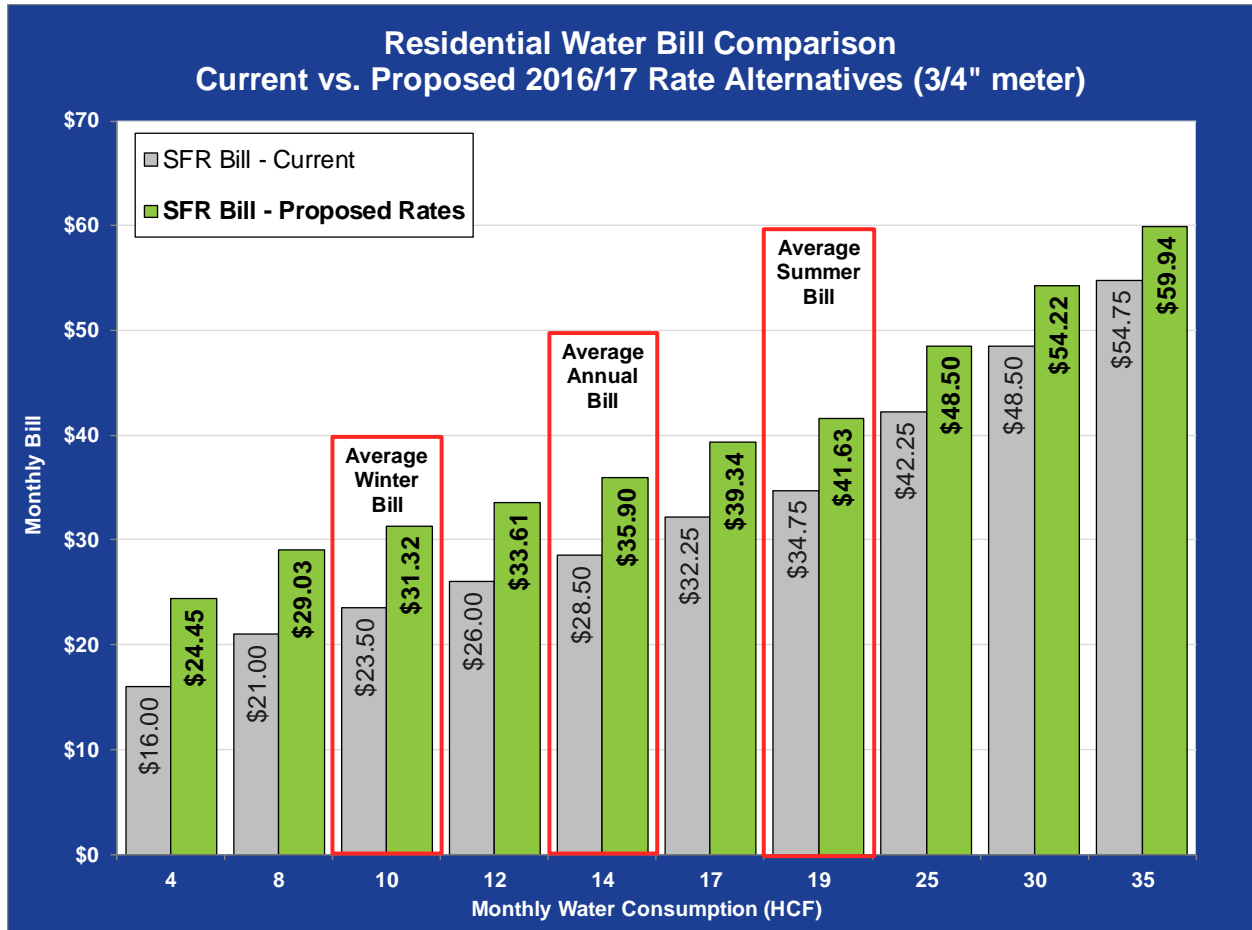
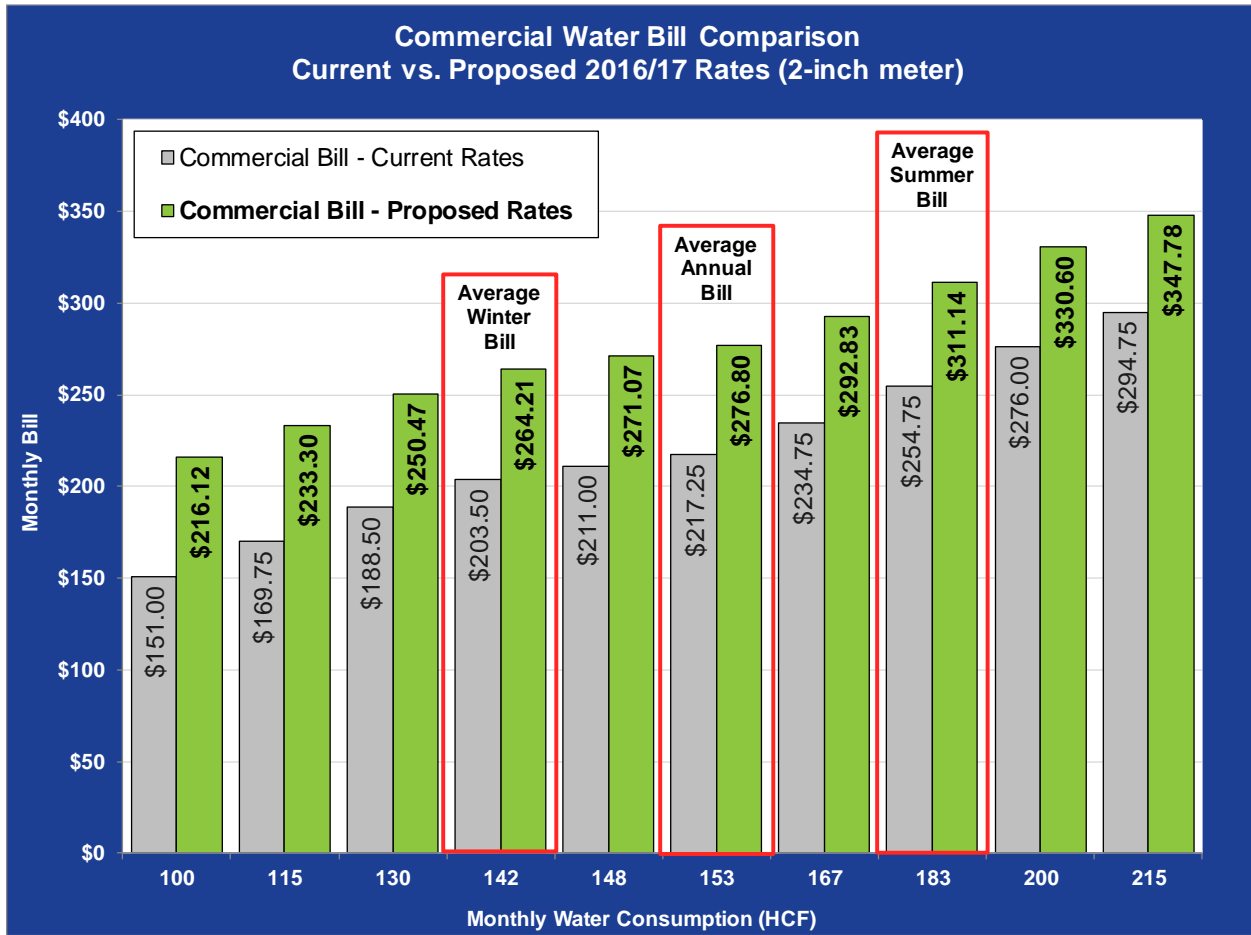


Figure 14. Monthly Water Bill Comparison for a Commercial Customer with a 2-inch Meter¹⁶



¹⁶ Bill comparison for a commercial customer with a 2-inch meter is for illustration purposes only.

SECTION 3. RECOMMENDATIONS AND NEXT STEPS

A. CONSULTANT RECOMMENDATIONS

NBS recommends District take the following actions:

- **Approve and Accept this Study:** NBS recommends the District Board formally approve and adopt this Study and its recommendations, and proceed with the steps outlined below 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 Increases and Proposed Rates:** Based on successfully meeting the Proposition 218 procedural requirements, the District Board should proceed with implementing the 5 year schedule of proposed rates and rate increases¹⁷ previously shown in Figure 12. This will help ensure the continued financial health of the District.

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 improvement, repair and replacement costs.

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

C. NBS' PRINCIPAL ASSUMPTIONS AND CONSIDERATIONS

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

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

¹⁷ A full rate schedule for Prop 218 purposes is shown in Figure 12.

TECHNICAL APPENDIX

DETAILED WATER RATE STUDY TABLES & FIGURES

TABLE 1
FINANCIAL PLAN AND SUMMARY OF REVENUE REQUIREMENTS

RATE REVENUE REQUIREMENTS SUMMARY (1)	Budget		Projected							
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26
Sources of Water Funds										
<i>Rate Revenue:</i>										
Water Sales Revenue Under Current Rates	\$ 1,856,078	\$ 1,883,919	\$ 1,912,178	\$ 1,940,861	\$ 1,969,974	\$ 1,999,523	\$ 2,029,516	\$ 2,059,959	\$ 2,090,858	\$ 2,122,221
Revenue from Rate Increases (2)	123,739	470,791	848,308	1,295,326	1,823,889	2,148,856	2,223,195	2,299,708	2,378,454	2,459,494
Subtotal: Rate Revenue After Rate Increases	1,979,817	2,354,711	2,760,486	3,236,187	3,793,863	4,148,379	4,252,711	4,359,666	4,469,312	4,581,715
<i>Non-Rate Revenue:</i>										
Water Services Revenue	\$ 104,050	\$ 106,131	\$ 108,254	\$ 110,419	\$ 112,627	\$ 114,880	\$ 117,177	\$ 119,521	\$ 121,911	\$ 124,349
Materials	30,000	30,600	31,212	31,836	32,473	33,122	33,785	34,461	35,150	35,853
Interest - County Treasury (3)	2,000	4,107	6,059	7,668	8,494	16,613	19,403	21,863	24,031	24,653
Subtotal: Non-Rate Revenue	136,050	140,838	145,525	149,923	153,594	164,615	170,365	175,845	181,092	184,856
Total Sources of Funds	\$ 2,115,867	\$ 2,495,549	\$ 2,906,011	\$ 3,386,110	\$ 3,947,457	\$ 4,312,994	\$ 4,423,075	\$ 4,535,511	\$ 4,650,404	\$ 4,766,571
Uses of Water Funds										
<i>Operating Expenses (4):</i>										
Source of Supply	\$ 7,500	\$ 7,700	\$ 7,900	\$ 8,100	\$ 8,300	\$ 8,500	\$ 8,700	\$ 8,900	\$ 9,100	\$ 9,300
Pumping	590,000	623,400	658,700	696,100	735,800	777,800	822,300	869,400	919,200	972,000
Transmission & Distribution	1,218,605	1,242,800	1,267,300	1,292,200	1,317,700	1,343,700	1,370,300	1,397,600	1,425,300	1,453,400
Administrative & General	298,200	303,650	309,050	314,550	320,150	305,900	311,800	317,700	323,800	330,000
Subtotal: Operating Expenses:	\$ 2,114,305	\$ 2,177,550	\$ 2,242,950	\$ 2,310,950	\$ 2,381,950	\$ 2,435,900	\$ 2,513,100	\$ 2,593,600	\$ 2,677,400	\$ 2,764,700
<i>Other Expenditures:</i>										
Existing Debt Service	\$ 28,719	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859
New Debt Service	14,880	189,478	250,149	672,743	747,426	811,943	811,943	811,943	811,943	811,943
Rate-Funded Capital Expenses	-	-	593,073	591,138	659,520	858,993	914,614	911,306	911,565	907,487
Subtotal: Other Expenditures	\$ 43,599	\$ 191,337	\$ 845,081	\$ 1,265,740	\$ 1,408,805	\$ 1,672,795	\$ 1,728,416	\$ 1,725,108	\$ 1,725,367	\$ 1,721,289
Total Uses of Water Funds	\$ 2,157,904	\$ 2,368,887	\$ 3,088,031	\$ 3,576,690	\$ 3,790,755	\$ 4,108,695	\$ 4,241,516	\$ 4,318,708	\$ 4,402,767	\$ 4,485,989
Annual Surplus/(Deficit)	\$ (42,038)	\$ 126,662	\$ (182,020)	\$ (190,580)	\$ 156,701	\$ 204,298	\$ 181,559	\$ 216,803	\$ 247,637	\$ 280,582
Total Rate Revenue After Rate Increases (same as above)	\$ 1,979,817	\$ 2,354,711	\$ 2,760,486	\$ 3,236,187	\$ 3,793,863	\$ 4,148,379	\$ 4,252,711	\$ 4,359,666	\$ 4,469,312	\$ 4,581,715
Net Revenue Req't. (Total Uses less Non-Rate Revenue)	\$ 2,021,854	\$ 2,228,049	\$ 2,942,506	\$ 3,426,767	\$ 3,637,161	\$ 3,944,080	\$ 4,071,152	\$ 4,142,863	\$ 4,221,675	\$ 4,301,133
Projected Annual Rate Revenue Increase	16.00%	15.50%	15.50%	15.50%	15.50%	1.00%	1.00%	1.00%	1.00%	1.00%
<i>Cumulative Increase from Annual Revenue Increases</i>	16.00%	33.98%	54.75%	78.73%	106.44%	108.50%	110.59%	112.69%	114.82%	116.97%
<i>Debt Coverage After Rate Increase</i>	0.04	1.66	2.63	1.59	2.09	2.31	2.35	2.39	2.42	2.46

