# Lake Whatcom Water & Sewer District

# Draft Report for 2014 WATER & SEWER RATE UPDATE

April 2014

FCS GROUP
7525 166th Avenue NE, Suite D-215
Redmond, WA 98052
T: 425.867.1802 | F: 425.867.1937

FCS GROUP
Solutions-Oriented Consulting

**Firm Headquarters**
Redmond Town Center
7525 166th Ave NE
Suite D-215
Redmond, Washington 98052

**Serving the Western U.S. and Canada since 1988**
Washington | 425.867.1802
Oregon | 503.841.6543
Alaska | 907.242.0659

April 22, 2014

Patrick Sorensen, General Manager
Lake Whatcom Water and Sewer District
1220 Lakeway Drive
Bellingham, WA 98229

Subject: 2014 Water & Sewer Rate Update

Dear Mr. Sorensen:

FCS GROUP is pleased to submit this draft report documenting the findings and recommendations of the 2014 Water & Sewer Rate Update conducted for the Lake Whatcom Water & Sewer District (LWWSD). Enclosed is a description of our methodology, key assumptions, findings, and recommendations. The report includes a set of technical appendices containing the analytical documentation of the study.

It has been a pleasure to work with District staff on this effort. We look forward to working with you in the future, and we encourage you to contact us at 425-867-1802 if you have any comments or questions regarding this study.

Sincerely,

Gordon Wilson

Tage Aaker

# TABLE OF CONTENTS

# SECTION 1: INTRODUCTION

In July 2013, Lake Whatcom Water and Sewer District contracted with FCS GROUP to undertake a Water and Sewer Rate Study. This memorandum documents the objectives, assumptions, findings, and recommendations of the study. Major study elements include:

- Evaluating financial policies
- Developing a capital financing strategy
- Assessing revenue needs and forecasting needed rate adjustments
- Performing a cost of service (COS) analysis
- Providing alternative rate structures for water & wastewater including:
  - Providing a cost of service based rate structure for both water and sewer
  - Reducing or eliminating the current usage allowance in water
  - Exploring a three-tiered increasing block rate structure in water
  - Developing a Low-Income Senior / Disabled discount for both water and sewer
- Providing water, sewer, and combined customer bill impact analyses
- Providing a multi-jurisdictional water and sewer rate comparison survey

**Exhibit 1-1** shows the recommended five year rate increases for the water and sewer utilities under the existing rate structure. Detailed alternate rate schedules specific to each utility's rate structures are provided in later sections.

**Exhibit 1-1: Recommended System-Wide Rate Increases**

| Utility | 2015 Projected | 2016 Projected | 2017 Projected | 2018 Projected | 2019 Projected |
|---|---|---|---|---|---|
| Water | 8.75% | 8.75% | 8.75% | 8.50% | 4.00% |
| Sewer | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% |

# SECTION 2: FINANCIAL POLICIES

In order to establish adequate rates, a utility must define its benchmarks for financial performance. Typically, several different standards are necessary to satisfy all financial objectives. This section outlines financial policies that the District should consider in the context of its utility management responsibilities. These policies are used to guide financial planning and ratemaking decisions.

**The following policies are described and evaluated for the District's water and sewer utilities:**

- Fund Management and Self-Supporting Utilities
- Operating and Capital Cash Reserves
- System Reinvestment Funding
- Debt Management

## 2.1. FUND MANAGEMENT AND SELF-SUPPORTING UTILITIES

Conceptually, utility expenditures can be divided into three main types of costs: operating, capital, and debt service. For financial forecasting purposes, operating costs tend to be ongoing and predictable, while capital costs are highly variable and may be comprised mainly of large, one-time projects. Debt service results when one-time capital costs are converted into an ongoing stream of payment obligations. Therefore, debt service is similar to capital in its *purpose* but similar to the operating budget in the sense that it consists of regular, relatively predictable amounts.

**The main funding source for the operating budget is the utility's ongoing rate revenue. Capital** funding sources consist of debt and loan proceeds, general facility charges, most types of grants, as well as operating revenue designated for capital purposes. Operating revenue can be used for capital purposes, either in the current year or by building reserves for future capital needs. However, capital funding sources cannot be used for operating purposes.

The sources and uses of operating, capital, and debt service functions is illustrated in **Exhibit 2-1.**

**Exhibit 2-1: Summary of Operating, Capital, and Debt Accounts**

| Operating Account | Capital Account | Debt Service |
|---|---|---|
| **Sources of Funding**<br>User Rates<br>Interest Earnings<br>Miscellaneous Service Fees<br><br>**Uses**<br>Operating Expenses<br>Maintenance<br>Administration<br>Transfers to Debt Service<br>Transfers to Capital | **Sources of Funding**<br>General Facility Charges<br>Debt Proceeds<br>Transfers from Operating<br>Interest Earnings<br>Grants<br><br>**Uses**<br>Capital Projects | **Sources of Funding**<br>Transfers from Operating<br>Debt Proceeds (for initial establishment of bond reserves)<br><br>**Uses**<br>Debt Service Payments |

The District currently maintains separate funds for operating, capital, and debt service functions—a practice that we recommend be continued. While there typically is only one operating fund per utility, there may be more than one capital or debt service fund, depending on the nature of the dedicated funding sources.

In our rate forecast, we are assuming that the water utility and sewer utility are both intended to be self-supporting. In other words, each is intended to fully rely on its own user fees to meet its financial requirements, without a cross-subsidy from the other utility. In order to model two self-supporting utilities, we created a "Water Fund" within the forecast separate from a "Sewer Fund." If the rate revenue of either is insufficient to meet its expenses and achieve its required reserves, then a rate increase is recommended.

The District currently does not manage its water and sewer utilities in separate funds. Instead, it comingles water and sewer functions in the following funds:

- Operating Fund (Fund 401)
- Capital Funds:
  - System Reinvestment Fund (Fund 420)
  - Capital Bond Projects Fund (Fund 430)
- Debt Service Funds:
  - 2009 Bond Debt Service Fund (Fund 450)
  - 2009 Bond Reserve Fund (Fund 460)

Funds that are currently dedicated to either sewer or water purposes but not both include the Sewer/Stormwater Contingency Fund (Fund 425), DWSRF Projects Fund (Fund 440), Water Loans Debt Service Fund (Fund 470). These are kept separate because their original funding source was specific to either sewer or water service.

**Recommended Policy:** We recommend that the District create and maintain separate funds for Water and Sewer, so that each has at least one operating, capital, and debt service fund.

**Current Achievement:** Currently, the District separates operating, capital and debt service functions, but it does not separate water from sewer.

The primary reason for this recommendation is that the water and sewer utilities provide service to different sets of customers. As long as there are water-only or sewer-only customers, then cross-subsidies would be inequitable to one or the other group of customers.

Separating the funds would not be exceptionally difficult, because the District already records its revenues and expenditures separately in Fund 401. Only the fund balance would need further separation, so that the distinction between water and sewer amounts would carry over from one year to the next. Similarly, the capital funds already separate their revenues and expenditures by capital project, which are specific to a given utility, and the debt service funds can easily be allocated based on the stated purpose of the original debt. (For example, debt service on the District's 2009 revenue bond is allocated 91% to Sewer and 9% to Water, based on the projects that were funded by that bond issue.) This rate study could serve as the starting point for the separation of funds beginning in the 2015 budget. The allocation of 2014 beginning balances between water and sewer purposes is discussed below in Section 3.

When issuing bonded debt, the District currently "cross-pledges" its bonds—that is, it pledges as security the revenue from *either* water or sewer rate revenues, even if the intended use of the proceeds and intended source of repayment are specific to just one of the utilities. Cross-pledging is a common practice among cities, counties, and water/sewer districts, and it does not mean that the

water and sewer funds need to be comingled. Instead, a given debt issue is tracked according to its intended source of repayment. The cross-pledge simply serves as a backup source of repayment—one that is rarely invoked and need not affect the accounting practices. Cross-pledging allows the District to use a combined debt service coverage test, which leads to a more favorable rating by the District when it comes time to actually issue debt. However, in our rate forecast, we expect each of the two utilities to meet the policy target for debt service coverage independently, which makes the District's financial management deliberately conservative.

## 2.2. OPERATING RESERVES (WORKING CAPITAL)

When evaluating fund reserve levels and objectives, it is important to recognize that the value of reserves lies in their potential use. A reserve strategy that deliberately avoids any use of reserves negates their purpose. Fluctuation of reserve levels merely indicates that the system is working, while lack of variation over many years strongly suggests that the reserves are, in fact, unnecessary.

An operating reserve is designed to provide a liquidity cushion; it protects the utility from the risk of short-term variation in the timing of revenue collection or payment of expenses. Like other types of reserves, operating reserves also serve another purpose: they help smooth rate increases over time. Target funding levels for an operating reserve are generally expressed as a certain number of days of operating and maintenance (O&M) expenses, with the minimum requirement varying with the expected revenue volatility.

Industry practice for utility operating reserves ranges from 30 days (8%) to 120 days (33%) of O&M expenses, with the lower end more appropriate for utilities with stable revenue streams and the higher end of the range more appropriate for utilities with significant seasonal or consumption-based fluctuations. The most common operating reserve targets are 30-45 days for stormwater utilities, 45-60 days for sewer utilities, and 60-90 days for water utilities. This study assumes the following operating reserve targets:

**Recommended Policy:** For Water, ending target of between 60 and 90 days (16-25% of annual O&M). For Sewer, ending target of between 45 and 60 days (12-16% of annual O&M expenses).

**Current Achievement:** In 2014, combined cash balances were allocated to provide 45 days to Sewer and 90 days to Water.

In our forecast, the operating reserve target is based on December 31 of each calendar year, with the balance expected to vary during the course of the year. Generally, in any year where operating reserves exceed the maximum target at the year-end, we recommend using the excess cash to help pay for capital projects. This can be accomplished by calculating the target balance at year end and comparing it against the actual ending cash balance. If the actual balance is greater than the target, the difference is transferred to the utility capital account.

## 2.3. CAPITAL RESERVES (CAPITAL CONTINGENCY)

In addition to protecting against variations in the timing of operating costs and revenues, it is prudent to maintain a capital contingency reserve to meet unexpected emergency capital outlays. While it would be impractical to reserve against major system-wide failures as a result of a catastrophic event, it is reasonable to identify and quantify possible failures of individual system components. There are several methods used in the industry to set the level of these types of reserves, including:

- Most costly piece of equipment or infrastructure: A utility may predict the cost of replacing its most expensive piece of equipment or infrastructure, such as a large reservoir, vital transmission main, or a key pump station.

- Average annual cost of capital program: Alternatively, a utility may use a percentage of its projected capital program, or set the reserve equal to the average annual cost of its capital program.
- Percentage of utility plant: A utility may also elect to hold a capital contingency equal to a percentage of its fixed assets, usually 1-2% of the original cost of total assets. Alternatively, a percentage of replacement value can also be used, with the percentage adjusted downward to reflect the fact that replacement value is higher than original cost.

This rate study uses the District's estimate of *replacement costs* to derive the targeted reserve dollar amount, because replacement cost data is readily available.

**Recommended Policy:** Capital contingency target of 0.5% of the replacement cost of fixed assets. As of the beginning of 2014, this equates to $225,000 for water and $380,000 for sewer.

**Current Achievement:** Based on our allocated funds analysis in Section 3, as of the beginning of 2014, the District currently has $363,000 for water and $990,000 for sewer; both exceed the minimum capital contingency.

## 2.4. RATE-FUNDED CAPITAL REINVESTMENT

The cost of replacing a given piece of infrastructure is typically much higher than its original construction cost many years ago, due to inflation, construction conditions, and the reduced availability of grants or developer funding. Given the integrated nature of utility infrastructure, it is also possible that multiple assets will need to be replaced concurrently. For this reason, and in order to avoid excessive reliance on future debt, it is prudent to have a policy that commits a certain amount of current rate revenue to the replacement of system assets.

A common approach is to establish a system reinvestment funding target using a percentage of depreciation expense as a benchmark. Conceptually, basing system reinvestment funding on total depreciation expense meets several standards for reasonable rates:

- Financial integrity: Funding depreciation expense from current rates avoids a decline in system asset value;
- Rate equity: Funding depreciation expense from rates means that customers are charged in proportion to their consumption of facilities' useful lives; and
- Adequacy of capital funding: Funding depreciation expense from current rates provides a stable funding source for capital expenditures, especially those related to repair and replacement of existing system infrastructure.

The District already has a policy of setting aside a certain amount of rate revenue each year for system reinvestment, as shown in **Exhibit 2-2**. Since the asset data we had available contained replacement cost rather than original cost, we estimated the original cost of each asset using the ENR Construction Cost Index and the date the asset was placed in service. The "original cost depreciation" figures here are based on that estimate of original cost, along with each asset's expected useful life.

**Exhibit 2-2: Current Rate-Funded Capital Reinvestment**

| System Reinvestment Funding | Current | Original Cost Depreciation* | Current % of |
|---|---|---|---|
| Water | $200,000 | $340,000 | 59% |
| Sewer | $700,000 | $500,000 | 140% |
| **Total** | **$900,000** | **$840,000** | **107%** |

*Estimated from Replacement Cost asset detail and backdated with ENR index

**Exhibit 2-2** shows that the District is currently setting aside $700,000 per year to replace sewer assets. This represents 140% of the estimated original cost depreciation for the sewer utility. As will be apparent in Section 4, this level of rate-fund system reinvestment is enough for the District to fund its sewer capital program on a pay-as-you-go basis until 2018, when $475,000 of debt proceeds will be needed to re-build the Geneva Pump Station. We recommend that the sewer rate-funded system reinvestment be continued at $700,000 per year plus an adjustment to match additional capital assets.

For the water utility, rate-funded capital reinvestment represents only 59% of estimated original cost depreciation. This level of funding causes Water to be more dependent upon debt financing for the capital program. Ideally, the water utility would be able to gradually increase its rate-funded capital commitment over time. However, the projected rate increases for the water utility are already significant, so at this time we do not recommend increasing the rate-funded capital reinvestment for the water utility. In fact, we are recommending a temporary reduction. The Water capital program includes two major projects in the years 2014-17: the Division 22 reservoir and Geneva area main replacement, totaling $3.4 million. The District will be relying primarily on State loans for those projects, with debt service of nearly $200,000 per year beginning in 2016. In order to avoid rate shock in the first years of the forecast, we are recommending temporarily reducing the water system reinvestment level to $100,000 in 2014 and zero for the following two years, then resuming the annual commitment of $200,000 beginning in 2017. However, we suggest re-evaluating the level of water rate-funded capital reinvestment in the next study, with the goal of gradually increasing it for future years.

## 2.5. DEBT MANAGEMENT

Debt financing is one appropriate tool for capital funding. Compared with pay-as-you-go funding, debt smoothes out the rate impact of a capital program by spreading costs over time. It also creates intergenerational equity—it is sometimes called "pay-as-you-use" because future customers who use the assets are the ones paying for them. However, debt cannot be relied on too much because it carries the risk of default. Debt also reduces budget flexibility—pay-as-you-go capital projects can be delayed if there is a revenue shortfall, but once the utility has sold debt, the debt service needs to be paid in good times or bad. So while debt is a useful part of the toolbox, it needs to be monitored to ensure that the system does not become too heavily dependent on it. To evaluate the District's debt level, we will discuss two measurements: debt service coverage and capital structure.

