

## WATER AND WASTEWATER RATE STUDY

### Final Study Report

March 2016

**OFFICE LOCATIONS:**

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

*Davis - Regional Office*  
140 B Street, Suite 5-292  
Davis, CA 95616

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

*Irvine - Regional Office*  
18012 Cowan Street, Suite 290  
Irvine, CA 92614

Phone: 800.676.7516  
[www.nbsgov.com](http://www.nbsgov.com)



## TABLE OF CONTENTS

SECTION 1. PURPOSE AND OVERVIEW OF THE STUDY .....	1
A. BACKGROUND AND STUDY OBJECTIVES .....	1
B. PURPOSE .....	1
C. OVERVIEW OF THE STUDY .....	1
D. RATE STUDY METHODOLOGY .....	2
SECTION 2. WATER RATE STUDY .....	5
A. KEY WATER RATE STUDY OBJECTIVES .....	5
B. WATER UTILITY REVENUE REQUIREMENTS .....	5
C. COST-OF-SERVICE ANALYSIS .....	7
D. CURRENT VS. PROPOSED WATER RATES .....	9
E. RATE STABILIZATION (DROUGHT) RATES .....	12
F. LOW INCOME DISCOUNT .....	14
SECTION 3. SEWER RATE STUDY .....	15
A. KEY SEWER RATE STUDY OBJECTIVES .....	15
B. SEWER UTILITY REVENUE REQUIREMENTS .....	16
C. SEWER CUSTOMER CHARACTERISTICS .....	18
D. CURRENT VS. PROPOSED SEWER RATES .....	20
E. RATE STABILIZATION (DROUGHT) RATES .....	23
SECTION 4. RECOMMENDATIONS AND NEXT STEPS .....	24
A. CONSULTANT RECOMMENDATIONS .....	24
B. NEXT STEPS .....	24
C. PRINCIPAL ASSUMPTIONS AND CONSIDERATIONS .....	25
TECHNICAL APPENDICES .....	26
APPENDIX A - WATER RATE ANALYSIS	
APPENDIX B - SEWER RATE ANALYSIS	

## LIST OF FIGURES

Figure 1. Primary Components Of A Rate Study .....	2
Figure 2. Summary of Water Revenue Requirements .....	7
Figure 3. Summary of Water Reserve Funds .....	7
Figure 4. Volumetric Cost Allocation Factors .....	8
Figure 5. Capacity-Related Cost (Fixed) Allocation Factors .....	8
Figure 6. Customer-Related Cost (Fixed) Allocation Factors .....	9
Figure 7. Current & Proposed Monthly Water Fixed Charges for FY 2016/17 through 2020/21 .....	10
Figure 8. Current & Proposed Monthly Water Volumetric Rates for FY 2016/17 through 2020/21 .....	11
Figure 9. Comparison of Bi-Monthly Water Bills for Single-Family Residential Customers .....	11
Figure 10. Comparison of Bi-Monthly Water Bills for Commercial Customers .....	12
Figure 11. Water Rate Stabilization Calculations .....	13
Figure 12. Water Rate Stabilization Rate Adjustments .....	13
Figure 13. Low Income Discounts .....	14
Figure 14. Summary of Sewer Revenue Requirements .....	17
Figure 15. Summary of Sewer Reserve Funds .....	18
Figure 16. Summary of Estimated Flow to Treatment Plant .....	18
Figure 17. Summary of Annual Flow and Strength Characteristics by Customer Class (TSS): .....	19
Figure 18. Summary of Annual Flow & Strength Characteristics by Customer Class (BOD): .....	19
Figure 19. Number of Accounts and Billing Units by Customer Class .....	20
Figure 20. Summary of Rate Revenue Requirements by Customer Class .....	20
Figure 21. Current vs. Proposed Sewer Rates .....	21
Figure 22. Residential Sewer Bill Comparison – Current vs. Proposed Rates .....	22
Figure 23. Commercial Sewer Bill Comparison – Current vs. Proposed Rates .....	22
Figure 24. Sewer Rate Stabilization Rates .....	23
Figure 25. Sewer Rate Stabilization Rate Adjustments .....	23

**Commented [CN1]:** Figure headings and references need to be updated AFTER track changes has all changes accepted.

We may include 5-year bill comparison graphs – email sent to client 3/8/2015 & we are waiting to hear back.



## SECTION 1. PURPOSE AND OVERVIEW OF THE STUDY

---

### A. BACKGROUND AND STUDY OBJECTIVES

The City of Benicia (City) supplies municipal water and sanitary sewer service to the community. The main source of City water is the State Water Project, via the North Bay Aqueduct. Total water system capacity is 12 million gallons per day (mgd), with a peak usage during the winter of four (4) mgd and twice that amount (8 mgd) during the summer. The City maintains 160 miles of water distribution pipelines and five water storage tanks with a combined capacity of 11.8 million gallons.

The City inspects and maintains 148 miles of sewer lines and owns and operates a 4.5-mgd wastewater treatment facility. This treatment plant opened in 1958 and was expanded to secondary treatment in 1978. A \$30 million major renovation and improvement project was completed in year 2000 to improve the plant's reliable capacity and meet state and federal environmental regulations.

In light of the now 4-year long drought, State-mandated conservation, and significant decreases in the level of consumption by City water customers, the City wanted a thorough re-examination of both water and sewer rates. The primary objectives in evaluating the City's rates included meeting broader rate design objectives, such as revenue sufficiency, providing adequate funding for rehabilitation and replacement of the City's aging water and sewer infrastructure, and meeting Proposition 218 (Prop 218) requirements, including those related to recent court decisions regarding water rates.

### B. PURPOSE

The City retained NBS in September 2014 to re-evaluate its water and sewer rates. Examining funding options for capital improvements and how much revenue is collected from fixed charges vs. volumetric rates were key components of this analysis (in addition to the primary objectives noted above). The rates developed in this study meet basic Prop 218 requirements and were developed based on industry standards, including recent court rulings<sup>1</sup> affecting how water rates must be established. In developing proposed new water and sewer rates, NBS and City Staff worked cooperatively in developing study results and rate alternatives. Based on input from the City Staff, NBS recommends the City adopt the water and sewer rates summarized in this report.

In addition to documenting this rate study performed, this report is also intended to meet the City's objective of maintaining transparent communications between the City and its residents and businesses.

### C. OVERVIEW OF THE STUDY

**Key Issues Addressed** – As part of the effort to meet the overall objectives summarized above, the specific elements addressed in this study included:

- **Overall Rate Design** – The fairness, equity and impacts of rate increases on customer bills are significant concerns to the City Council and staff and, therefore were critical considerations in evaluating the overall rate design, including the amount of revenue collected from fixed charges vs. volumetric rates. Several alternatives were evaluated prior to arriving at the proposed rates.
- **Financial Planning Alternatives** – The longer-range financial plans and capital improvement funding alternatives for the water and sewer utilities were closely examined and adjusted to best meet annual operating and longer-term capital improvement costs. Ten-year forecasts were prepared for three financial scenarios: Optimal, Achievable, and Minimal.

---

<sup>1</sup> Capistrano Taxpayers Association, Inc. v. City of San Juan Capistrano (2015) 235 Cal.Ap.4<sup>th</sup> 1493. See Appendix A for further explanation.

- **Water Conservation** – The City places a high priority on water conservation, and has seen an encouraging response to the drought and regulatory mandates. Combined with the planned installation of new water meters, it was important to accurately reflect projected water production and consumption levels in the rate analysis.
- **Rate Stabilization (Drought) Rates** – The City currently has five drought stages; rates corresponding to the continuing impacts of the drought were developed for the purpose of rate stabilization (that is, offsetting the revenue impacts of changing consumption levels).
- **Commercial Sewer Rates that Include a Volumetric Rate** – A new volumetric rate was developed based on monthly water consumption for commercial and industrial customers; this replaces the City's current rate calculation methodology and improves the equity of sewer rates by more accurately reflecting effluent generation of individual commercial and industrial customers.

**Recommendations** – As a part of the long-range financial plan, NBS evaluated projected revenues and expenditures and developed net revenue requirements. NBS recommends the City adopt the proposed water and sewer service rates and rate stabilization water rates summarized in this report.

#### D. RATE STUDY METHODOLOGY

**Components of the Rate Study Methodology** – A comprehensive utility rate study, whether for water or sewer rates, typically encompasses three major components: (1) the utility's overall revenue requirements and financial plan, (2) the cost-of-service for each customer class, and (3) rate structure design. These three components were used in this study, and are summarized in Figure 1.

Figure 1. Primary Components Of A Rate Study



These components reflect general industry standard cost-of-service methodologies, primarily from the American Water Works Association (AWWA)<sup>2</sup>, and are intended to address general requirements for equity and fairness. In terms of the chronology of the study, these three steps represent the order they were performed in this study.

As a part of this rate study, NBS projected revenues, expenditures, net revenue requirements, performed cost-of-service rate analyses, and evaluated rate design alternatives that resulted in the recommended new water and sewer rates. Significant rate increases -- or more accurately, increases in the total revenue collected from water and sewer rates<sup>3</sup> -- are recommended. The following sections present an overview of the methodologies, assumptions, and data used along with the financial plans and rates developed during this study.

<sup>2</sup> *Principles of Water Rates, Fees, and Charges*, Manual of Water Supply Practices, M1, AWWA, sixth edition, 2012.

<sup>3</sup> Increases in individual rates (and customer bills) in the first year will not match the annual percentage rate increase because cost-of-service adjustments typically result in rates in some classes being different than in other classes.

**Rate Design Criteria** – 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. For example, the foundation for evaluating rate structures is generally credited to James C. Bonbright in the *Principles of Public Utility Rates*<sup>4</sup> which outlines pricing policies, theories, and economic concepts along with various rate designs. The most commonly referenced industry standard in California is the AWWA Manual M1. The following is a simplified list of some of the broader 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 utility's perspective.
- Rates should promote the efficient allocation of the resource.
- Rates should be equitable and non-discriminating (that is, cost based).
- There should be continuity in the rate making philosophy over time.
- Other utility policies should also be considered (for example, encouraging conservation and economic development).
- Rates should provide month-to-month and year-to-year revenue stability.

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

**Rate Structure Issues** – One of the most fundamental components in rate design is the relationship between fixed and variable costs; the vast majority of rate structures contain a fixed charge in combination with a volumetric charge. Fixed costs typically do not vary with the amount of water consumed; debt service and personnel are examples of a fixed cost. In contrast, variable costs tend to change with the quantity of water sold, such as the cost of purchased water, chemicals and electricity. However, in the City's case, purchased water is primarily a fixed cost, because the price for water is not based on volume purchased and the City pays the same regardless of the quantity used.

The City of Benicia is unique in many ways; because of this, the City's rate design objectives are not necessarily the same as those of other communities. For example, communities with very expensive purchased water costs often place a very high priority on conservation-oriented rates. Other communities, such as those who have many low-income customers, may want to implement low-income subsidies. AWWA's Manual M1 states that these other priorities and community objectives can and should be considered in designing rate structures<sup>5</sup>.

