

To: Craig Omoto, SPU
From: Shawn Koorn, HDR
Date: March 28, 2016
Subject: SPU Retail Water Rate Structure Review

Introduction

HDR Engineering, Inc. (HDR) was retained by Seattle Public Utilities (SPU) to assist in the review its retail water cost allocation as well as the water and wastewater rate structures. This memo will discuss the review of SPU's retail water rate structure. Specifically, this will compare and contrast SPU's current water rate structures versus industry trends and comparable utilities.

Rate Terminology

Prior to reviewing SPU's current water rate structures, it is helpful to understand some basic terminology that is related to rate structures and rate designs. The initial starting point in considering a rate structure is the relationship between fixed costs and variable costs. Fixed costs do not vary with the production or flow of water. Debt service is an example of a fixed cost. In contrast, variable costs tend to change with the quantity of water produced. Examples of variable costs are the cost of chemicals and electricity. Most rate structures contain a fixed or minimum charge, and a volumetric consumption (commodity) charge. Provided below is a more detailed discussion of the fixed and variable charges.

Fixed Charges – Fixed charges can take many forms. These may be labeled or called base charges, minimum charges, customer charges, meter charges, etc. Regardless of the label used, their purpose is to collect a portion of the fixed costs associated with serving a customer, regardless of the customer's level of consumption. Fixed charges are typically a significant component of the utility's overall cost structure (i.e., fixed vs. variable costs). Rarely do utilities collect 100% of their fixed costs via fixed charges. Customers typically prefer to be charged on a volumetric basis, as opposed to a fixed charge basis.

The most basic form of a fixed customer charge is a meter charge. While the charge is a fixed amount regardless of consumption, for a water utility it typically varies (increases) by meter size. The rate at which the meter charge increases is typically a function of either meter investment (cost) or the meter's safe operating capacity.¹ Meter capacity is an important concept, especially for a water utility, in that a customer that has a 2" meter is regarded from a capacity perspective as the equivalent of eight (8) 5/8"x3/4" customers. Therefore, in developing fixed meter charges, a customer with a 2" meter may have a fixed meter charge

¹ American Water Works Association, Principles of Water Rates, Fees and Charges – M1 Manual, p. 202.

that is eight (8) times greater than the 5/8"x3/4" meter charge. Knowing that a large portion of a typical utility's costs are related to meeting capacity requirements, one can see the importance of taking into account capacity in establishing fixed charges for customers.

Variable Charges - While it was noted that there are different approaches that can be used to collect fixed charges, the same can be said for variable or volumetric charges. For a water utility, volumetric consumption charges are generally based upon metered consumption and charged on a \$/unit cost. Although the unit of measurement may vary, (e.g. thousands of gallons, hundreds of cubic feet, etc.) this is not a critical element in the development of the rates. This is because the charge per unit is simply adjusted to reflect the units of measurement being used.

Rate Structure – Rate structure involves defining the rate *level* and *structure*. The rate level reflects the amount of revenue that is to be generated, or collected, from the rates while the structure is how the customers are charged or how the bill is calculated.

A review of the rate structures from other water utilities across the U.S. reveals a wide variety of structures and approaches in use today. While it may seem that there are an endless number of different rate structures to be found, the reality is that they are all based upon a few basic concepts. It is how these basic concepts are applied, modified, and combined that creates what appear to be endless possibilities.

There are four basic rate structures for variable charges; a uniform charge, a declining block charge, inverted (increasing) block charge and seasonal. Figure 1 provides an overview of each of these variable charge rate structures.