### 2.5.1. Debt Service Coverage

Debt service coverage is most easily understood by focusing on its reciprocal: the amount of debt service as a percentage of the utility's net revenue. "Net revenue" is analogous to the operating profit of a private business; it refers to the total operating income minus operating expenses. For example, if net revenue were $200,000 and debt service were $100,000, then debt service as a percentage of net revenue would be 50% (or $100,000 divided by $200,000). If you take the reciprocal of that percentage (in other words, $200,000 divided by $100,000), you get 2.0. This is "coverage," as the term is used in debt agreements. Occasionally, State loans will have coverage requirements, but usually this requirement comes from the sale of revenue bonds, in which case the calculation only includes bonded debt service. A typical coverage requirement for utility revenue bonds is 1.25, including for the District's 2009 existing revenue bond. In the simple illustration above, if annual bonded debt service were $100,000, then net revenue each year would have to be at least $125,000 in order to comply with bond covenants. A bond coverage requirement of 1.25 is equivalent to saying that bonded debt service can be no higher than 80% of net revenue ($100,000 divided by $125,000).

Because of the coverage requirement, when it sells bonds, the District agrees to collect enough revenue to meet operating expenses and not only pay debt service, but collect an additional 25% increment above debt service. The extra revenue is a cushion that makes bondholders more confident

that debt service will be paid on time. The extra revenue can be used for capital expenditures, to build system reinvestment reserves, or for debt service on subordinate debt that does not require coverage. Achieving a bonded debt service coverage level greater than what is contractually required is a positive result that bond rating agencies notice, and it can result in more favorable terms when the District next goes to the market for revenue bonds.

**Recommended Policy:** Per contractual obligation from the 2009 revenue bond issuance, the District has a minimum bonded debt service coverage of 1.25. However, the analysis assumes a target bonded debt service coverage of at least 1.50, which is more conservative than the contractual requirement.

**Current Achievement:** The District currently has a 2.8 combined water and sewer coverage ratio beginning in 2014 and is projected to end the study period in 2019 with a coverage ratio of just over 3.0. Looking at the two utilities independently: sewer debt service coverage remains above 2.7 throughout the life of the forecast. The water utility is just as strong with respect to bonded debt—the bonded debt service is projected to remain above 2.9 through 2019, the last year of the forecast. This is due to the fact that the major water borrowing—$3.36 million from 2014-2016—is from the Drinking Water State Revolving Fund, which does not have a coverage requirement. If the DWSRF loan were included in the calculation, the District's water debt service would drop to 1.10 in 2014 and 1.13 in 2016. So for Water, the District's ability to carry out its capital program is dependent on the fact that State loans were available for the 2014-16 projects.

### 2.5.2. Capital Structure

Another useful measurement in assessing the debt burden of a utility is the capital structure: the outstanding debt as a percentage of total capital assets (original cost net of depreciation). This is an estimated metric, as the original cost of the assets and accumulated depreciation were estimated based upon replacement cost records provided by the District.

A capital structure of 60% debt / 40% equity is considered a conservative target. A capital structure lower than this suggests that the utility has the financial capacity to issue more debt if needed.

**Current Achievement (2014):** Water's capital structure is 7% debt / 93% equity; Sewer's capital structure is 21% debt / 79% equity; combined capital structure is 16% debt / 84% equity.

**Future Achievement (2019):** Water's projected capital structure is 32% debt / 68% equity; Sewer's projected capital structure is 18% debt / 82% equity; combined capital structure is 22% debt / 78% equity.

## 2.6. CUMULATIVE IMPACT OF FISCAL POLICIES

Many fiscal policies overlap, resulting in the simultaneous achievement of several objectives within the same level of rates. For example, the policy for system reinvestment funding through rates serves several beneficial purposes: it helps build capital contingency reserves, contributes to the cash funding of capital projects, helps maintain a healthy capital structure, and contributes annual revenue towards debt service coverage. System reinvestment funding can also help mitigate rate spikes during periods of significant capital needs. Each policy helps determine how much revenue is appropriate, and satisfying them all generally reduces financial risk and increases financial stability.

In our evaluation of these fiscal policies, the District's utilities currently achieve each of the recommended benchmarks for reserves and debt policies. We recommend that separate funds be used to account for water and sewer functions independently, and we suggest that the Water utility target for rate-funded capital reinvestment be re-evaluated in the next rate study, with the goal of gradually increasing the percentage of annual depreciation.

# SECTION 3: STUDY ASSUMPTIONS

## 3.1. GENERAL FORECAST ASSUMPTIONS

The following major assumptions were used in this rate forecast:

- General Cost Inflation – assumed to be 2.50% per year based on historical data from the Consumer Price Index Urban Consumers - Seattle / Tacoma / Bremerton (CPI - U)
- Construction Cost Inflation – assumed to be 3.50% per year based on historical data from the ENR Construction Cost Index (CCI) - 20 City Average index
- Personnel Cost Inflation – Estimated based on historical data and confirmed by District
  - Labor Cost Inflation: assumed to be 3.00% per year
  - Benefits Cost Inflation: assumed to be 6.00% per year
- Fund Earnings – 0.10% based on the current Local Government Investment Pool (LGIP) rate, phased towards the long term LGIP average, reaching 1.25% by 2019.
- Customer Growth – Estimated based on historical trends within the District from 2009-2013
  - Growth in number of customers: assumed to be 0.25% per year
  - Growth in water consumption: assumed to be 0.25% per year. This implies overall system growth of 0.25% but no growth in unit consumption.
- Revenue Bond Terms: 20 year maturity, 4.75% interest, 1% issuance cost, and 1.5 policy target coverage. Interest rate assumption is based upon relevant Bond Buyer Indices.

## 3.2. ALLOCATION OF FUND BALANCE

The District maintains fund balances for use by the utilities. However, other than Funds 425 (Sewer/Stormwater) and 470 (Water Loans Debt Service Fund), the amounts within each fund are not explicitly held for a particular utility use. As we described above, the rate study assumes that each utility would be independently sustainable going forward. In order to separate the utilities, we had to allocate the 2014 beginning fund balances between Water and Sewer. **Exhibit 3-1** summarizes the assumptions that were made in this allocation of fund balances.

**Exhibit 3-1: Allocation of Cash Assets (Beginning 2014)**

| Allocated 401 Funds so that each Utility has Max Reserves | | | |
|---|---|---|---|
| Sewer Max Oper. Reserve 2014 (45 days O&M) | $ | 293,597 | 41% |
| Water Max Oper. Reserve 2014 (90 days O&M) | $ | 422,556 | 59% |
| | $ | 716,153 | 100% |

| *Source: SKMBT_C22014010613540.pdf (1/6/2014 email)* | | | Allocation | | | |
|---|---|---|---|---|---|---|
| Fund # | Fund Desc. | Balance End 2013 | % to Water | % to Sewer | Target Fund | Allocation Basis |
| 401 | Operating - Starting Operating Reserve | $ 716,153 | 59% | 41% | Operating | Max Operating Reserve |
| 401 | Operating - Allocated on Need | $ 357,788 | 100% | 0% | Capital | All to Water |
| 425 | Sewer / Stormwater | $ 932,970 | 0% | 100% | Capital | All to Sewer |
| 430 | 2009 Bond Projects | $ 62,683 | 9% | 91% | Capital | Share of D.S. |
| 460 | 2009 Bond Reserve (Restricted) | $ 501,157 | 9% | 91% | Debt | Share of D.S. |
| 470 | Water Loans Debt Service Fund | $ 74 | 100% | 0% | Debt | All to Water |
| | **Total** | **$ 2,570,825** | | | | |

| | | Water | | | Sewer | | | Total |
|---|---|---|---|---|---|---|---|---|
| Fund # | Fund Desc. | Operating | Capital | Debt | Operating | Capital | Debt | Balance End 2013 |
| 401 | Operating - Starting Operating Reserve | $ 422,556 | $ - | $ - | $ 293,597 | $ - | $ - | $ 716,153 |
| 401 | Operating - Allocated on Need | $ - | $ 357,788 | $ - | $ - | $ - | $ - | $ 357,788 |
| 425 | Sewer / Stormwater | $ - | $ - | $ - | $ - | $ 932,970 | $ - | $ 932,970 |
| 430 | 2009 Bond Projects | $ - | $ 5,641 | $ - | $ - | $ 57,042 | $ - | $ 62,683 |
| 460 | 2009 Bond Reserve (Restricted) | $ - | $ - | $ 45,104 | $ - | $ - | $ 456,053 | $ 501,157 |
| 470 | Water Loans Debt Service Fund | $ - | $ - | $ 74 | $ - | $ - | $ - | $ 74 |
| | **Total** | **$ 422,556** | **$ 363,430** | **$ 45,178** | **$ 293,597** | **$ 990,011** | **$ 456,053** | **$ 2,570,825** |

The most straightforward allocations were the capital or debt service funds:

- Fund 425 (Sewer/Stormwater Contingency Fund) originated as project remainders from ULID 18, a sewer and stormwater improvement project. Because that original project had nothing to do with the water utility and the Board has designated its use toward sewer or stormwater capital projects, 100% of its fund balance is assigned to the Sewer utility.
- Fund 470 (Water Loans Debt Service Fund) is assigned 100% to Water, because it is used to pay debt service on loans that were originally for water projects.
- The funds associated with the 2009 Bond (Fund 430 and Fund 460) were both allocated based upon the stated purpose of the capital projects that led to the 2009 bond issue: 9% Water and 91% Sewer.

For the Operating Fund, we would normally suggest allocating its fund balance based on net operating revenues in prior years. However, the fund balances are legally available to either utility. In this forecast, the Water utility is facing sharp rate increases, while the Sewer utility is much more stable. For that reason, we allocated the Fund 401 balance based on the relative need of the two utilities. We assigned the minimum operating reserve to the Sewer utility (45 days, or about $294,000), and the remaining balance was assigned to the Water utility. Of the funds assigned to Water, the operating fund received 90 days of operating expenses, or about $423,000, while the remaining $358,000 was allocated to capital.

# SECTION 4: SEWER UTILITY RESULTS

## 4.1. SEWER CAPITAL FUNDING STRATEGY

**Exhibit 4-1** shows the sewer capital funding strategy for 2014 – 2019.

**Exhibit 4-1: Sewer Capital Funding Strategy**

| Capital Funding Strategy | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2014 - 2019 Total |
|---|---|---|---|---|---|---|---|
| Capital Expenditures (Escalated Dollars) | $ 914,985 | $ 810,198 | $ 899,240 | $ 999,086 | $ 957,378 | $ 1,162,151 | $ 5,743,039 |
| **Capital Funding Strategy:** | | | | | | | |
| Beginning Fund Balance | $ 990,011 | $ 798,360 | $ 753,950 | $ 633,990 | $ 419,228 | $ 737,945 | |
| plus: General Facilities Charge | 22,343 | 22,343 | 22,343 | 22,343 | 22,343 | 22,343 | $ 134,061 |
| plus: System Reinvestment Funding | 700,000 | 741,448 | 753,167 | 757,226 | 757,759 | 765,646 | 4,475,246 |
| plus: Excess Operating Reserves | - | - | - | - | 16,801 | 43,983 | 60,784 |
| plus: Interest Earnings | 990 | 1,996 | 3,770 | 4,755 | 4,192 | 9,224 | 24,927 |
| plus: Net Debt Proceeds Available for Projects | - | - | - | - | 475,000 | - | 475,000 |
| Total Capital Resources | $ 1,713,345 | $ 1,564,148 | $ 1,533,229 | $ 1,418,314 | $ 1,695,323 | $ 1,579,142 | |
| less: Capital Expenditures | 914,985 | 810,198 | 899,240 | 999,086 | 957,378 | 1,162,151 | 5,743,039 |
| Ending Fund Balance | $ 798,360 | $ 753,950 | $ 633,990 | $ 419,228 | $ 737,945 | $ 416,991 | |

According to the District's 2013 Annual Budget, "because of economic conditions, low growth, near build-out conditions, and development restrictions, the District is now 100% dependent upon user rates to fund both operations costs and future capital improvements." This means that capital projects must largely be funded with annual rate revenue, reserves, or debt that is repaid by existing customers, with very little growth. Approximately 87% of the sewer capital funding strategy results from system reinvestment funding which comes from annual rate revenue. Debt funding is projected to account for nearly 9% of the capital plan. A limited amount of capital funding is provided from General Facilities Charges, interest earnings, and transfers from operating when balances exceed the maximum operating reserve target of 60 days.

In this forecast, sewer system capital needs are funded on a pay-as-you-go basis through 2017. In 2018, $475,000 in bond proceeds are projected to be received to help fund the Geneva Pump Station replacement.

## 4.2. SEWER ANNUAL FINANCIAL FORECAST

**Exhibit 4-2** shows the annual financial forecast for the sewer system, including the impact of the capital funding strategy.

**Exhibit 4-2: Sewer Annual Financial Forecast**

| Revenue Requirements | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| **Assuming Existing Rates:** | | | | | | |
| **Revenue** | | | | | | |
| Rate Revenues | $ 3,495,022 | $ 3,503,759 | $ 3,512,519 | $ 3,521,300 | $ 3,530,103 | $ 3,538,929 |
| Non-Rate Revenues | 11,750 | 12,920 | 14,929 | 17,163 | 19,750 | 22,722 |
| **Total Revenue** | $ 3,506,772 | $ 3,516,680 | $ 3,527,448 | $ 3,538,464 | $ 3,549,854 | $ 3,561,651 |
| **Expenses** | | | | | | |
| Cash Operating Expenses | $ 2,381,400 | $ 2,452,603 | $ 2,526,288 | $ 2,602,558 | $ 2,681,517 | $ 2,763,277 |
| Existing Debt Service | 406,907 | 407,453 | 403,085 | 407,635 | 407,089 | 407,117 |
| New Debt Service | - | - | - | - | 40,936 | 40,936 |
| Rate-Funded Capital Replacement | 700,000 | 741,448 | 753,167 | 757,226 | 757,759 | 765,646 |
| Additions to Operating Reserve | - | - | - | - | - | - |
| **Total Expenses** | $ 3,488,306 | $ 3,601,504 | $ 3,682,539 | $ 3,767,419 | $ 3,887,301 | $ 3,976,976 |
| Cash Surplus / (Deficiency) | $ 18,465 | $ (84,824) | $ (155,091) | $ (228,955) | $ (337,447) | $ (415,325) |
| **Annual Rate Adjustment** | | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% |
| **Cumulative Annual Rate Adjustment** | | 3.00% | 5.58% | 8.21% | 10.92% | 13.69% |
| **After Rate Increases:** | | | | | | |
| Rate Revenues | $ 3,495,022 | $ 3,608,872 | $ 3,708,342 | $ 3,810,553 | $ 3,915,581 | $ 4,023,505 |
| Net Cash Flow | 18,465 | 17,723 | 35,952 | 53,238 | 38,622 | 57,423 |
| Debt Service Coverage - Revenue Bonds | 2.77 | 2.87 | 2.97 | 3.00 | 2.79 | 2.86 |
| Debt Service Coverage - All Debt | 2.77 | 2.87 | 2.97 | 3.00 | 2.79 | 2.86 |

| Ending Fund Balances | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| Operating Reserve | $ 312,063 | $ 329,786 | $ 365,738 | $ 418,976 | $ 440,797 | $ 454,237 |
| Capital Reserve | 798,360 | 753,950 | 633,990 | 419,228 | 737,945 | 416,991 |
| Debt Reserve | 456,053 | 456,053 | 456,053 | 456,053 | 496,989 | 496,989 |
| **Total** | $ 1,566,475 | $ 1,539,789 | $ 1,455,780 | $ 1,294,257 | $ 1,675,732 | $ 1,368,217 |
| Operating Reserve (Days of O&M Expense) | 48 days | 49 days | 53 days | 59 days | 60 days | 60 days |
| Target Capital Contingency | $ 380,441 | $ 384,492 | $ 388,989 | $ 393,984 | $ 398,771 | $ 404,582 |
| Capital Contingency Deficit (if any) | $ - | $ - | $ - | $ - | $ - | $ - |
| Capital Structure: % Debt | 21% | 20% | 18% | 17% | 18% | 16% |
| Capital Structure: % Equity | 79% | 80% | 82% | 83% | 82% | 84% |

This forecast continues the overall 3% rate increase already adopted for 2015. Following 2015, the forecast calls for overall rate increases of 2.5% per year for the remainder of the five-year forecast horizon. With these rate increases assumed, the sewer system will build operating reserves to the upper end of the target range, end with capital reserves above the target contingency (0.5% of replacement total system cost), and maintain excellent debt service coverage (always above 2.75) and a favorable capital structure (16% debt / 84% equity in 2019). This rate forecast suggests current system reinvestment funding levels are sufficient to fund a majority of capital projects and only increases with a small annual adjustment to match additional capital assets. When significant capital project needs arise, debt funding is an available tool that can be used without over-leveraging the Sewer utility's resources. It is forecasted that a debt issue of $475,000 will be needed in 2018.