In evaluating the City's rates, incorporating both Prop 218 requirements along with the City's unique rate design objectives were controlling factors.

### **Key Financial Assumptions**

Following are the key assumptions used in the water and sewer rate analyses:

- **Funding of Capital Projects** – After the City's extensive review of the planned capital improvement projects (CIP) and funding requirements, with assistance from V.W. Housen & Associates, the City developed three Funding Alternatives: Optimal, Achievable and Minimal. *The analyses and tables presented below assume the Optimal Funding Alternative for both utilities.*

<sup>4</sup> James C. Bonbright; Albert L. Danielsen and David R. Kamerschen, *Principles of Public Utility Rates*, (Arlington, VA: Public Utilities Report, Inc., Second Edition, 1988), p. 383-384.

<sup>5</sup> AWWA's M1 Manual states that "...pricing policies may support a community's social, economic, political, and environmental concerns." – see page 91.

- **Reserve Targets** – Target reserves for both Water and Sewer Utilities operations and maintenance (O&M) and capital rehabilitation and replacement (R&R), reflect typical industry practices for utility reserve fund management:

- ✓ Operating & Maintenance Reserve target levels – 90-days of O&M expenses.
- ✓ Capital Rehabilitation and Replacement Reserve levels – approximately 3.0 percent of net assets.

- **Inflation and Growth Projections** –

- ✓ No annual customer growth.
- ✓ General costs (such as professional and contractual services, fuel, vehicle maintenance, electricity) are inflated between 2 percent to 4 percent annually.
- ✓ Operating expenses are inflated at a rate of approximately 2 percent to 4.5 percent annually, and include chemicals purchased, energy, raw water purchases, and internal transfers.
- ✓ Labor costs are inflated at 3 percent annually, and include retirement and benefits.
- ✓ No inflation is added to other budget items, such as late fee revenue, lease income, and availability fees.

The next two sections discuss the water and sewer rate studies.

## SECTION 2. WATER RATE STUDY

---

### A. KEY WATER RATE STUDY OBJECTIVES

A few of the more specific objectives for the water rate study included:

- Incorporating the City's significant conservation of approximately 30 percent this year; to ensure adequate revenues are generated, the percentage of rate revenue collected from fixed charges should be increased.
- Finding an acceptable plan for generating sufficient revenue to meet projected funding requirements.
- Evaluating the customer bill impacts resulting from changing the percent of water rate revenue collected from fixed monthly charges vs. volumetric rates to improve revenue stability.
- Updating water fixed charges based on meter size.
- Evaluating volumetric rates in a manner that is consistent with Proposition 218.

NBS developed multiple water rate alternatives over the course of this study; all of them were developed using industry standards and cost-of-service principles and were "revenue neutral" (that is, they all generated the same amount of rate revenue). The following are the basic components of this analysis:

- **Developing Unit Costs:** The water revenue requirements were "functionalized" into three categories: (1) customer service costs; (2) fixed capacity costs; and (3) variable (or volume-based) costs.
- **Determining Revenue Requirements by Customer Class:** Costs for each of these functional costs were then allocated to customer classes based on allocation factors such as water consumption, peaking factors, and number of accounts. The total revenue that should be collected from each customer class was determined using these functional costs and allocation factors. For example, volume-related costs are allocated based on the water consumption for each class, while customer costs are allocated based on number of meters (or accounts).
- **Rate Design:** Once the revenue requirement for each customer class is determined, collecting these revenue requirements from each customer class is part of the rate design task. The two primary components of rate design involve (1) the percentages collected from fixed vs. variable charges, and (2) the number of tiers used in collecting volumetric charges.
  - ✓ *Fixed vs. Variable Costs* – The cost of service analysis indicated that approximately 77 percent of the City's costs are fixed and 23 percent are variable. Generally, the larger the ratio of variable revenue to fixed revenue, the greater the conservation incentive. In fact, members of the California Urban Water Conservation Council (CUWCC) are encouraged to recover at least 70 percent of revenue from variable charges, among other "best practices" designed to encourage customer conservation (CUWCC, 2011). Ironically, the inverse ratio commonly holds true for the costs of a water utility<sup>6</sup>.  
NBS developed two fixed/variable alternatives: one collects 70 percent of revenue from fixed charges and 30 percent of revenue from volumetric charges, while the other alternative collects 30 percent of revenue from fixed charges and 70 percent of revenue from volumetric charges.
  - ✓ *Volumetric Tiers* – The City's current rate structure includes three tiers for single-family customers and two tiers for non-residential customers. After reviewing the costs that would be recovered from different tiers, a uniform (single-tier) rate was recommended for all customer classes under both fixed/variable alternatives.

### B. WATER UTILITY 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.

---

<sup>6</sup> CUWCC statements provided by City Staff member Christian DiRenzo.

Rate increases are governed by the need to meet operating and capital costs, maintain adequate debt coverage, and maintain reserve funds. The current state of the City's water utility, with regard to these objectives is as follows:

- **Meeting Net Revenue Requirements:** The City's water utility is currently running a structural deficit in Fiscal Year (FY) 2016/17, which would increase significantly in FY 2020/21 if no rate increases are implemented. For FY 2016/17 through 2020/21, the projected net revenue requirement (that is, total annual expenses, less non-rate revenues) is approximately \$7.87 million to \$8.73 million. Recommended annual rate increases of 20 percent, 16 percent, 10 percent, 3 percent and 3 percent for 5 consecutive years are needed to fund all O&M and CIP (proposed rate increases would be effective July 1, 2016). Additionally, it appears the City will not meet its debt coverage requirement of 1.25 for its 2002 Refunding Bonds; with these rate increases, the utility will still miss this requirement until the second year (FY 2017/18).
- **Building and Maintaining Reserve Funds:** The City should maintain sufficient reserves; this analysis assumes reserves will be gradually built over the next 5 years with the intent of reaching the following recommended target reserve fund target balances:
  - ✓ **Operating Reserve** is intended to promote financial viability in the event of any short-term fluctuation in revenues and/or expenditures. Fluctuations might be caused by weather patterns, the natural inflow and outflow of cash during billing cycles, natural variability in demand-based revenue streams (for example, variable charges), and – particularly in periods of economic distress – changes or trends in age of receivables. Typical industry practices are to maintain 90 days (or 25 percent) of the Utility's budgeted annual operating expenses. However, current City policy is to maintain 75 days of budgeted annual revenues, which is equal to two and a half months (or 20 percent). NBS has used the City's policy in this analysis.
  - ✓ **Capital Rehabilitation and Replacement (R&R) Reserve** should typically be equal to a minimum of 3 percent of net depreciable capital assets, which equates to a 33-year replacement cycle for capital assets. This target serves simply as a starting point for addressing long-term capital repair and replacement needs.
  - ✓ **Rate Stabilization Fund** is designed to further promote financial stability when there are fluctuations in rate revenue. The target fund balance is set to 30 days of the Utility's budgeted annual operating expenses, or \$576,000 in FY 2016/17.
  - ✓ **Debt Reserve** is the reserve requirement for the outstanding SRF loan, which is \$749,001.

**CIP Funding Scenarios** – City staff developed three levels of funding for capital improvement projects. Each carries a different level of funding and revenue requirements; only the Optimal scenario is presented in the figures in the following sections of the water rate analysis:

1. **Optimal Funding Scenario** – Funds a total of \$3.6 million from FY 2016/17 to FY 2020/21 and results in rate increases over this period of 20 percent, 16 percent, 10 percent, 3 percent and 3 percent.
2. **Achievable Funding Scenario** – Funds a total of \$3.4 million from FY 2016/17 to FY 2020/21 and results in rate increases over this period of 20 percent, 12 percent, 8 percent, 4 percent and 4 percent.
3. **Minimal Funding Scenario** – Funds no CIP projects from FY 2016/17 to FY 2020/21 and results in rate increases over this period of 10 percent, 10 percent, 10 percent, 7 percent and 7 percent.

Figure 2 summarizes the sources and uses of funds, net revenue requirements, and the recommended annual percent increases in total rate revenue for the next 5 years. As this figure shows, the water utility runs at a deficit through FY 2017/18 after rate increases, with surpluses in subsequent years. These surpluses are used to build up reserves, with the intent of meeting target reserve-fund balances at some point in the future.

Figure 2. Summary of Water Revenue Requirements

Summary of Sources and Uses of Funds and Net Revenue Requirements	Budget		Projected			
	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>Sources of Water Funds</b>						
Rate Revenue Under Prevailing Rates	\$ 6,638,819	\$ 5,996,319	\$ 5,996,319	\$ 5,996,319	\$ 5,996,319	\$ 5,996,319
Non-Rate Revenues	1,410,685	1,116,685	1,117,921	1,117,921	1,117,921	1,117,921
Interest Earnings	5,555	8,411	7,546	9,717	16,768	36,500
<b>Total Sources of Funds</b>	<b>\$ 8,055,059</b>	<b>\$ 7,121,415</b>	<b>\$ 7,121,786</b>	<b>\$ 7,123,957</b>	<b>\$ 7,131,008</b>	<b>\$ 7,150,740</b>
<b>Uses of Water Funds</b>						
Operating Expenses	\$ 6,911,127	\$ 6,854,831	\$ 7,372,981	\$ 8,366,593	\$ 7,712,781	\$ 7,889,696
Debt Service	1,685,462	1,669,707	1,656,908	747,497	747,666	747,841
Rate-Funded Capital Expenses	-	475,957	482,548	832,877	405,746	1,390,474
<b>Total Use of Funds</b>	<b>\$ 8,596,589</b>	<b>\$ 9,000,496</b>	<b>\$ 9,512,437</b>	<b>\$ 9,946,966</b>	<b>\$ 8,866,193</b>	<b>\$10,028,011</b>
<b>Surplus (Deficiency) before Rate Increase</b>	<b>\$ (541,531)</b>	<b>\$ (1,879,080)</b>	<b>\$ (2,390,651)</b>	<b>\$ (2,823,009)</b>	<b>\$ (1,735,185)</b>	<b>\$ (2,877,271)</b>
Additional Revenue from Rate Increases	-	1,199,264	2,350,557	3,185,245	3,460,692	3,744,402
<b>Surplus (Deficiency) after Rate Increase</b>	<b>\$ (541,531)</b>	<b>\$ (679,816)</b>	<b>\$ (40,094)</b>	<b>\$ 362,235</b>	<b>\$ 1,725,507</b>	<b>\$ 867,131</b>
<b>Projected Annual Rate Increase</b>	<b>0.00%</b>	<b>20.00%</b>	<b>16.00%</b>	<b>10.00%</b>	<b>3.00%</b>	<b>3.00%</b>
Debt Coverage After Rate Increase	0.68	0.88	1.27	2.60	3.85	4.02
<b>Net Revenue Requirement<sup>1</sup></b>	<b>\$ 7,180,350</b>	<b>\$ 7,875,399</b>	<b>\$ 8,386,970</b>	<b>\$ 8,819,328</b>	<b>\$ 7,731,504</b>	<b>\$ 8,873,590</b>

1. 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, for the next 5 years. A summary of the water utility's proposed 10-year financial plan is included in Appendix A – Water Rate Study Summary Tables. These tables include revenue requirements, reserve funds, revenue source and proposed rate increases for the 10-year period.

