CITY OF BOULDER
WATER RESOURCES ADVISORY BOARD
AGENDA ITEM

MEETING DATE: August 15, 2016

AGENDA TITLE: Discussion of Preliminary Findings for Utility Rate Study

PRESENTER/S
Jeff Arthur, Director of Public Works for Utilities
Ken Baird, Utilities Financial Manager
Eric M. Ameigh, Public Works Projects Coordinator

PURPOSE

The purpose of this item is to share key preliminary findings of the Utility Rate Study Phase 1 analysis and solicit WRAB's feedback, including the board's thoughts on how the current rate structures do or do not conform with the guiding principles affirmed by WRAB in June 2015. WRAB's response to the Phase 1 findings will help determine which rate structure adjustments, if any, are studied further in Phase 2 of the project.

BACKGROUND

In 2014, Utilities Division staff met with customers to better understand the impacts of proposed 2015 utility rate increases. Many customers indicated they did not understand utility rate structures and/or had questions and concerns about the calculation of the charges on their utility bills.

The Utilities Division periodically reviews its rate setting methodology to assure that utility rates are meeting community goals and are aligned with fee-based principles. These findings led staff to propose an evaluation of the rate structure and associated calculations for water, wastewater, and stormwater/flood management utilities as part of the 2015 work plan. As a first step, a public engagement process was implemented to solicit broader feedback across all customer classes. The initial public engagement process took place in April and May 2015 and consisted of three open houses and an online survey. More than 26,000 postcards were mailed to utilities customers to notify them about the engagement opportunities.

In June 2015, staff presented to WRAB the results of the public engagement process, as well as options for the Utility Rate Study's guiding principles and its areas of study (the June 2015 packet can be found here). Guiding principles are high-level goals and speak to what the rate structures should be designed to accomplish. The public engagement process did not indicate a strong need or desire to change the five existing guiding principles for the water rate structure. WRAB recommended that the guiding principles should apply not only to water but also to the other two utilities. In addition, it was determined that the stormwater/flood management utility should have a guiding principle specifically encouraging development that minimizes stormwater impacts. These discussions resulted in recommended guiding principles and their application across the three utilities, as shown in the following table.

Principle	Water Utility	Wastewater Utility	Stormwater/Flood Management Utility
Discourage wasteful use, while promoting all justified types and amounts of use.	X		
Be effective in yielding total revenue requirements.	X	X	X
Provide revenue stability and predictability for the utilities.	X	X	X
Fairly allocate the total cost of service across customer classes to attain equity.	X	X	X
Be dynamic and proactive to address changing supply and demand conditions, as well as the city's sustainability and resilience goals.	X		
Encourage low-impact development to decrease stormwater impacts.			X

During the same meeting, WRAB also agreed with the project's following suggested areas of study.

Effectiveness of Water Budgets
When water budgets were established, the rate structure was designed to adhere to the aforementioned principles. With the data from seven years of water budgets, now is a good time to determine how well the water rate structure and water budgets are accomplishing those stated goals.

Cost of Service
Cost of service analyses are important to conduct on a routine basis. The analysis will update the costs of providing different utility services to each customer class. All three utilities are being analyzed.

Fixed vs. Variable Charges
In the water and wastewater utilities, customers pay both a fixed service charge based on meter size, and a variable quantity charge based on water consumption. Along with cost of service, this is another issue that should be revisited on a regular basis to make sure the relationship between fixed and variable charges accurately reflects the utilities' costs to provide services and conforms to industry standards.

Outside City vs. Inside City Charges

In the water and wastewater utilities, customers pay different amounts based on whether they are inside the city or outside the city. Along with cost of service and fixed and variable charges, the difference in these charges should be revisited on a regular basis to make sure the relationship accurately reflects the utilities' costs to provide services and conforms to industry standards.

Stormwater/Flood Management Calculation Methodology
The current stormwater monthly fee calculation uses the same basic methodology across all customer classes. Customers other than single family residential are assessed stormwater charges based on the ratios of their lot size and impervious area to a typical single family residential lot. Some large customers have questioned whether a more complex methodology might better account for unique characteristics of their properties. For example, the fee for a large agricultural property is largely driven by lot size even though the runoff impacts may not be proportionally larger than those of a single family residential lot.

Following the June 2015 meeting and discussion, staff prepared and distributed an Information Packet memorandum for City Council to update them on the project's progress. Based on WRAB feedback and guidance related to guiding principles and areas of study, staff developed a scope of work for the analysis phase of the project. The scope of work informed a request for consultant proposals (RFP) which was issued in early November 2015. Staff received four complete proposals and selected Denver-based Raftelis Financial Consultants (RFC) to assist with the project.

The analysis component of the project is roughly divided into three phases, as follows:

Phase 1 – Investigation and Assessment (February – August)
RFC will assist the staff in comprehensively understanding what is happening within the rate structures and the pros and cons of the current systems. The consultant team and staff will present these preliminary findings to WRAB at the August meeting. WRAB's feedback will help determine which identified issues require a new approach within the rate structures.

Phase 2 – Analysis of Potential Alternatives (August – November)
Based on WRAB feedback at the August meeting, and staff direction, RFC will develop and analyze options to address issues identified in the first phase. Alternatives will be developed and tested across all three utilities and all customer classes and bill impacts will be calculated. Staff and RFC will present the results of the options analysis at the November meeting and offer draft recommendations as appropriate.

Phase 3 – Recommendations (November – December)
Based on the results of the second phase and WRAB discussion in November, staff and RFC will refine the analysis and draft recommendations and present a final report for WRAB's acceptance and recommendation to council.

ANALYSIS
The analysis completed by staff and RFC in Phase 1 revealed a number of findings, the most significant of which are outlined below at a summary level. Additional detail can be found in Attachment A, which is RFC's memo to city staff.

The key findings and supporting analysis were all developed through the filter of the guiding principles. Where applicable for each area of study, RFC explored questions of revenue sufficiency and stability, water conservation, customer equity, and other goals inherent in the guiding principles.

Water Utility, including Water Budgets

RFC has identified the following five key issues relative to the existing water utility rate structure.

1. Water budget rate structures do not work well for diverse commercial, industrial and institutional (CII) customers.

2. Blocks 1 and 2 could be combined into a single block to provide for more consistent monthly water budgets. Alternatively, a modified definition could be applied where, quite simply, block 1 is defined as the indoor budget and block 2 as the outdoor budget.

3. Residential indoor water allocations exceed recent indoor water use.

4. Reliance on revenue generated in Blocks 3, 4 and 5 results in a level of revenue instability that could adversely impact utility operations.

5. Block width and block pricing may not be aligned with City pricing objectives.

Wastewater Utility

RFC has identified the following two key issues relative to the existing wastewater utility rate structure.

1. Revenue insufficiency due to:
    a. declining volume sales and
    b. amount of revenue recovered through monthly service charge.

2. Industrial Pre-Treatment fees do not recover the costs incurred.

Stormwater/Flood Management Utility

RFC has identified the following two key issues relative to the existing stormwater utility rate structure.

1. Non-single family rate structure is unnecessarily complex.

2. The current rate structure penalizes individual large lot customers.

NEXT STEPS

September - Following the August meeting, staff will summarize WRAB's feedback for inclusion in the August meeting minutes. Staff will also make a recommendation and seek WRAB guidance on which rate structure adjustments to further analyze in Phase 2.

November – Staff will present WRAB with the results of the Phase 2 analysis and seek feedback on which rate structure adjustments to refine for final recommendation.

December – The final report and recommendations will be presented to WRAB for acceptance and recommendation to City Council.

First Quarter 2017 – Staff will present project results and WRAB recommendations to City Council for their consideration.

ATTACHMENTS
A – Memo from Raftelis Financial Consultants regarding Phase 1 findings

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DRAFT MEMORANDUM

To: Ken Baird, Utilities Financial Manager
City of Boulder, Colorado
From: Andrew Rheem, Project Manager
Date: July 29, 2016
Re: Utility Rate Analysis Phase 1

This memorandum summarizes Raftelis Financial Consultants, Inc. (RFC) findings for Phase 1 (Investigation and Assessment) of the City of Boulder's (City) water, wastewater, and stormwater Utility Rate Analysis (Study). Feedback regarding items for Phase 2 (Analysis of Potential Alternatives) and Phase 3 (Recommendations) will be requested during the August 2016 meeting with the City's Water Resources Advisory Board (WRAB).

