Tables

Figures

Appendices

Austin Water Utility
Cost of Service Rate Study 2008

SECTION

1

Executive Summary

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

1. Executive Summary

This Executive Summary presents the background and results of the water and wastewater rate and fee study conducted by Red Oak Consulting, a division of Malcolm Pirnie, Inc., for the Austin Water Utility (AWU).

1.1. Study Objectives

Section 2 of this report contains a detailed list of project objectives. These objectives can be summarized as:

- Conduct a comprehensive review of AWU's water and wastewater cost-of-service methodologies to determine if these methodologies are fair, promote conservation, and protect the financial feasibility of AWU.
- Review the findings of the Water Conservation Task Force and, where possible, incorporate its findings into AWU's methodologies.
- Conduct these reviews within a structured public process to allow meaningful participation by members of each of AWU's rate classes.

1.2. Overview of the Study

Based on the study objectives, the study consisted of four major elements. These elements are:

1. Public Involvement Process
2. Water Cost-of-Service Analysis
3. Wastewater Cost-of-Service Analysis
4. Reports and Presentations

Each of these major project elements supported the study objectives and provided the project team with a list of modifications to implement within AWU's cost-of-service methodologies.

1.3. Public Involvement Process

The public involvement process included three major elements. These elements were:

1. Executive Team. AWU formed an Executive Team for the project that provided project sponsorship and ultimately made methodological and other decisions that guided the project team's work.

2. Public Involvement Committee (PIC). The PIC consisted of members of each of AWU's customer classes (e.g., single-family residential, multifamily, commercial etc.) The PIC was the focal point of the public process and provided direct comments to the Executive Team.

3. Workshops, Briefings, and Issue Papers. The project team communicated the often complex cost-of-service methodological issues to the PIC and Executive Team through Issue Papers and presentations.

Within the process, the project team prepared Issue Papers which examined the findings of its review of AWU's current methodologies. Where appropriate, the project team presented alternative methodologies and evaluations of these methodologies in the Issue Papers. Volume II of the study report includes each of the Issue Papers presented to the PIC.

Once available, the PIC and Executive Team reviewed the Issue Papers and attended the facilitated workshops where the project team presented the information and answered questions from the PIC and public. Also during the workshops, individual PIC members were encouraged to present their thoughts for the consideration of the entire PIC. In addition, a public comment period was available at each workshop to allow the members of the public to provide direct comments to members of the PIC.

The goal of the Issue Papers and workshops was to provide the PIC with adequate information on the methodological issues under examination so its members could provide specific comments to the Executive Team. Also, after each workshop, members of the PIC were encouraged to provide written comments to the Executive Team on the issues presented in the Issue Papers and the workshops. This information was then presented to the Executive Team during its subsequent briefings. If enough information was available to the Executive Team, it would make a specific decision on the methodological options in question. Otherwise the Executive Team would defer its decision and instruct the project team to provide additional information. Once a decision was made by the Executive Team, the project team presented the decisions to the PIC during the next scheduled workshop.[1]

1.4. Significant Issues Examined

One key aspect of this study was the review of alternative approaches to determining water and wastewater rates. The study included the examination of 31 separate cost-of-service related issues. Of those examined, 11 issues are the most significant and are

[1] Members of the Executive Team attended each PIC workshop. The attendance of the Executive Team was invaluable since it allowed PIC members to ask questions directly of the Executive Team and allowed the Executive Team to hear the PIC members' comments and concerns firsthand.

discussed in this Executive Summary.[2] Appendix A contains the comprehensive list of issues examined during the study. This list also includes the final decisions of the Executive Team. The issues examined in this Executive Summary are presented in Table 1-1. Each is discussed below.

Table 1-1 Summary of Issues Examined

Issues	Previous Method	Proposed Method
Water Issues		
Which cost allocation method would be used?	Base/Extra-Capacity	Base/Extra-Capacity
How should the cost incurred by AWU to provide fire protection be recovered?	Indirectly	Fixed Charge
Should customers with separate irrigation meters be charged the highest residential block rate?	No	No
Should AWU implement a fifth block for its single-family residential customers?	4 Blocks	5 Blocks
What conservation incentives should exist for wholesale customers	Individual Rates	Individual Rates
Wastewater Issues		
Which cost allocation method would be used?	Design Basis	Functional and Design
How should the cost of inflow and infiltration be recovered?	50% Customer 50% Flow	System Cost
Common Issues		
Should the large-volume customer classes be separated?	Aggregated	Disaggregated
How could a low-income subsidy be provided?	No subsidies	Waive Customer Charge
Should the subsidy to the residential customer class continue?	Subsidized	Transition to COS
Should the inside-city and outside-city retail classes be combined?	Separate Classes	Merged

1.4.1. Water Issues

The primary issues examined during the water cost-of-service analysis were:

1. Which cost allocation method would be used?
2. How should the cost incurred by AWU to provide fire protection be recovered?
3. Should customers with separate irrigation meters be charged the highest residential block rate?
4. Should AWU implement a fifth block for its single-family residential customers?
5. What conservation incentives should exist for wholesale customers?

1.4.1.1. Cost Allocation Methods

The PIC examined alternative cost allocation procedures for the water cost-of-service analysis. Three alternative cost allocations were reviewed. Two of the methods were industry-standard approaches promulgated by the American Water Works Association (AWWA). These were the base/extra-capacity and commodity/demand approaches.

[2] Section 3 presents all of the issues reviewed. The issues presented in this executive summary are those that were most consequential to the study.

Additionally, AWU's Residential Rate Advocate suggested a third approach which allocated costs by mixing parts of the two standard approaches. The Executive Team reviewed all three approaches and instructed the Red Oak team to develop the cost-of-service model to allow comparisons of the results. After full consideration, the Executive Team chose the base/extra-capacity approach. The Executive Team's decision was based on technical and non-technical criteria. One important consideration is the Executive Team's preference for industry-standard approaches to ensure objectivity to the cost-of-service methodology.

1.4.1.2. Recovery of Fire Protection Costs

In addition to providing potable water for its customers, AWU provides facilities and capacity that provide water for fighting fires. The cost to provide the water used for fire protection includes both the cost of maintaining fire hydrants and other directly related facilities (called "direct fire costs"), and the cost of the capacity required to be available when fires occur (called "indirect fire costs").

As part of this study, the project team examined alternative methods of recovering these fire-related costs. Of the methods examined, the Executive Team decided to include the fire-related costs in the fixed monthly charges that vary by meter size. This method allocates more costs to meters of larger size to recognize the impact larger facilities have on the fire protection requirements of the system.

1.4.1.3. Customers with Separate Irrigation Meters

The City's Water Conservation Task Force directed AWU to:

> *Conduct a cost of service study to evaluate strategies to reduce water demands by at least 5 MGD, including ... establishing commercial irrigation rates comparable to highest residential tiers...*[3]

The project team evaluated this water conservation strategy and determined that its implementation could significantly reduce rate equity among customers.[4] If implemented, the strategy would result in larger water bills for customers with a separate irrigation meter than those without a separate irrigation meter. If implemented, two customers with identical water use patterns would have differing total bills if one customer had an irrigation meter and the other received its irrigation water through its domestic meter. This difference in bill would provide a disincentive for commercial customers to install separate water meters for their irrigation use. Those commercial customers without separate irrigation meters would continue to receive water for irrigation use at the lower commercial rates.

[3] From *Water Conservation Strategies Policy Document*, Water Conservation Task Force, Austin, Texas, page 25.

[4] As used here, rate equity is a measure of proportionality of a customer's bill and the cost (on an average cost basis) a customer imposes on the system.

Table 1-2 presents a sample bill calculation for two hypothetical customers—one with a separate irrigation meter, and one without. In this hypothetical example, both customers have identical water consumption. In this example, that consumption is assumed to be 94 thousand gallons (kgal) in a month. For the customer with the combined meter, all water is priced at the peak-season rate of $4.58 per kgal. The total volume bill (excluding the fixed monthly charge) for the customer with the combined meter would be $430.52.