Figure 3. Summary of Water Reserve Funds

Beginning Reserve Fund Balances and Recommended Reserve Targets	Budget		Projected			
	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>Operating Reserve</b>	\$ 1,166,491	\$ 490,420	\$ 455,943	\$ 825,669	\$ 1,745,101	\$ 2,589,667
<i>Recommended Minimum Target</i>	<i>1,420,000</i>	<i>1,409,000</i>	<i>1,515,000</i>	<i>1,719,000</i>	<i>1,585,000</i>	<i>1,621,000</i>
<b>Capital Rehabilitation &amp; Replacement Reserve</b>	\$ 515,763	\$ 515,763	\$ 515,763	\$ 515,763	\$ 688,200	\$ 708,000
<i>Recommended Minimum Target</i>	<i>708,200</i>	<i>700,800</i>	<i>693,900</i>	<i>697,300</i>	<i>688,200</i>	<i>708,000</i>
<b>Rate Stabilization Fund Reserve</b>	\$ -	\$ -	\$ -	\$ -	\$ 643,000	\$ 657,000
<i>Recommended Minimum Target</i>	<i>576,000</i>	<i>571,000</i>	<i>614,000</i>	<i>697,000</i>	<i>643,000</i>	<i>657,000</i>
<b>Debt Reserve</b>	\$ 749,001	\$ 749,001	\$ 749,001	\$ 749,001	\$ 749,001	\$ 749,001
<i>Recommended Minimum Target</i>	<i>749,001</i>	<i>749,001</i>	<i>749,001</i>	<i>749,001</i>	<i>749,001</i>	<i>749,001</i>
<b>Total Ending Balance</b>	<b>\$ 2,431,255</b>	<b>\$ 1,755,184</b>	<b>\$ 1,720,707</b>	<b>\$ 2,090,433</b>	<b>\$ 3,825,302</b>	<b>\$ 4,703,668</b>
<i>Total Recommended Minimum Target</i>	<i>\$ 3,453,201</i>	<i>\$ 3,429,801</i>	<i>\$ 3,571,901</i>	<i>\$ 3,862,301</i>	<i>\$ 3,665,201</i>	<i>\$ 3,735,001</i>

### C. COST-OF-SERVICE ANALYSIS

As noted in Figure 1, the second component of a water rate study is the cost-of-service analysis whereby annual revenue requirements are fairly and equitably allocated to customer classes. In the City's case, customer classes are represented by type of customer (that is, residential, multi-family, and commercial).

The first step in developing recommended fixed and volumetric charges is to allocate costs to: (1) capacity-related and similar fixed costs, or (2) variable costs. Figures 4 through 6 summarize the allocation factors used for in allocating costs to each of these classifications. Figure 4 shows the volumetric allocation factors, which are the relative percentages of annual consumption by various types of customers. The City of Benicia has already achieved 35 percent consumption conservation at the time of this study; state mandated conservation for the City of 28 percent total. This is in response to the general State conservation goal of 25 percent announced this spring by Governor Brown.

**Figure 4. Volumetric Cost Allocation Factors**

<b>Development of the COMMODITY Allocation Factors</b>			
<b>Customer Class</b>	<b>FY 2013/14 Volume (hcf)<sup>1</sup></b>	<b>Sep 2014 - Aug 2015 Volume (hcf)<sup>1</sup></b>	<b>Percent of Total Volume</b>
Residential	1,221,138	838,417	<b>59.2%</b>
Multifamily	207,014	177,060	<b>12.5%</b>
Mobile Home	18,330	13,801	<b>1.0%</b>
Commercial	141,071	158,626	<b>11.2%</b>
Industrial	24,934	42,956	<b>3.0%</b>
Municipal	13,533	8,118	<b>0.6%</b>
Municipal Irrigation (No Sewer)	106,254	62,107	<b>4.4%</b>
Irrigation (No Sewer)	173,557	113,098	<b>8.0%</b>
Construction Hydrant	1,184	1,035	<b>0.1%</b>
Fire Hydrant	2,282	-	<b>0.0%</b>
Fire sprinkler	-	-	<b>0.0%</b>
Untreated	-	-	<b>0.0%</b>
<b>Grand Total</b>	<b>1,909,296</b>	<b>1,415,218</b>	<b>100%</b>

1. Water use is per the City's utility billing data for FY 2013/14 and September 2014 - August 2015.

Figure 5 shows the peaking factors used to allocate costs that are related to system capacity (fixed costs).

Figure 6 shows the customer account data that is used to allocate more general billing and administrative costs (which are also considered fixed costs).

**Figure 5. Capacity-Related Cost (Fixed) Allocation Factors**

<b>Development of the CAPACITY Allocation Factors</b>				
<b>Customer Class</b>	<b>Average Bi-Monthly Use (hcf)</b>	<b>Peak Bi-Monthly Use (hcf)</b>	<b>Bi-Monthly Peaking Factor</b>	<b>Bi-Monthly Peak Capacity Factor</b>
Residential	153,445	235,698	<b>1.54</b>	<b>61.3%</b>
Multifamily	30,509	36,503	<b>1.20</b>	<b>9.5%</b>
Mobile Home	2,447	3,329	<b>1.36</b>	<b>0.9%</b>
Commercial	27,110	31,147	<b>1.15</b>	<b>8.1%</b>
Industrial	7,408	9,227	<b>1.25</b>	<b>2.4%</b>
Municipal	1,600	3,082	<b>1.93</b>	<b>0.8%</b>
Municipal Irrigation (No Sewer)	12,323	24,155	<b>1.96</b>	<b>6.3%</b>
Irrigation (No Sewer)	22,005	40,940	<b>1.86</b>	<b>10.6%</b>
Construction Hydrant	156	575	<b>3.69</b>	<b>0.1%</b>
Fire Hydrant	0	0	<b>0.00</b>	<b>0.0%</b>
Fire sprinkler	0	0	<b>0.00</b>	<b>0.0%</b>
Untreated	0	0	<b>0.00</b>	<b>0.0%</b>
<b>Grand Total</b>	<b>257,004</b>	<b>384,655</b>		<b>100.0%</b>

**Figure 6. Customer-Related Cost (Fixed) Allocation Factors**

Development of the CUSTOMER Allocation Factors		
Customer Class	Number of Meters <sup>1</sup>	Percent of Total
Residential	8,448	86.0%
Multifamily	306	3.1%
Mobile Home	12	0.1%
Commercial	466	4.7%
Industrial	73	0.7%
Municipal	29	0.3%
Municipal Irrigation (No Sewer)	72	0.7%
Irrigation (No Sewer)	192	2.0%
Construction Hydrant	10	0.1%
Fire Hydrant	8	0.1%
Fire sprinkler	211	2.1%
Untreated	1	0.0%
<b>Grand Total</b>	<b>9,828</b>	<b>100.0%</b>

1. From the City's Revenue billing data as of September 2015 (file: ACTIVE ACCOUNTS WITH WATER USAGE BILLED 010113 thru 083015.xls).

As previously shown in Figure 2, the total rate revenue expected to be collected in FY 2016/17 would be approximately \$7,195,583. This revenue of \$7.2 million, along with the cost allocation factors shown in Figures 4 through 6 are used to calculate the amount collected from fixed charges and volumetric rates.

How these costs are then collected from fixed and volumetric charges from each customer class is part of the rate design analysis, the third study component, which is presented in the next section.

#### D. CURRENT VS. PROPOSED WATER RATES

Currently, the City charges all customer classes a monthly fixed charge; non-residential charges are based on meter size, while residential customers pay a fixed monthly charge without reflecting the small differences typically found in residential meter sizes (multi-family and mobile home accounts are based on their total EDUs, which reflects their higher usage levels).

In addition to a fixed monthly charge, all customers pay commodity charges; residential customers have three tiers (Tier 1: 0-8 hcf, Tier 2: 8+-30 hcf, and Tier 3: 30+ hcf), and non-residential customers have two tiers (Tier 1: 0-30 hcf<sup>7</sup>, Tier 2: 30+ hcf). The City also provides water service for commercial fire meters, construction hydrants, and raw water.

NBS recommends using a uniform volumetric rate for all customers. This recommendation was the result of evaluating several potential configurations for tiered volumetric rates in light of the City's specific sources of water supply and the more stringent cost-basis that must be demonstrated for each tier as a result of the San Juan Capistrano Appellate Court decision.<sup>8</sup> Additionally, there are significant differences in typical water use for commercial and industrial customers (for example, laundromat vs. restaurants vs. office space), and a uniform commodity rate better represents the differences in their costs of service.

The City decided that two rate structure alternatives should be evaluated as part of this rate study. Both are revenue neutral (that is, they collect the same amount of revenue from individual customer classes):

<sup>7</sup> One hcf is equal to one hundred cubic feet of water, or 748 gallons.

<sup>8</sup> See the Appendix for a brief overview of key aspects of the San Juan Capistrano appellate court decision.

- Alternative #1 – collects 70 percent of revenue from volumetric charges and 30 percent of revenue from fixed charges, and
- Alternative #2 – collects 30 percent of revenue from volumetric charges and 70 percent of revenue from fixed charges.

Collecting 70 percent of the rate revenue from fixed charges provides the benefit of greater revenue stability, since revenue will change less with a higher amount collected from fixed charges. In contrast, collecting 70 percent of rate revenue from volumetric rates offers a higher incentive for conservation. While NBS would typically recommend a rate alternative that better protects the financial health of a water utility (that is, Alternative #2), the City carefully considered the relative benefits of revenue stability vs. conservation incentives in selecting a rate design alternative. After detailed review, the City chose Alternative #1 as the rate design structure that best meets the City's conservation goals; therefore, it is presented as the recommended rate alternative in this report.

Figure 7 and Figure 8 provide a comparison of the current and proposed monthly rates for FY 2016/17 through 2020/21. Figure 9 shows a comparison of bi-monthly bills for residential customers under current and proposed rates at varying levels of water consumption and Figure 10 shows a similar comparison of commercial customers.