In June 2015, City staff presented to WRAB the results of the public engagement process completed earlier that year, as well as options for the Utility Rate Study's guiding principles and the areas of focus for the Study. Guiding principles are high-level goals and speak to what the rate structures should be designed to accomplish. The public engagement process did not indicate a strong need or desire to change the five existing guiding principles for the water rate structure. WRAB recommended that the guiding principles should apply not only to water but also to the wastewater and stormwater/flood management utilities. An additional stormwater/flood management utility guiding principle specifically encouraging development that minimizes stormwater impacts was identified. Table 1 shows the resulting guiding principles and their applications across the City's three utilities.

Table 1: Utility Rate and Fee Structure Guiding Principles

Principle	Water Utility	Wastewater Utility	Stormwater / Flood Management Utility
Discourage wasteful use, while promoting all justified types and amounts of use	X		
Be effective in yielding total revenue requirements	X	X	X
Provide revenue stability and predictability for the utilities	X	X	X
Fairly allocate the total cost of service across customer class to attain equity	X	X	X
Be dynamic and proactive to address changing supply and demand conditions as well as the City's sustainability and resilience goals	X		
Encourage low-impact development to decrease stormwater impacts			X

The guiding principles provide a mechanism for RFC and City staff to evaluate the implications of modifications to the current utility rates and fees and to assess the implications of pricing and rate structure alternatives in Phases 2 and 3 of the Study.

Water Utility

The City implemented a water budget rate structure in 2007 that includes a fixed monthly service charge and an inclining 5-block rate structure. While some modifications have been made since adoption, the adopted structure has largely remained intact. Table 2 summarizes the fixed monthly service charge that increases by water meter size. Table 3 summarizes the inclining block 5-block rate structure based on each individual customer's actual water use and water budget. This structure is applicable to all customer classes.

Table 2: Monthly Water Service Charges

Meter Size	Monthly Service Charge
¾-inch	$10.44
1-inch	17.57
1.5-inch	37.84
2-inch	66.29
3-inch	147.46
4-inch	261.10
6-inch	585.92
8-inch	1,040.64

Table 3: Monthly Water Volume Rates

Block	Percent of Water Budget	Volume Rate
1	0 to 60%	$2.76
2	61 to 100%	3.68
3	101 to 150%	7.36
4	151 to 200%	11.04
5	Greater than 200%	18.40

The outdoor allocation is based on customer-specific irrigable area as provided by the City's geographic information system (GIS) allocated monthly for efficient water use using historic evapotranspiration (ET) factors consistent with Boulder's climate. Table 4 summarizes the percent of the annual budget provided throughout the year.

Table 4: Outdoor Allocation – Percent of Monthly Water Budget

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Percent of Outdoor Budget	0%	0%	1%	7%	14%	20%	20%	18%	12%	7%	1%	0%

Table 5 shows the options available to customers by customer class for use in determining each customer's water budget.

Table 5: Water Budget Options and Percent of Accounts by Option

Water Budget Basis	SFR / MFR	CII	Irrigation-Only
Indoor / Outdoor: Class specific indoor allocations and GIS and ET based customer specific outdoor budgets	100%	7%	100%
Average Monthly Usage: 85% of Historical Monthly Use	0%	83%	0%
Historical Monthly Usage: 85% of rolling three-year average for each month	0%	6%	0%
Efficiency Standard: Customer specific budget based on engineer developed and approved customer specific budget	0%	1%	0%
Plant Investment Fee: Budget based on water allocation secured through plant investment fee	0%	3%	0%

Blocks 1 and 2 of the structure are intended to provide a reasonable indoor and outdoor water use allowance for each customer. Blocks 3-5 are intended to send a conservation or efficient use message (i.e., use more than your allotted budget and a meaningful price signal is provided).

RFC has identified the following five key issues relative to the existing water utility rate structure and resulting revenues used to fund water utility revenue requirements.

1. Water budget rate structures do not work well for diverse commercial, industrial and institutional (CII) customers.
2. Blocks 1 and 2 could be combined into a single block to provide for more consistent monthly water budgets. Alternatively, a modified definition could be applied where, quite simply, block 1 is defined as the indoor budget and block 2 as the outdoor budget.
3. Residential indoor water allocations exceed recent indoor water use.
4. Reliance on revenue generated in Blocks 3, 4 and 5 results in a level of revenue instability that could adversely impact utility operations.
5. Block width and block pricing may not be aligned with City pricing objectives.

<u>Water Issue #1: Water Budget Rate Structures Do Not Work Well for Diverse Commercial, Industrial and Institutional (CII) Customers</u>

The City's water budget rate structure applies to the CII class and the customer's budget is most commonly based on that customer's historical usage. While there are several alternatives available, about 83% of CII water budgets are based on each customer's Average Monthly Usage (AMU), which is calculated using the historical average of 12 consecutive months of water use for the account, the default year being 2005. CII customers represent a diverse group of land uses, customers, and end water uses. Finding a single efficiency measure (e.g., irrigable area) for efficient use is impossible and even within a group of similar CII users (e.g., restaurants) is very difficult as evidenced by the City's CII Benchmarking study completed in 2016. For CII, historical use is a commonly used basis due to the challenges of finding and administering some other

measure(s). Due to the difficulty in finding an efficiency measure, communities that have implemented water budgets either restrict use of this rate alternative to residential and irrigation-only customers where end uses are more homogeneous and efficiency factors may be found, or provide CII water budgets based on historical customer use like the City has done. Even if it is determined that this approach should be continued for the City's CII customers, at a minimum, 2005 may no longer be a valid "base" year.

The City has experienced a higher percent of revenue from CII customers in Blocks 3, 4 and 5 relative to SFR as shown in Figure 1. In 2015, 37% of CII revenue came from Blocks 3-5 while Residential had only 21% from these same blocks. Not including the fixed charge, in 2015 the CII class paid $3.78 per 1,000 gallons, while the SFR customers paid $3.17 per 1,000 gallons. Based on this, there appears to be inequities in how water budgets are calculated across SFR and CII customer classes.

Furthermore, CII customers demonstrate a lower ratio of peak to average monthly use relative to SFR customers and the overall system. The ratio provides an additional proxy for the cost to serve customers as those customers that exhibit the highest peaking requirements create the demand for the maximum system capacity and, as such, are the most expensive customers to serve. Facilities are sized to meet the peak demands during the irrigation season, but are "idle" during non-irrigation season months; a very expensive service cost. Figure 2 shows the peak month to average month data for SFR customers, CII customers and the overall system for 2012 through 2015.