Figure 1 Overview of the Various Variable Charge Rate Structures

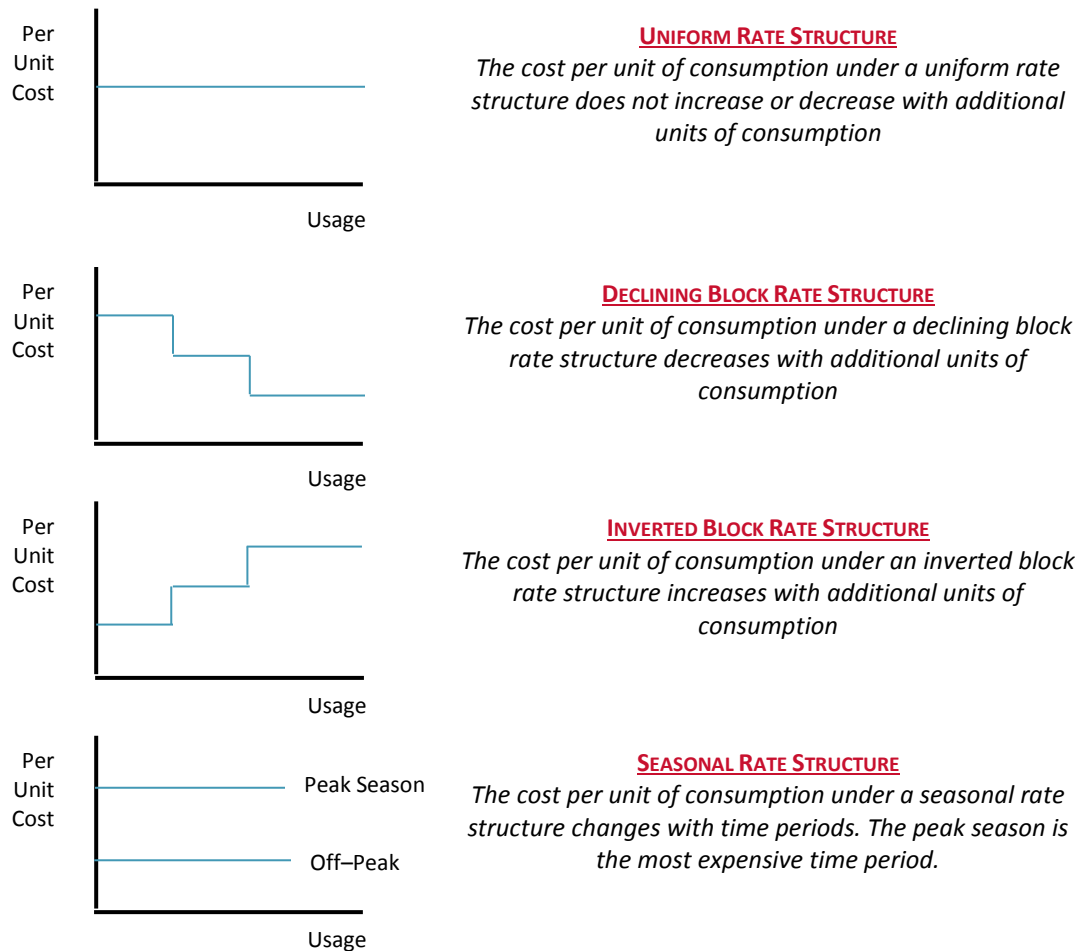


Figure 1 illustrates that the basic philosophy of each of these variable charge rate structures varies significantly. Under a uniform rate structure, the cost per unit does not change with consumption. The uniform structure is a simple and straightforward approach from the perspective of customer understanding and rate administration/billing. In contrast, the declining block rate structure is a bit more complex. The number of blocks (e.g. 3 stepped blocks) and size of the blocks (e.g. 0 – 10,000 gallons) may vary. However, the number of *blocks*² should be reasonable (i.e. 2 – 5 blocks) for reasons of simplicity and administration. Declining block rates may imply that there are certain economies of scale with additional consumption, or improved capacity use, and not necessarily a “volume discount.” Depending

² “Blocks” or “Consumption Blocks” is used in a declining block or inverted block rate structure and refers to the amount of consumption allowed before the price changes to a succeeding price block. The initial block refers to the first price block (e.g. 0 to 5,000 gallons). The tail block refers to the last price block (e.g. all usage over 5,000 gallons).

upon the specific utility, this may or may not be a true statement. An inverted (increasing or tiered) block rate structure attempts to send a price signal to consumers that their consumption costs more, as more water is consumed. Again, this may or may not be the proper price signal regarding the specific utility's water resource costs. Finally, a seasonal rate structure is a form of a time-differentiated rate structure. Under a seasonal rate structure, water consumed in the summer is priced at a higher level than winter water consumption. This structure attempts to reflect the difference in costs associated with usage during a peak period when water supply resources may be constrained.

The rate structure concepts noted above may be combined and used to form various different rate structures. As an example, a seasonal inverted block rate structure is developed by combining the seasonal rate structure concept with the inverted block rate structure. This example is similar to SPU's current residential customer rate structure.

Overview of SPU's Current Water Rates

To begin the review of SPU's water rates, we begin with a brief history of where they have been historically.

- Starting in 1974, all customers were charged the same. A fixed monthly charge which included 3 CCF per month and a uniform commodity charge on a per CCF basis.
- The first major change occurred in 1981 when the fixed charge for residential customers decreased significantly and the commodity charge more than doubled. For general service³ customers, the fixed charge decreased slightly and the commodity charge increased slightly. Additionally, the first 3 CCF that was included in the rates was done away meaning that all consumption was now charged a uniform commodity rate. The reason for the changes was to better reflect that customers that irrigated (single family houses and duplexes) used more water in summer, when the marginal cost to provide that water was higher. Because the billing system could not accommodate different rates for off peak and peak seasons, the customers were split into two classes based on their peaking behavior.
- The next major change that happened was in 1989 when the uniform rate changed to an off-peak rate and a two-tiered peak rate for residential customers. For general service customers, the uniform rate transformed into a seasonal rate (as it exists today). This adjustment was to take advantage of the ability to have different peak and off peak rates, which provided additional flexibility to reflect each customer class's cost on the system.
- Throughout the 1990s, there were no major rate structure changes except for a brief introduction of a third tier to the peak season commodity rate for residential customers in 1992. However, that was removed after the end of the drought that spurred its inception.

³ For SPU, "residential" customers include single family homes and duplexes. The "general service" customer class encompasses all other uses (including multi-family buildings), except for private fire and public fire. Other utilities use the term "non-residential" which may be defined differently than SPU's general service customer class.

- In 2001, in response to a citizens' initiative to encourage conservation⁴, the current third tier was added to the summer season rates for residential customers.
- The last noteworthy change was in 2008, when residential and general service rates achieved a level of parity. Based on the cost of service study, SPU was able to set the same base service charge and off peak commodity rates for the two customer classes, and set the residential second tier peak rate the same as the general service peak rate. This structure was initially helpful from a customer understanding and perceived equity standpoint, but there was no requirement that these remain linked.

This snapshot of SPU's water rates shows a history of revisiting and revising the rates to reflect changing priorities, goals and objectives, and availability of water supply. Below in Table 1 is a summary of SPU's current residential and general service water rates.