**Figure 7. Current & Proposed Monthly Water Fixed Charges for FY 2016/17 through 2020/21  
Optimal Funding Scenario**

Current vs. Proposed Monthly Water Rates	Current Rates	New AMI Monthly Fee*	Recommended Water 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>			20.00%	16.00%	10.00%	3.00%	3.00%
<b>Fixed Charges</b>							
<b>SFR Fixed Charges</b>							
Single Family Service Charge:	\$19.86	\$6.00	\$13.00	\$15.08	\$16.59	\$17.09	\$17.60
Multiple Family Service Charge* (per EDU):	\$14.91	\$6.00	* Multi-Family and Mobile Home Park Customers are no longer included in the Residential Customer Class; Fixed Charges will be based on meter size.				
Mobile Home Park Service Charge* (per EDU):	\$14.91	\$6.00					
<b>All Other Users Fixed Charges (Excl. Commercial Fire)</b>							
5/8 inch	\$25.65	\$6.00	\$14.90	\$17.28	\$19.01	\$19.58	\$20.17
3/4 inch	\$25.65	\$6.00	\$21.76	\$25.24	\$27.77	\$28.60	\$29.46
1 inch	\$45.57	\$7.00	\$35.49	\$41.17	\$45.29	\$46.64	\$48.04
1.5 inch	\$102.50	\$7.00	\$69.81	\$80.98	\$89.08	\$91.75	\$94.50
2 inch	\$182.17	\$7.00	\$111.00	\$128.76	\$141.63	\$145.88	\$150.26
3 inch	\$409.86	\$7.00	\$207.10	\$240.23	\$264.25	\$272.18	\$280.35
4 inch	\$728.59	\$7.00	\$413.02	\$479.10	\$527.01	\$542.83	\$559.11
6 inch	\$1,639.29	\$7.00	\$927.84	\$1,076.29	\$1,183.92	\$1,219.44	\$1,256.02
8 inch	--	\$7.00	\$1,236.72	\$1,434.60	\$1,578.06	\$1,625.40	\$1,674.16
10 inch	--	\$7.00	\$1,648.58	\$1,912.35	\$2,103.58	\$2,166.69	\$2,231.69
<b>Fixed Charges - Commercial Fire Meters</b>							
<b>Automatic Sprinkler Service Charge:</b>							
5/8 inch	--	--	\$1.43	\$1.66	\$1.82	\$1.88	\$1.94
3/4 inch	--	--	\$1.56	\$1.82	\$2.00	\$2.06	\$2.12
1 inch	--	--	\$1.84	\$2.13	\$2.34	\$2.41	\$2.48
1.5 inch	--	--	\$2.51	\$2.91	\$3.20	\$3.30	\$3.40
2 inch	\$12.62	--	\$3.32	\$3.85	\$4.24	\$4.37	\$4.50
3 inch	--	--	\$5.21	\$6.05	\$6.65	\$6.85	\$7.06
4 inch	\$23.59	--	\$10.62	\$12.32	\$13.55	\$13.96	\$14.38
6 inch	\$33.39	--	\$22.79	\$26.44	\$29.08	\$29.95	\$30.85
8 inch	\$43.77	--	\$39.01	\$45.25	\$49.78	\$51.27	\$52.81
10 inch	\$53.78	--	\$60.64	\$70.35	\$77.38	\$79.70	\$82.09
12 inch	\$63.88	--	--	--	--	--	--
<b>Private Fire Hydrants Service Charge:</b>							
Double outlet & steamer	\$16.85	--	\$10.62	\$12.32	\$13.55	\$13.96	\$14.38
Single outlet & wharf	\$5.07	--	\$10.62	\$12.32	\$13.55	\$13.96	\$14.38

\* Proposed New Automatic Metering Infrastructure (AMI) fee included in bill calculations per City Staff. AMI replacement not included in this analysis. Meters 1-inch and larger have a slightly higher charge per month.

Figure 8. Current & Proposed Monthly Water Volumetric Rates for FY 2016/17 through 2020/21  
*Optimal Funding Scenario*

Current vs. Proposed Monthly Water Rates	Current Rates	Recommended Water 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>		20.00%	16.00%	10.00%	3.00%	3.00%
<b>Volumetric Charges</b>						
<b>Single Family Residential:</b>						
Tier 1, 0 - 8 hcf	\$2.60	--	--	--	--	--
Tier 2, 8+ - 30 hcf	\$4.07	--	--	--	--	--
Tier 3, 30+ hcf	\$4.56	--	--	--	--	--
Single Tier, Rate per hcf	--	\$3.56	\$4.13	\$4.54	\$4.67	\$4.81
<b>Non-Residential:</b>						
Tier 1, 0 - 30 hcf	\$3.29	--	--	--	--	--
Tier 2, 30+ hcf	\$3.99	--	--	--	--	--
Single Tier, Rate per hcf	--	\$3.56	\$4.13	\$4.54	\$4.67	\$4.81
<b>Industrial &amp; Construction Hydrants</b>						
Single Tier, Rate per hcf	--	\$3.56	\$4.13	\$4.54	\$4.67	\$4.81

Figure 9. Comparison of Bi-Monthly Water Bills for Single-Family Residential Customers

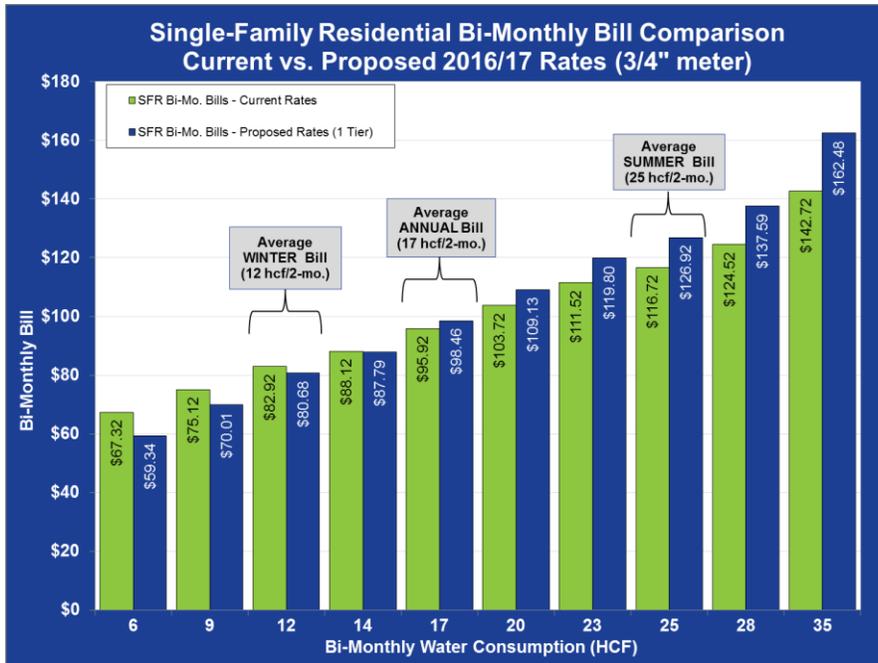
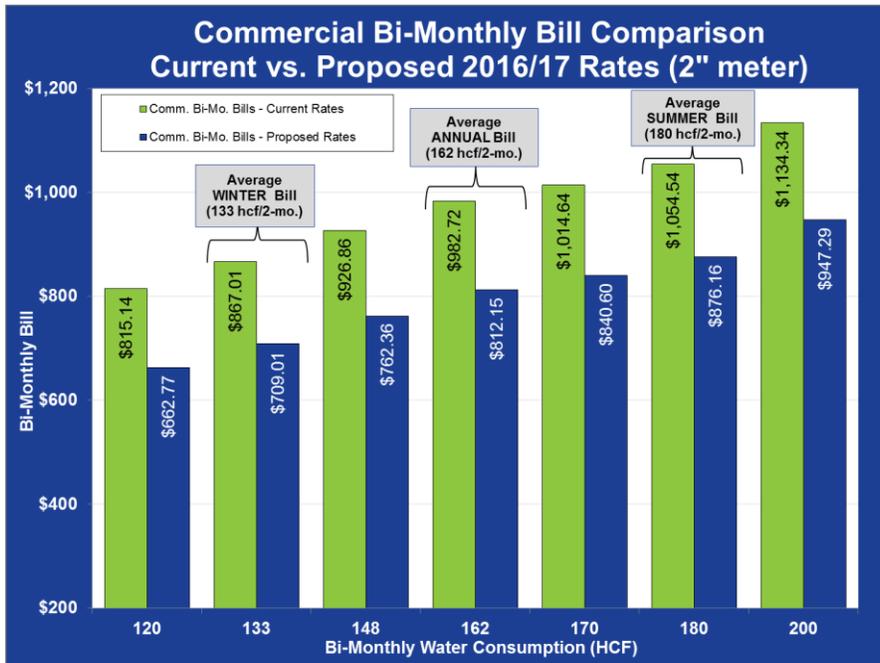


Figure 10. Comparison of Bi-Monthly Water Bills for Commercial Customers



### E. RATE STABILIZATION (DROUGHT) RATES

The study included revision of the City’s rate stabilization (drought) rates. When the State of California mandated drought-related cutbacks,<sup>9</sup> the City of Benicia was mandated a 20 percent reduction as compared to 2013 consumption levels. At the time of this report, the City has exceeded their conservation goals by over 10 percent.

Rate stabilization rates can be used to offset potential lost revenue and to encourage customers to reduce consumption levels. Given the current uncertainty about future conservation levels, including mandated conservation, the City’s water utility should prepare for the potential conservation-related net losses of revenue that, in the long run, would be financially unsustainable.

The City has five stages of rate stabilization calculations, ranging from voluntary conservation up to 50 percent conservation. The revised rate stabilization rates have three stages: (1) the current stage set at 30 percent conservation, (2) 40 percent conservation, and (3) 50 percent conservation. Figure 111 and **Error! Reference source not found.** show the rate stabilization calculations developed to offset these drought-related reductions, for both rate alternatives. Rates are presented as a percentage change over proposed volumetric rates per hcf.

**Commented [AC2]:** I see Carmen’s note in the TOC regarding necessary figure updates. Using comments, I’ve noted the specific places that figure numbering is incorrect throughout the report. Figures 11 and 12 are not cited in text or present in the report; Figure 14 is cited here, but the figure itself was removed. Are these figures going to be inserted, or do we need to renumber the figures (starting with Figure 11)?

<sup>9</sup> State Water Resources Control Board, Resolution 2015-0032.

Figure 111. Water Rate Stabilization Calculations

ADJUSTED REVENUE REQUIREMENTS - RATE STABILIZATION RATES

Adjusted Net Revenue Requirements (70% Variable, 30% Fixed)			
Estimated Volumetric Rates Needed to Offset Net Revenue Losses Due to Conservation	Conservation Scenario		
	Stage 3 <sup>1</sup>	Stage 4	Stage 5
<i>Conservation Level (vs. 2013 Level)</i>	30%	40%	50%
<i>Change from Current Consumption</i>	0%	10%	20%
<b>Annual Water Sales &amp; Reductions</b>			
Current Water Sales (hcf/yr.) <sup>2</sup>	1,415,218	1,415,218	1,415,218
Change in Water Sales vs. Current per Stage (hcf) <sup>3</sup>	0	(141,522)	(283,044)
<b>Adjusted Water Sales (hcf/yr.)</b>	<b>1,415,218</b>	<b>1,273,696</b>	<b>1,132,174</b>
<b>Revenue Reqts. &amp; Conservation Rate Calculation</b>			
Current Volumetric Rate Revenue Requirements <sup>4</sup>	\$5,034,727	\$5,034,727	\$5,034,727
Adjustment to Volumetric Costs <sup>5</sup> :			
Chemicals - Increase or (Decrease)	\$0	(\$8,895)	(\$17,790)
Total: Adjustment to Volumetric Costs	\$0	(\$8,895)	(\$17,790)
<b>Adjusted Volumetric Rate Revenue Reqts.</b>	<b>\$5,034,727</b>	<b>\$5,025,832</b>	<b>\$5,016,937</b>
<b>Adjustment to Uniform Volumetric Rate (%)<sup>6</sup></b>	<b>0%</b>	<b>10%</b>	<b>20%</b>

1. The City of Benicia is currently in Stage 3 Conservation Scenario.
2. From Water Rate Model.
3. Change from Current Consumption % percentage multiplied by Current Water Sales.
4. From proposed new rates (30% fixed/70% variable).
5. FY 2015/16 Budget expense times Change from Current Consumption % percentage.
6. Adjustment to Uniform Volumetric Rate was rounded up to the nearest percent.