1. Revenue and expenses for FY 2016/17 are from source file: 160523 Current 16-17 Budget and prior yr comparison.pdf
2. Revenue from rate increases assumes an implementation date of February 2017 for new rates, and January for each year thereafter.
3. Interest earning for FY 2016/17 is from the FY 2016/17 budget. For all other years, it is calculated based on historical LAIF returns.
4. The FY 2016/17 operating expenses are from the budget. Inflationary factors are applied to these expenses to project costs in FY 2016/17 and beyond.
5. Debt coverage requirement is assumed to be 1.25 for expected SFR loans. Staff has recommended internal target minimum of 1.3.
Conditional formatting has been applied to highlight years where a 1.25 debt coverage ratio is not met.

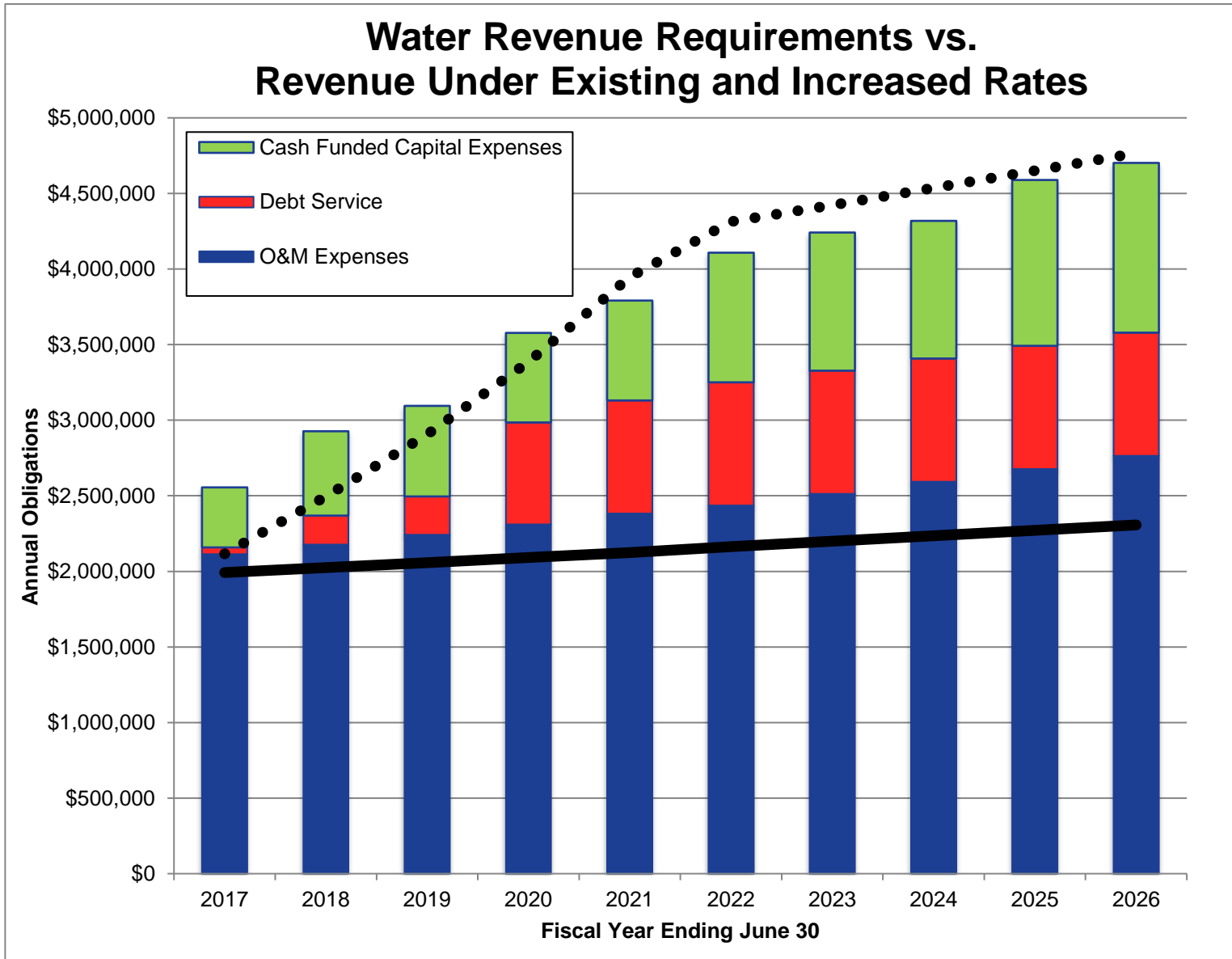
ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Financial Plan and Reserve Projections

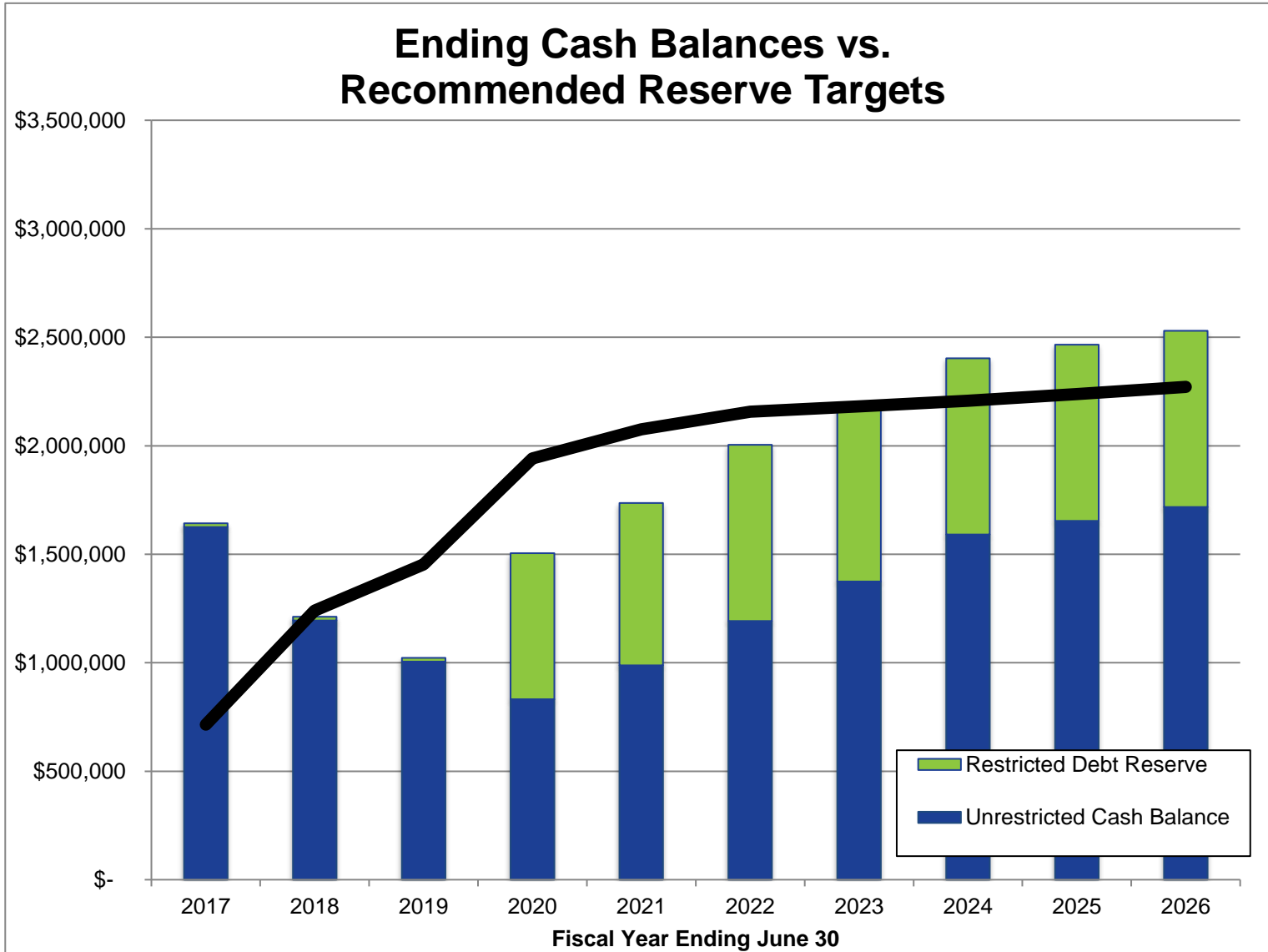
Financial Plan & Reserve Summary - Arsenic Response #1
Path #2 - Phase 2B No Treatment Needed.