⁴ In October 2001, the Mayor and Seattle City Council adopted City of Seattle Ordinance No. 120532, otherwise known as I-63 Settlement Ordinance (I-63 SO). This ordinance established various measures designed to promote water conservation, including the creation of the "Everyone Can Conserve" program to retrofit plumbing fixtures in low-income housing through 2010. The ordinance also required SPU to fund, at least in part, the program with revenues from the residential summer peak use third block, which was proposed by Initiative 63 and adopted via Ordinance 120408. The requirement for a third block rate expired when the "Everyone Can Conserve" program ended in 2010.

Table 1
Summary of 2016 Water Rates

Fixed Charge

Residential & General Service

<u><i>Meter Size</i></u>	<u><i>\$/Month</i></u>
3/4" and less	\$14.15
1"	14.60
1-1/2"	22.50
2"	24.90
3"	92.25
4"	132.15
6"	162.65
8"	199.00
10"	297.00
12"	402.00
16"	477.00
20"	614.00
24"	771.00

Consumption Charge

\$/CCF

Residential

Off-Peak Usage ^[1]	\$5.06
Peak Usage ^[2]	
0 – 5 CCF	\$5.20
5 – 18 CCF	6.43
19 + CCF	11.80

General Service

Off-Peak Usage ^[1]	\$5.06
Peak Usage ^[2]	6.43

[1] – Sept. 16th – May 15th

[2] – May 16th – Sept. 15th

As noted, SPU charges its customers a monthly fixed charge that varies by the size of service meter. For the consumption charge, residential customers are charged a uniform rate for consumption during the off-peak time period from September 16th to May 15th. During the peak time period from May 16th to September 15th, residential customers are charged on a 3-tiered increasing block rate structure. General service customers are charged a seasonal rate on a per CCF basis. It should be noted that SPU bills most of its customers on a bi-monthly basis.

Current Industry Thinking and Trends

As with any industry, the thinking and practices have changed over time. This is particularly true with water utility rate structures. As total costs, and customer bills, have increased and resources/capacities have become more constrained, the industry philosophy and thinking concerning rate structures has changed and evolved.

It was not that long ago that declining block rates were used to encourage sales of water. In some areas of the U.S., that philosophy still carries on. However, today most utilities are emphasizing water conservation and efficient use due to limited or constrained water resources, particularly in the western U.S., but also in other parts of the Country as droughts are seemingly becoming more frequent. As these changes in utility costs have occurred, the water utility industry's rate structure philosophy and thinking has kept pace with more utilities implementing conservation oriented rate structures.

At the current time, in HDR's opinion, there appears to be three key rate structure trends occurring in the water rate setting industry. These are revenue stability, conservation, and affordability.

- **Revenue Stability** - The need for revenue stability trend is driven by a variety of issues, one key reason being declining per capita consumption. The industry has been experiencing a decline in per capita consumption for many years. As consumption has declined, so have consumption based revenues. As a result, many utilities are revisiting their rate structure to increase the level of revenues received from the fixed charge, or have been revising the sizing of the consumption blocks to reflect recent water trends and minimize the impact of consumption changes on revenues. As will be noted later, this is one of the rate structure goals that SPU has identified for the review of its water rate structure.
- **Conservation** – Conservation is still a key goal for utilities across the U.S., and in some areas of the U.S. it is the driving component of the rate structure. That is, rate structures have been developed and implemented with a conservation incentive (i.e., price signal) to promote the reduction in overall water consumption or peak period water consumption. As a result, over the past decade or more, utilities have implemented tiered rate structures to provide a price signal to customers using higher amounts of water. Utilities have also implemented conservation programs and provide information to customers on how to efficiently consume water.

SPU's current residential water rate structure is very conservation-oriented given the sizing and pricing of the consumption tiers. In addition, the general service rate structure is also conservation oriented given the seasonal structure. While conservation is still a priority, at the current time there are other priorities that are more important to SPU for its water rate structure. However, as shown during the 2015 drought, conservation will continue to be a consideration in developing water rate structures. Given this, the development of a conservation oriented rate structure will remain a goal for SPU. However, given the decline in the number of residential customers consuming water in the peak summer tier and the total consumption in that tier, future water rate structure alternatives will need to consider

the impacts on customer behavior and the impacts it may have on revenues from a conservation standpoint.

- **Affordability** – As consumption levels have declined, and inflationary measures continue to increase overall operating costs, utility rates have had to be raised to maintain sufficient revenues to maintain and operate the utility. As a point of reference, the 2012 AWWA Water and Wastewater Rate Survey notes that the annualized water rate increase from 1996 to 2012 was 4.9%, compared to the consumer price index (CPI) over the same time of 2.5%. The result of this is the continued increase in the overall level of water rates. With this increase comes the concern that utility bills are, or will become, unaffordable. This is an issue utilities across the U.S. are facing and policy decisions are necessary to develop assistance programs to help those customers where the bill becomes unaffordable. In recent years, the City of Seattle has made increasing the number of households in its Utility Discount Program a priority, with a goal of doubling the enrollment between 2014 and 2018. When an increasing number of customers receive discounts through this program, additional upward pressure is placed on rates for other customers as the overall cost of providing service remains the same.

It should also be noted, that at the present time, there are no specific federal or state agencies or national association requirements/regulation on water rate structures. The vast majority of water utilities follow the guiding principles of establishing cost-based rates that meet the utility's O&M and capital infrastructure requirements. Additionally, many utilities, specifically in the mid-west and east coast, are expanding drastically the number and size of renewal and replacement projects. This is happening in large part because as their systems have aged significantly, capital projects to replace existing infrastructure has not kept pace over time. This will apply additional pressure on rates in order to adequately fund these projects and also maintain a reliable water system.