Figure 122. Water Rate Stabilization Rate Adjustments

PERCENTAGE ADJUSTMENTS TO VOLUMETRIC RATES - RATE STABILIZATION RATES

Adjusted Net Revenue Requirements (70% Variable, 30% Fixed)					
Proposed Uniform Volumetric Rates by Conservation Level					
Conservation Scenario	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Rate Increases (per Financial Plan):	20%	16%	10%	3%	3%
Stage 3 (30% Conservation) <sup>1</sup>	0%	0%	0%	0%	0%
Stage 4 (40% Conservation)	10%	10%	10%	10%	10%
Stage 5 (50% Conservation)	20%	20%	20%	20%	20%

1. The City of Benicia is currently in Stage 3 Conservation Scenario.

## F. LOW INCOME DISCOUNT

The City wishes to continue offering qualified low income water customers a discount on the fixed portion of their bill. The discount is funded from the General Fund annually, is not subsidized by other water utility customers, and was recalculated using current water consumption levels, the projected number of qualified low-income customers, and anticipated funding available from the General Fund. There is no discount on commodity-based rates.

Figure 13 shows the current and proposed low-income discount per account (not per dwelling unit), per month for FY 2016/17 to FY 2020/21, and is based on the estimated available funding from the City's General Fund. Future discounts may change accordingly based on future General Fund availability.

**Figure 13. Low Income Discounts**

Low Income Discount	Current Rates	Recommended Water Rates				
		FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>Low-Income Senior Citizen Discount:</b>		<b>Low Income Discount Per Account, Per Month (1):</b>				
Single Family Service Charge:	\$ 9.93	\$ 7.10	\$ 8.20	\$ 9.10	\$ 9.30	\$ 9.60
Multiple Family Service Charge:	\$ 7.46	\$ 7.10	\$ 8.20	\$ 9.10	\$ 9.30	\$ 9.60
<b>Water Rates per hcf:</b>						
0 - 8 hcf	\$ 1.97	--	--	--	--	--
8+ - 30 hcf	\$ 3.10	--	--	--	--	--
30+ hcf	\$ 3.31	--	--	--	--	--

1. Proposed Low Income Discount applies to Fixed Rate only. This rate structure is easier to administer and is consistent with promoting conservation.

## SECTION 3. SEWER RATE STUDY

---

### A. KEY SEWER RATE STUDY OBJECTIVES

The specific objectives addressed in the sewer rate analysis included:

- Evaluating alternatives for generating the additional revenue needed to meet projected revenue requirements, which are primarily driven by the need to fund capital improvement costs.
- Updating the fixed charges for residential, multi-family, and mobile home customers.
- Creating a new residential volumetric-based charge that is applied to monthly water consumption (but capped at 9 hcf/month so as to minimize the impacts of outdoor irrigation-related water use).
- Updating fixed charges for commercial, industrial and municipal customers to better reflect the actual cost of service.
- Creating a volumetric-based charge for commercial, industrial and municipal customers tied to monthly water use, which replaces the current outdated and complicated City formula.

During the course of this study, NBS developed a number of sewer rate alternatives for the City to consider. As with the water rates, all rate structure alternatives reflect industry standards and cost-of-service principles. These rate alternatives also reflect the input from City staff and direction from the City Council, and the decision for selecting the alternative implemented ultimately lies with the City Council.

The updated rates considered the net revenue requirements, number of customer accounts, number of equivalent dwelling units (EDUs), water consumption, and the estimated amount and strength of the effluent. The following are the basic components included in calculating new rates:

- **Customer Classes:** Customer classes are typically determined by grouping customers with similar flow and strength characteristics into different categories, in order to reflect the cost differences in serving each type of customer. The City's existing customer classes, which have been maintained in the rates developed and proposed in this report, are as follows:
  - ✓ **Residential** – Consists of single-family, multi-family and mobile home residential properties; while single-family customers are charged for each account, multi-family and mobile home accounts are assessed fixed charges based on the number of EDUs.
  - ✓ **Commercial and Industrial** – All commercial and industrial users have been combined into one class, but have been re-classified into one of three strength categories (that is, low-, medium- or high-strength users).
  - ✓ **Municipal** – Includes all municipal users, which are all City accounts.
- **Cost Allocation Factors:** For the purpose of allocating costs to customer classes, the sewer revenue requirements were "functionalized" into four categories: (1) flow (volume) related costs; (2) strength costs related to biochemical oxygen demand (BOD); (3) strength costs related to total suspended solids (TSS); and (4) customer service related costs. The effluent strength factors were derived from the State Water Resources Control Board<sup>10</sup>.

These cost allocation factors have different implications for the costs of serving customers. For example, effluent from customers with higher levels of BOD and TSS is more costly to treat at the sewer treatment plant and, therefore, those customers should be allocated a greater proportion of treatment costs compared to residential customers, who have lower-strength effluent. Detailed tables documenting these cost allocations are shown in Appendix B.

- **Determining Revenue Requirements by Customer Class:** The cost allocation factors were used to determine the percentage of the revenue requirements allocated to each customer class. For example,

---

<sup>10</sup> State Water Resources Control Board Revenue Program Guidelines, Appendix G, page G-21 "Commercial User Strength Characteristics" (which include residential customer strengths).

customer costs are allocated based on number of accounts and billable units, flow-related costs are allocated based on the estimated volume of effluent generated by each class, and strength-related costs are allocated based on estimated pounds of BOD and TSS resulting from the wastewater discharged by each customer class. Once these costs are allocated and the revenue requirement for each customer class is determined, collecting these revenue requirements from each customer class is addressed in the rate design task.

- **Rate Design:** The revenue collected from residential customers is based on their number of EDUs and monthly water consumption (capped at 9 hcf/month). Capping water consumption provides a reasonable estimate of indoor water use that enters the sewer collection system and is ultimately processed at the wastewater treatment plant. Revenue requirements for commercial, industrial, and municipal customers are most commonly developed based on the number of accounts and their monthly water consumption. This is because the amount of wastewater discharged by each commercial and industrial user is generally assumed to be more correlated to their water use than residential customers.

**Results for Residential Customers** – The proposed sewer rates for residential customers retain a combined single family, multi-family, and mobile home “residential” class, but add a volumetric rate based on monthly water use. This volumetric rate will apply to water use but be capped at 9 hcf per month, or 18 hcf every two months, as the City bills bi-monthly.

**Results for Commercial Customers** – The proposed sewer rate structure for commercial, industrial and municipal customers will continue to use a fixed monthly charge per account, but creates a new variable rate based on monthly water consumption. The City’s current methodology of applying effluent strength- and volumetric-factors to commercial and industrial customers is outdated and therefore is being replaced with a volumetric rate that is applied to accounts that have been re-classified into low-, medium-, or high strength users.

## B. SEWER UTILITY 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 and build reserve funds. The current state of the City’s sewer utility is as follows:

- **Meeting Net Revenue Requirements:** The City’s sewer utility is currently running a structural deficit in FY 2016/17, which would increase significantly in FY 2020/21 if no rate increases are implemented. Projected net revenue requirement (that is, total annual expenses plus debt service and rate-funded capital costs, less non-rate revenues) increases from approximately \$8.5 million to \$11.5 million in FY 2016/17 through 2020/21.

Recommended annual rate increases of 16 percent, 12 percent, 9 percent, 7 percent, and 5 percent are needed to fund all O&M and the “Optimal” CIP funding scenario. Similar to the water utility, if rate increases aren’t implemented, the sewer utility will not meet its debt coverage requirements for its outstanding debt<sup>11</sup>, and will begin running annual deficits, which will require larger rate adjustments in later years.

- **Building and Maintaining Reserve Funds:** The City should maintain sufficient reserves; NBS recommends that the City adopt and maintain the following reserve fund targets:

---

<sup>11</sup> The sewer utility currently has three debt obligations: 2005 revenue refunding bonds, a wastewater treatment plant SRF loan, and an inflow and infiltration SRF loan. These rate increases will enable the sewer utility to meet its coverage requirements, although a temporary transfer-in of cash reserves in FY 2016/17 will be needed to meet the 1.25 coverage requirement; otherwise, an FY 2016/17 rate increase of more than 35 percent would be needed.

- ✓ **Operating Reserve** is intended to promote financial viability in the event of any short-term fluctuation in revenues and/or expenditures. This reserve is often set to equal 90 days of the Utility's budgeted annual operating expenses. However, the City's policy is to hold 75 days of the budgeted annual revenues in reserve, which is equal to a two-and-a-half month (or 20 percent) cash cushion for normal operations. NBS used the City's policy in this analysis.
- ✓ **Capital Rehabilitation and Replacement Reserve** equal to a minimum of 3 percent of net depreciable capital assets (or approximately \$1,570,200 based on a total system asset value of approximately \$53.9 million). This reserve provides for capital repair and replacement needs.
- ✓ **Rate Stabilization Fund** is designed to further promote financial stability when there are fluctuations in rate revenue. The target fund balance is set to 30 days of the Utility's budgeted annual operating expenses, or \$770,000 in FY 2016/17.

**CIP Funding Scenarios** – As with the water rate analysis, City staff developed three levels of funding for capital improvement projects for consideration; only the Optimal scenario is presented in the figures in the following sections of the sewer rate analysis:

1. **Optimal Funding Scenario** – Funds a total of \$7.2 million from FY 2016/17 to FY 2020/21 and results in rate increases over this period of 16 percent, 12 percent, 9 percent, 7 percent and 5 percent.
2. **Achievable Funding Scenario** – Funds a total of \$4.3 million from FY 2016/17 to FY 2020/21 and results in rate increases over this period of 8 percent, 6 percent, 6 percent, 3 percent and 2 percent.
3. **Minimal Funding Scenario** – Funds a total of \$2.0 million from FY 2016/17 to FY 2020/21 and results in rate increases over this period of 4 percent, 3 percent, 3 percent, 3 percent and 3 percent.