## 4.3. COST OF SERVICE RESULTS

Whereas **Exhibit 4-2** above was focused on overall amount of revenue needed by the Sewer system, the following discussion looks at how those revenues are recovered and whether or not the proportion between the account charge and the charge per dwelling unit properly reflects the cost of service.

**Exhibit 4-3** focuses on the relative share of sewer system costs allocated to customers equally (through the account charge), versus other costs which are recovered from the per-dwelling-unit charge. It compares the results from the last rate study, in 2004, with results from this rate study.

The decreased allocation to the Customer category can be mainly attributed to an increase in the number of maintenance workers since 2004, which further weights salary costs toward Operations. District staff positions were allocated between four categories: Billing & Meter Reading, Customer Service, Administrative, and Operations. In the previous study, 16% of staff cost was related to the Billing & Meter Reading and Customer Service categories; now it is only 12%. This percentage is applied to the salaries and benefits line items in the operating budget and is recovered through the "Account" charge. As a result, the current staff analysis shifts more system costs to the "Volume Charge per Dwelling Unit" charge from the "Account" charge when compared to the 2004 study. The underlying analysis for **Exhibit 4-3** was completed with the input of District staff.

**Exhibit 4-3: Functional Allocation of Entire Revenue Requirement**

| Functional Cost Allocation | Previous Study | Current Study |
|---|---|---|
| Customer | 5.2% | 4.4% |
| Other Costs | 94.8% | 95.6% |

## 4.4. RATE DESIGN ALTERNATIVES

This section presents two rate design alternatives for the sewer utility; each structure is designed to recover the same level of revenue.

- **Alternative A – Across-The-Board (ATB) Adjustments to Existing Structure:** This alternative adjusts the existing rate structure through across-the-board increases.
- **Alternative B – Cost of Service Rates:** The second alternative is to update the rate structure with the cost recovery shift shown in **Exhibit 4-3** in addition to applying the overall rate increase. This shifts cost recovery from the account charge to the dwelling-unit charge. This alternative also incorporates Low-Income Senior / Disabled rates.

To provide context for these alternatives, the following **Exhibit 4-4** shows the rates adopted by resolution through 2015. The alternatives would supersede these adopted rates.

**Exhibit 4-4: Adopted Rates through 2015**

| Bi-Monthly Rate Schedule | 2014 Existing | 2015 Adotped |
|---|---|---|
| Annual System-Wide Rate Increases: | | 3.00% |
| **Across the Board Rate Adjustments - Alternative A** | | |
| Account | $ 8.27 | $ 8.52 |
| Volume Charge per Dwelling Unit | $ 133.07 | $ 137.06 |
| **Total Charge per Bi-Month** | **$ 141.34** | **$ 145.58** |

### 4.4.1. Alternative A – Across the Board Sewer Rates

The simplest rate option for the sewer utility is to apply the annual rate increases to the existing rate structure. **Exhibit 4-5** summarizes the impacts of this rate structure option.

**Exhibit 4-5: Alternative A – Rate Schedule**

| Bi-Monthly Rate Schedule | 2014 Existing | 2015 Projected | 2016 Projected | 2017 Projected | 2018 Projected | 2019 Projected |
|---|---|---|---|---|---|---|
| Annual System-Wide Rate Increases: | | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% |
| **Across the Board Rate Adjustments - Alternative A** | | | | | | |
| Account | $ 8.27 | $ 8.52 | $ 8.73 | $ 8.95 | $ 9.17 | $ 9.40 |
| Volume Charge per Dwelling Unit | $ 133.07 | $ 137.06 | $ 140.49 | $ 144.00 | $ 147.60 | $ 151.29 |
| **Total Charge per Bi-Month** | **$ 141.34** | **$ 145.58** | **$ 149.22** | **$ 152.95** | **$ 156.77** | **$ 160.69** |

### 4.4.2. Alternative B – Cost of Service Sewer Rates

The second option is for the sewer rates to incorporate the updated cost-of-service analysis. The cost of service analysis suggests that recovering more costs from the dwelling unit charge (and less from the account charge) would be more equitable. In addition, Alternative B creates Low-Income Senior/Disabled rates with a 50% discount. A Low-Income Senior/Disabled discount is not based on the cost of service; however, it is allowed by State law, and it is commonly used by utilities in order to address affordability issues for a vulnerable group of customers. Based on information provided by the County to the District, 180 accounts are assumed to qualify for this discount. **Exhibit 4-6** details the rate schedule for the study period.

**Exhibit 4-6: Alternative B – Rate Schedule**

| Bi-Monthly Rate Schedule | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| | Existing | Projected | Projected | Projected | Projected | Projected |
| Annual System-Wide Rate Increases: | | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% |
| **Cost of Service Rates - Alternative B** | | | | | | |
| **With Low-Income Senior / Disabled at 50%** | | | | | | |
| Regular Customers | | | | | | |
| Account | $ 8.27 | $ 7.06 | $ 7.24 | $ 7.42 | $ 7.61 | $ 7.80 |
| Volume Charge per Dwelling Unit | $ 133.07 | $ 141.63 | $ 145.17 | $ 148.80 | $ 152.52 | $ 156.33 |
| **Total Charge per Bi-Month** | **$ 141.34** | **$ 148.69** | **$ 152.41** | **$ 156.22** | **$ 160.13** | **$ 164.13** |
| Low-Income Senior / Disabled | | | | | | |
| Account | | $ 3.53 | $ 3.62 | $ 3.71 | $ 3.80 | $ 3.90 |
| Volume Charge per Dwelling Unit | | $ 70.81 | $ 72.59 | $ 74.40 | $ 76.26 | $ 78.17 |
| **Total Charge per Bi-Month** | | **$ 74.35** | **$ 76.21** | **$ 78.11** | **$ 80.06** | **$ 82.06** |

## 4.5. SEWER CUSTOMER BILL IMPACTS

**Exhibit 4-7** provides a detailed summary of the dollar and percentage bill impacts for each type of customer. For example, the table assumes one account and a corresponding number of dwelling units, and each row within the table represents at least one customer. The majority of customers would fall within the "One Account + One Dwelling Unit" combination. Under the across-the-board option, all customers would see a 3.0% increase. Under the cost of service update however, the majority of customers would see an approximate increase of at least 5%. This is higher than the overall rate increase of 3.00% because in order to provide Low-Income Senior/Disabled rates for a subset of the customers, overall rates for everyone else need to increase to make up for the shortfall.

**Exhibit 4-7: Bi-Monthly Bill Impacts for Each Unique Customer Combination**

| Unique Account Combos | | | Calculated Bills | | | % Change Above Existing | |
|---|---|---|---|---|---|---|---|
| Account | Dwelling Unit | Number of Accounts | 2014 Current Structure | 2015 Across the Board | 2015 COS + Low-Income Senior / | 2015 Across the Board | 2015 COS + Low-Income Senior / |
| 1 | 1 | 3563 | $141.34 | $145.58 | $148.69 | 3.00% | 5.20% |
| 1 | 1 | 180 | $141.34 | $145.58 | $74.35 | 3.00% | -47.40% |
| 1 | 2 | 12 | $274.41 | $282.64 | $290.32 | 3.00% | 5.80% |
| 1 | 3 | 3 | $407.48 | $419.70 | $431.95 | 3.00% | 6.01% |
| 1 | 4 | 21 | $540.55 | $556.77 | $573.58 | 3.00% | 6.11% |
| 1 | 7 | 7 | $939.76 | $967.95 | $998.47 | 3.00% | 6.25% |
| 1 | 8 | 2 | $1,072.83 | $1,105.01 | $1,140.10 | 3.00% | 6.27% |
| 1 | 10 | 1 | $1,338.97 | $1,379.14 | $1,423.36 | 3.00% | 6.30% |
| 1 | 12 | 2 | $1,605.11 | $1,653.26 | $1,706.62 | 3.00% | 6.32% |
| 1 | 21 | 1 | $2,802.74 | $2,886.82 | $2,981.29 | 3.00% | 6.37% |
| 1 | 22 | 1 | $2,935.81 | $3,023.88 | $3,122.92 | 3.00% | 6.37% |
| 1 | 24 | 1 | $3,201.95 | $3,298.01 | $3,406.18 | 3.00% | 6.38% |
| 1 | 25 | 1 | $3,335.02 | $3,435.07 | $3,547.81 | 3.00% | 6.38% |
| 1 | 32 | 1 | $4,266.51 | $4,394.51 | $4,539.21 | 3.00% | 6.39% |

= Assumed number of Low-Income Senior / Disabled accounts, assumed one dwelling unit per account

# SECTION 5: WATER UTILITY RESULTS

## 5.1. INCREASED COSTS & RATE REDUCTION EFFORTS

When presenting our initial draft results to District staff early in 2014, the Water utility was facing nearly a 20% rate increase in 2015 and a 15% rate increase in 2016. These rate increases were higher than projected from our previous study. This is a result of several factors: higher annual operating costs, a significant capital program, and lower revenues. District staff readily identified two recent programmatic changes that have resulted in increased operating costs:

- **Compensation Study:** One significant O&M increase was the result of a compensation study that revealed that District pay levels were low across several positions. Correcting this deficiency increased staffing costs.
- **Water Quality Programs in Lake Whatcom Watershed**: The second significant O&M increase is a result of inter-local agreements with the County and the City of Bellingham in an effort to protect water quality in the Lake Whatcom watershed through two programs: tributary and water quality monitoring and invasive species removal.

In addition to these increases in operating costs, the Water utility is currently undertaking a significant capital program. By the end of our study period, new debt for these projects would add up to about $340,000 per year in annual debt service. In contrast, existing debt service is about $100,000 per year.

- The Water capital program includes a combined $3.4 million project which focuses on the Division 22 Reservoir and the replacement of asbestos concrete mains in the Geneva area. The District was able to secure low-cost financing from the Drinking Water State Revolving Fund program for that project. Even with a low-cost loan, debt service from this project alone will be about $200,000 per year.
- In addition to this pair of projects, the District is also working on Reservoir Seismic Restraints and the Division 7 & Geneva Reservoir Coating and Structural repairs which will total approximately $1 million dollars and will likely be financed with external loans or revenue bond proceeds.

Additionally, revenues have been a lower than expected. For example, a 9% rate increase was adopted for water in 2013. However, revenues increased by less than 6% as a result of lower than expected consumption from water customers.

During our meeting with staff in early 2014, FCS GROUP and District staff developed a plan to help avoid double digit percentage increases in both 2015 and 2016. The following actions were taken to soften the rate impact in the first few years of the forecast period.

- Capital projects within the study period (2014 – 2019) were reduced, delayed, or eliminated.
- Rate-funded capital reinvestment was temporarily reduced or eliminated in 2014-16. This funding requirement is assumed to return to historical levels of $200,000 per year, starting in 2017. This strategy results in increased debt funding in the near term, which

helps spread out near-term capital costs over a longer period of time, but it also creates a long-term obligation in the form of outstanding debt.

- With staff concurrence, the operating budget was assumed to be reduced by roughly $50,000 per year, which equates to about a 3% cut in operating costs.
- We adjusted the allocation of the 2014 beginning fund balance to the method described in Section 3.2, which gave the Water utility a stronger financial starting point.

As a result of these policy choices, rate increases in the first two years were reduced from 20% and 15% in 2015 and 2016 to 8.75% in each year.

## 5.2. WATER CAPITAL FUNDING STRATEGY

The following **Exhibit 5-1** details the capital funding strategy for 2014 – 2019 for the water utility.

**Exhibit 5-1: Water Capital Funding Strategy**

| Capital Funding Strategy | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2014 - 2019 Total |
|---|---|---|---|---|---|---|---|
| Capital Expenditures (Escalated Dollars) | $ 526,016 | $ 1,876,369 | $ 1,751,279 | $ 318,832 | $ 818,308 | $ 773,065 | $ 6,063,869 |
| **Capital Funding Strategy:** | | | | | | | |
| Beginning Fund Balance | $ 363,430 | $ 291,434 | $ 245,369 | $ 54,346 | $ 828,578 | $ 236,213 | |
| plus: General Facilities Charge | 17,657 | 17,657 | 17,657 | 17,657 | 17,657 | 17,657 | 105,939 |
| plus: System Reinvestment Funding | 100,000 | - | - | 200,000 | 200,000 | 200,000 | 700,000 |
| plus: Excess Operating Reserves | - | 39,919 | 29,373 | - | - | - | 69,292 |
| plus: Interest Earnings | 363 | 729 | 1,227 | 408 | 8,286 | 2,953 | 13,965 |
| plus: Net Debt Proceeds Available for Projects | 336,000 | 1,772,000 | 1,512,000 | 875,000 | - | 540,000 | 5,035,000 |
| Total Capital Resources | $ 817,450 | $ 2,121,738 | $ 1,805,626 | $ 1,147,411 | $ 1,054,521 | $ 996,822 | |
| less: Capital Expenditures | 526,016 | 1,876,369 | 1,751,279 | 318,832 | 818,308 | 773,065 | 6,063,869 |
| Ending Fund Balance | $ 291,434 | $ 245,369 | $ 54,346 | $ 828,578 | $ 236,213 | $ 223,757 | |

As was mentioned earlier, the District can no longer rely upon growth to fund very much of the capital plan. The Water capital funding strategy varies significantly from the capital strategy for Sewer. For Water, only about 12% of the total capital funding requirement is met by rate-funded capital reinvestment (compared with nearly all of it for Sewer). In contrast, debt financing is projected to account for approximately 85% of the capital funding through 2019. The remaining funding is provided through General Facilities Charge revenue, interest earnings, and transfers from the Operating Fund when balances exceed maximum operating reserve targets.

# 5.3. WATER ANNUAL FINANCIAL FORECAST

The following **Exhibit 5-2** shows the annual financial forecast for the water system, including the impact of the additional debt service required by the capital funding strategy.