Based on discussions and information provided by SPU staff, SPU is on the downhill side of a major renewal and replacement funding cycle that started over 20 years ago with major expenditures in the late 1990's and early 2000's. SPU continues to plan for future renewal and replacements in the development of prudent water rate levels.

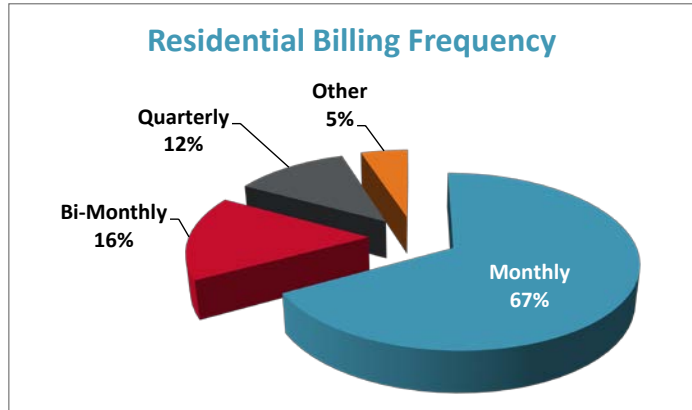
U.S. Water Rate Review

The widest perspective of water rates is the national viewpoint. HDR utilized American Water works Association, (AWWA) 2012 Water and Wastewater Rate Survey to sort certain rate design and billing information contained within that survey.

For the 290 water utility respondents, the data was sorted to determine billing frequency for residential customers. In viewing the billing frequency graph, it can be seen that the most common billing frequency is on a monthly basis at 67% of the utilities. A bi-monthly and quarterly frequency was less common at 16% and 12%, respectively. Currently, SPU bills its customers on a bi-monthly basis. The frequency of billing varies from utility to utility and is a balancing of cost savings and the price signal or bill impact. However as bi-monthly bills have increased over time, many utilities have transitioned to monthly billing to minimize the impact

of the bills. The billing frequency may also reflect the timing of other utility, or entity, billings such as a single bill for water, sewer, garbage, etc.

As noted, utilities typically have both a fixed and variable component to their rate structure. The level of the fixed charge varies from utility to utility, but the vast majority of water utilities have some form of fixed or minimum charge.

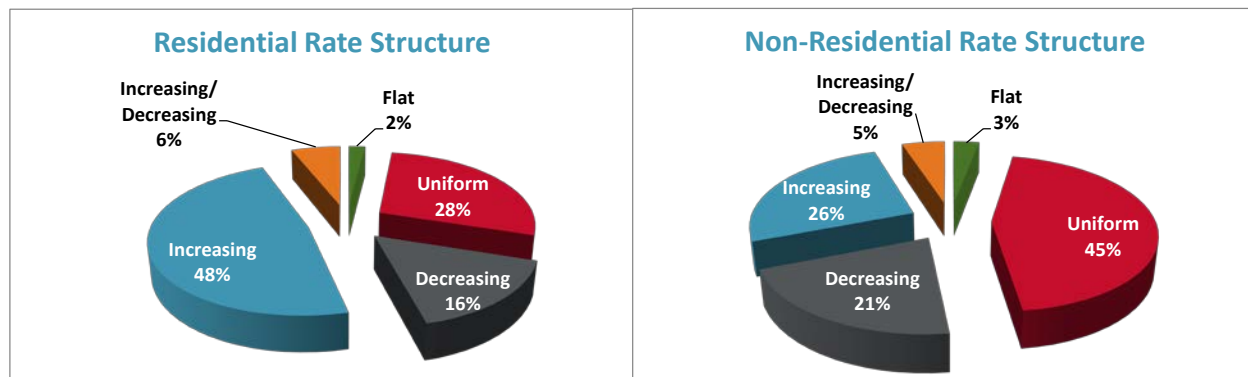


This is borne out by the AWWA 2012 Water and Wastewater Rate Survey. In this rate survey, over 90% of the participating water utilities had some level of charge for zero (0) consumption. In general the fixed charge is the same for all customers, specifically when based on meter size. However, it can vary by customer class of service depending on the type of fixed charge (e.g., minimum charge, customer charge). Of the surveyed utilities, the median base, or minimum, residential charge for the water utilities was \$8.70/month. At a minimum, most utilities have fixed charges to reflect the cost associated with meter reading, billing/accounting and collection costs. For comparison purposes, SPU's current monthly fixed charge for a residential customer is \$14.15 as shown in Table 1. In HDR's experience monthly fixed meter charges have been increasing over the past five to ten years.

In some cases utilities also included a water consumption allowance in the monthly fixed charge. Approximately 20% of the utilities responding to the survey included some level of allowance. On average those with an allowance provided approximately 2,500 gallons in the monthly fixed charge.

The next perspective reviewed was the rate structure (i.e., variable charge) used for residential and general service customer classes. Provided in Figure 2 is a summary of the rate structures for the utilities responding to the AWWA 2012 Water and Wastewater Rate Survey.

Figure 2
Summary of the 2012 AWWA Water & Wastewater Rate Survey



As shown in Figure 2, the survey indicates that the increasing (inclining, inverted/tiered) rate structure is the most predominate for residential customers while a uniform rate structure is more widely used for non-residential customer classes. In reviewing the survey results above, it should be noted that the survey did not identify or break out seasonal water rate structures as a specific category.