Figure 14 summarizes the sources and uses of funds, including net revenue requirements, and the recommended annual percent increases in total rate revenue for the next 5 years. As this figure shows, the sewer utility has a significant deficit in FY 2016/17 after rate increases. Any surpluses after rate increases are used to build up reserves, with the intent of meeting future target reserve-fund balances.

**Figure 14. Summary of Sewer Revenue Requirements**

Summary of Sources and Uses of Funds and Net Revenue Requirements	Budget	Projected				
	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>Sources of Sewer Funds</b>						
Rate Revenue Under Prevailing Rates	\$ 8,626,515	\$ 8,626,515	\$ 8,626,515	\$ 8,626,515	\$ 8,626,515	\$ 8,626,515
Non-Rate Revenues	91,798	91,798	91,798	91,798	91,798	91,798
Interest Earnings	6,427	13,452	5,474	5,505	12,797	12,533
<b>Total Sources of Funds</b>	<b>\$ 8,724,740</b>	<b>\$ 8,731,765</b>	<b>\$ 8,723,787</b>	<b>\$ 8,723,818</b>	<b>\$ 8,731,110</b>	<b>\$ 8,730,846</b>
<b>Uses of Sewer Funds</b>						
Operating Expenses	\$ 6,274,572	\$ 9,241,282	\$ 7,833,246	\$ 8,096,263	\$ 8,393,258	\$ 8,414,346
Debt Service	2,330,392	2,332,672	2,334,205	2,334,883	2,339,390	1,941,299
Rate-Funded Capital Expenses	-	498,623	1,316,736	1,409,137	2,631,552	1,194,052
<b>Total Use of Funds</b>	<b>\$ 8,604,964</b>	<b>\$ 12,072,577</b>	<b>\$ 11,484,187</b>	<b>\$ 11,840,283</b>	<b>\$ 13,364,200</b>	<b>\$ 11,549,697</b>
<b>Surplus (Deficiency) before Rate Increase</b>	<b>\$ 119,775</b>	<b>\$ (3,340,812)</b>	<b>\$ (2,760,400)</b>	<b>\$ (3,116,465)</b>	<b>\$ (4,633,091)</b>	<b>\$ (2,818,852)</b>
Additional Revenue from Rate Increases	-	1,380,242	2,581,053	3,589,734	4,444,872	5,098,441
<b>Surplus (Deficiency) after Rate Increase</b>	<b>\$ 119,775</b>	<b>\$ (1,960,570)</b>	<b>\$ (179,347)</b>	<b>\$ 473,269</b>	<b>\$ (188,219)</b>	<b>\$ 2,279,590</b>
<b>Projected Annual Rate Increase</b>	<b>0.00%</b>	<b>16.00%</b>	<b>12.00%</b>	<b>9.00%</b>	<b>7.00%</b>	<b>5.00%</b>
<b>Net Revenue Requirement<sup>1</sup></b>	<b>\$ 8,506,740</b>	<b>\$ 11,967,327</b>	<b>\$ 11,386,915</b>	<b>\$ 11,742,980</b>	<b>\$ 13,259,606</b>	<b>\$ 11,445,367</b>

<sup>1</sup>. Total Use of Funds less non-rate revenues and interest earnings. This is the annual amount needed from Sewer rates.

Figure 15 summarizes the projected reserve fund balances and reserve targets, for the next 5 years. A summary of the sewer utility's proposed 10-year financial plan is included in Appendix B – Sewer Rate Study Summary Tables. These tables include revenue requirements, reserve funds, revenue source and proposed rate increases for the 10-year period.

Figure 15. Summary of Sewer Reserve Funds

Beginning Reserve Fund Balances and Recommended Reserve Targets	Budget	Budget	Projected				
	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>Operating Reserve</b>							
Ending Balance	\$ 1,436,797	\$ 1,556,572	\$ (403,998)	\$ (583,344)	\$ (110,075)	\$ (298,294)	\$ 1,981,296
Recommended Minimum Target	1,566,000	1,569,000	2,310,000	1,958,000	2,024,000	2,098,000	2,104,000
<b>Capital Rehabilitation &amp; Replacement Reserve</b>							
Ending Balance	\$ 1,133,808	\$ 1,133,808	\$ 1,133,808	\$ 1,133,808	\$ 1,133,808	\$ 1,133,808	\$ 1,133,808
Recommended Minimum Target	1,618,800	1,570,200	1,534,500	1,526,800	1,502,400	1,533,900	1,522,600
<b>Rate Stabilization Fund Reserve</b>							
Ending Balance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Recommended Minimum Target	522,000	523,000	770,000	653,000	675,000	699,000	701,000
<b>Total Ending Balance</b>	<b>\$ 2,570,605</b>	<b>\$ 2,690,380</b>	<b>\$ 729,810</b>	<b>\$ 550,464</b>	<b>\$ 1,023,733</b>	<b>\$ 835,514</b>	<b>\$ 3,115,104</b>
<b>Total Recommended Minimum Target</b>	<b>\$ 3,706,800</b>	<b>\$ 3,662,200</b>	<b>\$ 4,614,500</b>	<b>\$ 4,137,800</b>	<b>\$ 4,201,400</b>	<b>\$ 4,330,900</b>	<b>\$ 4,327,600</b>

Commented [CN3]: Figure was replaced to remove footnote on figure (it was no longer applicable – due to change in debt service reserve)

### C. SEWER CUSTOMER CHARACTERISTICS

The key factors used in allocating costs as a part of the sewer cost-of-service analysis include the estimated effluent (flow) going to the sewer treatment plant from each customer class as well as the effluent strengths (BOD and TSS). Actual flow data from August 2014 through July 2015 at the City’s sewer treatment plant was used.

Based on water consumption records, residential customers account for approximately 78.8 percent of effluent at the plant (that is, single-family = 62.3 percent, multi-family = 15.1 percent, and mobile homes = 1.3 percent). Commercial and industrial customers account for 20.4 percent and municipal customers account for less than 1 percent of the flow. These estimates are summarized in Figure 16.

Figure 16. Summary of Estimated Flow to Treatment Plant

Development of the Volume Allocation Factor						
Customer Class	FY 2013/14 Annual Water Consumption (hcf) <sup>1</sup>	FY 2014/15 Annual Water Consumption (hcf) <sup>1</sup>	FY 2014/15 Annual Capped Water Consumption (hcf) <sup>2</sup>	FY 2014/15 Volume (MGD)	Adjusted Annual Volume Total (hcf) <sup>3</sup>	Percent of Adjusted Volume
Residential	1,142,266	825,955	614,988	1.69	623,039	62.3%
Multifamily	201,383	172,518	148,984	0.35	150,934	15.1%
Mobile Homes	17,258	13,170	13,170	0.03	13,342	1.3%
Commercial & Industrial - Low User	163,354	70,054	--	0.14	70,971	7.1%
Commercial & Industrial - Medium User <sup>4</sup>		38,752	--	0.08	39,259	3.9%
Commercial & Industrial - High User		92,776	--	0.19	93,991	9.4%
Municipal	12,257	7,760	--	0.02	7,862	0.8%
<b>Total</b>	<b>1,536,518</b>	<b>1,220,985</b>	<b>777,142</b>	<b>2.50</b>	<b>999,398</b>	<b>100%</b>
					Total Flow at WWTP (million gallons)	747.65
					Target Total (hcf)	999,398
					Adjustment Factor	1.01

(1) Consumption data was provided by the City on 10/06/2015 in file: ACTIVE ACCOUNTS CONSUMPTION HISTORY 2013-15.xls.  
 (2) Annual Capped Water Consumption is for Residential, Multifamily & Mobile Homes only; monthly cap is rounded up to 9 hcf/month (from 8.5).  
 (3) Adjusted annual volume is based on a Capped Monthly Water Consumption for Residential, Multi-Family and Mobile Home customers, and is equal to the Total Annual Water Consumption for Commercial, Industrial and Municipal customers.  
 (4) NBS assumed the 30 Commercial customers that were not categorized in to low, medium or high users could conservatively be included in the Commercial - Medium User category.

**Customer Class Effluent Strengths** – Effluent strength factors for individual customer classes can be determined by using the State Water Resources Control Council (SWRCB) Revenue Program Guidelines, Appendix G, page G-21 “Commercial User Strength Characteristics.” The estimated effluent strengths by customer class are described below.

- Residential customers, including single-family, multi-family and mobile homes, are estimated to have BOD and TSS strength factors of 200 mg/l.
- Commercial/Industrial customers can have strength factors that are higher or lower than residential users. As a part of this rate study, commercial/industrial users have been divided into three different strength-related classes (that is, low-, medium-, and high-strength users).

- Municipal standard strength customers are estimated to have the same BOD and TSS strength factors as residential users.

Figure 17 and Figure 18 summarize the flow and strength characteristics of the utility's sewer customer classes.

**Figure 17. Summary of Annual Flow and Strength Characteristics by Customer Class (TSS):**

Development of the Strength Allocation Factor					
Customer Class	Biochemical Oxygen Demand (BOD)				
	Adjusted Annual Flow	Average Strength Factor (mg/l) <sup>1</sup>	Calculated BOD (lbs./yr.)	Adjusted BOD (lbs./yr.)	Percent of Total
Residential	623,039	200	777,343	1,178,307	60.6%
Multifamily	150,934	200	188,315	285,451	14.7%
Mobile Homes	13,342	200	16,647	25,234	1.3%
Commercial & Industrial - Low User	70,971	75	33,206	50,333	2.6%
Commercial & Industrial - Medium User <sup>2</sup>	39,259	150	36,737	55,686	2.9%
Commercial & Industrial - High User	93,991	375	219,879	333,295	17.2%
Municipal	7,862	200	9,809	14,868	0.8%
<b>Total</b>	<b>999,398</b>		<b>1,281,935</b>	<b>1,943,174</b>	<b>100.0%</b>
<i>Target, from WWTP Data</i>				<i>1,943,174 BOD (lbs./yr.) 1.52 BOD Adj. Factor</i>	

(1) Average strength factors for BOD and TSS are derived from the SWRCB Revenue Program Guidelines, Appendix G.

(2) NBS assumed the 30 Commercial customers that were not categorized as low, medium or high users could conservatively be included in the Commercial - Medium User category.

**Figure 18. Summary of Annual Flow & Strength Characteristics by Customer Class (BOD):**

Development of the Strength Allocation Factor					
Customer Class	Total Suspended Solids (TSS)				
	Adjusted Annual Flow	Average Strength Factor (mg/l) <sup>1</sup>	Calculated TSS (lbs./yr.)	Adjusted TSS (lbs./yr.)	Percent of Total
Residential	623,039	200	777,343	1,444,786	59.2%
Multifamily	150,934	200	188,315	350,007	14.3%
Mobile Homes	13,342	200	16,647	30,940	1.3%
Commercial & Industrial - Low User	70,971	100	44,274	82,289	3.4%
Commercial & Industrial - Medium User <sup>2</sup>	39,259	175	42,860	79,660	3.3%
Commercial & Industrial - High User	93,991	400	234,537	435,916	17.9%
Municipal	7,862	200	9,809	18,230	0.7%
<b>Total</b>	<b>999,398</b>		<b>1,313,785</b>	<b>2,441,827</b>	<b>100.0%</b>
<i>Target, from WWTP Data</i>				<i>2,441,827 TDS (lbs./yr.) 1.86 TSS Adj. Factor</i>	

(1) Average strength factors for BOD and TSS are derived from the SWRCB Revenue Program Guidelines, Appendix G.