Table 1-2 Example of Potential Inequity

Customer Classes	Peak-Season Rate	Consumption (kgal)	Volume Charge
Customer A (Combined Meter)	$4.58	94	$430.52
Customer B (Separate Meters)			
Indoor	$4.58	56	$256.48
Irrigation	8.50	38	323.00
Total		94	$579.48
Additional Cost for Separate Meters			$148.96

The second customer is assumed to have a separate irrigation meter. Although the total consumption for this customer is the same as the first, part of this customer's bill is charged at the peak-season rate, and the remainder at the higher irrigation rate. In this example, the customer's assumed indoor use is 56 kgal. This is priced as if it runs through the non-irrigation meter at a rate of $4.58 per kgal. The remaining use is assumed to be measured by the irrigation meter and is priced at $8.50 per kgal. As shown in Table 1-2, the volume bill for this customer is $579.48, or $148.96 more than the customer without a separate meter. In this hypothetical example, the customer with a separate irrigation meter would have a bill 34.6 percent higher than the customer without the separate meter. Because each customer is assumed to have the same total water consumption, this difference in bill directly leads to rate inequity.

Several options were explored that would meet the objective of the Water Conservation Task Force's strategy without causing the rate inequity. Of those examined, the adoption of an excess-use rate structure for commercial customers was considered the most desirable. Under an excess-use rate structure, customers are charged for water using block rates similar to AWU's current block rates for single-family residential customers. The thresholds at which higher block rates are incurred are determined by each customer's individual water use throughout the year. Oftentimes the block thresholds are expressed as a percentage of a customer's average winter consumption.[5] With excess-use rates, customers without an irrigation meter, but which use water for irrigation, will pay

[5] Average winter consumption is a relatively good measure of water used for indoor use since it is measured during the winter period when outdoor water use is minimal.

higher rates for the water used during the peak season (i.e., outdoor water used for irrigation).

1.4.1.4. Residential Fifth Block

The City's Water Conservation Task Force also directed the utility to "Establish a residential fifth tier for use above 25,000 gallons per month." Red Oak and the utility analyzed likely consumption levels at differing thresholds for the fourth and fifth blocks to determine the expected level of conservation savings and the impact on the stability of AWU's revenues. The rates associated with the fifth block take into account the likely consumption within the fifth block without accounting for additional water conservation savings that might occur. Also, increasing the steepness of AWU's rate design will increase the impacts of weather on AWU's financial position. In other words, increasing the difference in rates between the higher and lower blocks will decrease AWU's revenue stability and put additional financial pressure on the utility during periods of lower than expected water sales.

As part of its analyses, Red Oak developed a conservation impact model (CIM) that AWU can use to analyze future rate design options.

Consistent with the Water Conservation Task force recommendations, the Executive Team directed that the five-block rate structure be used for single-family residential customers.

1.4.1.5. Conservation Incentives for Wholesale Customers

In addition to providing guidance on residential water rate design, the Water Conservation Task Force also recommended that AWU conduct a cost-of-service study that considers conservation rate structures for wholesale customers.

The three rate structures examined in this study include:

1. Uniform rates by wholesale class (current approach),
2. Seasonal rates, and
3. Excess-use rates.

Because each wholesale customer is treated as an individual customer class, each rate structure alternative will be designed to generate the same revenue consistent with the cost of service. The primary difference among the options is the impact on volatility of costs (for the wholesale customers) and revenues (for AWU). There may be an interim incentive to reduce consumption by wholesale customers during the implementation to avoid higher costs.

Red Oak recommended that AWU continue to use a uniform rate by customer class and work with its wholesale customers to achieve greater water conservation through other mechanisms. Red Oak's recommendation considered:

1. Several wholesale customers have implemented conservation rates.

2. Some of the existing wholesale agreements may prohibit the implementation of conservation rates. Introducing an inconsistent rate design for this class of customers may introduce equity concerns.

3. Rates for wholesale customers are based on each wholesale customer's individual peaking factors. Since these peaking factors directly affect the customer's rates, it provides each wholesale customer a direct incentive to manage its water demands during the peak season.

The Executive Team decided to maintain a uniform rate structure for wholesale customers.

1.4.2. Wastewater Issues

The primary issues examined during the wastewater cost-of-service analysis were:

1. Which cost allocation method should be used?

2. How should the cost of inflow and infiltration be recovered?

1.4.2.1. Cost Allocation Methods

As part of its cost-of-service methodology, AWU examined three methods to allocate wastewater collection and treatment costs. The three methods examined are:

1. Design basis[6],

2. Functional basis, and

3. Hybrid where O&M costs are allocated based on function, and capital costs based on design.

Under the design method, costs for each part of AWU's wastewater system are allocated based on the criteria used to design the facility. Under the functional approach, the costs are incurred based on the function associated with the costs. For example, a wastewater facility may be designed to allow the rate of flow through a portion of the plant to be such that solids can settle. In that situation, the design criteria would be the rate of flow and the functional criteria would be the settling of solids.

The primary difference among the alternative methods is that the design basis allocates costs based on engineering design criteria whereas the functional basis allocates costs

[6] Since its 1999 cost-of-service study, AWU allocated its wastewater-related costs using the design basis.

based on operational or functional purposes. The hybrid allocates O&M costs based on function and the capital costs based on design.

The Executive Team recommended the hybrid approach.

1.4.2.2. Recovery of Inflow and Infiltration Costs

Wastewater conveyed and treated by AWU consists of contributed waste from AWU's customers and other wastewater flows generally described as *inflow and infiltration* (I/I). Infiltration is the flow entering the sanitary sewer resulting from high groundwater or precipitation that occurred days or weeks before the observed flow in the sanitary sewer. Inflow results from rainfall that enters the sanitary collection system through a number of direct connections such as catch basins, roof drains, foundation drains, and manhole covers.

Because I/I has various sources, customers generally cannot influence the level of I/I in the system. Generally, the utility mitigates I/I to reduce the flow-related costs of treatment and allow the flow-related capacity of the facilities to be available to customers, thereby avoiding expansions of capacities.

The cost associated with collecting, conveying, and treating I/I must be allocated within the cost-of-service methodology. Currently the assumed I/I flow used to determine the cost of service in AWU's wastewater system is 10.5 percent of total flows.

As described in the Wastewater Cost Allocations issue paper (see Volume II of this report), the USEPA has issued guidelines on the allocation and recovery of I/I costs using several approaches. Based on these approaches, four alternatives were presented to the PIC and considered by the Executive Team.[7] These are:

1. Combined connections and volume (Current). Under this approach, I/I costs are treated as customer class-specific costs and allocated to each customer class based on a combined measure of each class' number of connections and volume of contributed wastewater volume.

2. Contributed wastewater volume. The contributed wastewater volume approach allocates the cost of I/I to all customers in proportion to the flow they contribute to the wastewater system. As such, the contributed wastewater volume approach treats I/I as a general cost of conveying wastewater.

3. Number of connections. Under this approach, I/I costs are allocated to each customer class based on the relative number of connections each class represents of the system total.

[7] Since AWU does not base its user charges on *ad valorem* property taxes, the value of property would not be consistent with USEPA guidelines. Therefore, it was not considered in this evaluation.

4. Land area. In some cases, I/I costs are allocated to customer classes (or customers) based on each class' share of the total land area served by the utility.

The primary differences among the alternatives are the alternative philosophies regarding the appropriate allocation of costs. AWU currently uses the combined approach which attributes 50 percent of the I/I flows to customer classes based on the number of connections and 50 percent based on the class' contributed wastewater flow. The other approaches are consistent with USEPA guidelines.

Red Oak recommended that AWU allocate and recover its I/I cost based on the contributed flow of each customer class. This recognizes the fact that individual customers cannot manage I/I, and that the cost of I/I is primarily in consuming flow-related capacity.

The Executive Team decided to allocate I/I as a system cost based on contributed volume. For analytical purposes, the Executive Team requested the model be developed with the capability of allocating I/I as a system cost or based on a ratio of volume and number of connections.