**Exhibit 5-2: Water Annual Financial Forecast**

| Revenue Requirements | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| **Assuming Existing Rates:** | | | | | | |
| **Revenue** | | | | | | |
| Rate Revenues | $ 1,719,989 | $ 1,724,289 | $ 1,728,600 | $ 1,732,921 | $ 1,737,254 | $ 1,741,597 |
| Non-Rate Revenues | 109,968 | 110,446 | 111,959 | 113,281 | 114,158 | 115,505 |
| **Total Revenue** | **$ 1,829,957** | **$ 1,834,735** | **$ 1,840,558** | **$ 1,846,202** | **$ 1,851,412** | **$ 1,857,102** |
| **Expenses** | | | | | | |
| Cash Operating Expenses | $ 1,713,699 | $ 1,720,055 | $ 1,775,317 | $ 1,832,702 | $ 1,892,305 | $ 1,954,225 |
| Existing Debt Service | 105,657 | 104,676 | 103,210 | 102,625 | 101,537 | 100,505 |
| New Debt Service | - | 22,407 | 220,090 | 295,499 | 295,499 | 342,037 |
| Rate-Funded Capital Replacement | 100,000 | - | - | 200,000 | 200,000 | 200,000 |
| Additions to Operating Reserve | - | - | - | - | - | - |
| **Total Expenses** | **$ 1,919,355** | **$ 1,847,138** | **$ 2,098,616** | **$ 2,430,826** | **$ 2,489,341** | **$ 2,596,767** |
| Cash Surplus / (Deficiency) | $ (89,398) | $ (12,403) | $ (258,058) | $ (584,624) | $ (637,928) | $ (739,665) |
| **Annual Rate Adjustment** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |
| **Cumulative Annual Rate Adjustment** | | **8.75%** | **18.27%** | **28.61%** | **39.55%** | **45.13%** |
| **After Rate Increases:** | | | | | | |
| Rate Revenues | $ 1,719,989 | $ 1,875,164 | $ 2,044,339 | $ 2,228,777 | $ 2,424,269 | $ 2,527,543 |
| Net Cash Flow | (89,398) | 130,885 | 41,803 | (113,705) | 14,537 | 6,755 |
| Debt Service Coverage - Revenue Bonds | 2.90 | 4.13 | 5.88 | 3.51 | 4.49 | 3.53 |
| Debt Service Coverage - All Debt | 1.10 | 2.04 | 1.13 | 1.22 | 1.56 | 1.47 |
| **Ending Fund Balances** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** |
| Operating Reserve | $ 333,158 | $ 424,123 | $ 436,553 | $ 322,849 | $ 337,385 | $ 344,141 |
| Capital Reserve | 291,434 | 245,369 | 54,346 | 828,578 | 236,213 | 223,757 |
| Debt Reserve | 45,178 | 67,585 | 67,585 | 142,994 | 142,994 | 189,533 |
| **Total** | **$ 669,769** | **$ 737,078** | **$ 558,486** | **$ 1,294,421** | **$ 716,593** | **$ 757,430** |
| Operating Reserve (Days of O&M Expense) | 71 days | 90 days | 90 days | 64 days | 65 days | 64 days |
| Target Capital Contingency | $ 222,909 | $ 232,291 | $ 241,047 | $ 242,641 | $ 246,733 | $ 250,598 |
| Capital Contingency Deficit (if any) | $ - | $ - | $ (186,701) | $ - | $ (10,520) | $ (26,841) |
| Capital Structure: % Debt | 7% | 8% | 28% | 33% | 30% | 32% |
| Capital Structure: % Equity | 93% | 92% | 72% | 67% | 70% | 68% |

In 2014, the first year of the forecast, the Water utility is projected to draw down on reserves by almost $90,000, even after reducing its rate-funded capital reinvestment by $100,000.

After the rate reduction measures described above, this forecast requires water rate increases of 8.75% per year for three years, then 8.50% in 2018 and 4.00% in 2019. With these rate increases, the water system will maintain operating reserves between the minimum and maximum targets, have capital reserves in line with target levels, and maintain excellent bonded debt service coverage and a healthy capital structure. With the planned new debt, the capital structure increases from 7% debt to 32% debt by 2019. This is a big increase, but it is still well below the prudent maximum of 60% debt.

# 5.4. COST OF SERVICE ANALYSIS

The cost of service analysis begins with an allocation of water system assets and costs into one of five functional areas: customer, meters and services, base demand, peak demand, and fire protection.

- **Customer** – Costs that vary mainly with the number of customers. This often includes printing/advertising, meter reading and billing, etc. This includes staff time that is spent in meter reading, billing, and customer service.
- **Meters & Services** – Costs associated with installation, maintenance, and repairs of meters and services.

- **Base Demand** – Costs associated with the utility's ability to deliver water for average annual levels of demand. Typically, these costs tend to vary with the amount of water consumption, such as purchased water, chemicals, and laboratory expenses.
- **Peak Demand** – The additional capacity (above base demand) that is needed during periods of peak consumption, such as the summer peak season.
- **Fire Protection** – Costs associated with the requirement that the water system be able to deliver a specified flow rate for fire suppression purposes.

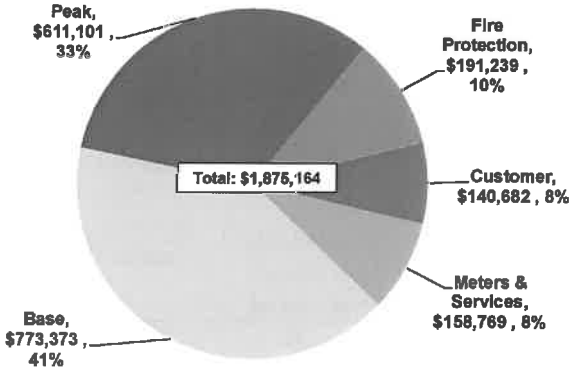
Capital-related costs include debt service payments, system reinvestment funding, and a portion of additions/uses of cash reserves. The most common methodology for assigning capital costs to functional components is to first allocate the existing plant-in-service to the five functions and then use a weighted average of the plant-in-service allocation to spread out the capital costs. This plant in service distribution to the functional categories was developed using the following assumptions:

- Allocation of supply and treatment assets between base and peak demands using the water system's ratio of peak day demand to average day demand of 1.88. This is the weighted average of the peaking factors in Section 2 of the 2010 Water Comp Plan.
- Allocation of pumping facilities is based on industry estimates of 10% to fire protection, with the remainder assigned to base and peak demands using the system ratio.
- Allocation of storage facilities is based on District storage analysis contained within a historical comprehensive plan. The most recent comprehensive plan (2010) does not contain an updated storage analysis, so no significant change was assumed.
- Allocation of transmission & distribution (T&D) facilities is first allocated 10% to fire costs, and the remainder assigned to base and peak demands using the system ratio.
- Meters & services assets are directly assigned to the meters & services functional component. Hydrant costs are directly assigned to fire protection, and general plant is allocated in proportion to all other infrastructure costs.

Operating costs are allocated to the functions based on a detailed review of line item categories, generally following the cost causation process used in the allocation of plant. For example maintenance supplies costs are allocated in proportion to total plant-in-service, watershed quality assurance program costs are allocated to "base demand" costs, miscellaneous costs are allocated in proportion to all other costs, and so forth. Costs that could not be assigned to a specific category were usually spread out based on the percentage allocation of overall plant in service.

The 2015 water revenue requirement totals nearly $1.9 million. **Exhibit 5-3** shows the breakdown of the revenue requirement by function, which in turn serves as the basis for the alternative rate designs.

**Exhibit 5-3: Water Cost of Service Summary by Function**



# 5.5. RATE DESIGN ALTERNATIVES

For reference throughout this discussion, the current adopted rate schedule is shown in **Exhibit 5-4.**

**Exhibit 5-4: Adopted Rates for 2014 - 2015**

| Bi-Monthly Rate Schedule | 2014 Existing | 2015 Adopted |
|---|---|---|
| **Adopted Rate Increases (Res. 774)** | | **5.00%** |
| Fixed Charge by Meter Size | | |
| 0.625 | $ 50.05 | $ 52.55 |
| 1.00 | $ 62.84 | $ 65.98 |
| 1.50 | $ 86.31 | $ 90.63 |
| 2.00 | $ 109.78 | $ 115.27 |
| 3.00 | $ 212.05 | $ 222.65 |
| Volume Charge | | |
| Allowance (cf) | 600 cf | 600 cf |
| Usage Over Allowance (per cf) | $ 0.063 | $ 0.066 |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 6.64 |

We developed five alternative rate structures that incorporate the new revenue requirements. All rate alternatives are designed to recover the same level of revenue. As explained later, we recommend that the District adopt Alternative C, although Alternative B is a close second. A short description of each of the alternatives is as follows.

- Alternative A – Across-The-Board (ATB) Adjustments to Existing Structure: This applies the overall rate increases equally to all customers. It does not incorporate a cost-of-service methodology, nor does it introduce Low-Income Senior / Disabled rates.

Alternatives B through E all follow a cost-of-service methodology and create Low-Income Senior / Disabled rates at 50% of the regular rates.

- Alternative B – Maintain Existing Usage Allowance at 600 cf per bi-month
- Alternative C – Reduce Usage Allowance from 600 cf to 400 cf per bi-month
- Alternative D – Eliminate Usage Allowance
- Alternative E – Eliminate Usage Allowance and Create 3-Tiered Block Rates

**Exhibit 5-5: Summary of Rate Design Alternatives**

| Alter-native | Description | Low-Income Senior / Disabled Rates? | Allowance | Revenue Profile (Fixed / Variable) | 2015 Rates: 5/8" Fixed Rate + Variable Rate | 2015 Rates: Bi-Monthly Sample Bill 5/8", 5 ccf / mo. | 2015 Rates: % above 2014 |
|---|---|---|---|---|---|---|---|
| Existing | 2014 Existing Rates | No | 600 cf | 58% / 42% | $50.05<br>$6.32 per ccf | $75.33 | |
| A | Across the Board Rate Increase to Existing Rates in 2014 | No | 600 cf | 58% / 42% | $54.43<br>$6.87 per ccf | $81.92 | *8.75%* |
| B | Cost of Service - Maintain Allowance | Yes | 600 cf | 55% / 45% | $52.97<br>$7.55 per ccf | $83.16 | *10.40%* |
| C | Cost of Service - Decrease Allowance | Yes | 400 cf | 49% / 51% | $46.63<br>$6.75 per ccf | $87.15 | *15.69%* |
| D | Cost of Service - Eliminate Allowance | Yes | 0 cf | 40% / 60% | $37.37<br>$5.26 per ccf | $89.95 | *19.41%* |
| E | Cost of Service - Eliminate Allowance + Block Rates | Yes | 0cf | 40% / 60% | $37.37<br>B1: $4.19 per ccf<br>B2: $6.29 per ccf<br>B3: $8.39 per ccf | $87.70 | *16.42%* |

## 5.5.1. Rate Impact of Updated Cost-of-Service Analysis

Of the alternative rate designs presented below, all except the across-the-board increase (Alternative A) follow a cost-of-service methodology in determining how each type of functional cost is recovered. Customer costs are recovered equally from each account. Meters and Services costs are recovered by meter size based on a set of "meter-service-equivalents" recommended by the American Water Works Association (AWWA) as an approximation of the relative cost of maintaining meters of various sizes. Fire Protection costs are recovered by meter size based on a set of "meter-capacity-equivalents," again recommended by the AWWA, which represent the amount of water that can flow through various sizes of meters (and therefore the system capacity that is demanded by that particular customer). With Base Demand and Peak Demand costs, the method of cost recovery varies with the particular type of rate design, though in general, Base Demand costs tend to be recovered by volume charges while Peak Demand costs are typically recovered through a mixture of fixed charges and volume charges.

For Alternatives B-E, a typical customer with a 5/8" meter who uses 5 ccf per month will see a bill increase that is higher than the overall increase of 8.75% in 2015. This is primarily because of the introduction of Low-Income Senior/Disabled rates. In order for 180 low-income customers to be charged 50% of regular rates, non-hardship customers would end up paying about 2.5% more. So this typical customer would expect to see an 11.25% increase in water bills above 2014 levels (8.75% plus 2.5%) before taking into account changes in the rate design or cost-of-service shifts between different types of cost recovery. For example, consider Alternative B, which only incorporates updated cost-of-service allocations and creates the Low-Income Senior/Disabled rates. **Exhibit 5-5** on the previous page shows a 10.4% increase for this typical customer. Since this is less than the 11.25% increase that would be expected from an across-the-board increase plus creation of low-income rates, the updated cost-of-service methodology must shift costs *away* from customers with 5/8" meters and average water consumption.

## 5.5.2. Alternative A – Across-the-Board Increase

The simplest rate option for the water utility is to apply the overall rate increases to the existing rate structure. **Exhibit 5-6** summarizes the impacts of this rate structure option. For 2015, these rates would replace the rates that are currently adopted within Resolution 774. Under the current rate structure, roughly 58% of revenue comes from fixed charges and 42% from volume charges.

**Exhibit 5-6: Alternative A – Rate Schedule with Across-the-Board Increases**

| Across the Board Rate Adjustments | | | Fixed: 58% | | Variable: 42% | | |
|---|---|---|---|---|---|---|---|
| No Low-Income Senior / Disabled | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Fixed Charge by Meter Size | | | | | | |
| 0.625 | $ 50.05 | $ 54.43 | $ 59.19 | $ 64.37 | $ 69.84 | $ 72.64 |
| 1.00 | $ 62.84 | $ 68.34 | $ 74.32 | $ 80.82 | $ 87.69 | $ 91.20 |
| 1.50 | $ 86.31 | $ 93.86 | $ 102.08 | $ 111.01 | $ 120.44 | $ 125.26 |
| 2.00 | $ 109.78 | $ 119.39 | $ 129.83 | $ 141.19 | $ 153.19 | $ 159.32 |
| 3.00 | $ 212.05 | $ 230.60 | $ 250.78 | $ 272.73 | $ 295.91 | $ 307.74 |
| Volume Charge | | | | | | |
| Allowance (cf) | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf |
| Usage Over Allowance (per cf) | $ 0.0632 | $ 0.0687 | $ 0.0747 | $ 0.0813 | $ 0.0882 | $ 0.0917 |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 6.87 | $ 7.47 | $ 8.13 | $ 8.82 | $ 9.17 |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |

Alternatives B through E all incorporate the updated cost-of-service analysis and create Low-Income Senior/Disabled rates at 50% of regular rates.[1]

## 5.5.3. Alternative B – Keep Usage Allowance at 600 cf/bi-month

**Exhibit 5-7** shows the rates which incorporate the cost-of-service analysis, create Low-Income Senior/Disabled rates, and maintaining the same usage allowance—600 cubic feet per bi-month. This alternative generates 55% of revenue from fixed charges, and 45% from usage charges.

**Exhibit 5-7: Alternative B – Rate Schedule with Existing Allowance at 600 cf/bi-month**

| Cost of Service - Maintain Existing Allowance With Low-Income Senior / Disabled | Fixed: 55% 2014 | 2015 | 2016 | Variable: 45% 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| **Fixed Charge** | | | | | | |
| 0.625 | $ 50.05 | $ 52.97 | $ 57.60 | $ 62.64 | $ 67.97 | $ 70.69 |
| 1.00 | $ 62.84 | $ 70.25 | $ 76.40 | $ 83.09 | $ 90.15 | $ 93.75 |
| 1.50 | $ 86.31 | $ 96.91 | $ 105.39 | $ 114.61 | $ 124.36 | $ 129.33 |
| 2.00 | $ 109.78 | $ 133.90 | $ 145.62 | $ 158.36 | $ 171.82 | $ 178.69 |
| 3.00 | $ 212.05 | $ 264.81 | $ 287.99 | $ 313.18 | $ 339.80 | $ 353.40 |
| Volume Charge | | | | | | |
| Allowance (cf) | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf |
| Usage Over Allowance (per cf) | $ 0.0632 | $ 0.0755 | $ 0.0821 | $ 0.0893 | $ 0.0969 | $ 0.1007 |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 7.55 | $ 8.21 | $ 8.93 | $ 9.69 | $ 10.07 |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |

Some customers in the District have expressed concern that when their water bills are below the usage allowance, they are paying for water that they do not use. For example, if bimonthly usage is 500 cf, customers are still charged for 600 cf as a minimum usage allowance included within the fixed meter charge. How often does this happen? Quite a lot. An analysis of customer data shows that about 26% of all bills show usage of 600 cf or less in a bi-monthly period. Furthermore, 26% of the *bills* corresponds to about 45% of *customers* who at least once in a given year drop below the 600 cf threshold, meaning that they are paying for water they do not use. This inequity is one reason for considering alternatives that would reduce or eliminate the allowance.