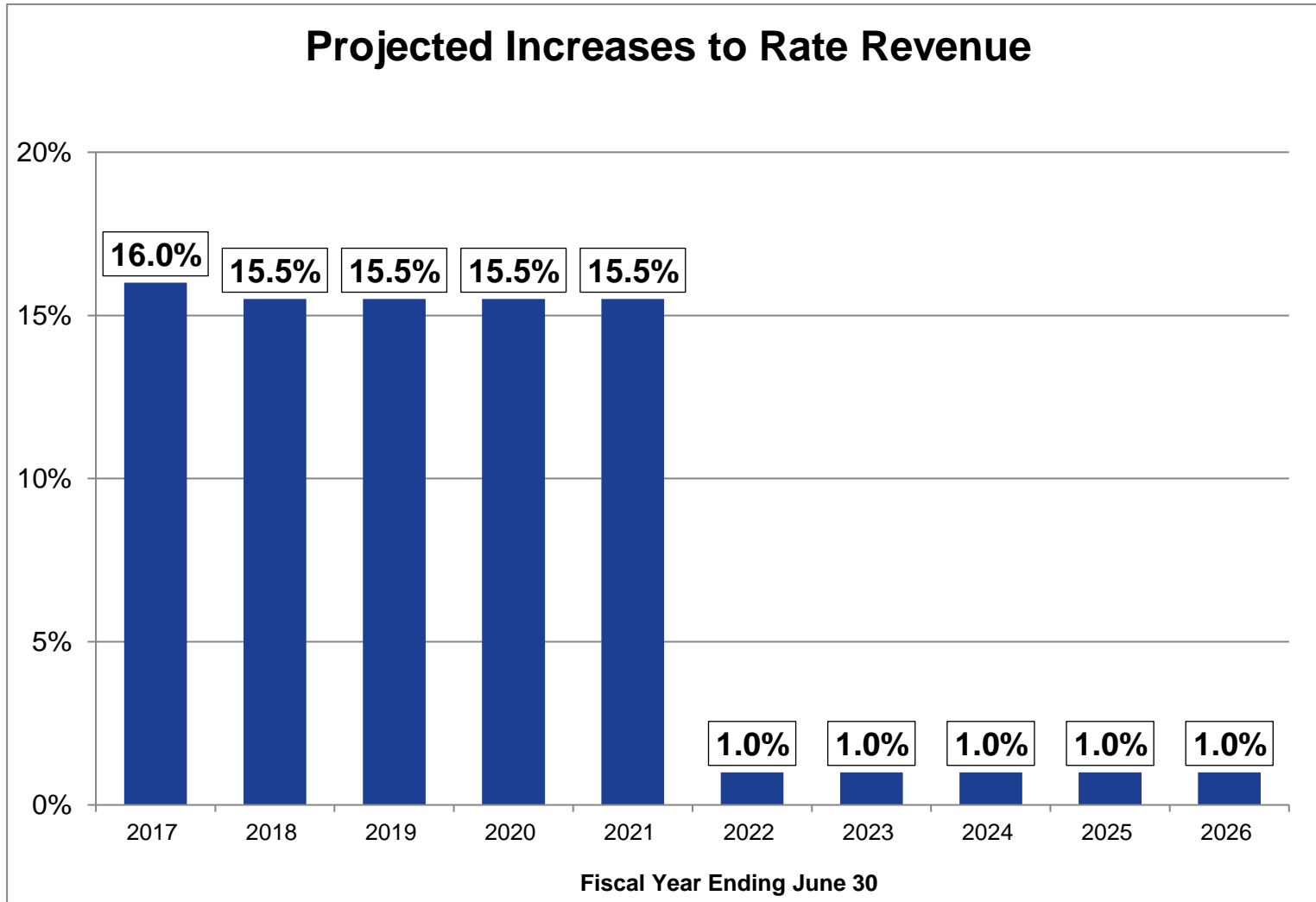
TABLE 2
RESERVE FUND SUMMARY

SUMMARY OF CASH ACTIVITY UN-RESTRICTED RESERVES	Budget	Projected								
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26
Total Beginning Cash (1)	\$ 2,081,867									
Operating Reserve										
Beginning Reserve Balance (1)	\$ 2,064,128	\$ 528,576	\$ 544,388	\$ 362,367	\$ 189,356	\$ 346,059	\$ 550,359	\$ 628,275	\$ 648,400	\$ 669,350
Plus: Net Cash Flow (After Rate Increases)	(42,038)	126,662	(182,020)	(190,580)	156,701	204,298	181,559	216,803	247,637	280,582
Plus: Transfer of Debt Reserve Surplus	-	-	-	17,569	1	2	2	3	3	4
Less: Transfer Out to Capital Replacement Reserve	(1,493,514)	(110,850)	-	-	-	-	(103,645)	(196,681)	(226,690)	(258,761)
Ending Operating Reserve Balance	\$ 528,576	\$ 544,388	\$ 362,367	\$ 189,356	\$ 346,059	\$ 550,359	\$ 628,275	\$ 648,400	\$ 669,350	\$ 691,175
Target Ending Balance (90-days of O&M)	\$ 528,576	\$ 544,388	\$ 560,738	\$ 577,738	\$ 595,488	\$ 608,975	\$ 628,275	\$ 648,400	\$ 669,350	\$ 691,175
Capital Rehabilitation & Replacement Reserve										
Beginning Reserve Balance	\$ -	\$ 1,096,539	\$ 649,670	\$ 642,300	\$ 642,300	\$ 642,300	\$ 642,300	\$ 745,945	\$ 942,626	\$ 983,890
Plus: Transfer of Operating Reserve Surplus	1,493,514	110,850	-	-	-	-	103,645	196,681	226,690	258,761
Less: Use of Reserves for Capital Projects	(396,975)	(557,719)	(7,370)	-	-	-	-	-	(185,426)	(215,890)
Ending Capital Rehab & Replacement Reserve Balance	\$ 1,096,539	\$ 649,670	\$ 642,300	\$ 642,300	\$ 642,300	\$ 642,300	\$ 745,945	\$ 942,626	\$ 983,890	\$ 1,026,761
Capital R&R Reserve (3% of Net Assets)	\$ 168,500	\$ 505,600	\$ 642,300	\$ 690,400	\$ 732,300	\$ 736,200	\$ 741,600	\$ 746,800	\$ 757,200	\$ 768,000
Ending Balance - Excludes Restricted Reserves	\$ 1,625,115	\$ 1,194,057	\$ 1,004,667	\$ 831,656	\$ 988,359	\$ 1,192,659	\$ 1,374,220	\$ 1,591,026	\$ 1,653,240	\$ 1,717,936
Min. Target Ending Balance - Excludes Restricted Reserves	\$ 697,076	\$ 1,049,988	\$ 1,203,038	\$ 1,268,138	\$ 1,327,788	\$ 1,345,175	\$ 1,369,875	\$ 1,395,200	\$ 1,426,550	\$ 1,459,175
Ending Surplus/(Deficit) Compared to Reserve Targets	\$ 928,039	\$ 144,070	\$ (198,370)	\$ (436,481)	\$ (339,429)	\$ (152,516)	\$ 4,345	\$ 195,826	\$ 226,690	\$ 258,761
Restricted Reserves:										
Debt Reserve										
Beginning Reserve Balance (2)	\$ 17,739	\$ 17,739	\$ 17,739	\$ 17,739	\$ 672,913	\$ 747,595	\$ 812,110	\$ 812,108	\$ 812,105	\$ 812,102
Plus: Reserve Funding from New Debt Obligations	-	-	-	672,743	74,683	64,517	-	-	-	-
Less: Transfer of Surplus to Operating Reserve	-	-	-	(17,569)	(1)	(2)	(2)	(3)	(3)	(4)
Ending Debt Reserve Balance	\$ 17,739	\$ 17,739	\$ 17,739	\$ 672,913	\$ 747,595	\$ 812,110	\$ 812,108	\$ 812,105	\$ 812,102	\$ 812,098
Target Ending Balance	\$ 17,739	\$ 189,650	\$ 250,320	\$ 672,913	\$ 747,595	\$ 812,110	\$ 812,108	\$ 812,105	\$ 812,102	\$ 812,098
Connection Fee Reserve (provided for informational purposes only)										
Beginning Reserve Balance (3)	\$ -	\$ 500,000	\$ 600,000	\$ 169,550	\$ 269,550	\$ 369,550	\$ 469,550	\$ 569,550	\$ 669,550	\$ 769,550
Plus: Capacity Fee Revenue	500,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Less: Use of Reserves for Capital Projects	-	-	(530,450)	-	-	-	-	-	-	-
Ending Connection Fee Fund Balance	\$ 500,000	\$ 600,000	\$ 169,550	\$ 269,550	\$ 369,550	\$ 469,550	\$ 569,550	\$ 669,550	\$ 769,550	\$ 869,550
Annual Interest Earnings Rate (4)	0.25%	0.25%	0.50%	0.75%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

1. Beginning cash estimated from 2015 CAFR and projected 2015/16 cash impact. Sources: Draft 5 Arvin CSD Annual Financial Report.pdf page 12 & 160523 Current 16-17 Budget and prior yr comparison.pdf
2. Beginning cash balance is assumed to equal reserve requirement for FY2016/17.
3. Staff recommended that all cash be treated as unrestricted. 5/26/16 conference call.
4. Interest earning rates were referenced on the CA Treasurer's Office website for funds invested in LAIF. Future years earnings were conservatively estimated in future years.







**ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Operating Revenue and Expenses**

EXHIBIT 1

Arsenic Response #1

Path #2 - Phase 2B No Treatment Needed.

REVENUE FORECAST (1):

TABLE 3

DESCRIPTION	Basis	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Water Sales Revenue											
Business & Commercial Water (Construction Meters)	1	\$ 180,000	\$ 182,700	\$ 185,441	\$ 188,222	\$ 191,045	\$ 193,911	\$ 196,820	\$ 199,772	\$ 202,769	\$ 205,810
Industrial Water Sales	1	\$ 75,000	\$ 76,125	\$ 77,267	\$ 78,426	\$ 79,602	\$ 80,796	\$ 82,008	\$ 83,238	\$ 84,487	\$ 85,754
Residential Water Sales	1	\$ 1,588,828	\$ 1,612,660	\$ 1,636,850	\$ 1,661,403	\$ 1,686,324	\$ 1,711,619	\$ 1,737,293	\$ 1,763,353	\$ 1,789,803	\$ 1,816,650
Water Sales Revenue - Other	1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Fire Protection Services (Private Fire)	1	\$ 12,250	\$ 12,434	\$ 12,620	\$ 12,810	\$ 13,002	\$ 13,197	\$ 13,395	\$ 13,596	\$ 13,800	\$ 14,007
Water Services Revenue											
Activation Fee	2	\$ 8,000	\$ 8,160	\$ 8,323	\$ 8,490	\$ 8,659	\$ 8,833	\$ 9,009	\$ 9,189	\$ 9,373	\$ 9,561
Call Outs	2	\$ 100	\$ 102	\$ 104	\$ 106	\$ 108	\$ 110	\$ 113	\$ 115	\$ 117	\$ 120
Engineering Fees	2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Labor Charge	2	\$ 10,000	\$ 10,200	\$ 10,404	\$ 10,612	\$ 10,824	\$ 11,041	\$ 11,262	\$ 11,487	\$ 11,717	\$ 11,951
Penalties	2	\$ 75,000	\$ 76,500	\$ 78,030	\$ 79,591	\$ 81,182	\$ 82,806	\$ 84,462	\$ 86,151	\$ 87,874	\$ 89,632
Miscellaneous Water Services	2	\$ 10,000	\$ 10,200	\$ 10,404	\$ 10,612	\$ 10,824	\$ 11,041	\$ 11,262	\$ 11,487	\$ 11,717	\$ 11,951
Will Serve Fee	2	\$ 600	\$ 612	\$ 624	\$ 637	\$ 649	\$ 662	\$ 676	\$ 689	\$ 703	\$ 717
Check Fee Charge	2	\$ 350	\$ 357	\$ 364	\$ 371	\$ 379	\$ 386	\$ 394	\$ 402	\$ 410	\$ 418
Other Revenue											
Materials	2	\$ 30,000	\$ 30,600	\$ 31,212	\$ 31,836	\$ 32,473	\$ 33,122	\$ 33,785	\$ 34,461	\$ 35,150	\$ 35,853
Interest - County Treasury	see FP	\$ 2,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Connection Fees	4	\$ 500,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
TOTAL: REVENUE		\$ 2,492,128	\$ 2,120,650	\$ 2,151,644	\$ 2,183,116	\$ 2,215,074	\$ 2,247,525	\$ 2,280,478	\$ 2,313,940	\$ 2,347,919	\$ 2,382,423