1.4.3. Issues Common to Both Water and Wastewater

Certain issues examined applied to both the water and wastewater utilities. These issues were:

1. Should the large-volume customer classes be separated?
2. How could a low-income subsidy be provided?
3. Should the subsidy to the residential customer class continue?
4. Should the inside-city and outside-city retail classes be combined?

1.4.3.1. Separation of Large-Volume Customers

AWU currently combines the use of all large-volume customers into one class. As such, the rates generated for this class are based on the average cost of serving the mix of large-volume customers. Because of their sizes, the study examined the feasibility of separating these customers into individual classes. The primary benefit of separating large-volume customers into separate classes is to enhance the pricing signal each customer receives. In other words, when separated, each customer realizes the benefits of modifying its usage patterns, etc., to lower the costs of operating the utility. This allows these customers to better justify expenditures that will save AWU money on capacity and treatment.

Red Oak recommended that AWU disaggregate its large-volume customers and establish individual rates for each customer based on that customer's estimated water and

wastewater usage characteristics. The Executive Team decided to disaggregate the large-volume customer class.

1.4.3.2. Low-Income Subsidy

Enhancing the affordability of water and wastewater services for customers of limited financial means has been an ongoing objective of AWU and its citizens. Ultimately, the approach that AWU uses to assist low-income customers must meet the social and political needs of the City rather than technical cost-of-service concerns.

Two issues were raised during the review of potential policies on low-income subsidies. First, AWU needs to identify the most appropriate method for providing a low-income subsidy. The second is how AWU should recover the costs that would otherwise be covered by customers receiving the low-income subsidy.

As part of the PIC process, AWU received comments from both members of the general public and the PIC that AWU should implement a low-income subsidy by eliminating the monthly customer charge. Furthermore, the PIC recommended that AWU recover the cost of the low-income subsidy as a general expense applied to all retail customers.

The Executive Team concurred and AWU has already implemented this policy in advance of adopting the full cost-of-service methodology.

1.4.3.3. Residential Subsidy

AWU has maintained a policy that its commercial and industrial customers pay water and sewer rates higher than their cost of service. The additional revenue generated from these customers has been used to reduce rates for single-family residential customers. This reduction in the charges to these customers was intended to make water more affordable to citizens.

AWU examined two options with regard to its subsidy of single-family residential customers. These were:

1. Maintain the current subsidy; or

2. Transition to cost of service (COS).

Currently AWU increases its charges to commercial and industrial customers by approximately 10 percent above the estimated cost to serve these customers. This revenue reduces rates charged to single-family residential customers. Although this policy makes water more affordable to single-family residential customers, it does not take into account the ability of some single-family residential customers to pay the full cost of providing water services. As discussed in Section 1.4.3.2 above, the Executive Team recommends using a low-income subsidy to provide affordable utility services to those customers most in need.

The Executive Team decided to transition to cost of service over five to seven years.

1.4.3.4. Combining Inside-City and Outside-City Retail Classes

Historically AWU has maintained separate customer classes for its inside-city and outside-city retail customers. For example, AWU maintained a class for inside-city residential and outside-city residential. The same is true for AWU's other retail customer classes (e.g., multifamily, commercial, etc.)

Over time, the difference in rates determined for these classes has become less material. This lessening of the difference is, in part, the result of AWU's steeply inclining block rate structure and the impact that structure has on revenues from AWU's customers. Because of differences in water and wastewater use between the two groups of customers, the revenue productivity of the inside-city and outside-city rate structures differed. When compared, the costs and revenues between the two groups of customers have converged over time resulting in very similar cost-of-service rates.

As part of this study, AWU considered the elimination of the inside-city and outside-city class distinction.

AWU examined two options for classifying its retail customers. These were:

1. Maintain the current separation of classes; or

2. Combine the inside- and outside-city classes.

The Executive Team decided to eliminate the inside-city and outside-city class distinction for AWU's retail customers.

1.5. Findings and Recommendations

1.5.1. Findings for Water

The water methodology used in this study follows the decisions of the Executive Team and the industry standard approaches described by the AWWA in its *Manual of Water Supply Practices: Principles of Water Rates, Fees, and Charges.*

The results presented in this report are based on AWU's revenue requirements for fiscal year ending (FY) 2009. These rates depict the impact that changes to AWU's cost-of-service approach would have on its customers. Where appropriate, results (both rates and revenue) from this study are compared to AWU's currently adopted rates and revenue for FY2009. Within this report, the current rates and revenue used for comparison are called AWU's *Existing Rates* or *Existing*. The rates and revenue calculated within this study, using the proposed methodology, are called AWU's *Computed Rates* or *Computed.*

Based on the analysis presented in Section 4, cost-of-service rates were calculated for AWU's various customer classes and meter sizes. Table 1-3 provides a summary of the existing and computed fixed monthly water charges by meter size. Appendix B of this report contains selected calculations for the water cost-of-service rate analysis.

Table 1-3 Existing and Computed Fixed Monthly Charges

Meter Size	Existing Rates	Computed Rates
5/8-Inch	6.25	6.58
3/4-Inch	7.21	7.78
1-Inch	8.55	9.24
1 1/4-Inch	10.47	11.79
1 1/2-Inch	12.39	14.36
2-Inch	16.23	21.44
3-Inch	33.13	38.92
4-Inch	52.33	75.93
6-Inch	100.33	152.09
8-Inch	148.33	859.64
10-Inch	196.33	897.18
12-Inch	225.13	919.71

The fixed monthly charges include an amount to recover both the direct and indirect fire costs. The increases proposed for larger meters recognize a greater burden for fire-related costs for these customers.

Table 1-4 provides a comparison of the existing and computed volume water rates by customer class. The computed rates include a full adjustment for the elimination of the residential subsidy. AWU's Executive Team proposed to phase the subsidy out over 5 to seven years.

Table 1-4 Existing and Computed Volume Water Rates

Volume Rates (per Kgal)	Existing Rates	Computed Rates
Residential		
Block 1	$0.98	$1.10
Block 2	2.59	3.00
Block 3	4.75	6.00
Block 4	8.50	8.62
Block 5	8.50	10.00
Multi Family		
Peak	$3.88	$3.66
Off-Peak	3.54	3.34
Commercial		
Peak	$4.58	$3.90
Off-Peak	4.20	3.56
Industrial		
Hospira		
Peak	$4.28	$5.01
Off-Peak	3.93	4.56
Spansion		
Peak	$4.28	$3.60
Off-Peak	3.93	3.26
Applied Materials		
Peak	$4.28	$3.74
Off-Peak	3.93	3.40
Freescale		
Peak	$4.28	$3.84
Off-Peak	3.93	3.48
Samsung		
Peak	$4.28	$3.76
Off-Peak	3.93	3.41
Sematech		
Peak	$4.28	$3.62
Off-Peak	3.93	3.30
University of Texas		
Peak	$4.28	$3.89
Off-Peak	3.93	3.53

As described in Section 1.4.1.4 on page 1-6, AWU examined the possibility of adding a fifth block to its residential water rate design. This fifth block applies to all consumption exceeding 25 kgal per month. The existing and proposed block thresholds are presented in Table 1-5.

Table 1-5 Existing and Proposed Block Thresholds (Kgal)

Block	1	2	3	4	5
Existing	2	9	15	Over	N/A
Proposed	2	9	15	25	Over

Currently single-family residential customers with separate irrigation meters are allowed to purchase water at all blocks for both meters. That allows a single-family residential customer with an irrigation meter to purchase twice as much water in blocks 1 and 2. The cost of water in these first two blocks is priced at less than the average cost of service to allow low-income citizens to have more affordable water. The unintended consequence is that single-family customers with irrigation meters can receive up to twice the benefit as other single-family customers. To correct this situation, AWU has proposed pricing all irrigation water consumed by single-family customers in blocks 1 and 2 at the block 3 rate. This will improve equity and provide a greater conservation incentive.

A summary of the existing and computed wholesale water rates is provided in Table 1-6.