## 5.5.4. Alternative C – Reduce Usage Allowance from 600 cf to 400 cf

**Exhibit 5-8** shows the rates if the usage allowance is reduced from 600 to 400 cf/bi-month.

**Exhibit 5-8: Alternative C – Rate Schedule Reducing Allowance to 400 cf/bi-month**

| Cost of Service - Move to 400 cf Allowance With Low-Income Senior / Disabled | Fixed: 49% 2014 | 2015 | 2016 | Variable: 51% 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| **Fixed Charge** | | | | | | |
| 0.625 | $ 50.05 | $ 46.63 | $ 50.71 | $ 55.15 | $ 59.83 | $ 62.23 |
| 1.00 | $ 62.84 | $ 63.91 | $ 69.51 | $ 75.59 | $ 82.01 | $ 85.29 |
| 1.50 | $ 86.31 | $ 90.57 | $ 98.50 | $ 107.12 | $ 116.22 | $ 120.87 |
| 2.00 | $ 109.78 | $ 127.56 | $ 138.73 | $ 150.86 | $ 163.69 | $ 170.23 |
| 3.00 | $ 212.05 | $ 258.48 | $ 281.09 | $ 305.69 | $ 331.67 | $ 344.94 |
| Volume Charge | | | | | | |
| Allowance (cf) | 600 cf | 400 cf | 400 cf | 400 cf | 400 cf | 400 cf |
| Usage Over Allowance (per cf) | $ 0.0632 | $ 0.0675 | $ 0.0734 | $ 0.0799 | $ 0.0867 | $ 0.0901 |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 6.75 | $ 7.34 | $ 7.99 | $ 8.67 | $ 9.01 |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |

[1] To conserve space in this report, low-income rates are not shown in the following rate schedules, but they should be understood to be 50% of the stated rate.

Alternative C is our recommended rate design alternative because of the following reasons:

- We recommend incorporating the updated cost-of-service analysis into the rates, simply to maintain equity with respect to customers with different meter sizes. Alternatives B through E all share this characteristic.
- We also recommend creating Low-Income Senior/Disabled rates for both Water and Sewer at this time. The level of water and sewer rates has become high enough—and about to go higher—to justify a special consideration for those customers who are most constrained in their ability to absorb high utility bills. Low-income rates are not justified by cost-of-service considerations, but they are allowed by State law, and they are very common as a way to soften the impact on a utility's most economically vulnerable customers. Again, Alternatives B through E all share this characteristic.
- Lowering the allowance to 400 cf reduces the number of annual bills where bi-monthly usage is within the minimum usage allowance from 26% to 14%. This in turn reduces the actual percentage of customers that would have at least one bill within the allowance throughout the year from 46% to 26%. Alternative C does not go as far as Alternatives D and E—which eliminate the usage allowance entirely—but it does reduce by nearly half the occasions on which customers would find themselves paying for water not consumed.
- Those customers whose consumption falls within the allowance who would see a decrease in the fixed monthly charge when compared to Alternatives A or B—about $47 for a 5/8" meter compared to $54 in Alternative A or $53 in Alternative B.
- Compared with Alternatives D and E, this alternative stays closer to the same revenue stability as at present. The percentage of revenue coming from fixed charges would go from the current 58% to 49%, rather than dropping to 40% in Alternatives D and E.

However, there is a trade-off with this alternative: consumption between 400 – 600 cubic feet per bi-month would now be charged. So, for example, a customer using approximately 600 cubic feet would see the total bill increasing by nearly 20%. Even though the fixed charge is lower in this alternative compared to the existing approach ($46.63 versus $50.05), charging the volume rate for up to 200 cubic feet more can more than make up the difference, particularly for those customers whose usage falls between 400 and 600 cubic feet. The effect of increasing the amount of billable usage is even more striking with Alternatives D and E; in fact, Alternative C is a middle option that strikes a balance between the characteristics of the other options. **Exhibit 5-14** later in this report shows in more detail how changing the allowance would affect the total bill at different levels of usage.

## 5.5.5. Alternative D – Eliminate Usage Allowance

**Exhibit 5-9** shows rates which eliminate the usage allowance. No consumption is included within the fixed charge, so every cubic foot of water used by a customer is charged at the stated rate.

**Exhibit 5-9: Alternative D – Rate Schedule**

| Cost of Service - Eliminate Usage Allowance | Fixed: 40% | | | Variable: 60% | | |
|---|---|---|---|---|---|---|
| With Low-Income Senior / Disabled | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Fixed Charge | | | | | | |
| 0.625 | $ 50.05 | $ 37.37 | $ 40.64 | $ 44.19 | $ 47.95 | $ 49.87 |
| 1.00 | $ 62.84 | $ 73.69 | $ 80.14 | $ 87.15 | $ 94.55 | $ 98.34 |
| 1.50 | $ 86.31 | $ 132.07 | $ 143.63 | $ 156.20 | $ 169.47 | $ 176.25 |
| 2.00 | $ 109.78 | $ 207.13 | $ 225.26 | $ 244.97 | $ 265.79 | $ 276.42 |
| 3.00 | $ 212.05 | $ 426.88 | $ 464.23 | $ 504.85 | $ 547.76 | $ 569.68 |
| Volume Charge | | | | | | |
| Allowance (cf) | 600 cf | 0 cf | 0 cf | 0 cf | 0 cf | 0 cf |
| Usage Charge (per cf) | $ 0.0632 | $ 0.0526 | $ 0.0572 | $ 0.0622 | $ 0.0675 | $ 0.0702 |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 5.26 | $ 5.72 | $ 6.22 | $ 6.75 | $ 7.02 |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |

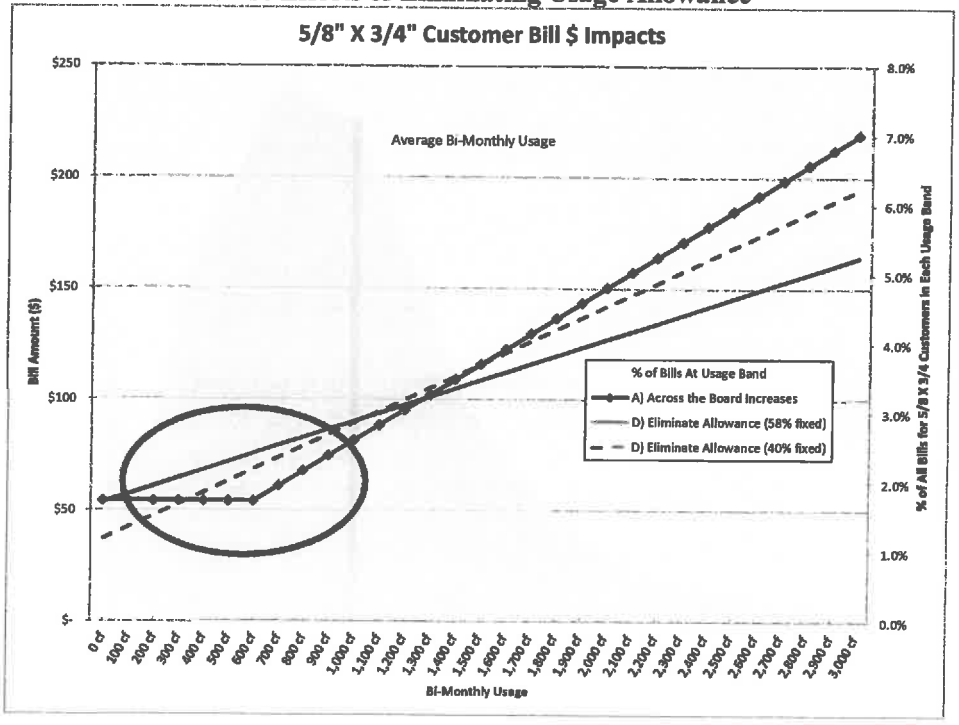
This rate alternative brings significant customer impacts. If the revenue profile were to remain at 58% fixed and 42% variable (the current 2014 level), fixed meter rates would have to essentially remain the same and the variable charge would be reduced. However, this would largely benefit large users that could recoup savings over large amounts of water usage (resulting from lower volume charges). Small water users would still have similar fixed charges without the included allowance, so essentially any usage would create a higher bill in comparison with fixed rates not being reduced.

In attempt to avoid hurting the relatively small water users, the revenue profile was reduced to the lowest recommended industry standard of 40% fixed and 60% variable, accomplished by proportionately reducing the fixed charges. This adjustment helps somewhat to reduce the bill increases to the smaller water users, but that increase is still significant.

In trying to eliminate the usage allowance, the major tradeoff is revenue stability versus the relative rate burden between large users and the large number of medium-small users who consume about as much as the allowance. Currently, about half of the total volume falls within the allowance of 600 cf/bi-month. The relative rate burden between high users and the medium-small users who consume 600 cf/bi-month is mainly determined by the volume rate. However, if we were to keep the volume rates without the allowance exactly the same as they are with the allowance, we would approximately double the revenue received from the volume rates, going from 42% of total revenue to roughly 84% of total revenue. Fixed rates would have to be reduced commensurately. A utility that received only 16% of its total revenue from fixed charges would be far too unstable financially. In order to maintain a prudent level of revenue stability (a minimum of 40% from fixed charges), eliminating the allowance inevitably means giving a break to the people who use very little water (less than the allowance) and also to the people who use a lot of water, at the expense of the people who use a medium amount of water.

**Exhibit 5-10** graphically illustrates the impact of eliminating the allowance for customers with a 5/8" meter, where the horizontal axis represents water consumption in cubic feet. The mountain-shaped dark background indicates the frequency of bills at the various levels of consumption; it refers to the percentages along the right axis. The left axis is the amount of the bill.

**Exhibit 5-10: Adverse Effects of Eliminating Usage Allowance**



In **Exhibit 5-10**, the black squared line shows the status quo rate design, continuing the existing 600 cf usage allowance. The inequity of the rate allowance is easy to see—customers who use 100 cf are charged the same amount per billing period as customers using 600 cf.

The solid red line shows the effect of eliminating the allowance while keeping the fixed charges the same, which would preserve revenue stability. This would provide no benefit to the very lowest users, a sharp increase to the medium users (those within a few hundred cubic feet of the 600 cf threshold), and a definite break to the highest users.

The red dotted line represents Alternative D, in which the allowance is eliminated, and fixed charges are reduced, but only as far as can be done without making the revenue from fixed charges less than 40% of total revenue. This scenario does provide some benefit to the very lowest users. It also reduces the volume rate and therefore the bills for the very highest users. However, the large group of users in the middle would still see substantial increases compared with the current rate design. Given this distribution of impacts to the various groups of users, on top of the already-high overall increases needed by the Water system, we do not recommend this alternative.

## 5.5.6. Alternative E – Three-Tiered Increasing Block Rates

**Exhibit 5-11** shows rates which eliminate the usage allowance rate structure while incorporating a three-tiered increasing block rate design for single-family customers.

**Exhibit 5-11: Alternative E – Rate Schedule**

| Cost of Service - Three-Tiered Increasing Block With Low-Income Senior / Disabled | 2014 | Fixed: 40% 2015 | 2016 | Variable: 60% 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| Fixed Charge | | | | | | |
| 0.625 | $ 50.05 | $ 37.37 | $ 40.64 | $ 44.19 | $ 47.95 | $ 49.87 |
| 1.00 | $ 62.84 | $ 73.69 | $ 80.14 | $ 87.15 | $ 94.55 | $ 98.34 |
| 1.50 | $ 86.31 | $ 132.07 | $ 143.63 | $ 156.20 | $ 169.47 | $ 176.25 |
| 2.00 | $ 109.78 | $ 207.13 | $ 225.26 | $ 244.97 | $ 265.79 | $ 276.42 |
| 3.00 | $ 212.05 | $ 426.88 | $ 464.23 | $ 504.85 | $ 547.76 | $ 569.68 |
| Volume Charge | | | | | | |
| (cubic feet) | | | | | | |
| Block One - (0-600) | | $ 0.0419 | $ 0.0456 | $ 0.0496 | $ 0.0538 | $ 0.0560 |
| Block Two - (601 - 2000) | | $ 0.0629 | $ 0.0684 | $ 0.0744 | $ 0.0807 | $ 0.0840 |
| Block Three - (> 2000) | | $ 0.0839 | $ 0.0912 | $ 0.0992 | $ 0.1076 | $ 0.1119 |
| Non Single Family Uniform Charge (per cf) | | $ 0.0532 | $ 0.0578 | $ 0.0629 | $ 0.0682 | $ 0.0710 |
| (100 cubic feet) | | | | | | |
| Block 1 | | $ 4.19 | $ 4.56 | $ 4.96 | $ 5.38 | $ 5.60 |
| Block 2 | | $ 6.29 | $ 6.84 | $ 7.44 | $ 8.07 | $ 8.40 |
| Block 3 | | $ 8.39 | $ 9.12 | $ 9.92 | $ 10.76 | $ 11.19 |
| Non Single Family Uniform Charge (per ccf) | | $ 5.32 | $ 5.78 | $ 6.29 | $ 6.82 | $ 7.10 |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |

Like Alternative D, this rate structure generates 40% of revenue from fixed charges and 60% of revenues from usage charges. For the same reasons discussed with Alternative D, the revenue profile was adjusted downward in an attempt to reduce the effects on the low-to-medium users of the system.

The recommended thresholds for these blocks were based on an evaluation of historical water usage patterns of District customers with 5/8" meters, which are assumed to be the single family customers.

- Block 1 (0 – 600 cubic feet per two-months) is set to equal the current usage allowance. This is a recognizable usage amount that is familiar to customers already. This accounts for about 51% of single family residential water usage.

- Block 2 (601 – 2,000 cubic feet per two-months) typically falls into place after determining blocks 1 and 3. In this case, approximately 42% of volume would fall within this range.
- Block 3 (Over 2,000 cubic feet per two-months) is the highest block rate and is typically designed to capture between 5 – 10% of volume. In this case, approximately 6.5% of single family usage would fall within the third block. This block helps send a conservation message to the largest of water consumers.

Customers with meters that were larger than 5/8" were the school, the fire authority, commercial, or assumed to be multi-family residential in condos and apartments. These customers would pay a uniform usage charge just like they do now.

We do not recommend this alternative because of the decrease in revenue stability and significant change in rate structure during times of material rate increases. Current industry trends show utilities moving towards rate structures that increase rather than decrease the share of revenue received from fixed charges, so this further supports not adopting Alternatives D or E.

## 5.6. WATER CUSTOMER BILL IMPACTS

The next two graphs show the impact of the various alternatives in dollars (**Exhibit 5-12**) and percentage increases (**Exhibit 5-13**), with bi-monthly water usage along the horizontal axis. Again, the shaded "mountain" in the background represents the percentage of bills at a given level of usage. For example, between 7 – 8% of bills are approximately in the 700 cubic feet per bi-month range; the total of all these points should approximate 100%. The darker grey bar represents the average water consumption, about 1,000 cubic feet per bi-month. The taller the "mountain" is, the more customers would be affected at a given position on the graph.