Figure 1: 2015 Percent of Annual Volume Water Sales Revenues by Customer Class

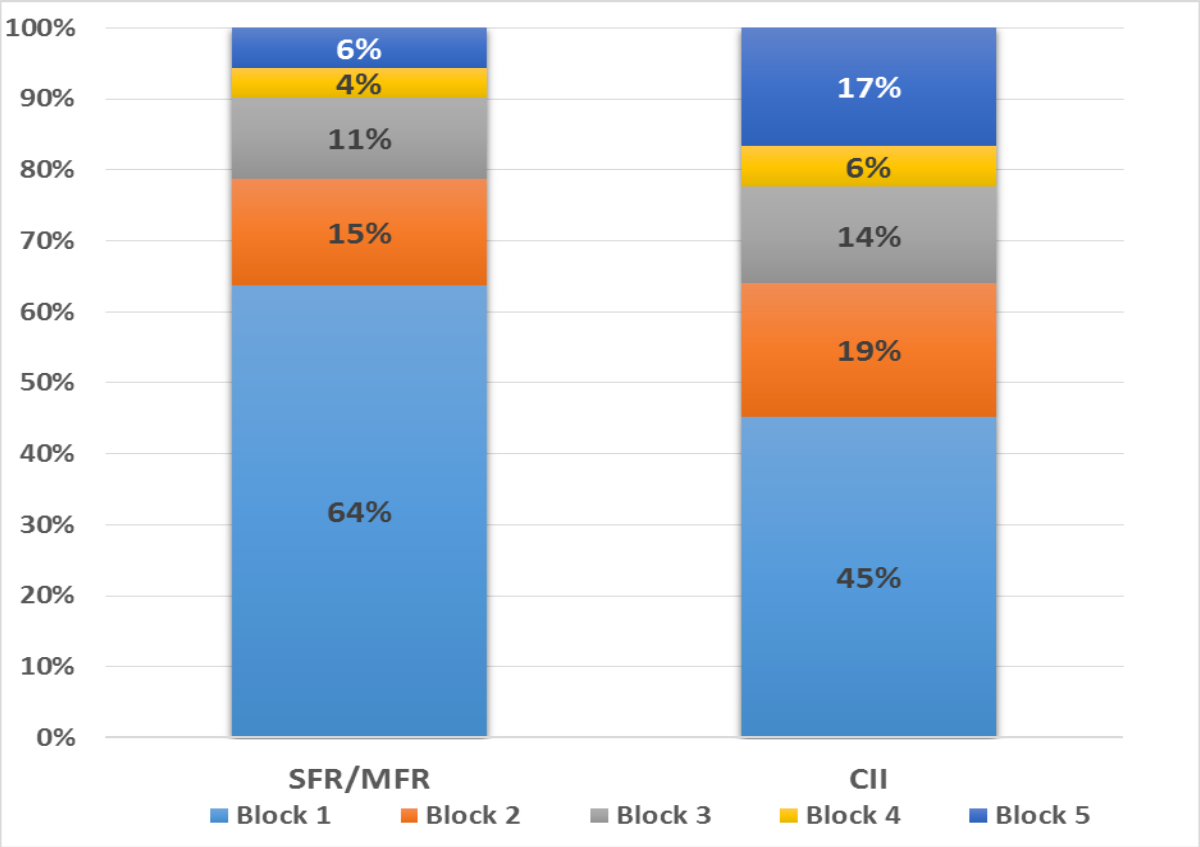


Figure 2: 2012 - 2015 Maximum Month to Average Month SFR, MFR, CII and System

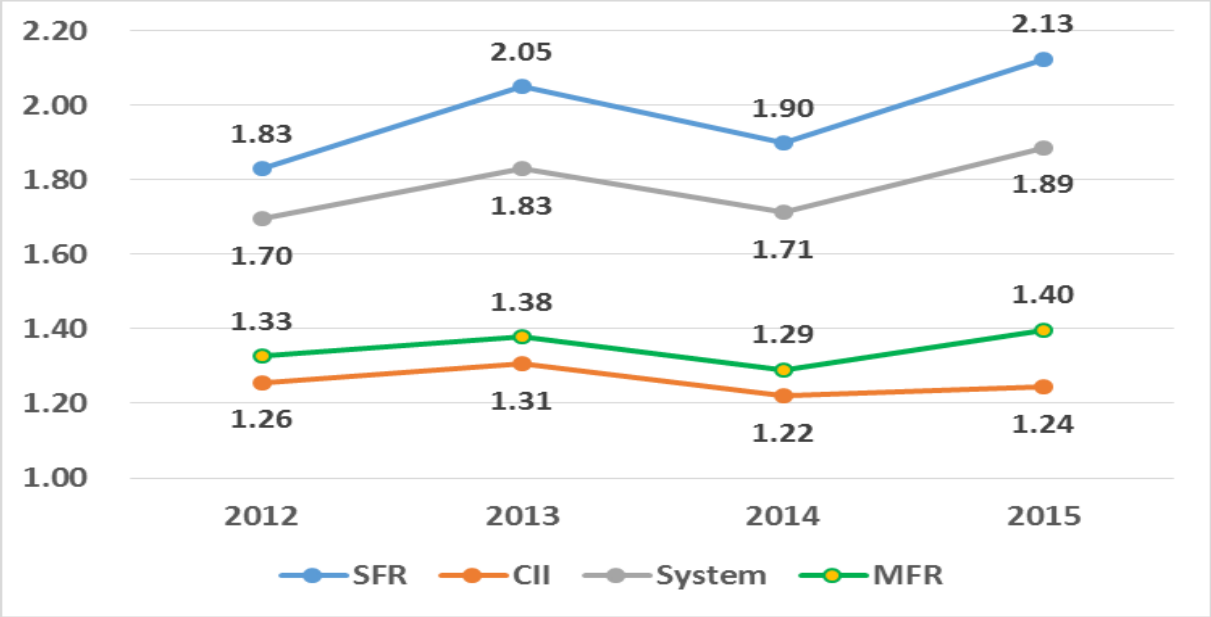
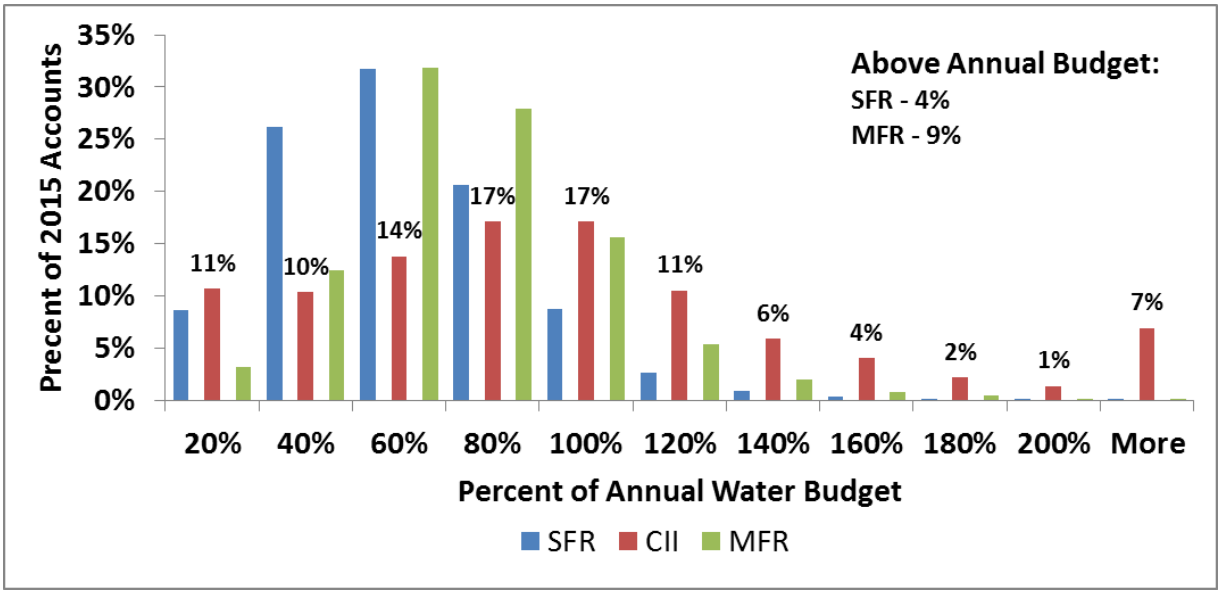


Figure 3 summarizes the percent of SFR, MFR and CII customers that exceed their annual budgets.

Figure 3: 2015 Percent of Annual Customers Below, at or Above Annual Water Budgets