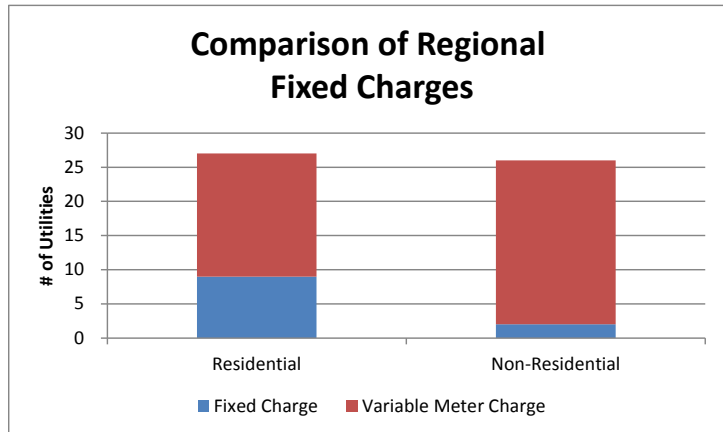
In summary, when viewing the survey of utilities across the U.S., the predominate method for charging residential customers is an increasing block rate structure. For the non-residential customers, billing on a monthly basis using a uniform consumption rate is the predominate approach. As a point of reference, SPU currently charges residential customers a uniform rate in the off peak season (Sept. 16 – May 15) and a three tiered, increasing block structure during the peak season. Non-residential customers are charged a seasonal rate structure. With that in mind, SPU’s rate structure reflects the typical rate structures in the AWWA 2012 Water and Wastewater Rate Survey and is very much in line with contemporary rate designs which have been focusing on incentivizing efficient water use and conservation of resources.

Regional Water Rate Comparison

In addition to the AWWA Rate Survey, HDR compared SPU’s water rates to 28 other local/regional water utilities within the Seattle/Tacoma/Everett/Spokane area. The utilities reviewed are the same utilities used in SPU’s past rate comparisons for the region. The vast majority (77%) of utilities’ water rates contain a fixed meter charge that varies by meter size. The remaining 23% have a flat fixed charge, regardless of meter or service sizes. Of those with a flat charge, the majority were for the residential customer class of service. Similar to the AWWA survey results, the majority of the regional utilities have a variable meter charge. In recent years water utilities have been more likely to implement variable meter charges to reflect the capacity requirements of larger meter sizes as the capacity costs on the system have

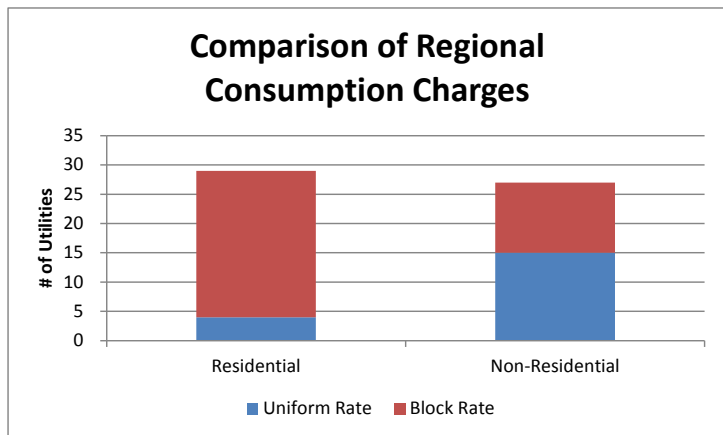
become more significant as well as reflect the fixed cost of providing the facilities to meet peak consumption periods and oversizing of infrastructure.

Upon reviewing the consumption (variable) charges of the regional utilities surveyed, 67% had a tiered volumetric (usage) charge and 33% had a uniform rate. Of those with a uniform rate, non-residential accounted for the majority of the customer type with this rate structure. This also reflects the similar results in the AWWA survey as the predominate non-residential rate structure was a uniform rate structure. This is typical



as it can be difficult to develop appropriate tier sizes which reflect non-residential customer consumption patterns when, as a group, the non-residential consumption patterns can vary significantly. Of those utilities with a tiered rate structure, the number of tiers ranged from 2 to 4, for both residential and non-residential customers. Typically when setting the tier sizes they are based on average indoor use (tier 1), average outdoor (tier 2), and all over tier 2 use (tier 3). This provides the rationale, or definition, for the sizing of the tiers within the rate structure and from that definition the data can be used to determine what tier sizes are appropriate.

As a side note, in reviewing the rate structures for the regional utilities, only four of the 28 utilities reviewed included an allowance in the fixed monthly charge. Two of the four included an allowance for the residential customers but no allowance for the non-residential customers. In addition, when reviewing the regional customers, 8 of the 28 utilities had the same rate structure for residential and non-residential customers.



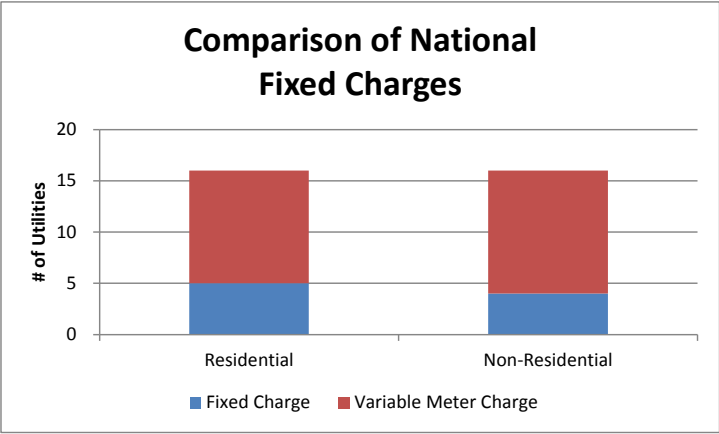
In general, the water rate structures reviewed in the region are very contemporary, and conservation oriented. They reflect similar findings as the AWWA rate survey. SPU's rate structures are very comparable to the rate structures of other surrounding utilities. Although in total, 67% of utilities had tiered consumption charges, for non-residential customers it was split approximately 50%/50% between a uniform rate structure and a tiered rate structure.