Table 1-6 Existing and Computed Wholesale Water Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - 5/8-inch meter	$6.25	$6.58
Volume Charge by Customer (per Kgal)		
Creedmore-Maha WSC	$2.88	$2.93
High Valley	2.75	2.80
Lost Creek MUD	3.02	3.06
Manor, City of	2.76	3.15
Manville WSC	3.27	3.32
Marsha Water	2.78	2.85
Nighthawk WSC	2.73	2.80
North Austin MUD	3.12	3.24
Northtown MUD	2.92	2.98
Rivercrest WSC	3.10	3.10
Rollingwood	3.33	3.39
Shady Hollow MUD	3.21	3.26
Sunset Valley MUD	3.19	3.29
Travis Co. Water District 10	3.13	3.19
Wells Branch MUD	2.80	2.84
Windermere Utility Co.	6.96	7.06

Calculating cost-of-service rates requires that both the use of the system and the cost of operations be estimated. In ratemaking, the costs of operating the utility are referred to as the utility's revenue requirements. The revenue requirements used in this analysis are described in Section 4.3 of this report.

Based on the analysis presented in this section, Table 1-7 below shows a summary of water revenue under existing and computed rates. This table is also provided in Appendix B as Table B-14.

Table 1-7 Water Revenue Under Existing and Computed Rates

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$78,810,693	$86,709,735	10.0%
Multi-Family	34,631,345	33,857,794	(2.2%)
Commercial	61,533,634	53,740,884	(12.7%)
Creedmore-Maha	178,719	179,953	0.7%
High Valley	18,859	18,865	0.0%
Lost Creek	887,545	891,647	0.5%
Manor, City of	729	642	(11.9%)
Manville WSC	280,479	280,725	0.1%
Marsha Water	28,059	28,378	1.1%
Nighthawk	29,375	29,606	0.8%
North Austin MUD	1,170,391	1,190,933	1.8%
Northtown MUD	627,063	629,259	0.4%
Rivercrest	317,685	311,953	(1.8%)
Rollingwood	434,825	434,956	0.0%
Shady Hollow	779,199	782,897	0.5%
Sunset Valley MUD	306,657	307,207	0.2%
Water District 10	2,633,503	2,650,573	0.6%
Wells Branch MUD	1,523,677	1,529,066	0.4%
Windermere	99,340	99,649	0.3%
Hospira	348,548	406,372	16.6%
Spansion	2,092,246	1,771,037	(15.4%)
Applied Materials	373,745	343,021	(8.2%)
Freescale	3,068,951	2,763,541	(10.0%)
Samsung	3,887,156	3,402,853	(12.5%)
Sematech	398,204	345,211	(13.3%)
University of Texas	1,946,422	1,804,453	(7.3%)
Totals	$196,407,020	$194,511,209	(1.0%)

1.5.2. Findings for Wastewater

Section 5 of this report documents the steps taken to calculate AWU's wastewater cost-of-service rates. Red Oak allocated the revenue requirements by categories and customer class to the customer characteristics, and determined the total cost of service by customer class. With that information, rates were developed for each customer class. Appendix C of this report contains selected calculations for the wastewater cost-of-service rate analysis. A summary of the existing and computed retail wastewater rates and fixed charges is provided in Table 1-8. The computed rates include a full adjustment for the elimination of the residential subsidy. AWU's Executive Team has decided to propose the complete elimination of the residential subsidy for wastewater in FY2010.

Table 1-8 Existing and Computed Retail Wastewater Rate

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - All Sizes	$8.00	$8.00
Volume Charge by Customer (per Kgal)		
Residential		
Block 1	$3.29	$3.34
Block 2	7.44	7.49
Multi-Family	6.59	6.85
Commercial	7.23	6.86
Industrial		
Hospira	6.64	6.74
Spansion	6.64	5.81
Applied Materials	6.64	7.00
Freescale	6.64	6.42
Samsung	6.64	6.36
Sematech	6.64	5.99
University of Texas	6.64	6.73

A summary of the existing and computed wholesale wastewater rates is provided in Table 1-9.

Table 1-9 Existing and Computed Wholesale Wastewater Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - All Sizes	$8.00	$8.00
Volume Charge by Customer (per Kgal)		
Comanche Canyon (WCID#17)	$3.50	$3.65
Manor, City of	4.62	4.99
North Austin MUD #1	4.98	4.98
Northtown MUD	5.00	4.96
Rollingwood, City of	4.72	5.02
Shady Hollow MUD	4.62	4.99
Sunset Valley, City of	4.62	4.96
Sterner Ranch (WCID #17)	3.58	3.62
Wells Branch MUD	4.94	5.02
Westlake Hills, City of	4.49	4.79

Calculating cost-of-service rates requires that both the use of the system and the cost of operations be estimated. In ratemaking, the costs of operating the utility are referred to as the utility's revenue requirements.

Based on the analysis presented in this section, Table 1-10 is provided below showing a summary of revenues under existing and computed rates. This table is also provided in Appendix C as Table C-14.

Table 1-10 Wastewater Revenue Under Existing and Computed Rates

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$74,392,185	$74,692,011	0.4%
Multi-Family	46,253,768	47,729,253	3.2%
Commercial	47,639,158	45,285,030	(4.9%)
Comanche Canyon (WCID#17)	8,496	8,795	3.5%
Manor, City of	277,296	296,195	6.8%
North Austin MUD #1	1,473,619	1,466,614	(0.5%)
Northtown MUD	839,721	829,885	(1.2%)
Rollingwood, City of	178,512	188,051	5.3%
Shady Hollow MUD	411,264	439,208	6.8%
Sunset Valley, City of	330,645	351,229	6.2%
Steiner Ranch (WCID #17)	1,718	1,824	6.1%
Wells Branch MUD	1,919,935	1,938,903	1.0%
Westlake Hills, City of	141,900	149,453	5.3%
Hospira	992,737	1,002,277	1.0%
Spansion	3,100,976	2,733,719	(11.8%)
Applied Materials	332,097	347,172	4.5%
Freescale	2,988,288	2,885,391	(3.4%)
Samsung	4,714,496	4,513,542	(4.3%)
Sematech	464,896	421,414	(9.4%)
University of Texas	1,607,649	1,620,537	0.8%
Extra Strength Surcharges	0	4,728,734	0.0%
Totals	$188,069,357	$191,629,215	1.9%

1.6. Other Recommendations

In addition to the recommendations presented above, Red Oak provides the following recommendations:[8]

1. AWU's proposed cost-of-service rates increase the volatility of revenue from year to year. Also, the new 5-block rate structure is based on estimated consumption for residential customers from past billing records. To mitigate risk to AWU's financial health, Red Oak recommends AWU closely track its revenue and accumulate sufficient reserves to allow for years with lower than expected revenue.

[8] Section 6.2 presents more information on our other recommendations.

2. Red Oak also recommends AWU consider implementing excess-use rates to achieve the goals set by the City's Water Conservation Task Force. Excess-use rates would allow AWU to provide a consistent conservation incentive to all of its customers without regard to separate irrigation meters.

3. AWU may want to consider transitioning to its new rate structures over time to mitigate significant swings in rates and customer bills.

Austin Water Utility
Cost of Service Rate Study 2008

SECTION

2

Introduction

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

2. Introduction

Austin Water Utility (AWU) provides municipal water and wastewater services to its citizens and other residents and businesses in the greater Austin, Texas area. AWU also provides wholesale water and wastewater service to a number of customers.

AWU engaged the services of Red Oak Consulting (Red Oak) to prepare cost-of-service rate analyses for its water and wastewater utilities. Additionally, Red Oak analyzed the impacts of a proposed conservation-oriented rate structure for AWU's residential water customers. This report documents the findings of the study.

The results presented in this report are based on AWU's revenue requirements for fiscal year ending (FY) 2009. These rates depict the impact that changes to AWU's cost-of-service approach would have on its customers. Where appropriate, result (both rates and revenue) from this study are compared to AWU's currently adopted rates and revenue for FY2009. Within this report, the current rates used for comparison are called AWU's *Existing Rates* or *Existing*. The rates calculated within this study, using the proposed methodology, are called AWU's *Computed Rates* or *Computed*.