TABLE 4 - REVENUE SUMMARY:

RATE REVENUE:											
Water Sales Revenue		\$ 1,856,078	\$ 1,883,919	\$ 1,912,178	\$ 1,940,861	\$ 1,969,974	\$ 1,999,523	\$ 2,029,516	\$ 2,059,959	\$ 2,090,858	\$ 2,122,221
OTHER REVENUE:											
Water Services Revenue		\$ 104,050	\$ 106,131	\$ 108,254	\$ 110,419	\$ 112,627	\$ 114,880	\$ 117,177	\$ 119,521	\$ 121,911	\$ 124,349
Materials		\$ 30,000	\$ 30,600	\$ 31,212	\$ 31,836	\$ 32,473	\$ 33,122	\$ 33,785	\$ 34,461	\$ 35,150	\$ 35,853
Interest - County Treasury		\$ 2,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Connection Fees		\$ 500,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
TOTAL: REVENUE		\$ 2,492,128	\$ 2,120,650	\$ 2,151,644	\$ 2,183,116	\$ 2,215,074	\$ 2,247,525	\$ 2,280,478	\$ 2,313,940	\$ 2,347,919	\$ 2,382,423
		TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Operating Revenue and Expenses

EXHIBIT 1

Arsenic Response #1

Path #2 - Phase 2B No Treatment Needed.

TABLE 5 - OPERATING EXPENSE FORECAST (1):

DESCRIPTION	Basis	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Source of Supply											
State Water Resources Ctrl Brd	2	\$ 7,500	\$ 7,700	\$ 7,900	\$ 8,100	\$ 8,300	\$ 8,500	\$ 8,700	\$ 8,900	\$ 9,100	\$ 9,300
Pumping											
Pumping - Maintenance	2	\$ 50,000	\$ 51,000	\$ 52,000	\$ 53,000	\$ 54,100	\$ 55,200	\$ 56,300	\$ 57,400	\$ 58,500	\$ 59,700
Pumping - Power	3	\$ 540,000	\$ 572,400	\$ 606,700	\$ 643,100	\$ 681,700	\$ 722,600	\$ 766,000	\$ 812,000	\$ 860,700	\$ 912,300
Transmission & Distribution											
Automobile Expense	2	\$ 25,000	\$ 25,500	\$ 26,000	\$ 26,500	\$ 27,000	\$ 27,500	\$ 28,100	\$ 28,700	\$ 29,300	\$ 29,900
Merchant Processing Fees	2	\$ 2,500	\$ 2,600	\$ 2,700	\$ 2,800	\$ 2,900	\$ 3,000	\$ 3,100	\$ 3,200	\$ 3,300	\$ 3,400
Continuing Education	2	\$ 7,500	\$ 7,700	\$ 7,900	\$ 8,100	\$ 8,300	\$ 8,500	\$ 8,700	\$ 8,900	\$ 9,100	\$ 9,300
General Liability Insurance	2	\$ 27,500	\$ 28,100	\$ 28,700	\$ 29,300	\$ 29,900	\$ 30,500	\$ 31,100	\$ 31,700	\$ 32,300	\$ 32,900
Health Insurance	2	\$ 110,000	\$ 112,200	\$ 114,400	\$ 116,700	\$ 119,000	\$ 121,400	\$ 123,800	\$ 126,300	\$ 128,800	\$ 131,400
Auto Insurance	2	\$ 5,500	\$ 5,600	\$ 5,700	\$ 5,800	\$ 5,900	\$ 6,000	\$ 6,100	\$ 6,200	\$ 6,300	\$ 6,400
Worker's Compensation	4	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000	\$ 16,000
Uniforms / Laundry	2	\$ 6,000	\$ 6,100	\$ 6,200	\$ 6,300	\$ 6,400	\$ 6,500	\$ 6,600	\$ 6,700	\$ 6,800	\$ 6,900
Employee Retirement	2	\$ 30,000	\$ 30,600	\$ 31,200	\$ 31,800	\$ 32,400	\$ 33,000	\$ 33,700	\$ 34,400	\$ 35,100	\$ 35,800
Salaries / Wages	2	\$ 543,605	\$ 554,500	\$ 565,600	\$ 576,900	\$ 588,400	\$ 600,200	\$ 612,200	\$ 624,400	\$ 636,900	\$ 649,600
Payroll Taxes	2	\$ 42,500	\$ 43,400	\$ 44,300	\$ 45,200	\$ 46,100	\$ 47,000	\$ 47,900	\$ 48,900	\$ 49,900	\$ 50,900
Engineering	2	\$ 60,000	\$ 61,200	\$ 62,400	\$ 63,600	\$ 64,900	\$ 66,200	\$ 67,500	\$ 68,900	\$ 70,300	\$ 71,700
Rent / Lease Expense	2	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500
Telephone Expense	2	\$ 5,000	\$ 5,100	\$ 5,200	\$ 5,300	\$ 5,400	\$ 5,500	\$ 5,600	\$ 5,700	\$ 5,800	\$ 5,900
Utilities	2	\$ 12,000	\$ 12,200	\$ 12,400	\$ 12,600	\$ 12,900	\$ 13,200	\$ 13,500	\$ 13,800	\$ 14,100	\$ 14,400
Trans. & Distribi. - Maintenance	2	\$ 300,000	\$ 306,000	\$ 312,100	\$ 318,300	\$ 324,700	\$ 331,200	\$ 337,800	\$ 344,600	\$ 351,500	\$ 358,500
Trans. & Distribi. - Water Sample	2	\$ 25,000	\$ 25,500	\$ 26,000	\$ 26,500	\$ 27,000	\$ 27,500	\$ 28,100	\$ 28,700	\$ 29,300	\$ 29,900
Administrative & General											
Medical	2	\$ 250	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300
Directors Fees	4	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
Advertising & Promotion	2	\$ 3,500	\$ 3,600	\$ 3,700	\$ 3,800	\$ 3,900	\$ 4,000	\$ 4,100	\$ 4,200	\$ 4,300	\$ 4,400
Bank Service Charges	2	\$ 3,300	\$ 3,400	\$ 3,500	\$ 3,600	\$ 3,700	\$ 3,800	\$ 3,900	\$ 4,000	\$ 4,100	\$ 4,200
Licenses & Permits	2	\$ 10,000	\$ 10,200	\$ 10,400	\$ 10,600	\$ 10,800	\$ 11,000	\$ 11,200	\$ 11,400	\$ 11,600	\$ 11,800
Computer Services & Software	2	\$ 12,500	\$ 12,800	\$ 13,100	\$ 13,400	\$ 13,700	\$ 14,000	\$ 14,300	\$ 14,600	\$ 14,900	\$ 15,200
Dues & Subscription	2	\$ 10,000	\$ 10,200	\$ 10,400	\$ 10,600	\$ 10,800	\$ 11,000	\$ 11,200	\$ 11,400	\$ 11,600	\$ 11,800
Equipment Rental	2	\$ 17,000	\$ 17,300	\$ 17,600	\$ 18,000	\$ 18,400	\$ 18,800	\$ 19,200	\$ 19,600	\$ 20,000	\$ 20,400
Equipment Rental - Backhoe	4	\$ 19,950	\$ 19,950	\$ 19,950	\$ 19,950	\$ 19,950	\$ -	\$ -	\$ -	\$ -	\$ -
Meals & Entertainment	4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Office Supplies & Expenses	2	\$ 20,000	\$ 20,400	\$ 20,800	\$ 21,200	\$ 21,600	\$ 22,000	\$ 22,400	\$ 22,800	\$ 23,300	\$ 23,800
Postage & Delivery	2	\$ 25,000	\$ 25,500	\$ 26,000	\$ 26,500	\$ 27,000	\$ 27,500	\$ 28,100	\$ 28,700	\$ 29,300	\$ 29,900
Accounting	2	\$ 30,000	\$ 30,600	\$ 31,200	\$ 31,800	\$ 32,400	\$ 33,000	\$ 33,700	\$ 34,400	\$ 35,100	\$ 35,800
Legal	2	\$ 50,000	\$ 51,000	\$ 52,000	\$ 53,000	\$ 54,100	\$ 55,200	\$ 56,300	\$ 57,400	\$ 58,500	\$ 59,700
Other Professional Fees	2	\$ 72,500	\$ 74,000	\$ 75,500	\$ 77,000	\$ 78,500	\$ 80,100	\$ 81,700	\$ 83,300	\$ 85,000	\$ 86,700
Travel, Lodging & Meals Expense	2	\$ 3,000	\$ 3,100	\$ 3,200	\$ 3,300	\$ 3,400	\$ 3,500	\$ 3,600	\$ 3,700	\$ 3,800	\$ 3,900
Janitorial Expense	2	\$ 2,200	\$ 2,200	\$ 2,200	\$ 2,200	\$ 2,200	\$ 2,200	\$ 2,200	\$ 2,200	\$ 2,200	\$ 2,200
Repairs & Maintenance	2	\$ 4,000	\$ 4,100	\$ 4,200	\$ 4,300	\$ 4,400	\$ 4,500	\$ 4,600	\$ 4,700	\$ 4,800	\$ 4,900
GRAND TOTAL: WATER OPERATING EXPENSES		\$ 2,114,305	\$ 2,177,550	\$ 2,242,950	\$ 2,310,950	\$ 2,381,950	\$ 2,435,900	\$ 2,513,100	\$ 2,593,600	\$ 2,677,400	\$ 2,764,700

ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Operating Revenue and Expenses

EXHIBIT 1
Arsenic Response #1
Path #2 - Phase 2B No Treatment Needed.

TABLE 6
NON-CASH ITEMS, EXCLUDED FROM ABOVE:

DESCRIPTION	Basis	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
DEPRECIATION	7	\$ 245,000	\$ 491,187	\$ 632,093	\$ 681,676	\$ 724,906	\$ 728,928	\$ 734,499	\$ 739,803	\$ 750,519	\$ 761,705
Total		\$ 2,359,305	\$ 2,668,737	\$ 2,875,043	\$ 2,992,626	\$ 3,106,856	\$ 3,164,828	\$ 3,247,599	\$ 3,333,403	\$ 3,427,919	\$ 3,526,405

TABLE 7 - FORECASTING ASSUMPTIONS

INFLATION FACTORS	Basis	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Customer Growth (2)	1	--	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
General Cost Inflation (3)	2	--	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Utilities and Chemicals (3)	3	--	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
No Escalation	4	--	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

1. Revenue and expenses for FY 2016/17 are from source file: *Budget FY 2016-2017.xlsx*
2. Customer growth conservatively set to 1.5% at the recommendation of staff, via email 7.15.16.
3. Expected Inflation factors based on expense type from 5 year average from Bureau of Labor Statistics Data. Source: <http://data.bls.gov/cgi-bin/surveymost>. November 17, 2015
4. Based on District Staff estimate.
5. Based on information provided in California State University Davis Energy Report that evaluates the future costs of SCE electricity prices in California.

ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Capital Improvement Plan Expenditures

EXHIBIT 2
Arsenic Response #1
Path #2 - Phase 2B No Treatment Needed.

TABLE 8 - CAPITAL FUNDING SUMMARY

CAPITAL FUNDING FORECAST	Budget					Projected				
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26
Funding Sources:										
Grants	\$ -	\$ -	\$ 900,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Use of Capacity Fee Reserves	-	-	530,450	-	-	-	-	-	-	-
SRF Loan Funding	930,000	11,169,862	3,157,158	1,693,727	1,463,161	-	-	-	-	-
Use of New Revenue Bond Proceeds	-	-	-	-	-	-	-	-	-	-
Use of Capital Rehabilitation and Replacement Reserve	396,975	557,719	7,370	-	-	-	-	-	185,426	215,890
Rate Revenue	-	-	593,073	591,138	659,520	858,993	914,614	911,306	911,565	907,487
Total Sources of Capital Funds	\$ 1,326,975	\$ 11,727,581	\$ 5,188,051	\$ 2,284,865	\$ 2,122,681	\$ 858,993	\$ 914,614	\$ 911,306	\$ 1,096,991	\$ 1,123,377
Uses of Capital Funds:										
Total Project Costs	\$ 1,326,975	\$ 11,727,581	\$ 5,188,051	\$ 2,284,865	\$ 2,122,681	\$ 858,993	\$ 914,614	\$ 911,306	\$ 1,096,991	\$ 1,123,377
Capital Funding Surplus (Deficiency)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
SRF Loan Funding	\$ -	\$ -	\$ 15,257,020	\$ 1,693,727	\$ 1,463,161	\$ -	\$ -	\$ -	\$ -	\$ -
New Revenue Bond Proceeds	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

CAPITAL IMPROVEMENT PROGRAM

TABLE 9 - Capital Improvement Program Costs (in Current-Year Dollars) (1):

Project Description	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Required One-Time Spec Studies										
Urban Water Management Plan	\$ 20,000	\$ -	\$ -	\$ -	\$ 20,000	\$ -	\$ -	\$ -	\$ -	\$ 20,000
Ground Management SGMA	\$ 50,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000
1, 2, 3, TCP	\$ 5,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Arsenic Mitigation (2)										
Three Additional Well Sites	\$ 180,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Plans and Specifications for Test Wells / Engineering/Legal/ Hydrogeology	\$ 150,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Test Wells: Drill/W. Q. Testing/ Report & Approval from Waterboards	\$ 540,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Plans and Specifications for Wells, Pumping Plants & Transmission Lines	-	\$ 300,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Civil/Geotechnical/Electrical/Legal/Hydrogeology	-	\$ 300,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Bid/Award/Construct Three Production Wells/Connective Pipelines	-	\$ 3,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Engineering/Legal/Mobilize Contractor & Begin Construction/Construction	\$ -	\$ 6,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction and Construction Management	\$ -	\$ -	\$ 2,744,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction and Construction Management / Commission Project	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CW 1 Well										
CW 1 Well	\$ 60,000	\$ 1,612,362	\$ 1,047,933	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1, 2, 3 TCP										
1, 2, 3 TCP Project (3)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Additional Projects SFR and Capacity Fee Funded Projects (4)										
Sonshine Consolidated Capacity Upgrade (5)	\$ -	\$ -	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Emergency Generator Backup Project	\$ -	\$ 250,000	\$ 250,000	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
North Side Pressure Zone	\$ -	\$ -	\$ -	\$ 1,300,000	\$ 1,300,000	\$ -	\$ -	\$ -	\$ -	\$ -
Distribution System										
GIS Infrastructure Mapping	\$ 18,500	\$ 18,500	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000	\$ 18,000
Meter Replacement Program	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000	\$ 175,000
Pipe Replacement Program	\$ -	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000
Vibratory Asphalt Roller	\$ 17,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ARRC Work Station	\$ 975	\$ 975	\$ 975	\$ 975	\$ 975	\$ 975	\$ 975	\$ 975	\$ 975	\$ 975
Valve Replacement Program	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000	\$ 85,000
Maintenance Truck	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ 25,000	\$ -
Future Estimated CIPs (5)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 200,000	\$ 200,000	\$ 200,000	\$ 300,000	\$ 300,000
Total: CIP Program Costs (Current-Year Dollars)	\$ 1,326,975	\$ 11,703,837	\$ 5,107,908	\$ 2,090,975	\$ 1,885,975	\$ 740,975	\$ 765,975	\$ 740,975	\$ 865,975	\$ 860,975

TABLE 10 - Capital Improvement Program Costs (in Future-Year Dollars) (6):

Project Description	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Required One-Time Spec Studies										
Urban Water Management Plan	\$ 20,000	\$ -	\$ -	\$ -	\$ 22,510	\$ -	\$ -	\$ -	\$ -	\$ 26,095
Ground Management SGMA 1, 2, 3, TCP	\$ 50,000	\$ 12,360	\$ 12,731	\$ 13,113	\$ 13,506	\$ 13,911	\$ 14,329	\$ 14,758	\$ 15,201	\$ 15,657
	\$ 5,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Arsenic Mitigation (2)										
Three Additional Well Sites	\$ 180,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Plans and Specifications for Test Wells / Engineering/Legal/ Hydrogeology	\$ 150,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Test Wells: Drill/W. Q. Testing/ Report & Approval from Waterboards	\$ 540,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Plans and Specifications for Wells, Pumping Plants & Transmission Lines Civil/Geotechnical/Electrical/Legal/Hydrogeology	\$ -	\$ 300,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Bid/Award/Construct Three Production Wells/Connective Pipelines	\$ -	\$ 3,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Engineering/Legal/Mobilize Contractor & Begin Construction/Construction Construction and Construction Management	\$ -	\$ 6,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction and Construction Management / Commission Project	\$ -	\$ -	\$ 2,744,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
CW 1 Well										
CW 1 Well	\$ 60,000	\$ 1,612,362	\$ 1,047,933	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
1, 2, 3 TCP										
1, 2, 3 TCP Project (3)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Additional Projects SFR and Capacity Fee Funded Projects (4)										
Sonshine Consolidated Capacity Upgrade (5)	\$ -	\$ -	\$ 530,450	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Emergency Generator Backup Project	\$ -	\$ 257,500	\$ 265,225	\$ 273,182	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
North Side Pressure Zone	\$ -	\$ -	\$ -	\$ 1,420,545	\$ 1,463,161	\$ -	\$ -	\$ -	\$ -	\$ -
Distribution System										
GIS Infrastructure Mapping	\$ 18,500	\$ 19,055	\$ 19,096	\$ 19,669	\$ 20,259	\$ 20,867	\$ 21,493	\$ 22,138	\$ 22,802	\$ 23,486
Meter Replacement Program	\$ 175,000	\$ 180,250	\$ 185,658	\$ 191,227	\$ 196,964	\$ 202,873	\$ 208,959	\$ 215,228	\$ 221,685	\$ 228,335
Pipe Replacement Program	\$ -	\$ 257,500	\$ 265,225	\$ 273,182	\$ 281,377	\$ 289,819	\$ 298,513	\$ 307,468	\$ 316,693	\$ 326,193
Vibratory Asphalt Roller	\$ 17,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ARRC Work Station	\$ 975	\$ 1,004	\$ 1,034	\$ 1,065	\$ 1,097	\$ 1,130	\$ 1,164	\$ 1,199	\$ 1,235	\$ 1,272
Valve Replacement Program	\$ 85,000	\$ 87,550	\$ 90,177	\$ 92,882	\$ 95,668	\$ 98,538	\$ 101,494	\$ 104,539	\$ 107,675	\$ 110,906
Maintenance Truck	\$ 25,000	\$ -	\$ 26,523	\$ -	\$ 28,138	\$ -	\$ 29,851	\$ -	\$ 31,669	\$ -
Future Estimated CIPs (5)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 231,855	\$ 238,810	\$ 245,975	\$ 380,031	\$ 391,432
Total: CIP Program Costs (Future-Year Dollars)	\$ 1,326,975	\$ 11,727,581	\$ 5,188,051	\$ 2,284,865	\$ 2,122,681	\$ 858,993	\$ 914,614	\$ 911,306	\$ 1,096,991	\$ 1,123,377

TABLE 11 - FORECASTING ASSUMPTIONS

Economic Variables	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual Construction Cost Inflation, Per Engineering News Record (6)	0.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Cumulative Construction Cost Multiplier from 2017	1.00	1.03	1.06	1.09	1.13	1.16	1.19	1.23	1.27	1.30

- Capital project costs & equipment purchases; source files: *Budget FY 2016-2017.xlsx, Schedule(Rev1).xlsx*
- Arsenic Response & CW 1 Well capital project costs were provided by Dee Jasper & Associates, Inc Civil Engineers (files: *Schedule(Rev1).xlsx & Memo to Files Cos of Replacement and Time Line - CW1.pdf*) and include inflation; therefore, they are not inflated in the future year cost estimates.
- 1, 2, 3 TCP Project costs not should not be born ACS D customers, it is expected that Dow Chemical Company and Shell Oil Company will support this project.
- Additional Projects and costs confirmed by staff on a conference call, 8/18/2016 & 11/8/2016.
- Due the capacity increasing nature of this project, it is assumed to be funded through connection/developer fees.
- Project costs (excluding Arsenic Mitigation & CW 1 Well) are inflated by 3% per year, Engineering News Record estimates of construction cost inflation.
- Construction inflator is based on the most current 10 year average of the Engineering News-Record Construction Cost Index. Source: www.enr.com/economics

TABLE 12 - CAPITAL FUNDING SUMMARY

ASSESSMENT DISTRICT DEBT OBLIGATIONS	Budget	Projected								
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26
Annual Repayment Schedules:										
FHA Loan #1 (1)										
Principal Payment	\$ 25,581	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest Payment	\$ 1,279	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal: Annual Debt Service	\$ 26,860	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Coverage Requirement (\$-Amnt above annual payment) (2)	\$ 32,232	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Reserve Requirement (total fund balance) (3)	\$ 2,686	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
USDA Loan #2 - Assessment (4)										
Principal Payment	\$ 1,004	\$ 1,050	\$ 1,097	\$ 1,146	\$ 1,198	\$ 1,252	\$ 1,308	\$ 1,367	\$ 1,428	\$ 1,493
Interest Payment	\$ 855	\$ 809	\$ 762	\$ 713	\$ 661	\$ 607	\$ 551	\$ 492	\$ 431	\$ 366
Subtotal: Annual Debt Service	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859
Coverage Requirement (\$-Amnt above annual payment) (2)	\$ 2,231	\$ 2,231	\$ 2,231	\$ 2,230	\$ 2,231	\$ 2,231	\$ 2,231	\$ 2,231	\$ 2,231	\$ 2,231
Reserve Requirement (total fund balance) (3)	\$ 173	\$ 172	\$ 171	\$ 170	\$ 169	\$ 167	\$ 165	\$ 162	\$ 159	\$ 154

1. Client provided Source File: *LOAN AMORTIZATION SCH.PDF* - Farmers Home Administration pg. 1
2. Coverage requirement set by USDA Loan and includes all Parity obligations. Source File: *Loan Doc - USDA.pdf* pg. 10
3. Client provided Source File: *Loan Doc - USDA.pdf* pg. 6
4. Client provided Source File: *LOAN AMORTIZATION SCH.PDF* - USDA Rural Development pg. 1

TABLE 13 - Existing Annual Debt Obligations to be Satisfied by Water Rates:

Existing Annual Debt Service	\$ 28,719	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859	\$ 1,859
Existing Annual Coverage Requirement	\$ 34,463	\$ 2,231	\$ 2,231	\$ 2,230	\$ 2,231	\$ 2,231	\$ 2,231	\$ 2,231	\$ 2,231	\$ 2,231
Existing Debt Reserve Target	\$ 2,859	\$ 172	\$ 171	\$ 170	\$ 169	\$ 167	\$ 165	\$ 162	\$ 159	\$ 154

**ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Debt Service**

EXHIBIT 3
Arsenic Response #1
Path #2 - Phase 2B No Treatment Needed.