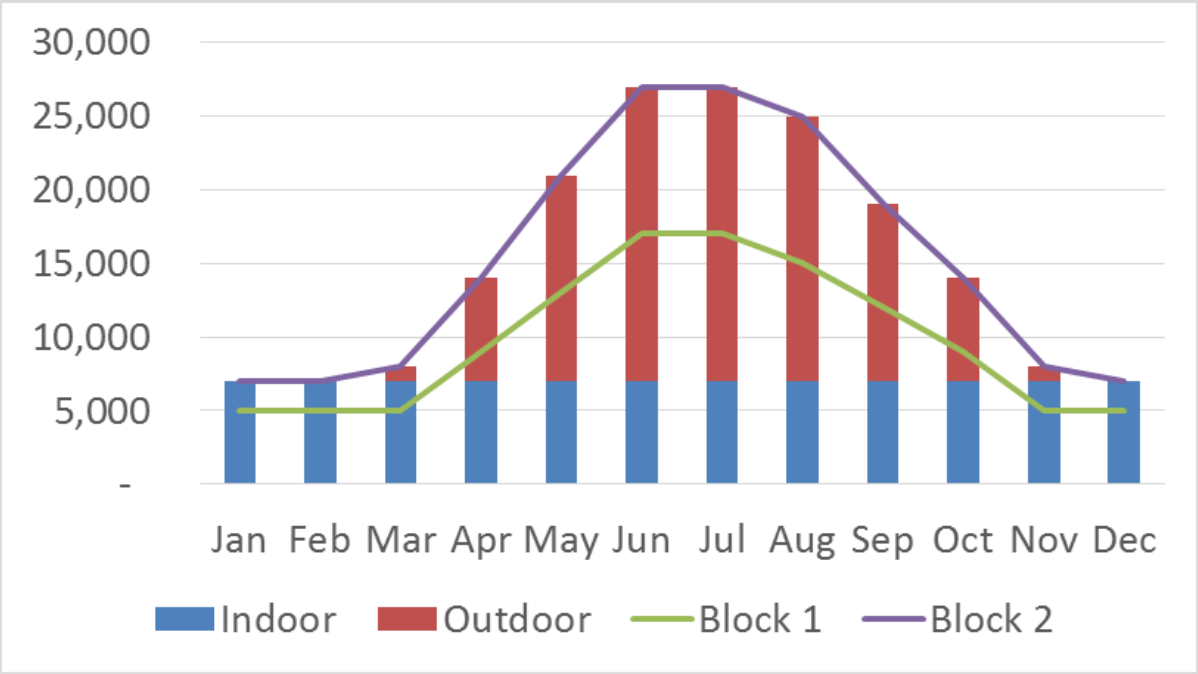


For example, 96% of SFR and 91% of MFR stay at or below the annual water budget. In contrast, only 69% of CII customers stay at or below the annual water budget. Additionally, 14% of CII customers were at 160% or more above their annual water budget. While CII customers may be less responsive to conservation pricing signals compared to individual SFR and MFR, how the budgets are implemented and established is a significant factor underlying these results.

<u>Water Issue #2: Blocks 1 and 2 Could Be Combined to a Single Block to Provide More Consistent Monthly Water Budgets or Alternatively Modified Where Block 1 is Defined as the Indoor Budget and Block 2 as the Outdoor Budget</u>

Block 1 today includes from 0% to 60% of each customer's monthly water budget while Block 2 provides for 61% to 100% of each customer's monthly water budget. The monthly water allocation for SFR customers is based on a fixed amount of water per account plus the percent of each customer's annual outdoor water allocations in March through November. Figure 5 summarizes the monthly allocations for a SFR customer with 7,000 square feet of irrigable area.

Figure 4: Monthly Water Budget SFR Customer with 7,000 Sq. Ft. Irrigable Area



As illustrated in Figure 4, the customer's monthly budget in winter months includes the 7,000-gallon allocation segmented in the two blocks, i.e., indoor use (in theory all winter-time water use is for indoor purposes) is priced at the unit rates represented by the Blocks 1 and 2 prices. As outdoor water budget amounts are included in March through November, the same indoor usage within the first 7,000 gallons is recovered in Block 1. The application of the policy in different months creates a confusing efficiency pricing signal that runs counter to the intended efficiency pricing signal as "in budget" use is priced at different rates during different months. An additional outcome is to indirectly incentivize inefficient water use during the irrigation season. This can occur since the pricing signal provided through the rate structure means the same unit of indoor water use priced at Block 2 in January is priced at Block 1 in June. The combined effect of Issue #2 and Issue #3 is to unfairly allocate costs amongst different users and encourage wasteful water use.

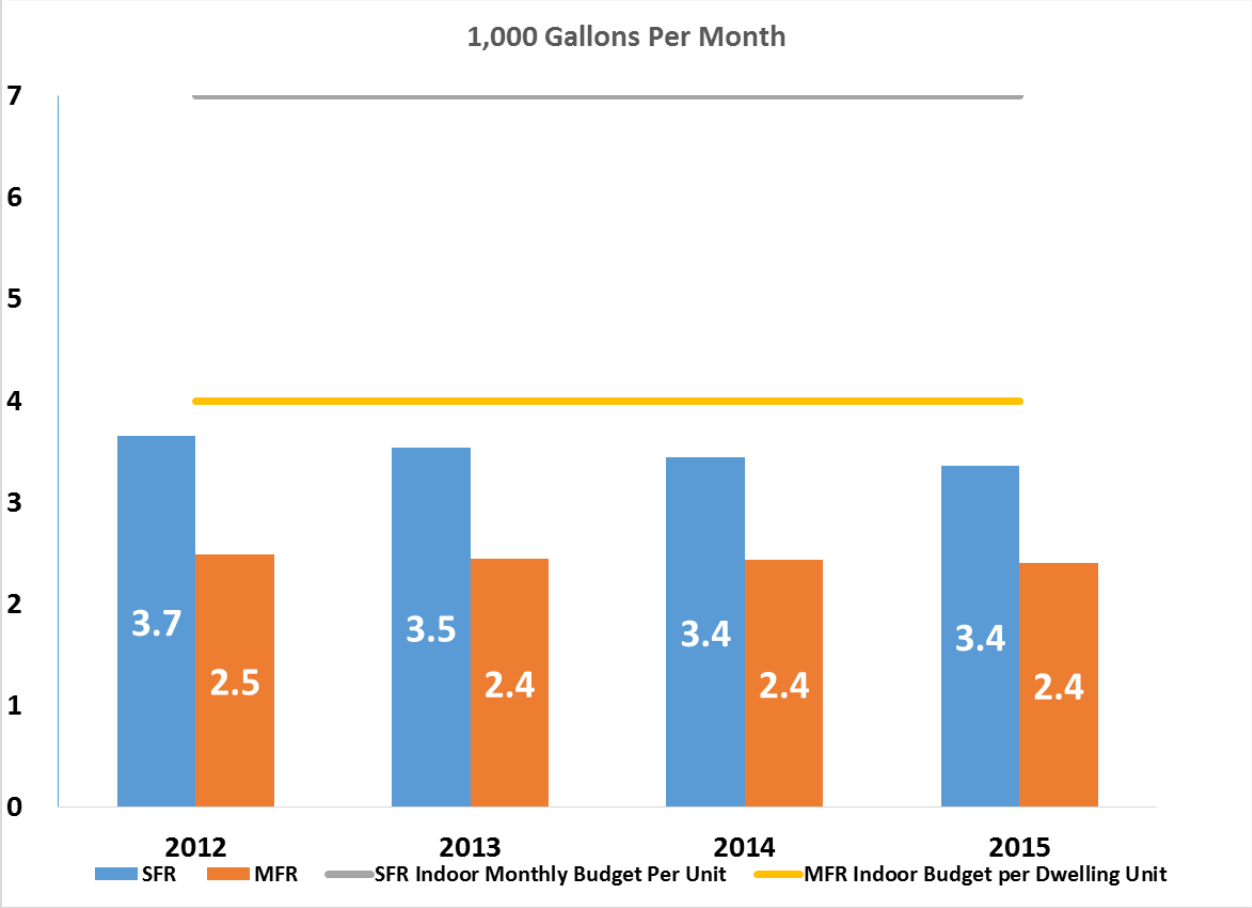
<u>Water Issue #3: Residential Indoor Water Allocations Exceed Recent Indoor Water Use</u>

Under the current budget rate structure, all SFR customers receive 7,000 gallons per month for their indoor allocation and all MFR customers receive 4,000 per month per dwelling unit. These amounts are referred to as "base allocations". Exception policies exist for customers to request additional allocations when they have more persons per household for SFR and additional dwelling units for MFR than assumed in the development of the base allocations.

One commonly used measure of SFR monthly indoor use is how much water is used during the Average Winter Consumption (AWC) months of December through March. In fact, this metric is used by the City for estimating the amount of water use returned to the wastewater system – the units used in billing for wastewater service. Figure 5 shows the AWC trend from 2012 through

2015 for SFR and MFR customers per dwelling unit compared to the base allocations given under the current water budget rate structure.