2.1. Study Objectives

AWU set the following objectives for this study:

1. Update the AWU's water and wastewater rates to recover revenue requirements through a comprehensive cost-of-service rate study.
2. Review, assess, and provide feedback on potential issues with AWU's existing water and wastewater cost-of-service methodologies. AWU's methodologies should adhere to industry standards for setting equitable rates for all customer classes.
3. Review AWU's customer demand data, peaking factor calculations, and other cost allocation methodologies.
4. Perform a comprehensive cost-of-service analysis including a public involvement process to analyze alternative cost allocation methods, cost recovery methods, and conservation incentives.
5. Estimate the impacts that conservation-oriented rates have on AWU's residential customers.
6. Provide information and obtain feedback from AWU's residential rate advocate regarding the cost-of-service study.
7. Develop a computer spreadsheet model that incorporates the cost-of-service methodologies and findings from the public involvement process. The computer

spreadsheet model will be provided to AWU at the end of the study, along with training for AWU staff on the operation of the model.

8. Based on the findings of the study, recommend cost-based rates to the City Council.

2.2. Scope of the Project

The scope of this project can be summarized into four major components. They are as follows:

1. Public Involvement Committee (PIC) Workshops
2. Water Analysis
3. Wastewater Analysis
4. Reports and Presentations

Each is described below.

2.2.1. Public Involvement Committee (PIC) Workshops

Red Oak collaborated with the public involvement specialist at Group Solutions RJW to develop and prepare a public involvement plan to address roles and responsibilities and task assignments relating to public involvement and communication. Much of this plan was designed to meet the needs of the PIC and address the issues that the PIC would analyze.

With Group Solutions RJW, the Red Oak team conducted a PIC Orientation Workshop to initiate the public involvement portion of the cost-of-service rate study. The workshop was designed to provide the PIC with study information, including an introduction of the project team, the scope of work, an overview of the rate design process, and the study schedule.

Following the orientation, the PIC was involved in a series of professionally facilitated workshops which examined various issues regarding AWU's methods for recovering its costs. The issues examined are listed below by category. Each issue is described in greater detail in Section 3 of this report.

2.2.1.1. Revenue Requirements

- Issue 1: Which method of determining revenue requirements is most appropriate?
- Issue 2: How should future O&M expenses be projected?
- Issue 3: How should the rate of return be determined?
- Issue 4: How should the rate base be valued?
- Issue 5: How should construction work in progress be treated?

2.2.1.2. Water Cost Allocations and Fire Charges

- Issue 1: Which is the most appropriate overall method for allocating costs?
- Issue 2: What are the appropriate time steps for the cost allocation method?
- Issue 3: Should AWU charge private fire connections for both the direct and indirect fire costs?
- Issue 4: How should AWU recover its public fire cost in its cost-of-service methodology?

2.2.1.3. Wastewater Cost Allocations

- Issue 1: Which is the most appropriate overall method for allocating costs?
- Issue 2: What are the appropriate customer service characteristics to use for the cost allocation process (e.g., flow, BOD, TSS, etc.)?
- Issue 3: How should inflow and infiltration (I/I) be estimated and allocated in the cost allocation process?

2.2.1.4. Customer Classification

- Issue 1: Should the large-volume customer class be disaggregated?
- Issue 2: Should the threshold for inclusion in the large-volume class be adjusted?
- Issue 3: Should an irrigation class be created?

2.2.1.5. Rate Design

- Issue 1: What is the best method for providing a subsidy to low-income customers?
- Issue 2: How should AWU recover a subsidy to low-income customers?
- Issue 3: Should AWU introduce a fifth block for single family residential customers?
- Issue 4: What conservation incentives should exist for wholesale customers?

2.2.1.6. Rates for Irrigation Customers

- Issue 1: If AWU implements higher rates for irrigation users, how should the excess revenues generated by the higher rates be used?
- Issue 2: What is an appropriate level for non-residential irrigation rates?
- Issue 3: Should single-family residential customers with irrigation meters receive irrigation water at the block 1 and 2 rates?

As mentioned, Section 3 of this report describes each of these issues in greater detail. Section 3 also describes the PIC, its roles, and the process by which each of these issues were addressed.

2.2.2. Water Analysis

Red Oak developed a cost-of-service model and specifications to perform the cost-of-service analysis of the water utility. Red Oak reviewed the cost-of-service model specifications with the Project Team, and populated it with data provided by AWU. Major milestones and results of the model analysis were reviewed with the Project Team.

Red Oak used the cost-of-service model to estimate revenues under existing rates to determine the sufficiency of these rates to meet the projected revenue requirements. We allocated costs according to the accepted methodology to determine unit costs and customer class cost of service.

Red Oak developed a conservation impact model and specifications to determine the impact of the proposed rate design on customers. We reviewed the conservation impact model specifications with the Project Team. We populated the conservation impact model with data obtained from AWU and reviewed the results of the model analysis with the Project Team.

Red Oak integrated the results of the bill frequency analysis into the rate design model and developed alternative rate structures. We presented the alternative rate structures to the Executive Team and Project Team for consideration and recommended an appropriate rate structure to meet AWU's pricing objectives and evaluation criteria.

2.2.3. Wastewater Analysis

The analysis for AWU's wastewater utility was very similar as that for its water utility. The one major difference was that for the water, Red Oak developed a conservation impact model and specifications to determine the impact of the proposed rate design on customers. A similar service was performed for wastewater, but it was done so within the context of the cost-of-service model, rather than in a separate conservation impact model. Otherwise the two analyses were conducted concurrently with one another.

2.2.4. Reports and Presentations

The last major effort involved in this project is the documentation and presentation of results and recommendations. This report constitutes a large part of the project documentation, but there were also memos, presentations, and issue papers produced throughout the analysis period to keep AWU and the PIC informed on the progress and results of the various parts of this study.

2.3. Overview of the Report

The findings from the study are presented in two separate volumes. This report and appendices are the first volume. Each volume and its contents are listed below.

- Volume I – Austin Water Utility Cost of Service Rate Study 2008
  - Section 1: Executive Summary. The Executive Summary provides a brief summary of the important assumptions and findings of the report.

- Section 2: Introduction. The Introduction is the section you are now reading.
- Section 3: Public Involvement Program. This section describes the public involvement process, including the Public Involvement Committee (PIC), PIC roles, and the process by which each of the issues were addressed.
- Section 4: Water Rate Analysis. The methodology used to conduct the water cost-of-service analysis is described in this section. Also included is a description of the rate design analysis completed for this study.
- Section 5: Wastewater Rate Analysis. The methodology used to conduct the wastewater cost-of-service analysis is described in this section.
- Section 6: Findings and Recommendations. This section contains an overview of our findings and recommendations to AWU.
- Appendices:
  - Appendix A – Summary Table of Executive Team Decisions
  - Appendix B – Selected Tables from Water Cost-of-Service Model
  - Appendix C – Selected Tables from Wastewater Cost-of-Service Model

➢ Volume II – Issue Papers

- Section 1: Issue Papers. The issue papers presented to AWU and the PIC as part of the Public Involvement Program are contained here.
- Appendices:
  - Appendix A – Executive Team Briefing Minutes
  - Appendix B – PIC Meeting Minutes
  - Appendix C – PIC Meeting Presentations

2.4. Acknowledgements

Development of AWU's Water and Wastewater Rate Study was a team effort among AWU's Project Team, AWU's Executive Team, the members of the PIC, the professionals from Group Solutions RJW, and the members of Red Oak's team. We would like to thank the individuals listed below who contributed their time, expertise, and support to make the project a success.