**Exhibit 5-12: Dollar Bi-Monthly Bill Increase for 5/8" Customers**

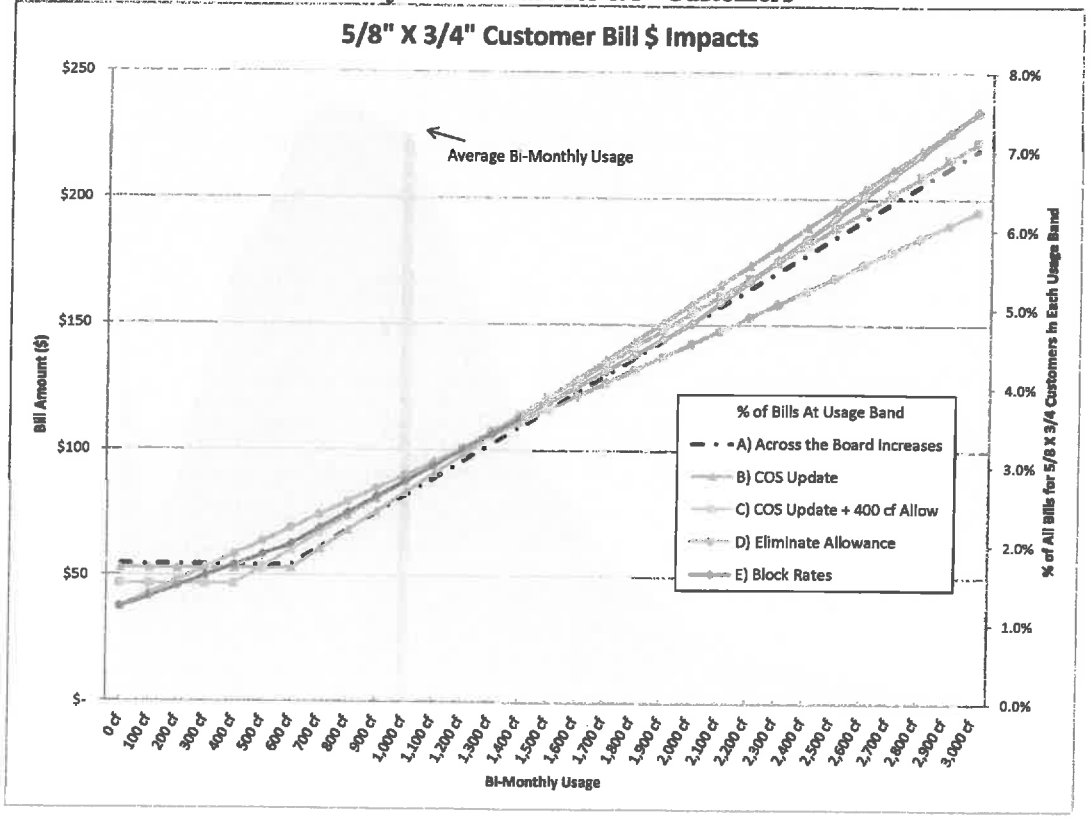


**Exhibit 5-13: Percent Bi-Monthly Bill Increase for 5/8" Customers**

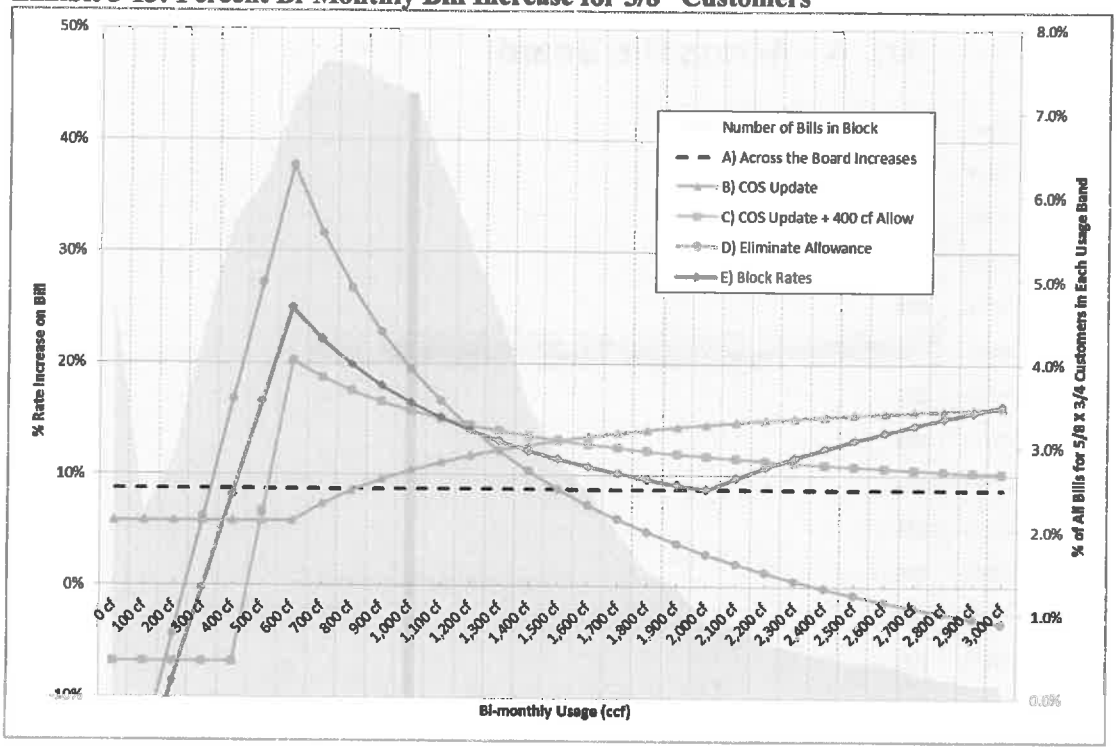


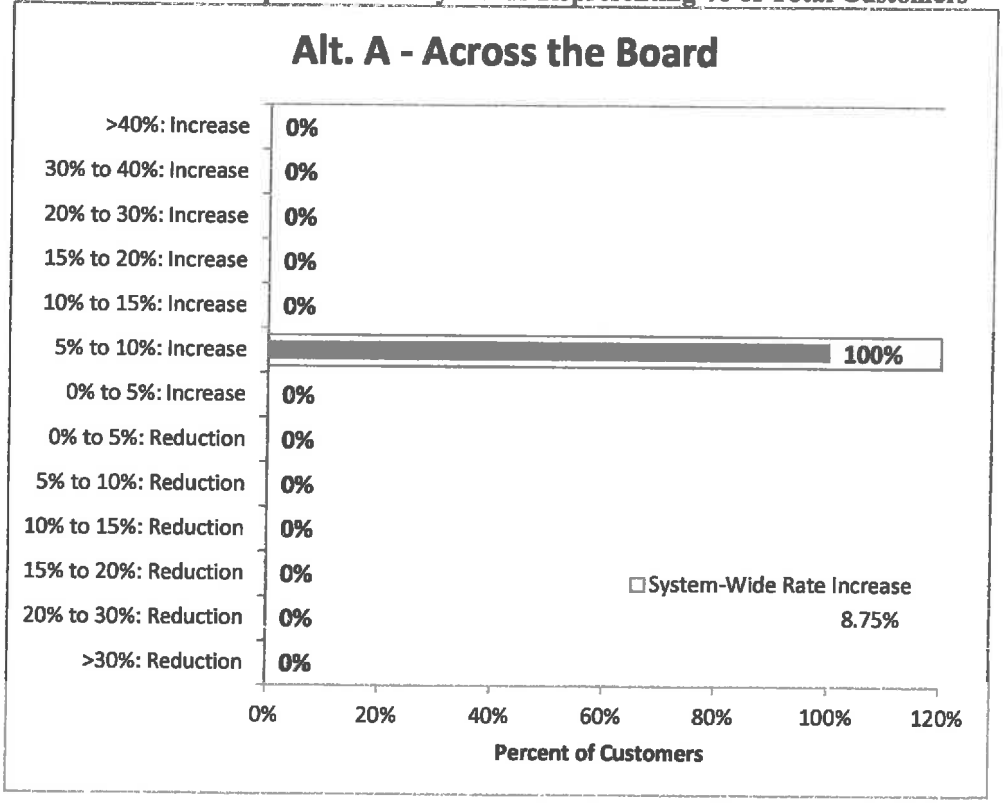

**Exhibit 5-13**, by expressing the impacts as percentage changes in the bill, makes it easier to differentiate the various alternatives. As an example, consider the average bi-monthly usage (1,000 cubic feet) mark. Eliminating the allowance would have the highest bill impact (about 20%) at that level of consumption, where simply applying across the board increases would have the lowest bill impact (8.75%) for someone of average usage. At that level of consumption, block rates (Alternative E) would have the second highest impact (purple line), followed by the reduction in the existing allowance (blue line), and lastly the basic cost-of-service update with Low-Income Senior/Disabled rates and a continuation of the existing allowance (orange line). There are tradeoffs for each alternative and different levels of impact depending upon water consumption levels and meter size. These graphs depict a range of usage for the smallest meter size, 5/8".

**Exhibit 5-14** on the following three pages shows the average bill impacts for each rate design alternative, banded into 5% or 10% increments. The light, translucent blue bar in the 5 – 10% range represents the across-the-board increase, which is in the "5-10% increase" band, because the across-the-board percentage increase in 2015 is 8.75%. So the light, translucent blue bar serves as a benchmark that indicates whether a portion of customers would be relatively higher or lower than this system-wide increase.

For example, under Alternative A, 100% of customers would see a rate increase between 5 – 10 %, since the across the board rate increase is 8.75%. Under Alternative B, 44% of customers would receive a 5-10% increase, while another 46% would receive a 10-15% increase.

In general, the rate impacts are much more concentrated under Alternatives B and C compared with Alternatives D and E. For all alternatives other than A, about 5% of customers are receiving "> 30% Reduction", which represents those customers receiving the 50% Low-Income Senior/Disabled rates.

**Exhibit 5-14: Bill Impacts Shown by Bands Representing % of Total Customers**



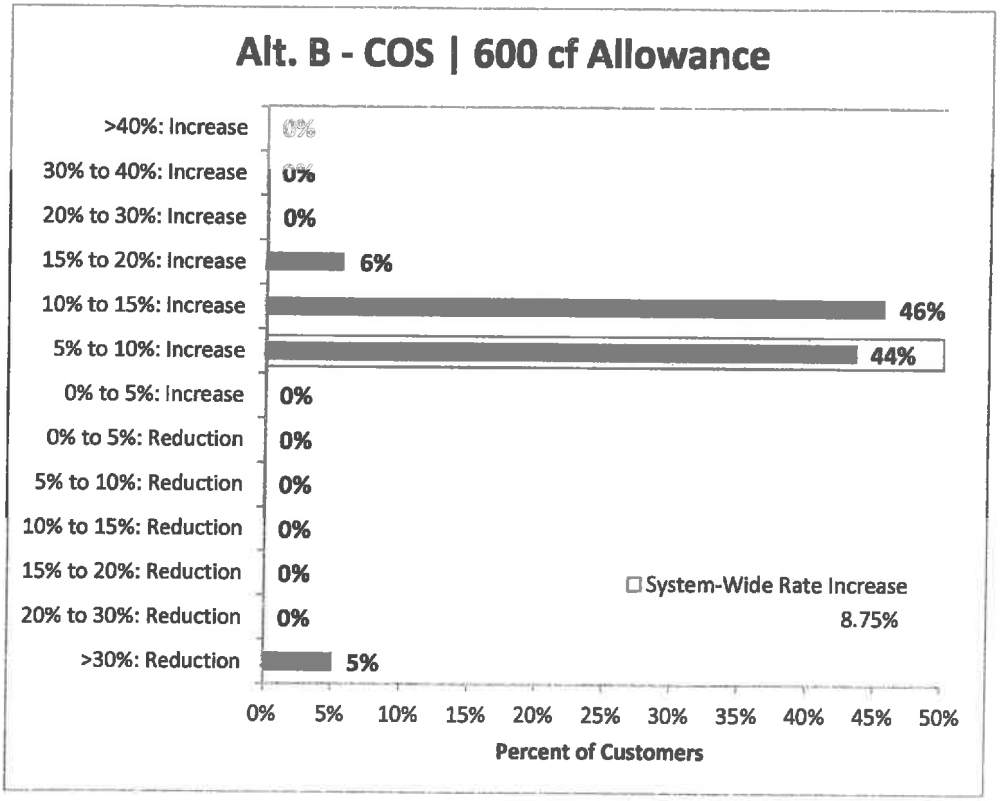
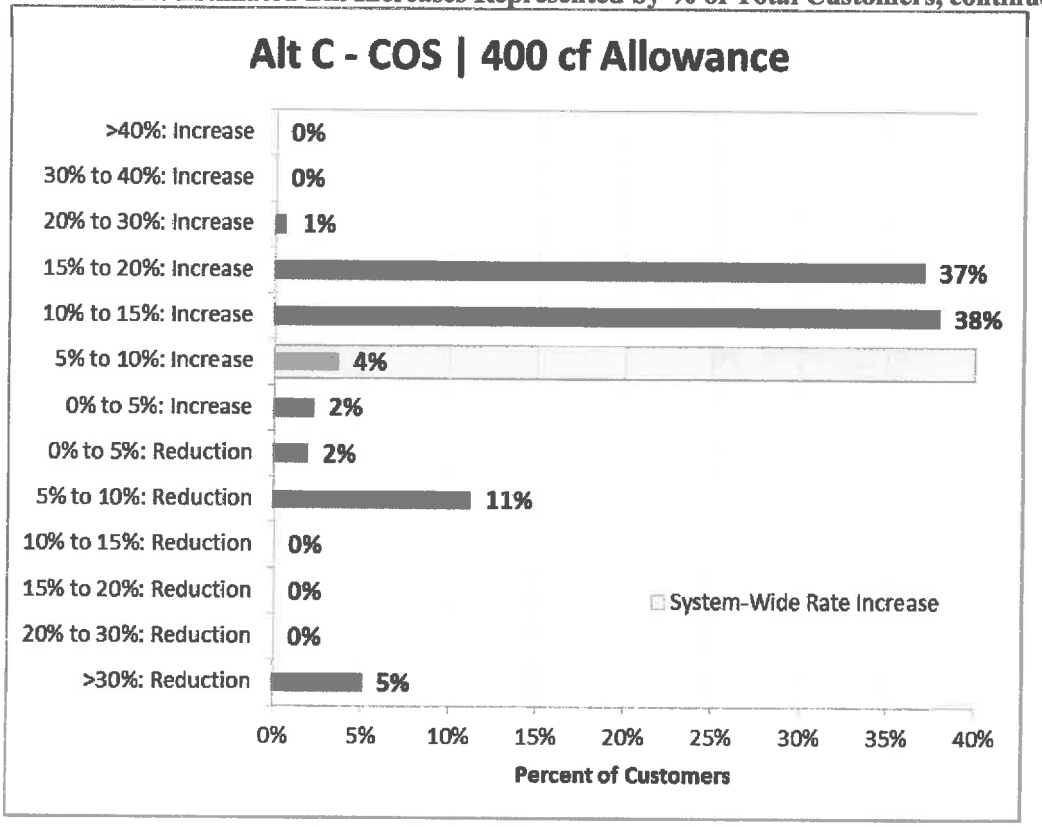