Figure 5: 2012 through 2015 SFR and MFR Monthly Indoor Water Use Per Dwelling Unit

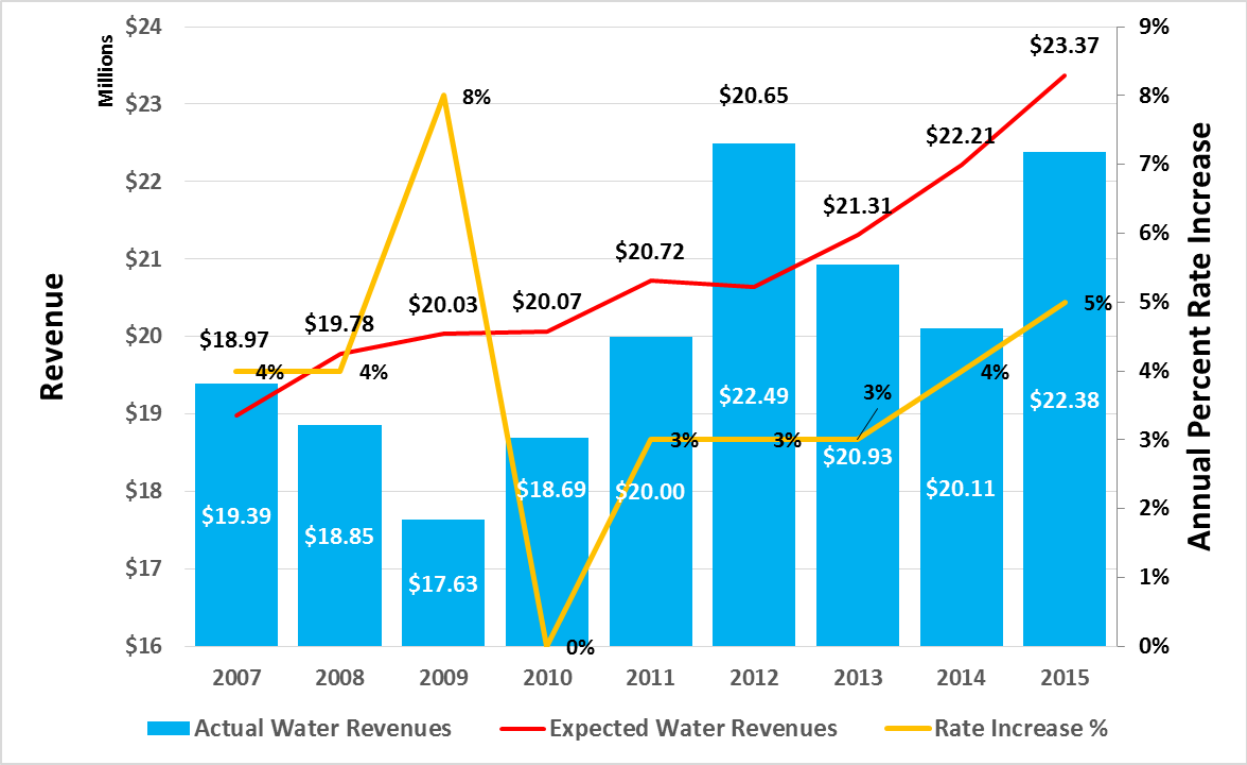


Over the years there has been a consistent downward trend in indoor use, with the 2015 AWC at around 3,400 gallons per month for SFR and 2,400 gallons per month for MFR. The averages reflect SFR using 49% with MFR customers using 60% of the monthly budgets or base allocations, respectively, in 2015. The guiding principle that the water rate structure should discourage wasteful water use and promote justified types of use can be significantly diluted when additional budget amounts are provided and priced at Block 1 and 2 rates. The result is that the indoor allocations are higher than what the average SFR and MFR customer uses resulting in more inefficient indoor use available and charged at the lower Block 1 rate. During the irrigation season excess indoor allocations are also then available for potentially inefficient outdoor watering. The combined effect is that the individualized customer efficiency pricing signal becomes meaningless for many customers.

Water Issue #4: Reliance on Revenue Generated in Blocks 3, 4 and 5 Results in a Level of Revenue Instability that Could Adversely Impact Utility Operations

When water budgets were adopted, one of the guiding principles was that the structure provide "Revenue Stability and Predictability". This objective has been reaffirmed by the City in 2015 as summarized in Table 1. Since weather is the most significant variable influencing water use and more specifically billed water use, revenues for the City have continued to be quite variable and the revenue variability increases as weather-affected usage is often billed at the highest or marginal volume rates for each customer. Figure 6 shows annual water revenues expected and received since 2007. Revenues received have varied from $17.6M to $22.5M[1]. In 2009, revenues received were 12% lower than expected (than budgeted), and in 2012, the only year where actual revenues exceeded expected revenues, they were 9% more than expected.

Figure 6: Actual and Expected Water Service Charge Revenue 2007 – 2015



While mostly a function of weather, revenue variability can be diminished or amplified by the rate structure and/or the "steepness" of the ratio of the inclining block rates since the last unit of consumption (discretionary use) generates the highest unit volume revenue. The more revenue received from the fixed service charge and from the lower blocks, the more stable the overall revenue stream. Figure 7 shows percentage of revenues received through the fixed service charge and the water budget blocks. Revenue received from the fixed service charge and blocks 1 and 2 (within the water budget) comprise, on average, 76% of billed revenue. As alternative rate

[1] Water rate revenue increases were 2008:4%, 2009: 8%, 2010: 0%, 2011 through 2013:3% annually, 2014:4%, and 2015:5%.

structures are considered, the impact of the change on revenue stability should be evaluated in order to better align any such alternatives with the revenue stability and predictability principle balanced against the other guiding principles.

Having revenues that are more variable affects financial planning. An estimated 85% of the water utility's costs are fixed. So even when water use is down significantly, the cost savings are relatively small. Variable water utility expenses like chemicals and electricity are a relatively small portion of the overall costs of running the utility, which includes maintaining and replacing source water, treatment, and distribution capital infrastructure, meeting water quality standards, and fixed costs associated with operating the water treatment plants. These costs are incurred independent from weather-affected water sales. In a year where revenues are lower than expected, the shortfall is not certain until relatively late in the year when most of the budget is already expended and construction/maintenance projects are already underway. Adjusting for the shortfall usually means either increasing rates in the subsequent year's budget process or cutting back on planned/necessary capital projects, which mostly means deferring capital maintenance and replacements. Conversely, in years following a revenue surplus, the options include adding back to capital projects and/or lowering planned rate increases. Therefore, the effect of the revenue variability is increased variability in planned rate increases and in capital maintenance planning.

Water Issue #5: Block Width and Block Pricing May Not be aligned with City Pricing Objectives

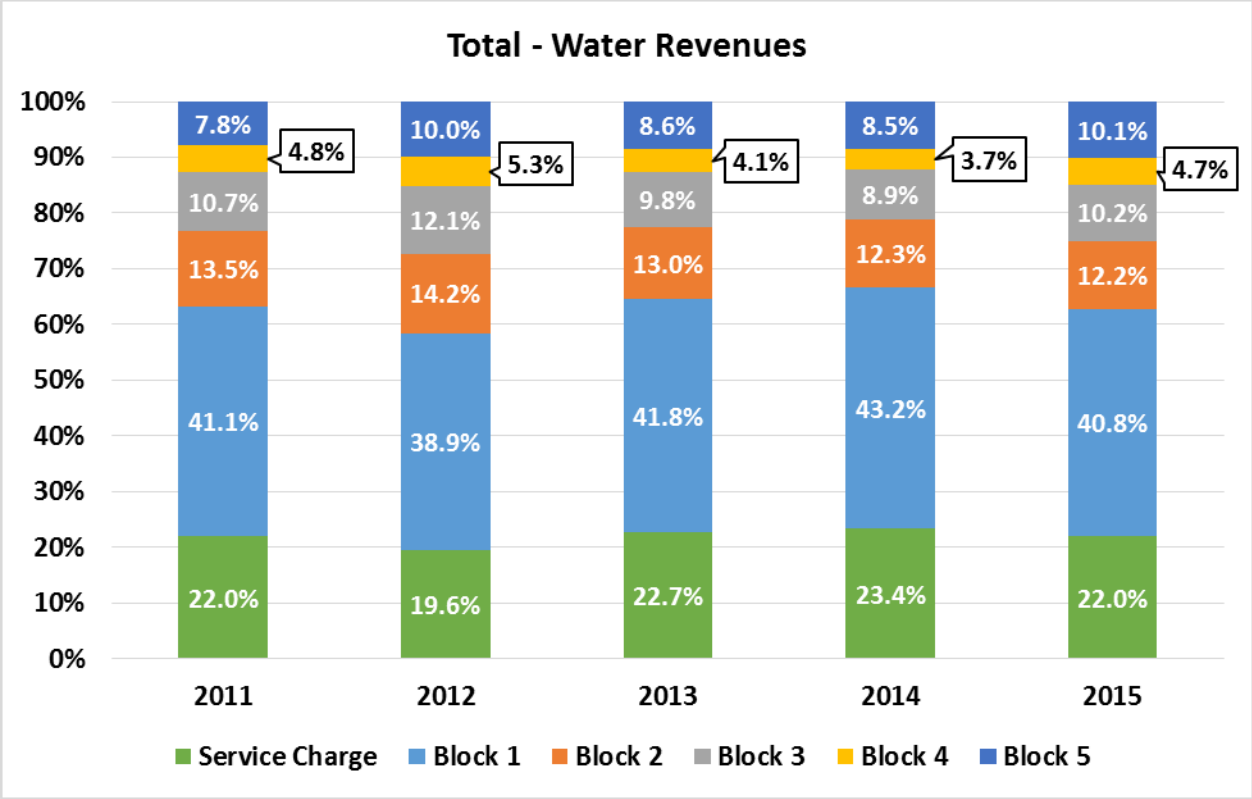
The current rate structure includes five blocks "linked" to varying percentages of each customer's water budget, with monthly use within the water budget recovered in Blocks 1 and 2. The Blocks 3, 4 and 5 price per 1,000 gallons are 2, 3 and 5 times the Block 2 volume rate, respectively. The higher price provides a pricing signal to customers intended to encourage water use within the customer's budget, but also creates revenue instability due to reliance on revenue from out-of-budget water use that, by design, should not occur.