AWU's Project Team included the following individuals:

- J. R. "Rusty" Cobern, CPA, Utility Budget & Finance Manager, AWU
- Michael Castillo, Utility Financial Manager, AWU

- Denise McDonald, Utility Financial Analyst Senior, AWU
- Darrel Culberson, Utility Financial Analyst Senior, AWU

The Executive Team included the following individuals:

- Greg Meszaros, Director, AWU
- Perwez Moheet, CPA, Deputy Director, AWU
- Daryl Slusher, Assistant Director, Environmental Affairs and Conservation, AWU
- David Anders, Assistant Director, Finance and Business Services, AWU

The PIC consisted of two representatives from each customer class and one water and wastewater commission member:

- Single-Family Residential
  - Lanetta Cooper
  - Angela Taylor Rubottom (Residential Rate Advocate)
- Multi-Family Residential
  - Kristan Arrona
  - Tom Graves
- Commercial
  - Gene McMenamin
  - Doris Williams
  - Nguyen Stanton[1]
- Large Volume
  - Dan Wilcox
  - Jeff Covington
- Wholesale
  - Joy Smith
  - Myra Salas
- Water & Wastewater Commission
  - Mario Espinoza

[1] Gene McMenamin attended the Revenue Requirements meeting and then resigned. Doris Williams attended the Water Cost Allocations, Wastewater Cost Allocations, Customer Classifications, and Rate Design meetings and then resigned. Nguyen Stanton joined the PIC for the Customer Classifications meeting and represented the commercial class for the remainder of the study.

Austin Water Utility
Cost of Service Rate Study 2008

SECTION

3

Public Involvement Process

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3. Public Involvement Process

3.1. Overview of the Process

To enhance stakeholder involvement, AWU implemented an extensive public involvement process for the cost-of-service study. Red Oak incorporated the public involvement professionals from Group Solutions RJW to lead the public process and provide professional facilitation services. The process included a series of public meetings with a Public Involvement Committee (PIC) and AWU's Executive Team. Figure 3-1 presents an overview of the process.

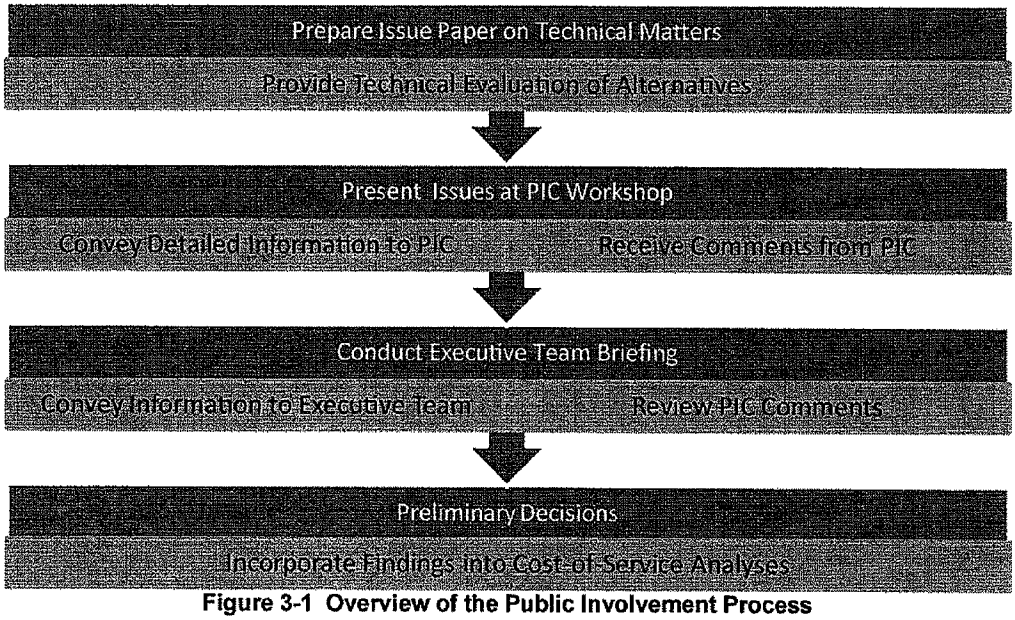

Figure 3-1 Overview of the Public Involvement Process

3.2. Participants

The participants in the public involvement process included the Executive Team, the PIC, the Project Team, and the consultants. Although the Executive Team made the decisions regarding the cost-of-service policies, it considered the comments of the PIC during its deliberations.

3.2.1. Executive Team

The Executive Team met after each PIC meeting to discuss the issues that were addressed by the PIC. The Executive Team encouraged PIC members to submit written comments following each PIC meeting. These comments were reviewed and considered by the

Executive Team during discussion of each issue. When necessary, the Executive Team deferred decisions until further information was received.

3.2.2. Public Involvement Committee

The PIC was designed to provide comments and recommendations to the Exectutive Team and to work with the constituents of their respective customer class.

The PIC consisted of two representatives from each customer class:

- Single family residential – Lanetta Cooper and Angela Taylor Rubottom (Residential Rate Advocate);
- Multifamily residential – Kristan Arrona and Tom Graves;
- Commercial – Gene McMenamin, Doris Williams, and Nguyen Stanton[1];
- Large Volume – Dan Wilcox and Jeff Covington;
- Wholesale – Joy Smith and Myra Salas;
- Water & Wastewater Commission – Mario Espinoza.

AWU retained Angela Taylor Rubottom, the Residential Rate Advocate, to represent the single-family residential class. In addition, Lanetta Cooper represented the Austin Neighborhood Council.

3.3. Evaluation Criteria

3.3.1. Overview

AWU developed a list of objective evaluation criteria to assist in the evaluation of proposed alternative cost-of-service policies. During the initial project meetings, Red Oak presented a preliminary list of evaluation criteria commonly used in this type of study. The City revised the preliminary list of evaluation criteria to more appropriately represent the City's values and goals. Then the Executive Team ranked the criteria individually, and these rankings were used to determine the weighting factors for the criteria.

3.3.2. Selected Criteria

The evaluation criteria are organized into five categories. These categories include:

- Implementation,
- Equity,
- Customer impact,
- Conservation, and
- Financial.

[1] Gene McMenamin attended the Revenue Requirements meeting and then resigned. Doris Williams attended the Water Cost Allocations, Wastewater Cost Allocations, Customer Classifications, and Rate Design meetings and then resigned. Nguyen Stanton joined the PIC for the Customer Classifications meeting and represented the commercial class for the remainder of the study.

Figure 3-2 presents these categories and the final criteria within them, as selected by the City.

Implementation	Equity	Customer	Conservation	Financial
Administrative Burden	Interclass	Affordability	Average-Day Savings	Revenue Sufficiency
Public Understanding	Intraclass	Economic Development	Peak-Season Savings	Revenue Stability
Public and Political Acceptance	Inter-generational	Rate Shock/ Volatility	Peak-Day Savings	Rate Stability
Risk of Implementation	Inside/ Outside City	Understand Bill	Sustainability	Rate Predictability
Legal Defensibility	Industry Standards			Financial Risk
Policy Durability				

Figure 3-2 Final Evaluation Criteria

Following is a brief description of each criterion by category.

3.3.2.1. Implementation

Criteria included in the implementation category are designed to compare the issues of implementing alternatives. Due to the nature of the criteria within this category, and the lack of an appropriate quantitative measure tool for many of them, these criteria are evaluated qualitatively.

ADMINISTRATIVE BURDEN

The amount of administrative burden required can vary greatly among alternatives. Additional data collection needs, changes to the accounting and budgeting system, or additional staff needs and training are a few examples of how administrative burden among alternatives can differ.

PUBLIC UNDERSTANDING

The public's ability to understand alternatives, the process by which they were developed, and the resulting cost consequences are imperative for successful implementation.

PUBLIC AND POLITICAL ACCEPTANCE

The selected alternative should be one the public and the City's elected officials will accept. Acceptance of a new alternative is typically tied to community values and goals. This criterion typically requires gathering information on likely customer responses and the involvement of elected officials.

RISK OF IMPLEMENTATION

The success of implementing any new alternative involves a degree of risk. The selected alternative should minimize risk that it may not be able to be implemented or can only be implemented outside an acceptable timeframe.

LEGAL DEFENSIBILITY

The proposed alternative must be legally defensible if challenged.

POLICY DURABILITY

The proposed alternative should remain viable as the utility's situation changes over time. Policies that are more likely to fair well considering an uncertain future are considered relatively more durable and receive a higher rating for *Policy Durability.*

3.3.2.2. Equity

INTERCLASS EQUITY

This type of equity assures that the alternative distributes the costs of services across customer classes in proportion to the cost of serving each class. Each customer class pays its fair share and no class provides or receives a subsidy from another class.