**Exhibit 5-14: Estimated Bill Increases Represented by % of Total Customers, continued**



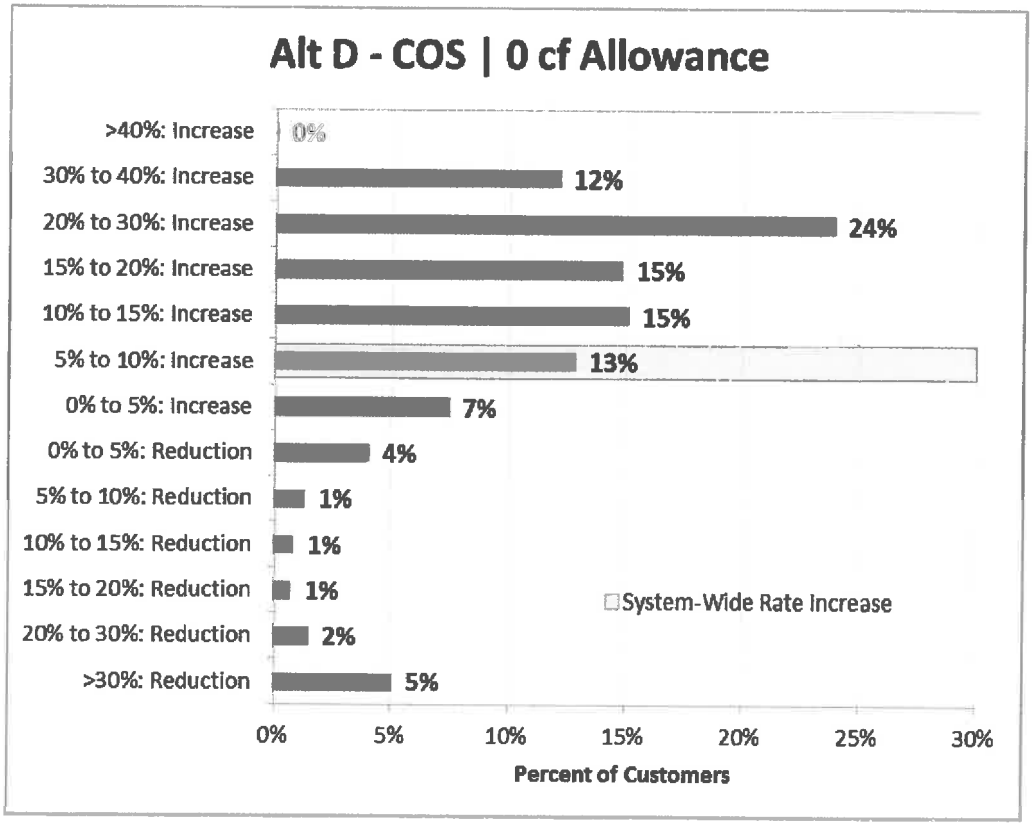
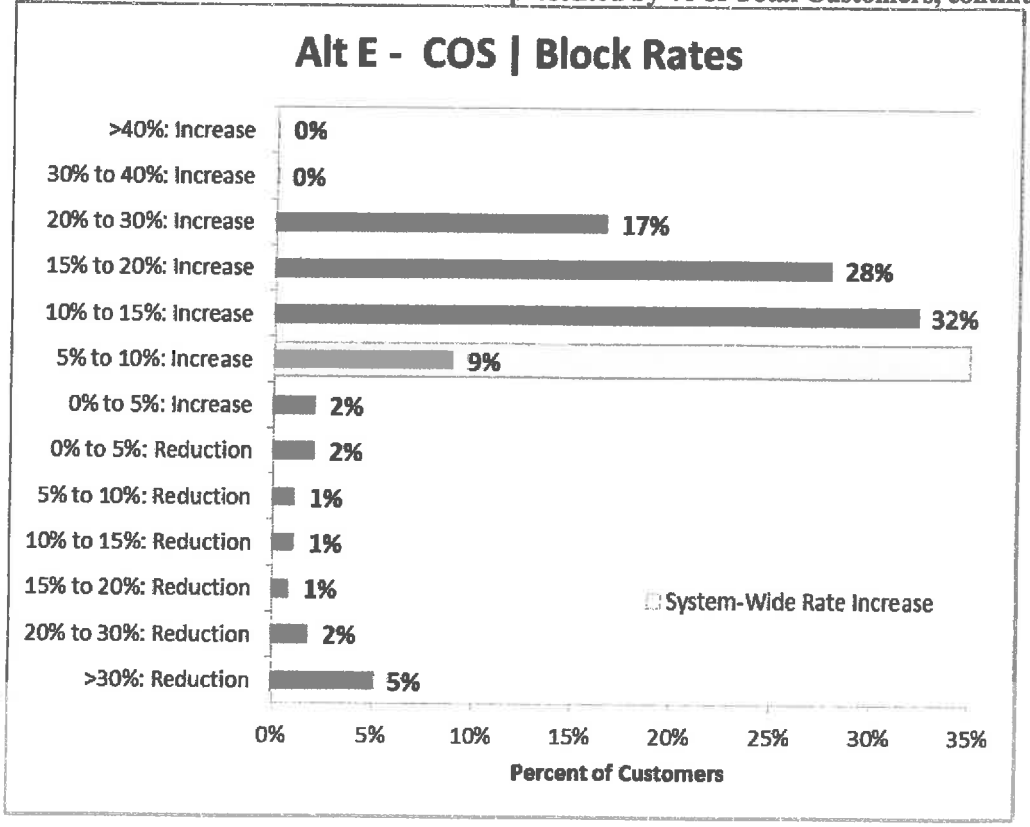



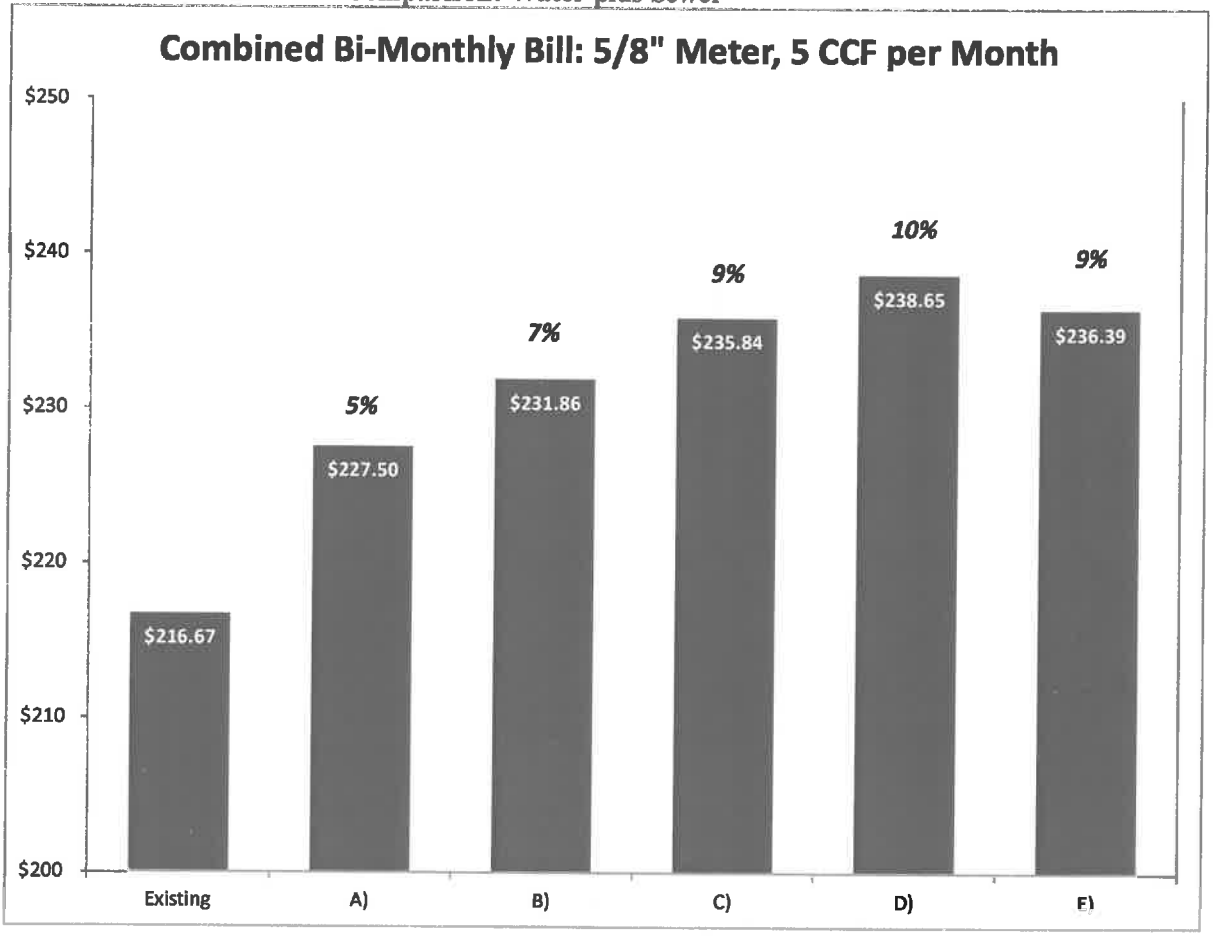
**Exhibit 5-14: Estimated Bill Increases Represented by % of Total Customers, continued**



# SECTION 6: COMBINED BILL IMPACTS

The following exhibit shows the existing combined water and sewer bi-monthly bill compared against each of the five water rate alternatives, assuming a typical customer with a 5/8" meter and 5 ccf per month. The existing bill with these assumptions is just under $217. This bi-monthly bill would increase to between $228 and $239 depending upon the rate alternative chosen by the District. The percent increase of each alternative is shown above each scenario's blue bar.

**Exhibit 6-1: Combined Bill Comparison: Water plus Sewer**




It is important to note that for an average customer, the sewer portion of the bill is approximately two-thirds of the total utility bill. So while water bills may increase between 9% – 20 %, that represents only one third of their bill. The remainder of the bill is sewer, which will be increasing between 3%–5%. That is why the weighted increase for this typical customer ranges from 5 – 10%.

# SECTION 7: JURISDICTIONAL SURVEY

The following exhibits compare Lake Whatcom's monthly (not bi-monthly) rates with those of other jurisdictions in western Washington. Rates assume the smallest meter size and 5 ccf of per month of water use, which is the District's monthly average. For both utilities the District is at or near the highest of the comparator jurisdictions. This can roughly be explained by a combination of small size, lack of significant commercial accounts, very slow growth, and pressing capital needs.

**Exhibit 7-1: Comparative Monthly Sewer Rates**

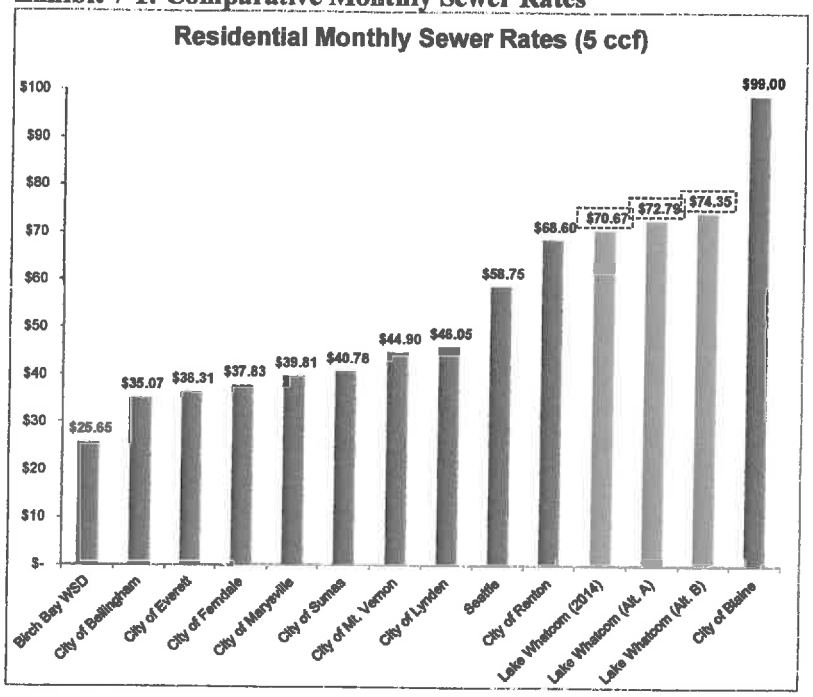
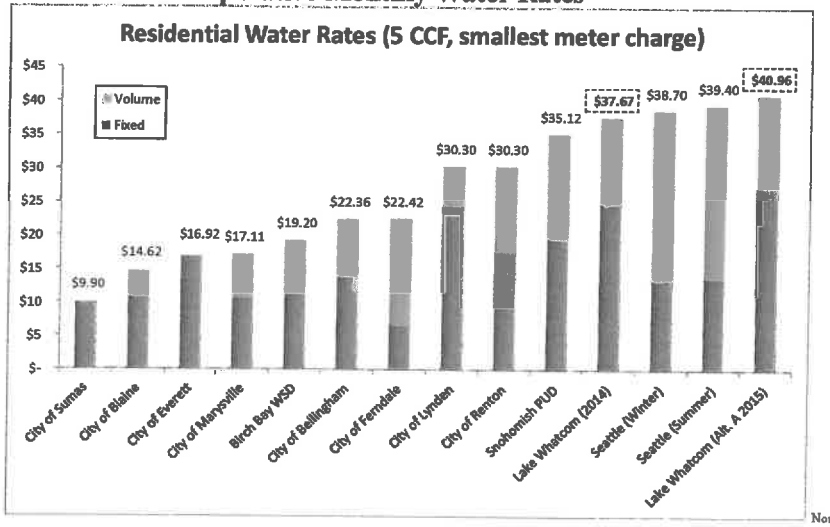



**Exhibit 7-2: Comparative Monthly Water Rates**




Note: Alternatives B – E would be higher than Alternative A

# SECTION 8: RECOMMENDATIONS

We recommend that District adopt the system-wide rate increases shown in **Exhibit 8-1.**

**Exhibit 8-1: Recommended Revenue Requirement Increases**

| Utility | 2015 Projected | 2016 Projected | 2017 Projected | 2018 Projected | 2019 Projected |
|---|---|---|---|---|---|
| **Water** | 8.75% | 8.75% | 8.75% | 8.50% | 4.00% |
| **Sewer** | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% |

Assuming these overall rate adjustments, we recommend the following rate designs.