In conjunction with Phase 2 alternatives to address other key issues, RFC recommends that the City evaluate the percent of the customer's water budget in each block (block width) and relationship of Blocks 3, 4 and 5 volume rates to Blocks 1 and 2 (block multipliers) for alignment with the affirmed pricing objectives.

Feedback regarding Issues 1 through 4 will influence the extent to which Block width and Block multipliers are evaluated since the number of blocks, amount of in-budget water allocations (e.g., base amount per month), CII water budget rate structure and revenue recovery will affect the block width and block multipliers.

Figure 7 shows the percent of annual revenues from the monthly service charge and each volume block from 2011 through 2015, which illustrates the water utility revenue recovery that combines block width, block multipliers and other policy items discussed in water utility issues 1 through 4.

Figure 7: 2011 - 2015 Percent of Annual Revenues from Monthly Service Charge and Each Volume Block



Wastewater Utility

The City implemented changes to the volume-related component of the wastewater rate structure in 2011, but otherwise has maintained the same rate structure for over 20 years. Table 6 summarizes the fixed monthly service charge that increases by water meter size. Table 7 summarizes the volume rate applicable to billed sewer volumes.

Table 6: Monthly Wastewater Service Charges

Meter Size	Monthly Service Charge
¾-inch	$1.50
1-inch	2.64
1.5-inch	6.02
2-inch	10.61
3-inch	23.85
4-inch	42.44
6-inch	95.49
8-inch	169.75

Table 7: Monthly Wastewater Volume Rates

Description	Volume Rate ($ / 1,000 gallons)
Volume Rate ($/1,000 gal)	$6.05

RFC has identified the following two key issues relative to the existing wastewater utility rate structure and fees assessed.

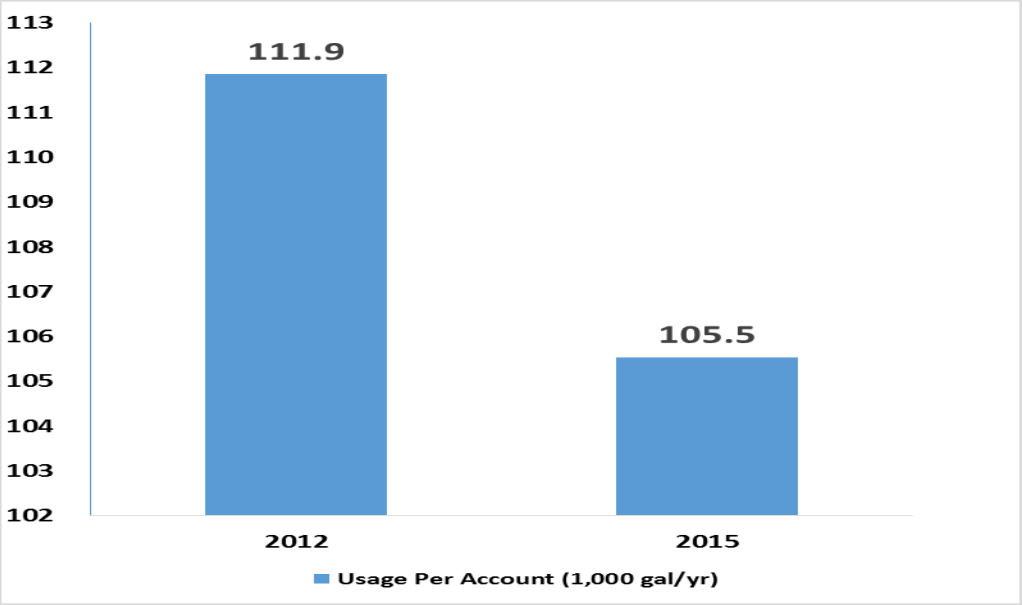
1. Revenue insufficiency due to:
    a. declining volume sales and
    b. amount of revenue recovered through monthly service charge.
2. Industrial Pre-Treatment (IPT) fees do not recover the costs incurred.

<u>Wastewater Issue #1: Revenue Insufficiency</u>

Volume wastewater sales are generally more stable compared to water volume sales because wastewater billing units are determined using the winter period water use (AWC) for most customers[2]. Winter water use largely takes place indoors and tends not to vary nearly as much from month to month as outdoor water use. In recent years, wastewater utilities nationally are experiencing declines in volume wastewater sales due to a variety of factors including, but not limited to, more efficient water fixtures (e.g., toilets and showerheads), pricing policies, and other changes to customer water use behaviors resulting in decreased indoor water consumption. The city is experiencing similar results as illustrated by Figure 8.

[2] Sewer volume use is based on the lessor of actual water use and winter water use period of December through March use for residential customers. Non-residential customer's sewer volume is billed sewer volume based on lessor of actual water use or indoor water budget allocation depending upon their selected water budget option.

Figure 8: Total System Wastewater Usage per Account (1,000 gallons per year)



From 2012 to 2015, total wastewater billed volume declined approximately 1.9% per year. The City recovers over 96% of annual user charge revenues from the rate assessed on wastewater billed volumes. As volume revenues have been decreasing, and a relatively small percentage of revenue has been generated from the monthly service charges, actual wastewater revenues have not always matched expected wastewater revenues. Figure 9 summarizes this trend for 2007 through 2015 as well as the percent rate increase adopted.