National Water Rate Comparison

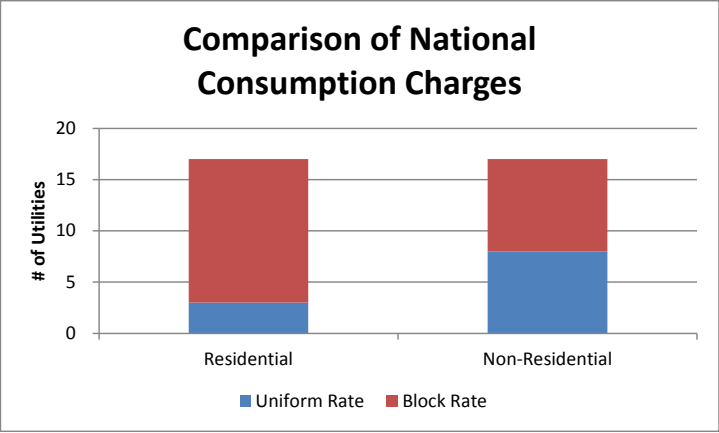
In addition to the regional rate comparison, utilities of similar size from around the country were reviewed in order to give further perspective. Although the local/regional comparison can bring in variables specific and unique to one area such as climate or annual precipitation, for Seattle, there are fewer comparably sized cities or utilities. HDR reviewed 17 different utilities from across the U.S. These utilities are the same as those used in prior SPU comparisons and include the following:

- New York
- Johnson County
- Louisville
- Kansas City
- Philadelphia
- Charlotte
- Washington D.C.
- Columbus
- Birmingham
- Atlanta
- Portland (OR)
- Irving
- Milwaukee
- San Francisco
- Oakland
- Boston
- San Diego

In reviewing the rate structures, many of the same trends can be seen with these large utilities across the country. For the fixed charge, a large majority of utilities have fixed meter charges varying by service or meter size. Those utilities that had a flat monthly rate, regardless of meter size, were in almost all cases the same utility with only one utility having a flat rate for residential and a variable meter charge for non-residential. It should also be noted that one utility did not have a monthly base charge.



When reviewing the volumetric, or consumption, charges, the trend was also similar to the regional comparison where the majority of the rate structures were tiered and fewer were a uniform rate. Although not to the degree as in the regional review, for the national comparison, the majority were still a uniform rate structure for non-residential with a smaller portion having a uniform rate for residential customers. The average number of tiers for the consumption charge was 3 tiers for residential. This contrasts to the regional comparison in which the non-residential rate structure averaged 4 tiers.



Of the rate structures for the national utilities, only 1 of the 17 utilities reviewed included an allowance in

the fixed monthly charge. In addition, when reviewing the national utilities, 7 of the 17 utilities had the same rate structure for all customers.

After reviewing a survey of national water rate structures, the relationships appear to be in line with what the Seattle area and AWWA survey review revealed. Again, the majority of water rates contain a fixed meter charge varying by meter size and a tiered consumption charge. However, specifically with non-residential, for the volumetric charge almost 50% utilize a uniform rate (which includes seasonal rates) structure which is similar when compared to the local water rate structures.

Rate Design Criteria and Considerations

Prudent rate administration dictates that several criteria must be considered in setting rates. The attributes of sound rate structures have been documented in a number of rate setting manuals. However, the foundation for evaluating rate structures is generally credited to James C. Bonbright in the *Principles of Public Utility Rates*.⁵ The manual *Principles of Public Utility Rates* provides utility managers and policymakers an understanding of pricing policies, theories and economic concepts that support various rate designs. Bonbright's list of the attributes of a sound rate structure is quoted in a number of other rate manuals and is often paraphrased and simplified in reading utility rate study reports. A simplified list of these attributes of a sound rate structure is listed below:

- Rates which are easy to understand, from the customer's perspective
- Rates which are easy for the utility to administer
- Consideration of the customer's ability to pay
- Continuity, over time, of the rate making philosophy
- Policy considerations (encourage conservation, economic development, etc.)
- Provide revenue stability from month to month and year to year
- Promote efficient allocation of the resource
- Equitable and non-discriminating (cost based)

Many contemporary rate economists and regulatory agencies feel that the last consideration, cost-based rates, should be of paramount importance and provide the primary guidance to utilities on rate structure and policy. HDR also agrees with this position.

This implies that a cost of service approach has been used to establish the proposed rates. The result of setting rates based on generally accepted cost of service approaches is that it provides SPU's customers with the proper price signal as to what their consumption or usage is costing. When evaluating SPU's current water rate designs, all of the above listed criteria should be taken into consideration. However, it is difficult - if not impossible - to design a rate which meets all of the goals and objectives listed above. For example, it may be difficult to design a rate that takes into consideration the customer's ability to pay, and one which is cost-based. In designing rates, there will always be trade-offs between the various goals and objectives.

⁵ James C. Bonbright; Albert L. Danielsen and David R. Kamerschen, *Principles of Public Utility Rates*, (Arlington, VA: Public Utilities Report, Inc., Second Edition, 1988), p. 383-384.