FUTURE DEBT FINANCING ASSUMPTIONS:

Long-Term Debt Terms	State Revolving Fund Loan	Revenue Bonds
Issuance Cost	0.00%	2.00%
Annual Interest Cost (%)	1.60%	5.50%
Term	30	30
Debt Reserve Funded?	Yes	Yes
Coverage Requirement (% above annual pmt)	20%	25%

FUTURE DEBT OBLIGATIONS:

Annual Repayment Schedules	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
SRF Loan Funding										
Principal Payment	\$ -	\$ -	\$ -	\$ 417,867	\$ 470,942	\$ 518,550	\$ 526,847	\$ 535,277	\$ 543,841	\$ 552,543
Interest Payment	14,880	189,478	250,149	254,876	276,485	293,393	285,096	276,666	268,102	259,400
Subtotal: Annual Debt Service	\$ 14,880	\$ 189,478	\$ 250,149	\$ 672,743	\$ 747,426	\$ 811,943	\$ 811,943	\$ 811,943	\$ 811,943	\$ 811,943
Revenue Bonds										
Principal Payment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest Payment	-	-	-	-	-	-	-	-	-	-
Subtotal: Annual Debt Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Grand Total: Future Annual Debt Service	\$ 14,880	\$ 189,478	\$ 250,149	\$ 672,743	\$ 747,426	\$ 811,943	\$ 811,943	\$ 811,943	\$ 811,943	\$ 811,943
Grand Total: New Annual Coverage Requirement	\$ 2,976	\$ 37,896	\$ 50,030	\$ 134,549	\$ 149,485	\$ 162,389	\$ 162,389	\$ 162,389	\$ 162,389	\$ 162,389
Grand Total: Future Debt Reserve Target	\$ 14,880	\$ 189,478	\$ 250,149	\$ 672,743	\$ 747,426	\$ 811,943	\$ 811,943	\$ 811,943	\$ 811,943	\$ 811,943

TOTAL DEBT SERVICE:

Annual Obligations	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual Debt Service	\$ 43,599	\$ 191,337	\$ 252,008	\$ 674,602	\$ 749,285	\$ 813,802	\$ 813,802	\$ 813,802	\$ 813,802	\$ 813,802
Annual Coverage Requirement	\$ 37,439	\$ 40,127	\$ 52,261	\$ 136,779	\$ 151,716	\$ 164,619	\$ 164,619	\$ 164,619	\$ 164,619	\$ 164,619
Total Debt Reserve Target	\$ 17,739	\$ 189,650	\$ 250,320	\$ 672,913	\$ 747,595	\$ 812,110	\$ 812,108	\$ 812,105	\$ 812,102	\$ 812,098

ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Cost of Service Analysis

Arsenic Response #1
Path #2 - Phase 2B No Treatment Needed.

TABLE 14
Classification of Expenses

Budget Categories	Total Revenue Requirements	Commodity	Capacity	Customer	Fire Protection	Basis of Classification			
	FY 2019/20	(COM)	(CAP)	(CA)	(FP)	(COM)	(CAP)	(CA)	(FP)
OPERATING EXPENSE									
Source of Supply									
State Water Resources Ctrl Brd	\$ 8,100	\$ 4,050	\$ 4,050	\$ -	\$ -	50.0%	50.0%	0.0%	0.0%
Pumping									
Pumping - Maintenance	\$ 53,000	\$ 15,900	\$ 33,348	\$ 2,650	\$ 1,102	30.0%	62.9%	5.0%	2.1%
Pumping - Power	\$ 643,100	\$ 643,100	\$ -	\$ -	\$ -	100.0%	0.0%	0.0%	0.0%
Transmission & Distribution									
Automobile Expense	\$ 26,500	\$ 7,399	\$ 13,250	\$ 5,300	\$ 551	27.9%	50.0%	20.0%	2.1%
Merchant Processing Fees	\$ 2,800	\$ -	\$ -	\$ 2,800	\$ -	0.0%	0.0%	100.0%	0.0%
Continuing Education	\$ 8,100	\$ 1,857	\$ 5,670	\$ 405	\$ 168	22.9%	70.0%	5.0%	2.1%
General Liability Insurance	\$ 29,300	\$ 4,372	\$ 22,854	\$ 1,465	\$ 609	14.9%	78.0%	5.0%	2.1%
Health Insurance	\$ 116,700	\$ 17,412	\$ 91,026	\$ 5,835	\$ 2,427	14.9%	78.0%	5.0%	2.1%
Auto Insurance	\$ 5,800	\$ 2,489	\$ 2,900	\$ 290	\$ 121	42.9%	50.0%	5.0%	2.1%
Worker's Compensation	\$ 16,000	\$ 2,387	\$ 12,480	\$ 800	\$ 333	14.9%	78.0%	5.0%	2.1%
Uniforms / Laundry	\$ 6,300	\$ 940	\$ 4,914	\$ 315	\$ 131	14.9%	78.0%	5.0%	2.1%
Employee Retirement	\$ 31,800	\$ 4,745	\$ 24,804	\$ 1,590	\$ 661	14.9%	78.0%	5.0%	2.1%
Salaries / Wages	\$ 576,900	\$ 86,074	\$ 449,982	\$ 28,845	\$ 11,999	14.9%	78.0%	5.0%	2.1%
Payroll Taxes	\$ 45,200	\$ 6,744	\$ 35,256	\$ 2,260	\$ 940	14.9%	78.0%	5.0%	2.1%
Engineering	\$ 63,600	\$ 9,489	\$ 49,608	\$ 3,180	\$ 1,323	14.9%	78.0%	5.0%	2.1%
Rent / Lease Expense	\$ 500	\$ 75	\$ 390	\$ 25	\$ 10	14.9%	78.0%	5.0%	2.1%
Telephone Expense	\$ 5,300	\$ 791	\$ 4,134	\$ 265	\$ 110	14.9%	78.0%	5.0%	2.1%
Utilities	\$ 12,600	\$ 1,880	\$ 9,828	\$ 630	\$ 262	14.9%	78.0%	5.0%	2.1%
Trans. & Distribi. - Maintenance	\$ 318,300	\$ 47,491	\$ 248,274	\$ 15,915	\$ 6,620	14.9%	78.0%	5.0%	2.1%
Trans. & Distribi. - Water Sample	\$ 26,500	\$ 26,500	\$ -	\$ -	\$ -	100.0%	0.0%	0.0%	0.0%
Administrative & General									
Medical	\$ 300	\$ 45	\$ 234	\$ 15	\$ 6	14.9%	78.0%	5.0%	2.1%
Directors Fees	\$ 15,000	\$ 2,238	\$ 11,700	\$ 750	\$ 312	14.9%	78.0%	5.0%	2.1%
Advertising & Promotion	\$ 3,800	\$ 567	\$ 2,964	\$ 190	\$ 79	14.9%	78.0%	5.0%	2.1%
Bank Service Charges	\$ 3,600	\$ 537	\$ 2,808	\$ 180	\$ 75	14.9%	78.0%	5.0%	2.1%
Licenses & Permits	\$ 10,600	\$ 1,582	\$ 8,268	\$ 530	\$ 220	14.9%	78.0%	5.0%	2.1%
Computer Services & Software	\$ 13,400	\$ 1,999	\$ 10,452	\$ 670	\$ 279	14.9%	78.0%	5.0%	2.1%
Dues & Subscription	\$ 10,600	\$ 1,582	\$ 8,268	\$ 530	\$ 220	14.9%	78.0%	5.0%	2.1%
Equipment Rental	\$ 18,000	\$ 2,686	\$ 14,040	\$ 900	\$ 374	14.9%	78.0%	5.0%	2.1%
Equipment Rental - Backhoe	\$ 19,950	\$ 2,977	\$ 15,561	\$ 998	\$ 415	14.9%	78.0%	5.0%	2.1%
Meals & Entertainment	\$ -	\$ -	\$ -	\$ -	\$ -	14.9%	78.0%	5.0%	2.1%
Office Supplies & Expenses	\$ 21,200	\$ 3,163	\$ 16,536	\$ 1,060	\$ 441	14.9%	78.0%	5.0%	2.1%
Postage & Delivery	\$ 26,500	\$ -	\$ -	\$ 26,500	\$ -	0.0%	0.0%	100.0%	0.0%
Accounting	\$ 31,800	\$ 4,745	\$ 24,804	\$ 1,590	\$ 661	14.9%	78.0%	5.0%	2.1%
Legal	\$ 53,000	\$ 7,908	\$ 41,340	\$ 2,650	\$ 1,102	14.9%	78.0%	5.0%	2.1%
Other Professional Fees	\$ 77,000	\$ 11,489	\$ 60,060	\$ 3,850	\$ 1,601	14.9%	78.0%	5.0%	2.1%
Travel, Lodging & Meals Expense	\$ 3,300	\$ 492	\$ 2,574	\$ 165	\$ 69	14.9%	78.0%	5.0%	2.1%
Janitorial Expense	\$ 2,200	\$ 328	\$ 1,716	\$ 110	\$ 46	14.9%	78.0%	5.0%	2.1%
Repairs & Maintenance	\$ 4,300	\$ 642	\$ 3,354	\$ 215	\$ 89	14.9%	78.0%	5.0%	2.1%
SUB TOTAL: OPERATING EXPENSES	\$ 2,310,950	\$ 926,671	\$ 1,237,447	\$ 113,473	\$ 33,359	40.1%	53.5%	4.9%	1.4%

ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Cost of Service Analysis

Arsenic Response #1
Path #2 - Phase 2B No Treatment Needed.