Figure 9: Actual and Expected Wastewater User Charge Revenue 2007 – 2015

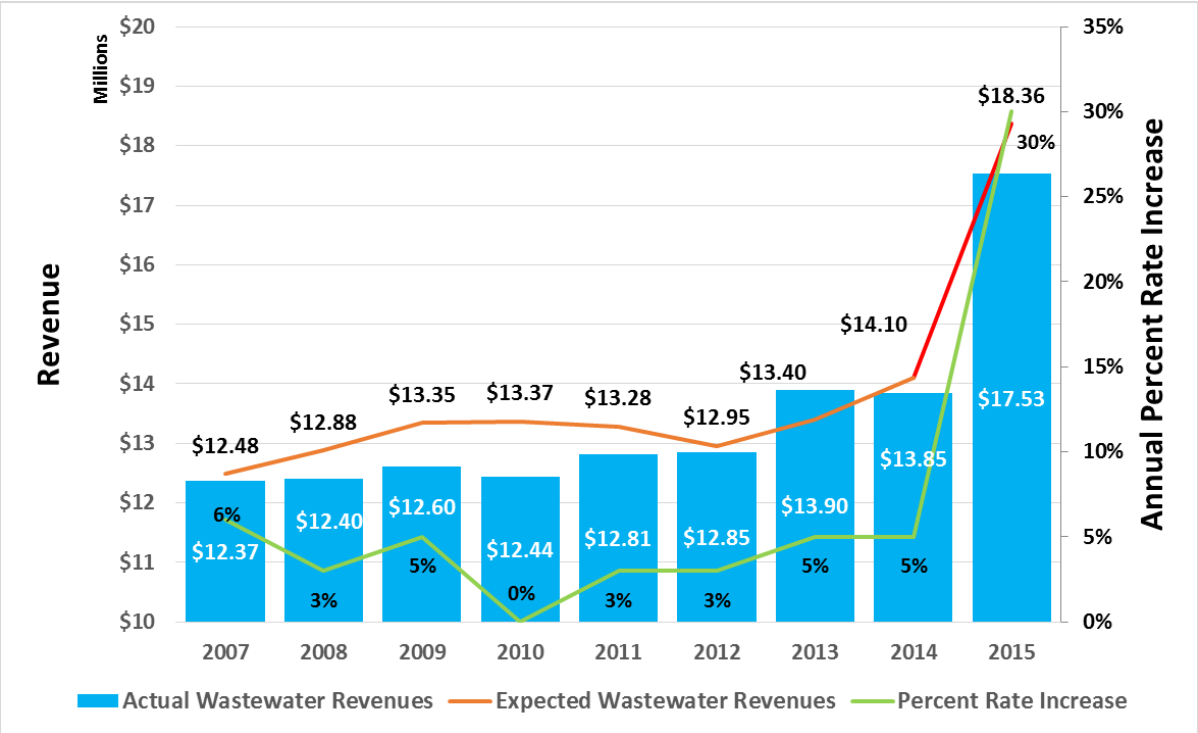
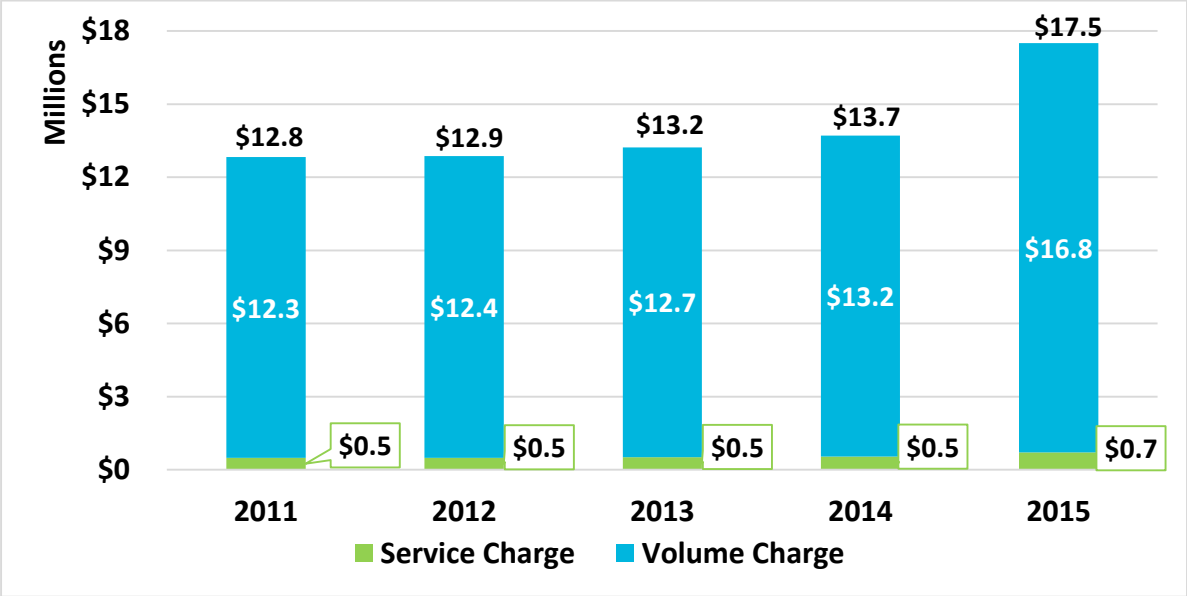


Figure 10 summarizes the annual revenues recovered from 2011 through 2015 through the service charge and volume charge. From 2012 through 2014, rate increases ranged from 3% to 5% annually before increasing by 30% in 2015 as previously summarized.

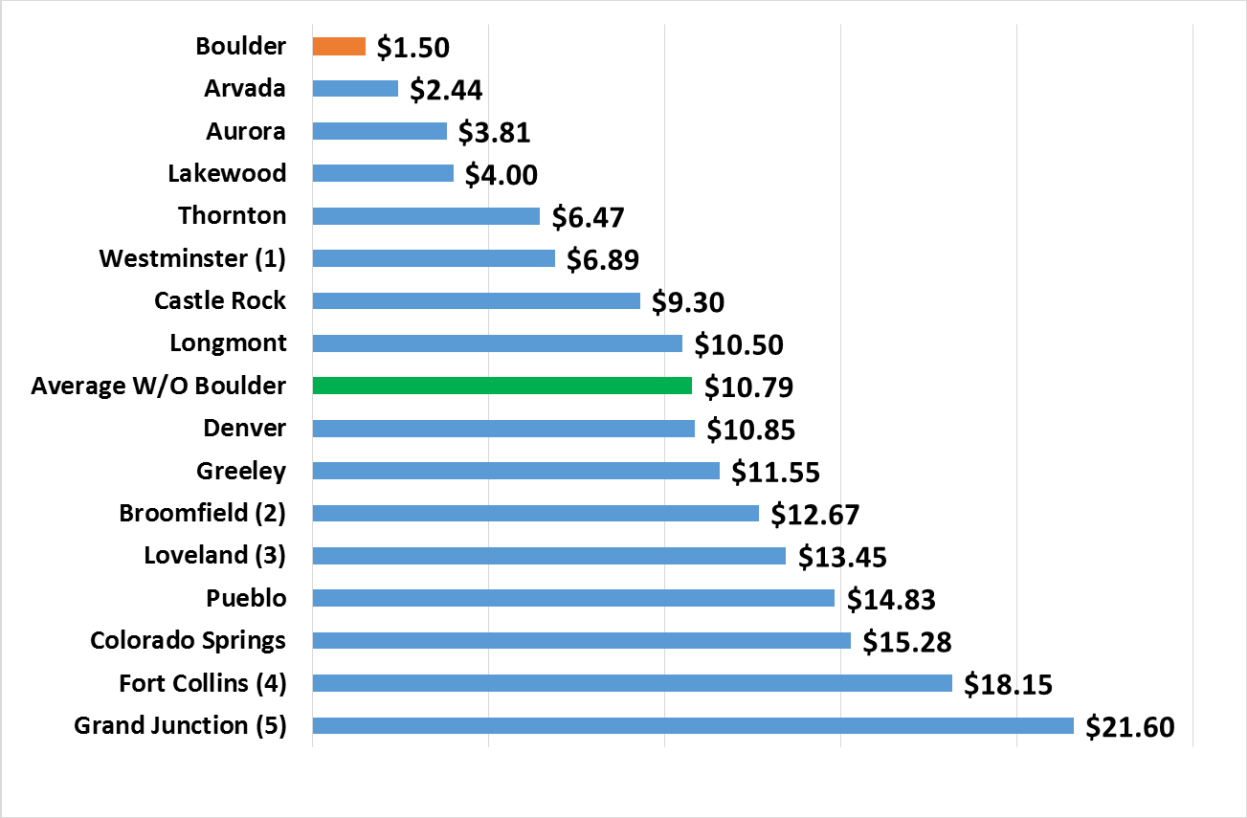
Figure 10: Wastewater Sales Revenues ($M per Year)



As wastewater billed volumes decline, the reliability of wastewater revenues decreases and, due to the size of the monthly service charge, results in increased risk of revenue insufficiency and instability. The effect of this outcome is similar to that within the water utility where future rate adjustments are increased as less revenue than projected is recovered and/or capital maintenance and replacement expenditures are deferred. Boulder's wastewater fixed service charge produces approximately 4% of the utility's user charge revenues, which is low by industry standards. The variability of billed volume revenues would have less of an impact on total revenues if fixed service charges were higher. The issue can be addressed through projecting volume revenue differently and/or increasing cash reserves to insulate near-term operations when actual revenues are below what may have been expected. It is important to note that, like the water utility, over 85% of wastewater expenditures are for fixed costs.