(2) NBS assumed the 30 Commercial customers that were not categorized as low, medium or high users could conservatively be included in the Commercial - Medium User category.

Figure 19 compares the total number of accounts and billing units or EDUs (depending on how customers are billed) by customer class. Figure 20 then summarizes the total rate revenue requirements by customer class resulting from the cost-of-service cost allocation process. Cost classification components include volume, treatment (BOD and TSS) and customer-related costs and are represented both as a dollar amount and as a percentage of total net revenue requirements.

**Figure 19. Number of Accounts and Billing Units by Customer Class**

Development of the Customer Allocation Factor				
Customer Class	Number of Accounts <sup>1</sup>	Percent of Total Accounts	Number of Billing Units <sup>2</sup>	Percent of Total Billing Units
Residential	8,427	90.5%	8,467	70.9%
Multifamily	309	3.3%	2,631	22.0%
Mobile Homes	12	0.1%	271	2.3%
Commercial - Low User	366	3.9%	366	3.1%
Commercial - Medium User <sup>3</sup>	108	1.2%	108	0.9%
Commercial - High User	69	0.7%	69	0.6%
Municipal	24	0.3%	24	0.2%
<b>Total</b>	<b>9,315</b>	<b>100.0%</b>	<b>11,936</b>	<b>100.0%</b>

(1) Number of accounts is from the City of Benicia Revenue billing data as of September 2015. Based on the City's Revenue billing data (files: ACTIVE ACCOUNTS WITH WATER BILLED 010113 thru 083015.xls., meterSize\_01-28-2015.xls and Benicia\_Missing\_Meter\_Sizes\_Fire\_02-06-2015.xls).

(2) Billing units provided by City of Benicia staff on 09/23/2015 in file ACTIVE ACCOUNTS WITH WATER BILLED 010113 thru 083015.xls. Commercial, Industrial, and Municipal number of billing units calculated based on EDU factors used at the City of Benicia.

(3) NBS assumed the 30 Commercial customers that were not categorized as low, medium or high users could conservatively be included in the Commercial - Medium User category.

**Figure 20. Summary of Rate Revenue Requirements by Customer Class**

Customer Class	Cost Classification Components				Customer Related	Cost-of-Service Net Revenue Reqs.	% of COS Net Revenue Reqs.
	Volume	Treatment					
		BOD	TSS				
<b>Net Revenue Requirements<sup>1</sup></b>	<b>\$ 6,374,762</b>	<b>\$ 1,450,958</b>	<b>\$ 1,450,958</b>	<b>\$ 730,080</b>	<b>\$ 10,006,757</b>	<b>--</b>	
<i>% of Revenue Requirements by Classification Component:</i>	63.7%	14.5%	14.5%	7.3%	100.0%		
Residential	\$ 3,974,116	\$ 879,836	\$ 858,506	\$ 660,481	\$ 6,372,939	63.7%	
Multifamily	\$ 962,750	\$ 213,145	\$ 207,977	\$ 24,218	\$ 1,408,091	14.1%	
Mobile Homes	\$ 85,106	\$ 18,842	\$ 18,385	\$ 941	\$ 123,273	1.2%	
Commercial & Industrial - Low User	\$ 452,696	\$ 37,584	\$ 48,897	\$ 28,686	\$ 567,863	5.7%	
Commercial & Industrial - Medium User	\$ 250,419	\$ 41,581	\$ 47,335	\$ 8,465	\$ 347,799	3.5%	
Commercial & Industrial - High User	\$ 599,528	\$ 248,870	\$ 259,025	\$ 5,408	\$ 1,112,831	11.1%	
Municipal	\$ 50,146	\$ 11,102	\$ 10,833	\$ 1,881	\$ 73,962	0.7%	
<b>Total</b>	<b>\$ 6,374,762</b>	<b>\$ 1,450,958</b>	<b>\$ 1,450,958</b>	<b>\$ 730,080</b>	<b>\$ 10,006,757</b>	<b>100%</b>	

1. Revenue requirement for each customer class is determined by multiplying the revenue requirement from each cost classification by the allocation factors for each customer class.

2. Per City of Benicia's utility billing data for fiscal year 2014/15.

## D. CURRENT VS. PROPOSED SEWER RATES

The rate design process provided an opportunity to evaluate rate-design objectives and policies, such as revenue stability, equity among customer classes, and how changing the amount of rate revenue collected from fixed monthly vs. volumetric charges affects typical customer bills.

Currently, all customers pay the same fixed monthly charge per EDU. Commercial and industrial customers are charged additional fees based on meter size and strength factors. These factors are translated into multipliers that are then applied to the fixed monthly charge per EDU. Instead of recreating this complex and outdated billing formula currently used for commercial and industrial customers, City staff asked NBS to develop a methodology that better reflects industry standards. This new methodology combines a fixed charge reflecting the system capacity requirements and a volumetric rate based on their effluent strength (that is, low-, medium-, or high-strength). This new methodology is simpler and easier to understand and administer.

Single family, multi-family and mobile home residential customers will pay a fixed monthly service charge and a volumetric rate based on capped water consumption. Sometimes there is a concern about irrigation for commercial customers and its impact on sewer bills; these commercial water customers can install

separate irrigation meters and, therefore, remove irrigation water use from the calculation of their sewer charges. Figure 21 shows current and proposed monthly sewer rates for FY 2016/17 through FY 2020/21. More detailed tables documenting the development of the proposed sewer rates are in Appendix B.

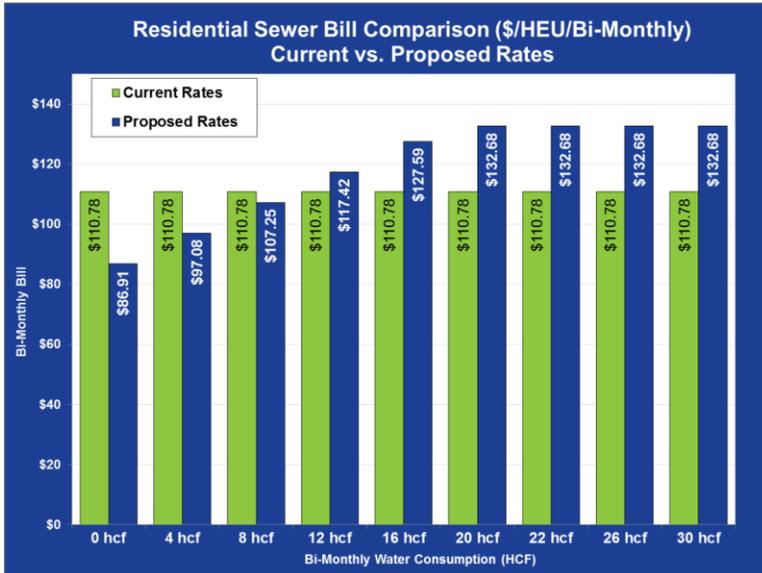
**Figure 21. Current vs. Proposed Sewer Rates  
Optimal Funding Scenario**

Sewer Rate Schedule	Current Rates	Recommended Sewer Rates				
		FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>Projected Increase in Rate Revenue per Financial Plan:</b>		16.00%	12.00%	9.00%	7.00%	5.00%
<b>Monthly Fixed Service Charge</b>						
Residential <sup>1</sup> (Per Billing Unit)	\$55.39	\$43.45	\$48.67	\$53.05	\$56.76	\$59.60
<b>Monthly Fixed Service Charge</b>						
Commercial & Industrial - Low Use (Per account)	\$55.39	\$64.65	\$72.41	\$78.92	\$84.45	\$88.67
Commercial & Industrial - Medium Use (Per account)	\$55.39	\$134.18	\$150.28	\$163.81	\$175.28	\$184.04
Commercial & Industrial - High Use (Per account)	\$55.39	\$403.20	\$451.58	\$492.23	\$526.68	\$553.02
Municipal (per EDU)	\$55.39	\$128.41	\$143.81	\$156.76	\$167.73	\$176.12
<b>Volumetric Charge (\$/HCF)</b>						
Residential (Applied to <i>Capped Monthly</i> Water Use)	N.A.	\$2.54	\$2.85	\$3.10	\$3.32	\$3.49
Commercial & Industrial - Low Use (Applied to <i>Monthly</i> Water Use)	N.A.	\$4.05	\$4.54	\$4.95	\$5.29	\$5.56
Commercial & Industrial - Medium Use (Applied to <i>Monthly</i> Water Use)	N.A.	\$4.49	\$5.03	\$5.48	\$5.86	\$6.15
Commercial & Industrial - High Use (Applied to <i>Monthly</i> Water Use)	N.A.	\$8.40	\$9.40	\$10.25	\$10.97	\$11.52
Municipal (Applied to <i>Monthly</i> Water Use)	N.A.	\$4.77	\$5.34	\$5.82	\$6.23	\$6.54
<b>Rate Stabilization Rates (% increase over existing \$/HCF rate) - Adjusted for Drought Stages<sup>2</sup></b>						
Residential, Commercial, Industrial & Municipal Rates						
Stage 3 (30% Conservation) <sup>3</sup>	N.A.	0%	0%	0%	0%	0%
Stage 4 (40% Conservation)	N.A.	8%	8%	8%	8%	8%
Stage 5 (50% Conservation)	N.A.	16%	16%	16%	16%	16%

1. Includes Single-Family, Multi-Family and Mobile Homes; Customers are assessed on the basis of their number of EDUs.  
 2. The adjustment for drought stages only applies to all customers.  
 3. The City of Benicia is currently in Stage 3 Conservation Scenario.

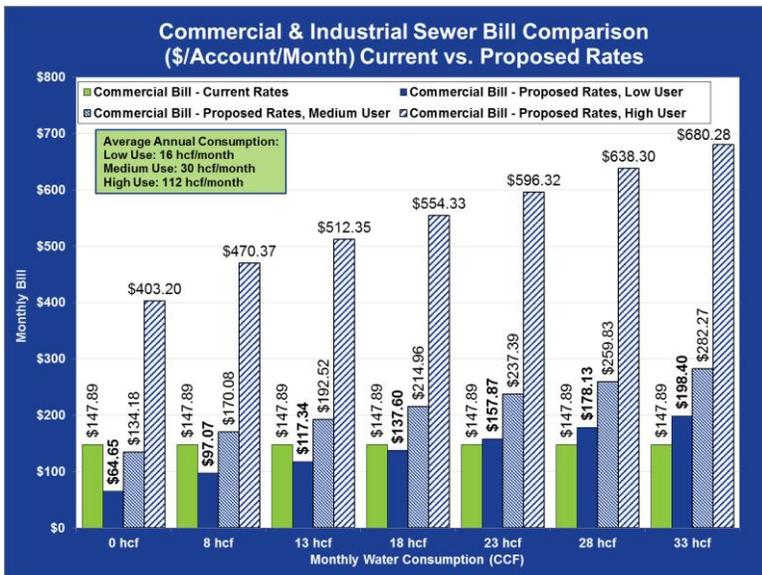
Because of the changes resulting from the cost-of-service adjustments, customers will see different increases in their monthly bill depending on the water consumption level. Figure 22 compares the average bi-monthly sewer bills for residential customers under current and proposed rates. Figure 23 compares commercial/industrial bills under current vs. proposed rates.