These goals and objectives may also result in implementing rates that don't follow cost of service principles to meet the overall rate setting goals and objectives. In this situation, it is important to understand the impacts of those policy decisions as the total cost to provide service on a system wide basis do not change. Given policy decisions, the costs may shift from one customer class of service to another, but the overall system costs will not change. As a result, it is important to compare the results of the rate design goals and objectives to the cost of service results to gain an understanding of the impact of policy decisions and any changes in costs to the different customer classes of service.

Provided below is a summary of SPU's current rate structure advantages and disadvantages.

Current Rate Structure	Advantages	Disadvantages
Residential	<ul style="list-style-type: none"> • Strong conservation incentive • Reflects past policy decisions • Cost based 	<ul style="list-style-type: none"> • Revenue stability • Possible affordability impacts • Customer understanding (winter/summer and peak season tiers) • Equity between customers as demand patterns change
General Service	<ul style="list-style-type: none"> • Simple to understand and administer • Conservation incentive • Reflects past policy decisions • Cost based 	<ul style="list-style-type: none"> • Revenue stability • Equity between customers as demand patterns change

Prioritizing SPU's goals and organizing its objectives will aid in this process and add clarity for decision making purposes. SPU completed a prioritization of rate structure goals and objectives during the 2013 rate structure review. The 2013 priorities, in order from highest to lowest, were:

1. Customer equity (both in price per unit and reflects costs imposed on the system)
2. Water as a basic right
3. Economic efficiency
4. Financial stability
5. Ease of implementation
6. Conservation

The results of this prioritization can then be used to develop rate structure alternatives that best meet the identified goals and objectives.

Alternative Water Rate Structures

Recently, based on the above prioritized goals and objectives, SPU developed several alternatives to determine customer bill impacts and to further evaluate the rate structure alternatives for possible implementation. These alternatives were:

1. Combine the residential and general service customers into a single retail class of service and implement a seasonal rate structure
2. Eliminate the residential peak period rate tiers, maintain a seasonal rate structure.
3. Increase the base meter charge, eliminate peak period rate tiers, and include an allowance of 2 CCF in the base meter charge.

Each of the above alternatives reflects the various prioritized goals and objectives. However, as noted, it is difficult to design and implement a rate structure that will meet each of the competing goals and objectives. As a result, there are always trade-offs that need to be made when developing an alternative water rate structure. It becomes necessary to evaluate which alternative most closely reflects the overall rate strategy and price signal SPU desires to provide to its customers.

In reviewing the typical rate structures provided in the AWWA 2012 survey, the region, and other specific similarly sized utilities, the primary rate structure for residential customers was a tiered rate structure, while the non-residential rate structure was almost evenly split between a tiered and uniform rate structure. Taking into consideration SPU’s prioritized goals and objectives, the alternatives developed by SPU appear reasonable and reflect the identified goals and objectives.

Given the above discussion, in HDR’s opinion there are multiple variations and/or alternatives that SPU could consider for revising the residential and non-residential rate structures. The alternatives can be applied only to the fixed meter charge, only to the consumption structure and charges, or a combination of both. For the fixed meter charges, the options are relatively limited. However, alternatives HDR would recommend for consideration are provided below along with identified advantages and disadvantages.

Alternative	Advantages	Disadvantages
Increase the monthly fixed meter charge	<ul style="list-style-type: none"> • Increase in revenue stability 	<ul style="list-style-type: none"> • Possible affordability impacts
Increase the monthly fixed meter charge – include a consumption allowance	<ul style="list-style-type: none"> • Increase in revenue stability • Address affordability and right to water priorities 	<ul style="list-style-type: none"> • Possible affordability impacts (low use customers) • Lack of understanding total water consumption’ • Reduced conservation signal
Revise fixed meter charge to reflect AWWA meter equivalency ratios	<ul style="list-style-type: none"> • Additional revenue stability through meter differentials • Possible reduction in the consumption charge to offset increased meter charge revenues 	<ul style="list-style-type: none"> • Possible bill impacts to customer with larger meters and lower consumption levels • Lack of customer understanding of rationale for changing the meter ratios

Currently, SPU has stated that approximately 20% of its water rate revenues are collected through the monthly fixed meter charge. SPU has historically set the monthly fixed meter

charge on the basis of actual costs to provide service for a ¾-inch meter. The costs used to develop the monthly fixed meter charge include:

- Meter testing
- Meter repair
- Register repair
- Meter exchange
- Service renewal
- Customer service costs

As can be seen, these costs are all related to meter and customer service related costs. This is a typical approach used by utilities to set the monthly fixed meter charge based on “customer” related costs. This level of costs does not however include additional “fixed” costs on the system that occur regardless of water consumption levels. Increasing the monthly fixed charge will then provide additional fixed revenues to reflect the high level of fixed costs on the system.

Increasing the monthly fixed meter charge can increase the stability of the revenues. There is no “correct” level of revenues to be collected through fixed charges, and utilities range from 0% to 100%. Over the last several years utilities have been increasing the fixed charge to help stabilize revenues. Another component to consider is that given the residential average annual monthly consumption is 5 CCF (60 CCF/year), and the first tier in the peak period is 5 CCF, a *portion* of this first tier revenue can also be considered “fixed” revenue as the majority of customers will use up to 5 CCF based on the annual monthly average use over the course of a year. It should be noted that winter consumption is, on average, less than 5 CCF given the lower use during this time period while the summer average is higher than 5 CCF given the outdoor use.