Boulder's fixed service charge is the lowest compared to peer utilities as shown in Figure 11. For example, the City's charge of $1.50 per account per month for ¾ inch residential meters is far below the average of $10.79 per month charged by other wastewater utilities.

Figure 11: Minimum Monthly Wastewater Charges



(1) $3.00 infrastructure surcharge in addition to the $3.89 base charge.
(2) Minimum of 4,000 gallons.
(3) Includes $3.03 capital recovery surcharge.
(4) Minimum of 3,000 gallons.
(5) Flat charge for residential customers with no volume rate assessed.

Wastewater Issue #2: Industrial Pre-Treatment Fees Do Not Reflect the Costs Incurred

RFC worked with City staff to evaluate the level of effort and costs associated with three areas of the City's Industrial Pre-Treatment Program (IPT Program). The three areas evaluated include:

- New Industrial User or Septic Hauler Permit
- Renewal of Each of the 13 active IPT Permits Every 5 Years
- Annual Maintenance of the 13 active IPT Permits

As a new industrial user establishes an account with the City, the City completes a review of the customer-specific activities and completes various laboratory analyses. A similar process is followed for a new septic hauler who would like to discharge at the City's WWTP. The City assesses a $100 per permit for each new industrial and each new septic hauler for this activity. Every five years, existing Significant Industrial Users (SIUs) must renew their permit, for which the City assesses $100 per permit generating $1,300 every five years. City staff have estimated the time required to issue a new permit as well as existing permits. RFC estimated the cost of these activities, as summarized in Table 8.

The cost difference between what is assessed to the user and the total cost to the City is approximately $5,000 for a new industrial customer and $4,500 for a new septic hauler. The aggregate cost of 13 permit renewals is approximately $34,000 representing an under recovery of approximately $33,000.

Table 8 Cost of a New and Existing SIU Permit

Type of Customer	Permits	Total Hours	Total Cost ($) (1)	Permit Fee Revenue ($)	Difference ($)
New Industrial User	N/A	102	$5,078	$100	$4,978
New Septic Hauler	N/A	93	4,630	100	4,530
Renew Existing Permit	**13**	**686**	**34,149**	**1,300**	**32,849**

The City charges an annual maintenance fee for each active SIU permittee (currently 13) based on the flow that they discharge to the City's WWTP. The fee increases based on the annual gallons per day (gpd) as shown in Table 9. Currently, the City permits 13 SIUs, which range in the type of industry and flow discharged annually. Only one customer's costs are below the annual permit fee and, in aggregate, the full cost is under recovered by $55,000 per year.

Table 9 Annual Permit Cost for Significant Industrial Users

Discharge Flow (gpd) for Previous 12 Months	Annual Permit Fee	Customers	Total Hours	Total Annual Cost (1)	Annual Permit Fee	Difference
Less than 100	$500	2	151	$ 9,238	$ 1,000	$ 8,238
101 – 10,000	3,959	2	282	19,556	7,998	11,638
10,001 – 25,000	5,590	1	104	5,786	5,590	196
Greater than 25,000	7,046	8	1,358	91,465	56,368	35,097
Total		13	1,895	126,045	70,876	55,169

Stormwater Utility

The City's current rate structure is designed to recognize the demand placed upon the stormwater/flood management utility by both impervious and pervious surfaces. The best proxy for flood management service demands includes the combined impervious and pervious area of the gross square feet of the development, although the two types of area are treated differently within the calculation. Pervious areas generally create less of an impact to the stormwater/flood system than impervious areas. Pervious areas often help absorb stormwater but, in large storm events, pervious surfaces become saturated, resulting in runoff similar to impervious surfaces. With this background, the City's current rate methodology and structure is one that is commonly used by local governments from across the U.S.

Table 10 summarizes the current residential stormwater rate structure.

Table 10: Current Residential Stormwater Fee

Size of Parcel	Monthly Fee per Dwelling Unit
Up to 15,000 sq. ft.	$14.00
15,001 to 30,000 sq. ft.	$17.49
30,001 sq. ft. or more	$21.01

The fee for all non-SFR dwellings is individually calculated based on the impervious and pervious areas. The calculation is provided below:

$$Fee = \frac{Total\ Site\ Area * Runoff\ Coefficient * Base\ Rate\ (\$13.46)}{7{,}000 * 0.43}$$

Where,

$$Runoff\ Coefficient = \frac{Total\ Impervious\ Area * 0.9 + Total\ Pervious\ Area * 0.2}{Total\ Site\ Area}$$

- Total Site Area: Total square feet of the non-residential property surface area; includes both the pervious and impervious surface areas.
- Runoff coefficient: Measures the relative percent of water that is absorbed by pervious areas and the stormwater that "runs off" the property's pervious and impervious areas that must be collected and managed by the stormwater collection infrastructure. This coefficient is different for different land uses and increases as the impervious area to total site area approaches 100-percent.
- Base Rate: The SFR rate per month per dwelling unit of $14.00 for properties up to 15,000 square feet.
- 7,000: The typical square footage of a typical SFR lot.
- 0.43: The expected runoff coefficient for typical SFR properties.

RFC has identified the following two key issues relative to the existing stormwater utility rate structure and practices.

1. Non-SFR rate structure is unnecessarily complex.
2. The current rate structure penalizes individual large lot customers.

<u>Stormwater Issue #1: The non-SFR rate structure is unnecessarily complex</u>

The current non-SFR customer formula is unnecessarily complex. Utility staff, customers and other stakeholders have a difficult time understanding and explaining the components of the formula. RFC's analysis of the calculation methodology shows that the calculation summarized

above could be condensed, with no substantive changes, to $175 per acre of impervious area plus $38 per acre of pervious area. Customers would be charged the same amount, but with a better understanding of how and why their bills were calculated.

Stormwater Issue #2: The rate structure penalizes individual large lot customers

The current non-SFR customer formula incorporates the base residential rate for a typical SFR customer to provide for recovery of system costs attributable to non-SFR customers. The current rate structure uses the ratio of the SFR base rate and SFR equivalent units applied to non-SFR properties. As a result, the monthly stormwater rate recovers amounts exceeding the impact of the individual property since the base rate assumes a level of impervious area and runoff based on the typical SFR property. The assumption does not accurately reflect the system impact of non-SFR customers with different relationships of impervious and pervious areas compared to what is expected from a typical residential customer. The inequity is more significant for those properties with the largest total site areas.

Additional Observations

As part of Phase 1 analysis, RFC has the following additional observations with a lower priority compared to the key issues previously discussed. While a lower priority, the City may wish to address them during Study Phases 2 and 3.

- Water Utility
  - The PIF Water Budget option does not work well for utility customers. The developer and/or builder that selects this option has an incentive to select the budget that provides the lowest PIF, but the ultimate customer "pays" higher monthly bills due to reduced water budgets they did not select.
- Wastewater Utility
  - The City is currently developing alternatives to address increased phosphorus limits anticipated to be in effect in 2022. While the increased limits are likely to require capital investments at the City's wastewater treatment plant, the impact is not currently known and City staff and RFC believe it is too early to include this additional category within the wastewater utility rates. RFC recommends that the City continue to track contributions and total system amounts processed, but wait until the capital and operational requirements are further defined before starting to assess within the rate structures.
- Stormwater Utility
  - There are credit policies which may be developed in conjunction with the rate structure modifications to provide economic incentives for low-impact developments. Credit programs are common across stormwater utilities. A credit is a reduction in the stormwater fee granted to a customer for measures that reduce demand upon the utility's drainage infrastructure, thereby reducing the cost for stormwater management. Through incentivizing decentralized stormwater management, a credit program is designed to:
    - Protect water quality.
    - Reduce flooding.

    - Create equity in the rate structure through appropriate fee reduction opportunities.
    - Reduce public expenditures on stormwater management by fulfilling permit requirements and meeting other program goals indirectly.
  - Based on the preliminary understanding of the City's utility and customer characteristics developed in Phase 1, RFC believes it is unlikely that a credit program to incentivize low impact development would have a significant impact on the stormwater / flood management utility's finances, nor would it fundamentally alter the rate structure. If the City remains interested in the possibility, RFC recommends further exploration of credit opportunities during Phase 2, which will focus on rate structure alternatives.