INTRACLASS EQUITY

This type of equity recognizes that alternatives will vary in their ability to assign costs to customers equitably within the same customer class.

INTERGENERATIONAL EQUITY

This type of equity recognizes that alternatives will vary in the degree which they compensate existing customers for investments already made in the system that will benefit new customers. Usually, intergenerational equity is managed by implementing appropriate system development charge methodologies.

INSIDE/OUTSIDE CITY

This type of equity measures the proportionality of costs to revenue for inside- and outside-city customers.

INDUSTRY STANDARDS

Industry standards have evolved to ensure the integrity of the cost-of-service process. The standards focus largely on ensuring proportionality of costs and revenue. These industry standards may guide the selection of alternatives.

3.3.2.3. Customer Impact

The customer impacts focus on the affects of an alternative on customers. Some criteria are very subjective and often require the direct participation of policymakers. Others, (e.g., rate shock), can be measured quantitatively.

AFFORDABILITY

In addition to promoting the health, general welfare, and fire protection needs of its customers, many utilities were formed by local governments to ensure that a minimum level of service is available to users who might not otherwise be able to afford them. This criterion focuses on the ability of residential customers to afford services.

ECONOMIC DEVELOPMENT

Water and sewer services are vital to local economic development. Also, local businesses are often affected by the cost of utility services. This criterion measures the relative impacts on economic development of the alternatives.

RATE SHOCK/VOLATILITY

Rate shock measures the significance of changes in customer bills because of a proposed alternative. Large, sudden increases in bills can impose economic difficulties that are harmful to local governments, businesses, and residents.

UNDERSTANDABILITY OF BILL

Public understanding of the service bill is an important criterion to consider when examining the likely customer impact of alternatives. Specifically, this criterion is tied to the complexity of the bill. Simpler rate designs will likely generate bills that are easier to read and understand by customers.

3.3.2.4. Conservation

Water savings is often a primary objective of modern rate designs. However, water savings can accumulate differently based on the type of rate structure selected. Therefore, the conservation criteria are selected to measure the types of water savings most important to AWU.

Often conservation criteria are considered to apply exclusively to water, and generally the criteria are more relevant to water. In some circumstances, however, conservation of water will reduce the cost of wastewater treatment.

AVERAGE-DAY SAVINGS

Some policies provide conservation incentives regardless of the time of year. These policies are best suited to reducing a utility's average-day water savings. These policies generally have greater impacts on wastewater flows than the criteria that include a focus on peaking. This criterion measures the reduction in average-day demands.

PEAK-SEASON SAVINGS

A commonly used criterion is the reduction in peak usage because reducing peak demands often results in a reduction in long-term capital costs. One factor driving the sizing of certain parts of a water system is peak-season demands. Policies that affect the amount of outdoor water use can impact peak-season savings.

PEAK-DAY SAVINGS

Like peak-season savings, reduction in peak-day demands can also result in reductions of long-term capital costs.

SUSTAINABILITY

The proposed alternative should promote the sustainability of the region's resources. Again, this may relate to promoting efficiency by the selected alternative, or in by the extent which growth is required to pay for itself.

3.3.2.5. Financial

REVENUE SUFFICIENCY

The proposed alternative needs to provide sufficient revenues to meet AWU's capital-related revenue requirements (i.e., fund the capital projects needs of AWU.) All alternatives proposed in this study will generate sufficient revenues for the utilities in the long run. However, the amount of system development fees generated as a source of revenues will vary between alternatives. Some alternatives may require additional revenues from rates to meet AWU's capital plan. Also this criterion measures the impact of assumptions on AWU's service expansion policies.

REVENUE STABILITY

The proposed alternative should minimize fluctuations in revenues due to changes in growth or other factors outside the control of AWU. This criterion measures the degree of volatility in resulting revenues from a propose alternative.

RATE STABILITY

Rate stability measures the volatility in the rates from year to year. Customers have a difficult time adjusting their budgets when rates are unstable. Steady rate increases over time are generally favored when compared to large, one-time adjustments.

RATE PREDICTABILITY

The proposed alternative should minimize the unpredictability in the total bill and fee. A customer will have a hard time predicting his/her bill and fees in the future if changes in use cause significant changes in the total bill. In contrast to the revenue sufficiency criterion, where the criterion is evaluated from the point of view of the utility, this criterion is evaluated from a customer's perspective.

FINANCIAL RISK

Notably for growth-related improvements, AWU takes on financial risk when anticipating growth and the expectation that new customers will connect to its systems, thereby helping to fund the improvements. The proposed alternative should minimize the risk AWU incurs when adding new infrastructure to its systems.

3.4. Issue Papers

3.4.1. Overview

Prior to each PIC meeting, Red Oak prepared an "issue paper" or "white paper" to discuss the topic that would be presented. The purpose of the issue papers was to provide the PIC members with information on the topics so they would be prepared to discuss the issues at the PIC meetings. This enabled a more focused discussion on the issues and ensured that the PIC members were knowledgeable about the issues and alternatives.

The Issue Papers were organized by theme and contained a series of policy questions and options. For each policy question, Red Oak provided a detailed evaluation using the weighted evaluation criteria discussed in Section 3.3 on Page 3-2.

The final copy of each Issue Paper is provided in Volume II of this report. Each issue is discussed below.

3.4.2. Revenue Requirements

3.4.2.1. Issue 1: Which Method of Determining Revenue Requirements Is Most Appropriate?

DESCRIPTION

The first revenue requirement policy issue to resolve was which industry standard approach to determining revenue requirements would be best for AWU and its customers. The alternative selected determines the method of setting the total revenue recovered from the cost-of-service analyses.

The three available alternative methodologies are:

1. Cash basis,
2. Utility basis, and
3. Utility basis with cash residual.

The primary difference among the alternatives is the concept of ownership and the method of consumer protection. Under the cash basis, consumer protection is provided by the budgeting oversight of the elected officials. These officials act both as a representative of the customers and the utility. Most often, the elected officials are elected by the citizens that act as the owners of the utility. Under this approach, ownership and consumer protection are combined into one elected body.

Under the utility basis, the consumer protection is often provided by public utility commissions or public service commissions. These regulatory bodies establish rates of return that provide consumer protection.

In situations where municipally owned utilities provide services to customers outside their corporate jurisdictions, consumer protection is often provided by explicit contractual agreements that specify the conditions under which utility rates are determined. This is

the situation most commonly found when the *Utility Basis with Cash Residual* method is used.

RECOMMENDATIONS

Red Oak recommended AWU use the cash basis for determining revenue requirements. This method is consistent with current practices and requires data that are readily available and dependable.

EXECUTIVE TEAM DECISION

The Executive Team decided to continue using the cash basis for determining revenue requirements.

3.4.2.2. Issue 2: How Should Future O&M Expenses Be Projected?

DESCRIPTION

All three methods of determining revenue requirements include an amount to recover O&M expenses. The method of projecting the O&M expenses influences the total revenue requirements.

Two alternatives are generally considered in projecting O&M expenses. These are:

- Historical test year with adjustments for known and measurable changes, and
- Future budgeted O&M expenses.

Under the first alternative, the allowance for O&M expenses is determined by using actual expenditures during a recent 12-month period for which detailed expenditure records are available. Because of the intricacies of municipal budgeting requirements, the 12-month period is generally the most recently completed fiscal year. The expenditures during the historical test year are then adjusted for what are called *known and measurable changes.* These adjustments to historical costs typically include allowances for changes in labor agreements, changes in utility rates, etc.

The alternative approach is to project future O&M expenses based on the utility's adopted annual budget. This approach depends on the municipal budgeting process to evaluate the reasonableness of projections of future O&M expenditures.

The compatibility of the methods used to project future O&M expenses may vary depending on the overall approach used to determine revenue requirements (i.e., cash basis, utility basis, and utility basis with cash residual.) One potential criticism of using the budget to project future O&M expenses is that municipal utilities generally cannot exceed their budget authorization. This restriction would indicate that budgeted O&M would exceed actual O&M. When the utility is on the cash basis, however, unspent O&M expenses result in additional ending fund cash balances which are available to offset future O&M expenses or capital expenditures.