**Figure 22. Residential Sewer Bill Comparison – Current vs. Proposed Rates**  
*Optimal Funding Scenario*



**Commented [AC4]:** Figure 21 is already present in report; this figure is cited as Figure 24 in the text.

**Figure 23. Commercial Sewer Bill Comparison – Current vs. Proposed Rates**  
*Optimal Funding Scenario*



**Commented [AC5]:** Figure 22 is already present in report; this figure is cited as Figure 25 in the text.

## E. RATE STABILIZATION (DROUGHT) RATES

The study included revisions to the City's drought (rate stabilization) rates based on the City's mandated 20 percent reductions compared to 2013 consumption levels. Reduced water consumption affects the sewer utility revenue due to volume-based rates. The revised rate stabilization rates have three stages, with the current stage set at 30 percent conservation, increasing to 50 percent conservation.

Rate stabilization rates are intended to offset revenue losses. Without them, the City's water utility would experience a net loss of revenue that, in the long run, would be financially unsustainable if City customers continued to reduce their current consumption levels. Similar to the tables previously shown in Figures 11 and 12 for the water rate stabilization rates, Figure 24 and 25 shows the sewer rate stabilization rates developed to offset these drought-related reductions. Rates are presented as a percentage change from proposed volumetric rates per hcf; these adjustments apply to volumetric sewer rates for all customer classes.

**Commented [AC6]:** This needs to be updated if Figure numbering changes. (See previous note at Figure 13)

**Figure 24. Sewer Rate Stabilization Rates**

<b>Adjusted Net Revenue Requirements</b>			
Estimated Volumetric Rates Needed to Offset Net Revenue Losses Due to Conservation	Conservation Scenario		
	Stage 3 <sup>1</sup>	Stage 4	Stage 5
<i>Conservation Level (vs. 2013 Level)</i>	<b>30%</b>	<b>40%</b>	<b>50%</b>
<i>Change from Current Consumption</i>	<b>0%</b>	<b>10%</b>	<b>20%</b>
<b>Annual Effluent Generation &amp; Reductions</b>			
Adjusted Flow to WWTP (hcf/yr.) <sup>2</sup>	999,398	999,398	999,398
Change in Flow vs. Current per Stage (hcf) <sup>3</sup>	0	(99,940)	(199,880)
<b>Adjusted Flow (hcf/yr.)</b>	<b>999,398</b>	<b>899,458</b>	<b>799,518</b>
<b>Revenue Reqts. &amp; Conservation Rate Calculation</b>			
Current Volumetric Rate Revenue Requirements <sup>4</sup>	\$3,249,869	\$3,249,869	\$3,249,869
Adjustment to Volumetric Costs <sup>5</sup> :			
Chemicals - Increase or (Decrease)	\$0	(\$25,990)	(\$51,980)
Energy - Increase or (Decrease)	\$0	(\$42,650)	(\$85,300)
Total: Adjustment to Volumetric Costs	\$0	(\$68,640)	(\$137,280)
<b>Adjusted Volumetric Rate Revenue Reqts.</b>	<b>\$3,249,869</b>	<b>\$3,181,229</b>	<b>\$3,112,589</b>
<b>Adjustment to Uniform Volumetric Rate (%)<sup>6</sup></b>	<b>0%</b>	<b>8%</b>	<b>16%</b>

**Commented [AC7]:** Figure 23 is already present in the report; this figure is cited as Figure 26 in the report.

1. The City of Benicia is currently in Stage 3 Conservation Scenario.
2. From Sewer Rate Model, Commercial, Industrial & Municipal customers only.
3. Change from Current Consumption % reduction multiplied by Adjusted Flow to WWTP.
4. From proposed new rates, all customers.
5. FY 2015/16 Budget expense times Change from Current Consumption % percentage.
6. Adjusted Volumetric Rate Revenue Requirements divided by Adjusted Flow of WWTP.

**Figure 25. Sewer Rate Stabilization Rate Adjustments**

### RATE STABILIZATION RATES

<b>Proposed Uniform Volumetric Rates by Conservation Level</b>					
Conservation Scenario	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Rate Increases (per Financial Plan):	16%	12%	9%	7%	5%
Stage 3 (30% Conservation) <sup>1</sup>	0%	0%	0%	0%	0%
Stage 4 (40% Conservation)	8%	8%	8%	8%	8%
Stage 5 (50% Conservation)	16%	16%	16%	16%	16%

1. The City of Benicia is currently in Stage 3 Conservation Scenario.

## SECTION 4. RECOMMENDATIONS AND NEXT STEPS

---

### A. CONSULTANT RECOMMENDATIONS

NBS recommends the City take the following actions for the water and sewer rates:

- **Approve and Accept This Study Report:** NBS recommends the City Council formally approve and adopt this report and its recommendations. This will provide documentation of the rate study analyses and the basis for analyzing potential changes to future rates.
- **Adopt Reserve Fund Targets:** NBS recommends the City Council adopt the consultant proposed water and sewer reserve fund targets described in Sections 2 and 3 of this report. The City should periodically evaluate reserve fund levels and make it a long-term goal to achieve and maintain these levels for the Operating, Capital, and Rate Stabilization Reserves.
- **Legal Review:** This rate study presents proposed new rates, which the City has had reviewed by a qualified attorney with respect to compliance with Proposition 218 and related State laws, and should also use legal assistance developing acceptable language for new resolutions to implement these rates.
- **Implement Recommended Levels of Rate Increases and Proposed Rates:** Based on the analysis presented in this report and the City Council detailed review of the alternatives, the City Council should implement the proposed rates for the next 5 years that are shown in Figure 7 and Figure 8 for water and Figure 21 for sewer. These rate adjustments are structured based on industry standards and are necessary to ensure the following objectives are met:
  - Water rates reflect the cost of providing water service to each customer class.
  - Sewer rates reflect the cost of providing sewer service to each customer class.
  - Maintaining the financial health of the City's water and sewer utilities.
- **Implement Recommended Rate Stabilization and Low Income Rates:** The rate stabilization rates will offset revenue reductions related to increased levels of conservation and help maintain the financial health of both utilities. Water rate stabilization rates are shown in Figure 11. Sewer rates are shown in Figure 24. Low income discount water rates are shown in Figure 133.

**Commented [AC8]:** This needs to be updated if Figure numbers change (see note at Figure 13).

### 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 drought-related water consumption patterns underscore the need for this review, as well as potential and unseen changing revenue requirements, particularly those related to environmental regulations that can significantly affect capital improvements and repair and replacement costs.

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

### **C. PRINCIPAL ASSUMPTIONS AND CONSIDERATIONS**

In preparing this report and the recommendations included herein, NBS has relied on a number of principal assumptions and considerations with regard to financial matters, number of customer accounts, water consumption and conservation levels, and other conditions and events that may occur in the future. This information and assumptions, including the City's budgets and customer account information provided by City staff, were furnished 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 or may vary significantly due to unanticipated events and circumstances. Therefore, the actual results can be expected to vary from those projected to the extent that actual future conditions differ from those assumed by us or provided to us by others.

## TECHNICAL APPENDICES

---

### Brief Overview of the “San Juan Capistrano Case”:

On April 20, 2015, the California Superior Court ruling in the San Juan Capistrano case<sup>12</sup> created stricter standards for how tiered rates should be set under Prop 218 requirements. One of the lead attorneys for the defendant (City of San Juan Capistrano), Kelly Salt of Best Best & Krieger, provided the following guidance on what this case means for water rates:

*“Although the opinion in Capistrano Taxpayers Association v. City of San Juan Capistrano held that tiered rates, or inclining block rates that go up progressively in relation to usage, are compatible with Proposition 218, in this instance, the court concluded that the City failed to demonstrate that the tiers correspond to the actual cost of providing service at a given level of usage. The court rejected reliance on article X, section 2 to promote water conservation as the sole basis for establishing tiers, holding the city had to show that the various usage tiers corresponded with its actual costs of delivering water in those increments.”*

*and*

*“...rates were not proportional to the cost of service because the City did not calculate the incremental cost of providing water at the level of use represented by each tier. Specifically, the court criticized the City for not correlating its rates within each tier to the prices of water used within each tier.”<sup>13</sup>*

As a result of the San Juan Capistrano case, many water agencies with tiered rates have either eliminated their tiered rates in favor of a uniform rate, or revised their tiered rates to better comply with the standards related to the San Juan Capistrano case.

---

<sup>12</sup> Capistrano Taxpayers Association, Inc. v. City of San Juan Capistrano, Opinion G048969, Super. Ct. No 30-2012-00594579, Filed April 20, 2015.

<sup>13</sup> See “Legal Alerts – California Court of Appeal Holds City’s Tiered Water Rate Structure Violates Proposition 218” by Kelly Salt, Best Best & Krieger, April 21, 2015.

## APPENDIX A – WATER RATE ANALYSIS

### Detailed tables included in Appendix A:

- Ten year Financial Plan Summary
- Graphical representation of ten year Financial Plans
- Exhibit 1, Operating Expenses
- Exhibit 2, Capital Improvement Plan Expenditures
- Exhibit 3, Existing Debt Obligations
- Current Rates
- Source of Water Supply
- Functionalization & Classification of Operating Expenses
- Allocation Factors
- Proposed Fixed Charges Calculations
- Proposed Volumetric Charges Calculations
- Conservation Rate Calculations
- Low Income Discount Calculations
- Current & Proposed Rates
- Various Bill Comparison Graphs
- Single Family Residential Distribution Curve for Consumption
- FY 2013-2014 Customer Data
- FY 2014-2015 Customer Data
- New Meter Surcharge Data

***This page intentionally left blank.***

## APPENDIX B – SEWER RATE ANALYSIS

### Detailed tables included in Appendix B:

- Ten year Financial Plan Summary
- Graphical representation of Ten year Financial Plans
- Exhibit 1, Operating Expenses
- Exhibit 2, Capital Improvement Plan Expenditures
- Exhibit 3, Existing Debt Obligations
- Current Rates
- Functionalization & Classification of Operating Expenses
- Allocation Factors
- Cost of Service Analysis Rate Calculations
- Current & Proposed Rates
- Various Bill Comparison Graphs
- FY 2013-2014 Customer Data
- FY 2014-2015 Customer Data
- Sewer Treatment Plant Loading Data