For Sewer, we recommend adopting Alternative B. This alternative incorporates the updated cost-of-service analysis, which shifts some of the costs from the account charge into the dwelling unit charge. This alternative also incorporates Low-Income Senior / Disabled rates. The rates are shown in **Exhibit 8-2.**

**Exhibit 8-2: Sewer – Alternative B – Rate Schedule (Bi-Monthly)**

| Bi-Monthly Rate Schedule | 2014 Existing | 2015 Projected | 2016 Projected | 2017 Projected | 2018 Projected | 2019 Projected |
|---|---|---|---|---|---|---|
| Annual System-Wide Rate Increases: | | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% |
| **Cost of Service Rates** | | | | | | |
| **With Low-Income Senior / Disabled at 50%** | | | | | | |
| Regular Customers | | | | | | |
| Account | $ 8.27 | $ 7.06 | $ 7.24 | $ 7.42 | $ 7.61 | $ 7.80 |
| Volume Charge per Dwelling Unit | $ 133.07 | $ 141.63 | $ 145.17 | $ 148.80 | $ 152.52 | $ 156.33 |
| **Billing Cycle Charge** | **$ 141.34** | **$ 148.69** | **$ 152.41** | **$ 156.22** | **$ 160.13** | **$ 164.13** |
| Low-Income Senior / Disabled | | | | | | |
| Account | | $ 3.53 | $ 3.62 | $ 3.71 | $ 3.80 | $ 3.90 |
| Volume Charge per Dwelling Unit | | $ 70.81 | $ 72.59 | $ 74.40 | $ 76.26 | $ 78.17 |
| **Billing Cycle Charge** | | **$ 74.35** | **$ 76.21** | **$ 78.11** | **$ 80.06** | **$ 82.06** |

For Water, we recommend adopting Alternative C. This alternative incorporates the cost of service analysis, introduces Low-Income Senior/Disabled rates, and lowers the usage allowance from 600 cf to 400 cf per bi-month. Reducing the allowance lowers the level of inequity for customers whose consumption is lower than the allowance level in a given month, without causing the dramatic customer bill impacts that would be occasioned by completely eliminating the allowance. The rates are shown in **Exhibit 8-3.**

**Exhibit 8-3: Water – Alternative C – Rate Schedule (Bi-Monthly)**

| Cost of Service - Move to 400 cf Allowance With Low-Income Senior / Disabled | Fixed: 49% 2014 | 2015 | 2016 | Variable: 51% 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| Fixed Charge | | | | | | |
| 0.625 | $ 50.05 | $ 46.63 | $ 50.71 | $ 55.15 | $ 59.83 | $ 62.23 |
| 1.00 | $ 62.84 | $ 63.91 | $ 69.51 | $ 75.59 | $ 82.01 | $ 85.29 |
| 1.50 | $ 86.31 | $ 90.57 | $ 98.50 | $ 107.12 | $ 116.22 | $ 120.87 |
| 2.00 | $ 109.78 | $ 127.56 | $ 138.73 | $ 150.86 | $ 163.69 | $ 170.23 |
| 3.00 | $ 212.05 | $ 258.48 | $ 281.09 | $ 305.69 | $ 331.67 | $ 344.94 |
| Volume Charge | | | | | | |
| Allowance (cf) | 600 cf | 400 cf | 400 cf | 400 cf | 400 cf | 400 cf |
| Usage Over Allowance (per cf) | $ 0.0632 | $ 0.0675 | $ 0.0734 | $ 0.0799 | $ 0.0867 | $ 0.0901 |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 6.75 | $ 7.34 | $ 7.99 | $ 8.67 | $ 9.01 |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |

Alternative C is a middle option—one that makes progress toward elimination of the allowance but is intended to avoid extreme water rate impacts to the largest number of customers. However, changes in rate design are always a sensitive matter, because some customers end up paying more while others pay less. It is possible that even Alternative C might be considered too disruptive to be acceptable, given the high overall rate increases that are needed for the Water system. In our view, a close second place for our recommendation is Alternative B, which leaves the 600 cf usage allowance but incorporates the updated cost-of-service analysis and creates Low-Income Senior/Disabled rates. If the District opts for Alternative B for water rates, the applicable rate table would be the one shown in **Exhibit 8-4.**

**Exhibit 8-4: Water – Alternative C – Rate Schedule (Bi-Monthly)**

| Cost of Service - Maintain Existing Allowance With Low-Income Senior / Disabled | Fixed: 55% 2014 | 2015 | 2016 | Variable: 45% 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| Fixed Charge | | | | | | |
| 0.625 | $ 50.05 | $ 52.97 | $ 57.60 | $ 62.64 | $ 67.97 | $ 70.69 |
| 1.00 | $ 62.84 | $ 70.25 | $ 76.40 | $ 83.09 | $ 90.15 | $ 93.75 |
| 1.50 | $ 86.31 | $ 96.91 | $ 105.39 | $ 114.61 | $ 124.36 | $ 129.33 |
| 2.00 | $ 109.78 | $ 133.90 | $ 145.62 | $ 158.36 | $ 171.82 | $ 178.69 |
| 3.00 | $ 212.05 | $ 264.81 | $ 287.99 | $ 313.18 | $ 339.80 | $ 353.40 |
| Volume Charge | | | | | | |
| Allowance (cf) | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf |
| Usage Over Allowance (per cf) | $ 0.0632 | $ 0.0755 | $ 0.0821 | $ 0.0893 | $ 0.0969 | $ 0.1007 |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 7.55 | $ 8.21 | $ 8.93 | $ 9.69 | $ 10.07 |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |

All of the alternative rate schedules are shown in the following **Appendix A.**

# SECTION 9: APPENDIX A – RATE SCHEDULES

## 9.1. SEWER RATE ALTERNATIVES

| Bi-Monthly Rate Schedule | 2014 Existing | 2015 Projected | 2016 Projected | 2017 Projected | 2018 Projected | 2019 Projected |
|---|---|---|---|---|---|---|
| Annual System-Wide Rate Increases: | | 3.00% | 2.50% | 2.50% | 2.50% | 2.50% |
| **Adopted Rate Increases (Res. 774)** | | | | | | |
| Account | $ 8.27 | $ 8.52 | | | | |
| Volume Charge per Dwelling Unit | $ 133.07 | $ 137.06 | *Adopted rates effective through 2015 | | | |
| **Billing Cycle Charge** | **$ 141.34** | **$ 145.58** | | | | |
| **Across the Board Rate Adjustments - Alternative A** | | | | | | |
| Account | $ 8.27 | $ 8.52 | $ 8.73 | $ 8.95 | $ 9.17 | $ 9.40 |
| Volume Charge per Dwelling Unit | $ 133.07 | $ 137.06 | $ 140.49 | $ 144.00 | $ 147.60 | $ 151.29 |
| **Billing Cycle Charge** | **$ 141.34** | **$ 145.58** | **$ 149.22** | **$ 152.95** | **$ 156.77** | **$ 160.69** |
| **Cost of Service Rates - Alternative B With Low-Income Senior / Disabled at 50%** | | | | | | |
| Regular Customers | | | | | | |
| Account | $ 8.27 | $ 7.06 | $ 7.24 | $ 7.42 | $ 7.61 | $ 7.80 |
| Volume Charge per Dwelling Unit | $ 133.07 | $ 141.63 | $ 145.17 | $ 148.80 | $ 152.52 | $ 156.33 |
| **Billing Cycle Charge** | **$ 141.34** | **$ 148.69** | **$ 152.41** | **$ 156.22** | **$ 160.13** | **$ 164.13** |
| Low-Income Senior / Disabled | | | | | | |
| Account | | $ 3.53 | $ 3.62 | $ 3.71 | $ 3.80 | $ 3.90 |
| Volume Charge per Dwelling Unit | | $ 70.81 | $ 72.59 | $ 74.40 | $ 76.26 | $ 78.17 |
| **Billing Cycle Charge** | | **$ 74.35** | **$ 76.21** | **$ 78.11** | **$ 80.06** | **$ 82.06** |

## 9.2. WATER RATE ALTERNATIVES

| Bi-Monthly Rate Schedule | 2014 Existing | 2015 Projected | 2016 Projected | 2017 Projected | 2018 Projected | 2019 Projected |
|---|---|---|---|---|---|---|
| **Adopted Rate Increases (Res. 774)** | | **5.00%** | | | | |
| Fixed Charge by Meter Size | | | | | | |
| 0.625 | $ 50.05 | $ 52.55 | | | | |
| 1.00 | $ 62.84 | $ 65.98 | | | | |
| 1.50 | $ 86.31 | $ 90.63 | | | | |
| 2.00 | $ 109.78 | $ 115.27 | *Adopted rates effective through 2015 | | | |
| 3.00 | $ 212.05 | $ 222.65 | | | | |
| Volume Charge | | | | | | |
| Allowance (cf) | 600 cf | 600 cf | | | | |
| Usage Over Allowance (per cf) | $ 0.063 | $ 0.066 | | | | |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 6.64 | | | | |
| Across the Board Rate Adjustments | | Fixed: 58% | | Variable: 42% | | **Alternative A** |
| No Low-Income Senior / Disabled | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
| Fixed Charge by Meter Size | | | | | | |
| 0.625 | $ 50.05 | $ 54.43 | $ 59.19 | $ 64.37 | $ 69.84 | $ 72.64 |
| 1.00 | $ 62.84 | $ 68.34 | $ 74.32 | $ 80.82 | $ 87.69 | $ 91.20 |
| 1.50 | $ 86.31 | $ 93.86 | $ 102.08 | $ 111.01 | $ 120.44 | $ 125.26 |
| 2.00 | $ 109.78 | $ 119.39 | $ 129.83 | $ 141.19 | $ 153.19 | $ 159.32 |
| 3.00 | $ 212.05 | $ 230.60 | $ 250.78 | $ 272.73 | $ 295.91 | $ 307.74 |
| Volume Charge | | | | | | |
| Allowance (cf) | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf |
| Usage Over Allowance (per cf) | $ 0.0632 | $ 0.0687 | $ 0.0747 | $ 0.0813 | $ 0.0882 | $ 0.0917 |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 6.87 | $ 7.47 | $ 8.13 | $ 8.82 | $ 9.17 |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** |

| Cost of Service - Maintain Existing Allowance With Low-Income Senior / Disabled | Fixed: 55% Variable: 45% 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Alternative B |
|---|---|---|---|---|---|---|---|
| Fixed Charge | | | | | | | |
| 0.625 | $ 50.05 | $ 52.97 | $ 57.60 | $ 62.64 | $ 67.97 | $ 70.69 | |
| 1.00 | $ 62.84 | $ 70.25 | $ 76.40 | $ 83.09 | $ 90.15 | $ 93.75 | |
| 1.50 | $ 86.31 | $ 96.91 | $ 105.39 | $ 114.61 | $ 124.36 | $ 129.33 | |
| 2.00 | $ 109.78 | $ 133.90 | $ 145.62 | $ 158.36 | $ 171.82 | $ 178.69 | |
| 3.00 | $ 212.05 | $ 264.81 | $ 287.99 | $ 313.18 | $ 339.80 | $ 353.40 | |
| Volume Charge | | | | | | | |
| Allowance (cf) | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf | 600 cf | |
| Usage Over Allowance (per cf) | $ 0.0632 | $ 0.0755 | $ 0.0821 | $ 0.0893 | $ 0.0969 | $ 0.1007 | |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 7.55 | $ 8.21 | $ 8.93 | $ 9.69 | $ 10.07 | |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** | |

| Cost of Service - Move to 400 cf Allowance With Low-Income Senior / Disabled | Fixed: 49% Variable: 51% 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Alternative C |
|---|---|---|---|---|---|---|---|
| Fixed Charge | | | | | | | |
| 0.625 | $ 50.05 | $ 46.63 | $ 50.71 | $ 55.15 | $ 59.83 | $ 62.23 | |
| 1.00 | $ 62.84 | $ 63.91 | $ 69.51 | $ 75.59 | $ 82.01 | $ 85.29 | |
| 1.50 | $ 86.31 | $ 90.57 | $ 98.50 | $ 107.12 | $ 116.22 | $ 120.87 | |
| 2.00 | $ 109.78 | $ 127.56 | $ 138.73 | $ 150.86 | $ 163.69 | $ 170.23 | |
| 3.00 | $ 212.05 | $ 258.48 | $ 281.09 | $ 305.69 | $ 331.67 | $ 344.94 | |
| Volume Charge | | | | | | | |
| Allowance (cf) | 600 cf | 400 cf | 400 cf | 400 cf | 400 cf | 400 cf | |
| Usage Over Allowance (per cf) | $ 0.0632 | $ 0.0675 | $ 0.0734 | $ 0.0799 | $ 0.0867 | $ 0.0901 | |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 6.75 | $ 7.34 | $ 7.99 | $ 8.67 | $ 9.01 | |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** | |

| Cost of Service - Eliminate Usage Allowance With Low-Income Senior / Disabled | Fixed: 40% Variable: 60% 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Alternative D |
|---|---|---|---|---|---|---|---|
| Fixed Charge | | | | | | | |
| 0.625 | $ 50.05 | $ 37.37 | $ 40.64 | $ 44.19 | $ 47.95 | $ 49.87 | |
| 1.00 | $ 62.84 | $ 73.69 | $ 80.14 | $ 87.15 | $ 94.55 | $ 98.34 | |
| 1.50 | $ 86.31 | $ 132.07 | $ 143.63 | $ 156.20 | $ 169.47 | $ 176.25 | |
| 2.00 | $ 109.78 | $ 207.13 | $ 225.26 | $ 244.97 | $ 265.79 | $ 276.42 | |
| 3.00 | $ 212.05 | $ 426.88 | $ 464.23 | $ 504.85 | $ 547.76 | $ 569.68 | |
| Volume Charge | | | | | | | |
| Allowance (cf) | 600 cf | 0 cf | 0 cf | 0 cf | 0 cf | 0 cf | |
| Usage Charge (per cf) | $ 0.0632 | $ 0.0526 | $ 0.0572 | $ 0.0622 | $ 0.0675 | $ 0.0702 | |
| Usage Over Allowance (per ccf) | $ 6.32 | $ 5.26 | $ 5.72 | $ 6.22 | $ 6.75 | $ 7.02 | |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** | |

| Cost of Service - Three-Tiered Increasing Block With Low-Income Senior / Disabled | Fixed: 40% Variable: 60% 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Alternative E |
|---|---|---|---|---|---|---|---|
| Fixed Charge | | | | | | | |
| 0.625 | $ 50.05 | $ 37.37 | $ 40.64 | $ 44.19 | $ 47.95 | $ 49.87 | |
| 1.00 | $ 62.84 | $ 73.69 | $ 80.14 | $ 87.15 | $ 94.55 | $ 98.34 | |
| 1.50 | $ 86.31 | $ 132.07 | $ 143.63 | $ 156.20 | $ 169.47 | $ 176.25 | |
| 2.00 | $ 109.78 | $ 207.13 | $ 225.26 | $ 244.97 | $ 265.79 | $ 276.42 | |
| 3.00 | $ 212.05 | $ 426.88 | $ 464.23 | $ 504.85 | $ 547.76 | $ 569.68 | |
| Volume Charge | | | | | | | |
| (cubic feet) | | | | | | | |
| Block One - (0-600) | | $ 0.0419 | $ 0.0456 | $ 0.0496 | $ 0.0538 | $ 0.0560 | |
| Block Two - (601 - 2000) | | $ 0.0629 | $ 0.0684 | $ 0.0744 | $ 0.0807 | $ 0.0840 | |
| Block Three - (> 2000) | | $ 0.0839 | $ 0.0912 | $ 0.0992 | $ 0.1076 | $ 0.1119 | |
| Non Single Family Uniform Charge (per cf) | | $ 0.0532 | $ 0.0578 | $ 0.0629 | $ 0.0682 | $ 0.0710 | |
| (100 cubic feet) | | | | | | | |
| Block 1 | | $ 4.19 | $ 4.56 | $ 4.96 | $ 5.38 | $ 5.60 | |
| Block 2 | | $ 6.29 | $ 6.84 | $ 7.44 | $ 8.07 | $ 8.40 | |
| Block 3 | | $ 8.39 | $ 9.12 | $ 9.92 | $ 10.76 | $ 11.19 | |
| Non Single Family Uniform Charge (per ccf) | | $ 5.32 | $ 5.78 | $ 6.29 | $ 6.82 | $ 7.10 | |
| **System - Wide Rate Increases** | | **8.75%** | **8.75%** | **8.75%** | **8.50%** | **4.00%** | |

***Note: Low-Income Senior / Disabled assumed to receive 50% discount on bill***