TABLE 15
Classification of Expenses, continued

Budget Categories	Total Revenue Requirements	Commodity	Capacity	Customer	Fire Protection	Basis of Classification			
	FY 2019/20	(COM)	(CAP)	(CA)	(FP)	(COM)	(CAP)	(CA)	(FP)
Debt Service Payments									
Outstanding Debt	\$ 1,859	\$ -	\$ 1,859	\$ -	\$ -	0.0%	100.0%	0.0%	0.0%
New Debt Issue - SRF Loan	\$ 672,743	\$ -	\$ 672,743	\$ -	\$ -	0.0%	100.0%	0.0%	0.0%
New Debt Issue - Revenue Bond	\$ -	\$ -	\$ -	\$ -	\$ -	0.0%	100.0%	0.0%	0.0%
Total Debt Service Payments	\$ 674,602	\$ -	\$ 674,602	\$ -	\$ -	0.0%	100.0%	0.0%	0.0%
Capital Expenditures									
Rate Funded Capital Expenses	\$ 591,138	\$ -	\$ 591,138	\$ -	\$ -	0.0%	100.0%	0.0%	0.0%
TOTAL REVENUE REQUIREMENTS	\$ 3,576,690	\$ 926,671	\$ 2,503,187	\$ 113,473	\$ 33,359	25.9%	70.0%	3.2%	0.9%
Less: Non-Rate Revenues									
Water Sales Revenue									
Business & Commercial Water (Construction Meters)	\$ -	\$ -	\$ -	\$ -	\$ -	25.9%	70.0%	3.2%	0.9%
Industrial Water Sales	\$ -	\$ -	\$ -	\$ -	\$ -	25.9%	70.0%	3.2%	0.9%
Residential Water Sales	\$ -	\$ -	\$ -	\$ -	\$ -	25.9%	70.0%	3.2%	0.9%
Water Sales Revenue - Other	\$ -	\$ -	\$ -	\$ -	\$ -	25.9%	70.0%	3.2%	0.9%
Fire Protection Services (Private Fire)	\$ -	\$ -	\$ -	\$ -	\$ -	25.9%	70.0%	3.2%	0.9%
Water Services Revenue									
Activation Fee	\$ (8,490)	\$ -	\$ -	\$ (8,490)	\$ -	0.0%	0.0%	100.0%	0.0%
Call Outs	\$ (106)	\$ -	\$ -	\$ (106)	\$ -	0.0%	0.0%	100.0%	0.0%
Engineering Fees	\$ -	\$ -	\$ -	\$ -	\$ -	25.9%	70.0%	3.2%	0.9%
Labor Charge	\$ (10,612)	\$ (2,749)	\$ (7,427)	\$ (337)	\$ (99)	25.9%	70.0%	3.2%	0.9%
Penalties	\$ (79,591)	\$ (20,621)	\$ (55,702)	\$ (2,525)	\$ (742)	25.9%	70.0%	3.2%	0.9%
Miscellaneous Water Services	\$ (10,612)	\$ (2,749)	\$ (7,427)	\$ (337)	\$ (99)	25.9%	70.0%	3.2%	0.9%
Will Serve Fee	\$ (637)	\$ (165)	\$ (446)	\$ (20)	\$ (6)	25.9%	70.0%	3.2%	0.9%
Check Fee Charge	\$ (371)	\$ (96)	\$ (260)	\$ (12)	\$ (3)	25.9%	70.0%	3.2%	0.9%
Other Revenue									
Materials	\$ (31,836)	\$ (8,248)	\$ (22,281)	\$ (1,010)	\$ (297)	25.9%	70.0%	3.2%	0.9%
Interest - County Treasury	\$ (7,668)	\$ (1,987)	\$ (5,367)	\$ (243)	\$ (72)	25.9%	70.0%	3.2%	0.9%
NET REVENUE REQUIREMENTS	\$ 3,426,767	\$ 890,055	\$ 2,404,277	\$ 100,393	\$ 32,041				
<i>Allocation of Revenue Requirements</i>	<i>100.0%</i>	<i>26.0%</i>	<i>70.2%</i>	<i>2.9%</i>	<i>0.9%</i>				

TABLE 16
Classification of Expenses, continued
Adjustments to Classification of Expenses

Adjustment for Current Rate Level:	Total	(COM)	(CAP)	(CA)	(FP)
FY 2016/17 Target Rate Rev. After Rate Increases	\$ 2,153,050				
Projected Rate Revenue at Current Rates	\$ 1,856,078				
FY 2016/17 Projected Rate Increase	16.0%				
Adjusted Net Revenue Req'ts	\$ 2,153,050	\$ 559,225	\$ 1,510,616	\$ 63,077	\$ 20,132
<i>Percent of Revenue</i>	<i>100.0%</i>	<i>26.0%</i>	<i>70.2%</i>	<i>2.9%</i>	<i>0.9%</i>

TABLE 17

Proposed Rates 55% Fixed / 45% Variable	Total Rate Revenue Requirements FY 2019/20	Commodity Related Costs	Capacity Related Costs	Customer Related Costs	Fire Protection Related Costs
Rate-Design Adjustments to Fixed/Variable %	100.0%	45.0%	51.9%	2.2%	0.9%
Rate-Design Adjustments to Fixed/Variable (\$)	\$2,153,050	\$968,873	\$1,117,388	\$46,658	\$20,132

Variable (Volumetric Rates)	45%
Fixed Charges	55%

**ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Water Cost of Service Analysis**

TABLE 18

Development of the COMMODITY Allocation Factor		
Customer Class	May 2015 - April 2016 Volume (hcf) (1)	Percent of Total Volume
Single Family Residential	577,479	68.2%
Multi-Family Residential	109,800	13.0%
Commercial	106,905	12.6%
Industrial	20,185	2.4%
Landscape Irrigation	31,960	3.8%
Fire Protection (Private Fire)	-	0.0%
Total	846,329	100%
Fire Hydrant (Construction/Temporary Hydrant) (2)	2,657	
Grand Total	848,986	

1. Consumption for May 2015 - April 2016. ACSD bills monthly.

Source files: *Jan-Apr 2016 Customer Class Consumption.pdf*; *Jan-Dec 2015 Customer Class Consumption.pdf*

2. Excluded from consumption as the water charged used by construction/temporary hydrants is inconsistent.

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

TABLE 19

Development of the CAPACITY (MAX MONTH) Allocation Factor				
Customer Class	Average Monthly Use (hcf)	Peak Monthly Use (hcf) (1)	Peak Monthly Factor	Max Month Capacity Factor
Single Family Residential	48,123	68,017	1.41	65.7%
Multi-Family Residential	9,150	12,405	1.36	12.0%
Commercial	8,909	13,590	1.53	13.1%
Industrial	1,682	2,824	1.68	2.7%
Landscape Irrigation	2,663	6,669	2.50	6.4%
Fire Protection (Private Fire)	0	0	0.00	0.0%
Total	70,527	103,505	1.47	100%
Fire Hydrant (Construction/Temporary Hydrant)	221	778	3.51	
Grand Total	70,749	104,283	1.47	

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

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

**ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Water Cost of Service Analysis**

TABLE 20

Development of the CUSTOMER Allocation Factor		
Customer Class	Number of Meters (1,2)	Percent of Total
Single Family Residential	3,490	90.3%
Multi-Family Residential	116	3.0%
Commercial	180	4.7%
Industrial	16	0.4%
Landscape Irrigation	36	0.9%
Fire Protection (Private Fire)	27	0.7%
Total	3,865	100.0%
Fire Hydrant (Construction/Temporary Hydrant)	5	
Grand Total	3,870	

1. Meter Count for April 2016. ACSD bills monthly.

Source files: *Jan-Apr 2016 Customer Class Consumption.pdf; Jan-Dec 2015 Customer Class Consumption.pdf*

2. "No base" customers are excluded from this table. No base meters are meters that are duplicated and the counterpart meter is counted and pays the fixed fee, but both meters are read to obtain the total volumetric charges.

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.

ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Water Cost of Service Analysis/Rate Design

Arsenic Response #1
Path #2 - Phase 2B No Treatment Needed.

TABLE 21

Meter Size	Standard Meters (1)		Fire Service Meters (2)	
	Meter Capacity (gpm)	Equivalency to 3/4- inch	Meter Capacity (gpm)	Equivalency to 3/4- inch
	<u>Displacement Meters</u>		<u>Displacement Meters</u>	
5/8 inch	20	0.67	20	0.67
3/4 inch	30	1.00	30	1.00
1 inch	50	1.67	50	1.67
1.5 inch	100	3.33	100	3.33
2 inch	160	5.33	160	5.33
	<u>Compound Class I Meters</u>		<u>Fire Service Type I & II</u>	
3 inch	320	10.67	350	11.67
4 inch	500	16.67	700	23.33
6 inch	1,000	33.33	1,600	53.33
8 inch	1,600	53.33	2,800	93.33

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 22 - ALLOCATION OF WATER REVENUE REQUIREMENTS:

Categories	Cost-of-Service Net Revenue Requirements (2019-20) 74% Fixed / 26% Variable		Adjusted Net Revenue Requirements (2016-17) 55% Fixed / 45% Variable	
Commodity-Related Costs	\$ 559,225	26.0%	\$ 968,873	45.0%
Capacity-Related Costs	\$ 1,510,616	70.2%	\$ 1,117,388	51.9%
Customer-Related Costs	\$ 63,077	2.9%	\$ 46,658	2.2%
Fire Protection (Private Fire)	\$ 20,132	0.9%	\$ 20,132	0.9%
Net Revenue Requirement	\$ 2,153,050	100%	\$ 2,153,050	100%

TABLE 23 - Allocation of Adjusted Net Revenue Requirements - FY 2016/17:

<i>Proposed Rates 55% Fixed / 45% Variable</i>						
Customer Classes	Classification Components				Cost of Service Net Rev. Req'ts	% of COS Net Revenue Req'ts
	Commodity-Related Costs	Capacity-Related Costs	Customer-Related Costs	Fire Protection-Related Costs		
Single Family Residential	\$ 661,095	\$ 734,278	\$ 42,131	\$ -	\$ 1,437,503	66.8%
Multi-Family Residential	\$ 125,698	\$ 133,918	\$ 1,400	\$ -	\$ 261,017	12.1%
Commercial	\$ 122,384	\$ 146,711	\$ 2,173	\$ -	\$ 271,268	12.6%
Industrial	\$ 23,108	\$ 30,486	\$ 193	\$ -	\$ 53,787	2.5%
Landscape Irrigation	\$ 36,588	\$ 71,995	\$ 435	\$ -	\$ 109,017	5.1%
Fire Protection (Private Fire)	\$ -	\$ -	\$ 326	\$ 20,132	\$ 20,458	1.0%
Total Net Revenue Requirement	\$ 968,873	\$ 1,117,388	\$ 46,658	\$ 20,132	\$ 2,153,050	100%

TABLE 24 - Cost-of-Service Summary of Revenue Requirements:

Customer Class	Rate Revenue - FY 2014/15		Proposed Rates 55% Fixed / 45% Variable		
	Rate Revenue	% of Revenue	COS Rev. Req't	% of COS Rev. Req't.	% of 2014/15 vs. 2016/17
Single Family Residential	\$ 1,189,220	76.9%	\$ 1,437,503	66.8%	-10.2%
Multi-Family Residential	\$ 167,117	10.8%	\$ 261,017	12.1%	1.3%
Commercial	\$ 96,607	6.3%	\$ 271,268	12.6%	6.3%
Industrial	\$ 29,799	1.9%	\$ 53,787	2.5%	0.6%
Landscape Irrigation	\$ 50,603	3.3%	\$ 109,017	5.1%	1.8%
Fire Protection (Private Fire)	\$ 12,276	0.8%	\$ 20,458	1.0%	0.2%
Total	\$ 1,545,622	100.0%	\$ 2,153,050	100%	0.0%