The second alternative of including a consumption allowance in the rate structure can result in minimizing the bill impacts and help assist in addressing affordability issues. However, this may also result in a customer not understanding their total consumption and weaken the conservation price signal. As noted in the rate structure comparisons, relatively few utilities include an allowance.

In reviewing the relationship (ratios) between the meter sizes it was noted that they are not based on the typical AWWA meter equivalency ratios. For the third alternative, implementing the AWWA meter equivalency ratios would result in additional revenues being received through the fixed meter charge. For example, the AWWA ratio for a 2” meter is 5.33 times a ¾” meter based on the capacity of those meters (30 gpm vs. 160 gpm). As a result of this change in meter equivalencies, SPU may be able to reduce the typical residential meter charge (¾” meter) and still increase the overall fixed revenues due to the additional revenues received from the larger meter sizes. Alternatively, SPU could maintain the current ¾” meter charge and decrease the consumption charges. Modeling these changes may provide some additional insight into the impacts these changes and how this could impact various customers with different meter sizes.

As a note, the fixed meter charge alternatives would be applied to all retail customers, both residential and general service.

There are many alternatives that SPU can consider for the consumption structure and charges. For the review of consumption alternatives the focus is on the residential rate structure as, in HDR’s opinion, the general service seasonal consumption rate structure appears equitable and provides a conservation incentive for general service customers. As a note, a seasonal rate structure is a structure that HDR frequently recommends for general service customers. Given this, alternatives that can be considered for the residential consumption rate structure are:

Alternative	Advantages	Disadvantages
Maintain current structure	<ul style="list-style-type: none"> • Customer understanding • Continuity of philosophy 	<ul style="list-style-type: none"> • May not reflect current consumption patterns • Minimal consumption in peak period upper tier
Maintain the current tier structure and revise the sizing of the tiers	<ul style="list-style-type: none"> • Better reflect consumption patterns • Maintains a strong conservation price signal 	<ul style="list-style-type: none"> • Does not address complexity of the current rate structure • Does not address the affordability of the rates
Include a lifeline tier (0-2 ccf) – both winter and summer period	<ul style="list-style-type: none"> • Address affordability impacts 	<ul style="list-style-type: none"> • Adds additional complexity and tiers to the current rate structure • Need to equitably price the low use tier
Reduce the number of tiers – 1 winter tier, 2 summer tiers and revised tier sizes	<ul style="list-style-type: none"> • Simplifies the rate structure • Better reflects current consumption patterns • Maintain a conservation (tiered) structure 	<ul style="list-style-type: none"> • Slight reduction in the conservation incentive • Adjust the tier 2 pricing to maintain target revenue levels
Seasonal rate structure – uniform winter and summer rate (same as general service)	<ul style="list-style-type: none"> • Increased simplicity and customer understanding of the rate structure • Maintains a conservation oriented rate structure 	<ul style="list-style-type: none"> • Reduces the conservation incentive of the rate structure • Maintaining equity between the retail customers (residential v. general service) in future periods based on cost of service results

As a note, several additional alternatives were considered (e.g., uniform rate, declining block rate), however given SPU’s goals and objectives these were not included as viable alternatives to consider.

Maintaining the current consumption rate structure is beneficial in that customers understand, for the most part, the purpose of the rates. However the result is a significant conservation

signal, which is not as key a driver of costs on SPU's system at this time as it was in the past. Given the declining consumption and current average customer use, peak costs are no longer the same as they have been in the past. Simply revising the tier sizes may also not fully meet SPU's current goals and objectives, and result in further complicating the rates for SPU's customers. Providing an additional lifeline tier, or low use consumption tier, could be beneficial in increasing the affordability of the rates. However, this may also be difficult as it would add an additional tier to the rate structure and may not benefit many of SPU's customers given the typical consumption patterns. Reducing the residential peak period tiers from three to two and revising the tier sizes to reflect current consumption patterns could be beneficial to SPU and customers. This alternative maintains a conservation incentive, simplifies the rate structure, and the tiers could be revised to reflect current consumption patterns. The final alternative would result in a single rate structure for all "retail", residential and general service, customers. While this would minimize the conservation incentive of the rate it would also simplify customer understanding and administrative ease.

In HDR's opinion, the fixed charge alternatives could be implemented relatively easily. However, the consumption rate structure alternatives would take additional time to develop and allow for sufficient customer outreach and education. Regardless of the final alternatives, additional analysis would be necessary to determine the final pricing and customer bill impacts. This will provide additional information to SPU to determine if there are any unacceptable rate impacts as a result of the proposed changes.

Conclusions and Recommendations

SPU has had a history of revising its rate structure as goals and objectives and conditions have changed. At the current time, SPU is facing different challenges than what has occurred in the past. The review and possible revisions to the rate structure to meet these challenges is timely.

The rates that SPU currently has in place have been effective, but may not reflect the current circumstances of SPU or the rate design goals and objectives. Per capita consumption is declining such that water is not as constrained as it once was projected to be. As a result, conservation and efficient use is still important, but not as important or critical as it once was. Given that, SPU has seen some fundamental changes in their system, particularly as they relate to customer usage patterns and demand profiles. While SPU's rate structure is still effective, it may be simplified to a certain degree and the issues of affordability and revenue stability addressed.

Past rate structure alternatives developed by SPU, as mentioned previously, appear reasonable and reflect the current goals and objectives. HDR has provided additional alternatives, for both the fixed meter charge and consumption charge, for SPU to consider. In some cases these alternatives are similar to past alternatives, while in other cases are different than what has been discussed in the past.