TABLE 25 - CALCULATION OF MONTHLY FIXED METER SERVICE CHARGES FOR FY 2016/17

Proposed Rates 55% Fixed / 45% Variable								
Number of Meters by Class and Size (1)	FY 2016/17							Total
	3/4"	1"	1.5"	2"	3"	4"	6"	
Single Family Residential	3,257	217	5	11	-	-	-	3,490
Multi-Family Residential	47	2	2	55	4	5	1	116
Commercial	109	14	12	41	-	3	1	180
Industrial	3	1	-	12	-	-	-	16
Landscape Irrigation	6	4	1	20	3	2	-	36
Total Meters/Accounts	3,422	238	20	139	7	10	2	3,838
<i>Hydraulic Capacity Factor (2)</i>	<i>1.00</i>	<i>1.67</i>	<i>3.33</i>	<i>5.33</i>	<i>10.67</i>	<i>16.67</i>	<i>33.33</i>	
Total Equivalent Meters	3,422	397	67	741	75	167	67	4,935
Monthly Fixed Service Charges								
Customer Costs (\$/Acct/month) (3)	\$1.01	\$1.01	\$1.01	\$1.01	\$1.01	\$1.01	\$1.01	
Capacity Costs (\$/Acct/month) (4)	\$18.87	\$31.45	\$62.90	\$100.64	\$201.28	\$314.50	\$628.99	
Total Monthly Meter Charge	\$19.88	\$32.46	\$63.90	\$101.64	\$202.28	\$315.50	\$630.00	
Annual Fixed Costs Allocated to Monthly Meter Charges								
Customer Costs	\$ 46,332							
Capacity Costs	1,117,388							
Total Fixed Meter Costs	\$ 1,163,720							
Annual Revenue from Monthly Meter Charges								
Customer Charges	\$ 41,310	\$ 2,873	\$ 241	\$ 1,678	\$ 85	\$ 121	\$ 24	\$ 46,332
Capacity Charges	774,866	89,820	15,096	167,865	16,907	37,739	15,096	1,117,388
Total Revenue from Monthly Meter Charges	\$ 816,175	\$ 92,693	\$ 15,337	\$ 169,543	\$ 16,992	\$ 37,860	\$ 15,120	\$ 1,163,720

- Number of meters by size and customer class for April 2016. ACSD bills monthly.
Source files: Jan-Apr 2016 Customer Class Consumption.pdf; Jan-Dec 2015 Customer Class Consumption.pdf
- Source file: AWWA Manual M1, "Principles of Water Rates, Fees, and Charges", Table B-1.
- Customer costs are allocated to each customer by dividing the total customer costs by the total number of customers.
- Capacity costs are allocated by meter size and the hydraulic capacity of the meter.

TABLE 26 - CALCULATION OF MONTHLY FIRE METER SERVICE CHARGES FOR FY 2016/17

Proposed Rates 55% Fixed / 45% Variable					
Number of Meters by Class and Size (1)	FY 2016/17				Total
	3"	4"	6"	8"	
Fire Protection (Private Fire)	-	18	7	2	27
Total Meters/Accounts	-	18	7	2	27
Hydraulic Capacity Factor (2)	11.67	23.33	53.33	93.33	
Total Equivalent Meters	-	420	373	187	980
Monthly Fixed Service Charges					
Customer Costs (\$/Acct/month) (3)	\$1.01	\$1.01	\$1.01	\$1.01	
Capacity Costs (\$/Acct/month) (4)	\$19.97	\$39.94	\$91.30	\$159.78	
Total Monthly Meter Charge	\$20.98	\$40.95	\$92.31	\$160.78	
Annual Fixed Costs Allocated to Monthly Meter Charges					
Customer Costs	\$ 326				
Capacity & Fire Protection Costs	20,132				
Total Fixed Meter Costs	\$ 20,458				
Annual Revenue from Monthly Meter Charges					
Customer Charges	\$ -	\$ 217	\$ 85	\$ 24	\$ 326
Capacity Charges	-	8,628	7,669	3,835	20,132
Total Revenue from Monthly Meter Charges	\$ -	\$ 8,845	\$ 7,754	\$ 3,859	\$ 20,458

- Number of meters by size and customer class for April 2016. ACS D bills monthly.
Source files: *Jan-Apr 2016 Customer Class Consumption.pdf*; *Jan-Dec 2015 Customer Class Consumption.pdf*
- Source file: *AWWA Manual M6, "Water Meters - Selection, Installation, Testing and Maintenance"*, Table 5-3.
- Customer costs are allocated to each customer by dividing the total customer costs by the total number of customers.
- Capacity costs are allocated by meter size and the hydraulic capacity of the meter.

ARVIN COMMUNITY SERVICES DISTRICT
WATER RATE STUDY
Water Cost of Service Analysis/Rate Design

Arsenic Response #1
Path #2 - Phase 2B No Treatment Needed.

TABLE 27 - CALCULATION OF VOLUMETRIC CHARGES FOR FY 2016/17

Proposed Rates 55% Fixed / 45% Variable						
Customer Classes	Number of Meters (1)	Water Consumption (hcf/yr.) (2)	Target Rev. Req't from Vol. Charges	% of Total Rate Revenue	Uniform Commodity Rates (\$/hcf)	Proposed Rate Structure
Single Family Residential	3,490	577,479	\$ 661,095	31%	\$1.145	<i>Uniform</i>
Multi-Family Residential	116	109,800	\$ 125,698	6%	\$1.145	<i>Uniform</i>
Commercial	180	106,905	\$ 122,384	6%	\$1.145	<i>Uniform</i>
Industrial	16	20,185	\$ 23,108	1%	\$1.145	<i>Uniform</i>
Landscape Irrigation	36	31,960	\$ 36,588	2%	\$1.145	<i>Uniform</i>
Fire Protection (Private Fire)	27	0	\$ -	0%	<i>Not Metered</i>	<i>N/A</i>
Total	3,865	846,329	\$ 968,873	45%		

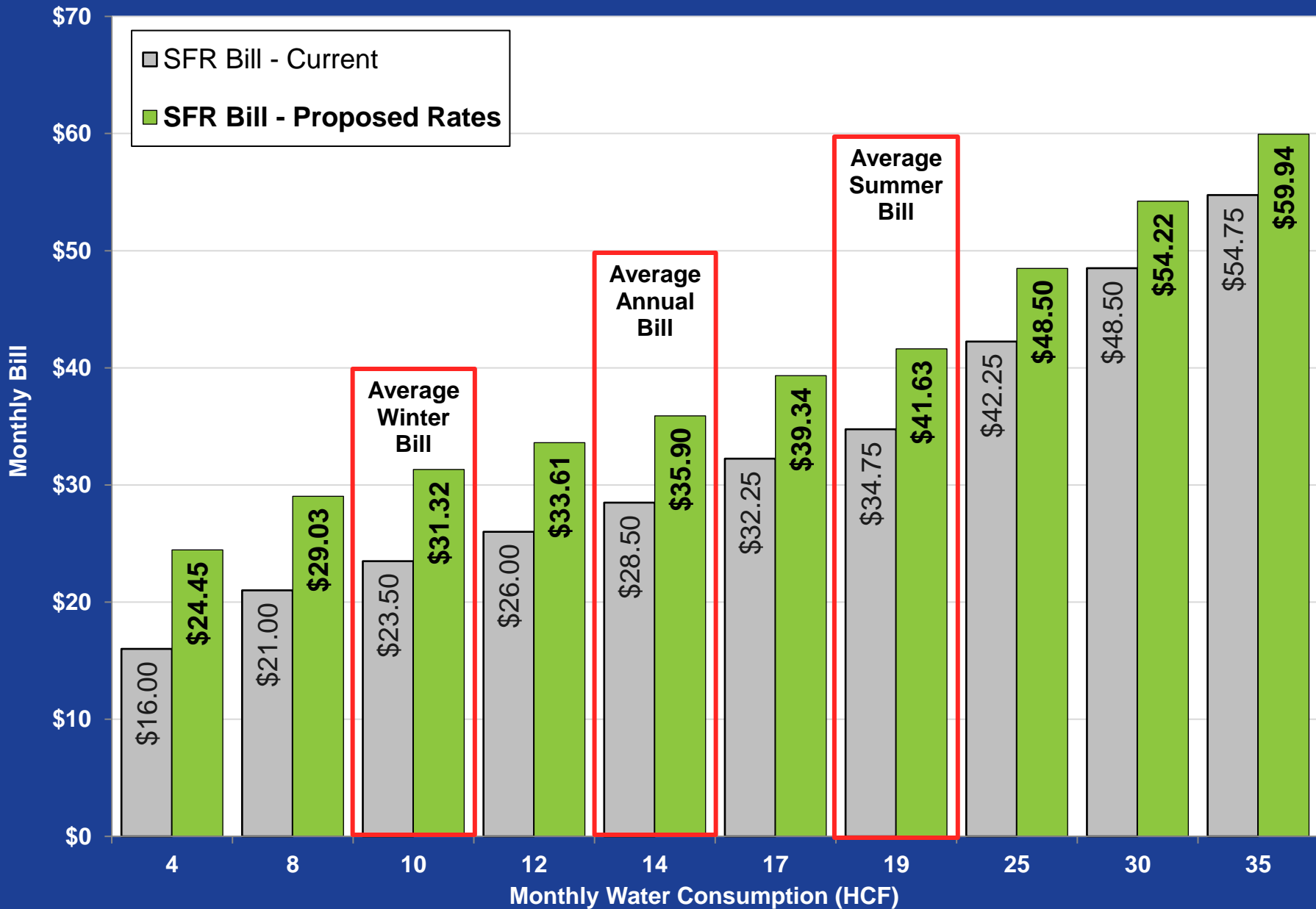
- Consumption for May 2015 - April 2016. ACSD bills monthly.
Source files: *Jan-Apr 2016 Customer Class Consumption.pdf*; *Jan-Dec 2015 Customer Class Consumption.pdf*
- Water consumption is zero % less than FY 2014/15 consumption to account for conservation.

CURRENT VS. PROPOSED WATER RATES:

TABLE 28

Proposed Rates 55% Fixed / 45% Variable						
Water Rate Schedule	Current Rates	Proposed Rates				
		FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<i>Projected Increase in Rate Revenue per Financial Plan:</i>		16.00%	15.50%	15.50%	15.50%	15.50%
Fixed Service Charge						
Monthly Fixed Service Charges:						
3/4 inch	\$11.00	\$19.88	\$22.96	\$26.51	\$30.62	\$35.37
1 inch	\$14.00	\$32.46	\$37.49	\$43.30	\$50.01	\$57.76
1.5 inch	\$20.00	\$63.90	\$73.81	\$85.25	\$98.46	\$113.73
2 inch	\$26.00	\$101.64	\$117.40	\$135.60	\$156.61	\$180.89
3 inch	\$38.00	\$202.28	\$233.64	\$269.85	\$311.68	\$359.99
4 inch	\$50.00	\$315.50	\$364.40	\$420.89	\$486.12	\$561.47
6 inch	\$74.00	\$630.00	\$727.65	\$840.43	\$970.70	\$1,121.16
Monthly Fire Service Charges:						
3 inch	\$27.00	\$20.98	\$24.23	\$27.99	\$32.32	\$37.33
4 inch	\$33.00	\$40.95	\$47.30	\$54.63	\$63.10	\$72.88
6 inch	\$45.00	\$92.31	\$106.61	\$123.14	\$142.23	\$164.27
8 inch	\$57.00	\$160.78	\$185.70	\$214.49	\$247.73	\$286.13
Commodity Charges for All Water Consumed						
Rate per hcf of Water Consumed	\$1.25	\$1.14	\$1.32	\$1.53	\$1.76	\$2.04

Residential Water Bill Comparison Current vs. Proposed 2016/17 Rate Alternatives (3/4" meter)



Commercial Water Bill Comparison Current vs. Proposed 2016/17 Rates (2-inch meter)