RECOMMENDATIONS

Red Oak recommended that the utility use the future budget to project O&M expenses. The future budget approach is more consistent with the municipal nature of AWU's operations than the historical test year.

EXECUTIVE TEAM DECISION

The Executive Team decided to continue using the future budget to project O&M expenses.

3.4.2.3. Issue 3: How Should the Rate of Return Be Determined?

DESCRIPTION

When using either the utility basis or utility basis with cash residual method of determining revenue requirements, the utility must determine its rate of return. This process can be extremely controversial since the impact on non-owner customers and the utility can be significant.

Regulated utilities generally are required to determine the rate of return based on their weighted average cost of capital. This approach is designed to meet the unique needs of regulated utilities that are subject to economic regulation.[2] If economic or market conditions change, the rates charged by the utility may need adjustment to maintain an equitable value of the company's shares.

Three alternatives are evaluated for determining the revenue requirements. These are:

- Weighted average cost of capital,
- Indexed return, and
- Fixed return.

The weighted average cost of capital is the typical approach used by regulated utilities. Under the weighted average cost of capital, the rate of return has two components. The first component is an allowance for debt. The return allowed for the allowance for debt is based on the effective interest rate on debt.[3] The second component is the return ascribed to equity. This return is calculated using sophisticated financial models that evaluate the relative risks associated with investing in an enterprise with comparable risks. The two

[2] Economic regulation is the approach used to ensure that investor-owned utilities earn a fair return but do not exploit their position as a natural monopolist. The standards for a fair rate of return commonly include the requirement that the utility earn profits at a rate comparable to other investors with similar risks and that the utility will attract sufficient capital to maintain its economic viability and value. These standards are less important to municipal utilities since municipal utilities do not have a requirement to maintain the price of their traded shares. Changing market and economic conditions can adversely affect consumers and/or shareholders and are generally reviewed when a regulated utility presents its rates for adjustment to its economic regulator.

[3] The effective interest rate on debt normally includes adjustments for the amortization of issuance costs and other similar expenses.

components are weighted based on the percentage of the value of the utility provided by debt versus equity.

The indexed return is a simpler method commonly used by municipal utilities that do not have easily evaluated costs for equity. Under this simple approach, the utility adopts an index with an allowance for equity. For example, the utility may tie its rate of return to the return on a municipal bond index with an allowance of 200 basis points[4] to account for additional risk associated with equity. If the bond index had an effective return of 4.5 percent, the rate of return would be set at 6.5 percent (i.e., 4.5 percent plus 2.0 percent equals 6.5 percent.) If the return for the bond index dropped to 4.0 percent, the rate of return used by the utility would be reduced to 6.0 percent. Similarly, if the return for the bond index rose to 5.0 percent, the rate of return used by the utility would increase to 7 percent.

The last alternative is a fixed rate of return. A fixed rate of return is generally used when a utility provides service on a wholesale basis to another utility. Under a fixed rate of return, the utility sets its return when it establishes its agreement with its wholesale customer. This return is fixed for the term of the agreement.

RECOMMENDATIONS

This issue is relevant only if the utility basis or utility basis with cash residual is chosen. If AWU uses the cash basis, as recommended by Red Oak, this issue is moot and there is no need to determine a rate of return. However if the utility uses a revenue requirement method that includes a rate of return, Red Oak recommended establishing a fixed rate of return. A fixed rate of return minimizes the volatility in revenue requirements and reduces the overall uncertainty for both owner and non-owner customers.

EXECUTIVE TEAM DECISION

The Executive Team chose to use the cash basis for determining revenue requirements. Therefore, this issue is moot.

3.4.2.4. Issue 4: How Should the Rate Base Be Valued?

DESCRIPTION

When using the utility basis or utility basis with cash residual, the utility must establish an approach to valuing the assets that serve its customers. During periods of high inflation, some utilities adopted an approach to value their fixed assets at reproduction costs rather than original costs. Under both alternatives, the value of the accumulated depreciation (at reproduction cost or original cost, as appropriate) is subtracted to provide the rate base.

These utilities restate their rate bases at reproduction costs to account for the impact that inflation has on the cost of replacing infrastructure. Generally as inflation rates declined

[4] A *basis point* is one one-hundredth of a percentage point. Therefore, 100 basis points equal 1 percent point.

during the 1980s, the interest in using reproduction costs for rate base also declined. Recent increases in the price for construction materials may prompt interest in this issue.

When the reproduction cost approach is used, the rate of return is generally reduced to exclude an inflationary component. This ensures the utility does not over collect as the cost of its rate base is restated due to inflation.

Two alternatives are examined here. The first is the traditional original cost approach. Under the original cost approach, the rate base is set at the net book value of the assets that are used and useful in providing utility services. The net book value is determined by subtracting the accumulated depreciation from the original cost.[5]

The second approach is to use the reproduction costs to determine the value of rate base. Under this approach, the reproduction costs would be net of accumulated depreciation (calculated at reproduction costs.) Also, the rate of return would be reduced to exclude an allowance for inflation. In other words, the rate of return would be a *real rate of return.*

RECOMMENDATIONS

If a determination of rate base is required, Red Oak recommended the use of original cost to determine rate base. However, this issue is moot if the cash basis is used to determine revenue requirements.

EXECUTIVE TEAM DECISION

The Executive Team chose to use the cash basis for determining revenue requirements. Therefore, this issue is moot.

3.4.2.5. Issue 5: How Should Construction Work In Progress Be Treated?

DESCRIPTION

Construction work in progress (CWIP) is the value of expenditures the utility has made in construction projects that have not been completed, and therefore, are not included as a fixed asset on the utility's books. Regardless of the status of booking the assets, the utility has carrying costs for these expenditures and the treatment of those carrying costs is the issue examined here.

Generally the carrying cost for CWIP is the interest expense (or interest earnings forgone) by having spent money on the project under construction. The longer the construction period is the greater the carrying costs will be, and the more important this issue will be.

This issue is only important if the utility uses either the utility basis or the utility basis with cash residual method of determining revenue requirements.

[5] Other adjustments for contributed capital and construction work in progress are also included.

Two alternatives are available for treating CWIP in the utility's rate base. The first option is to capitalize the interest during construction and include the capitalized interest in the asset value. Under this approach, the utility recovers the carrying cost of the CWIP over the life of the asset and earns a return on the outstanding investment in the carrying costs.

The second approach is to include CWIP in the rate base and allow the utility to earn a rate of return on CWIP during the construction itself.

The difference between the two approaches is primarily one of timing of receipt of the carrying costs and the impact that timing has on inter-generational equity. Generally, capitalizing the carrying costs spreads the carrying costs to those future users that benefit from the asset but delays the recovery of the investment by the utility.

RECOMMENDATIONS

Red Oak recommended using the capitalized interest approach to treat CWIP in the rate base. This approach follows industry standards, provides greater inter-generational equity, and is consistent with most utility's fixed asset accounting policies. However, if the cash basis is used to determine revenue requirements, this issue is moot.

EXECUTIVE TEAM DECISION

The Executive Team chose to use the cash basis for determining revenue requirements. Therefore, this issue is moot.

3.4.3. Water Cost Allocations and Fire Charges

3.4.3.1. Issue 1: Which Is the Most Appropriate Overall Method for Allocating Costs?

DESCRIPTION

The first cost-allocation policy to resolve is which overall cost allocation method is best for AWU and its customers. The alternative selected will determine the method of allocating costs to each of the customer classes.

The two available alternative methods are:

1. Commodity/demand, and
2. Base/extra-capacity (current approach).

These methods are fully described in the Water Cost Allocations and Fire Charges issue paper provided in Volume II of this report.

Figure 3-3 presents a hypothetical cross section of a water system asset that is sized to meet multiple demands of the water system. This figure illustrates the cost allocation differences between the base/extra-capacity method and the commodity/demand method.

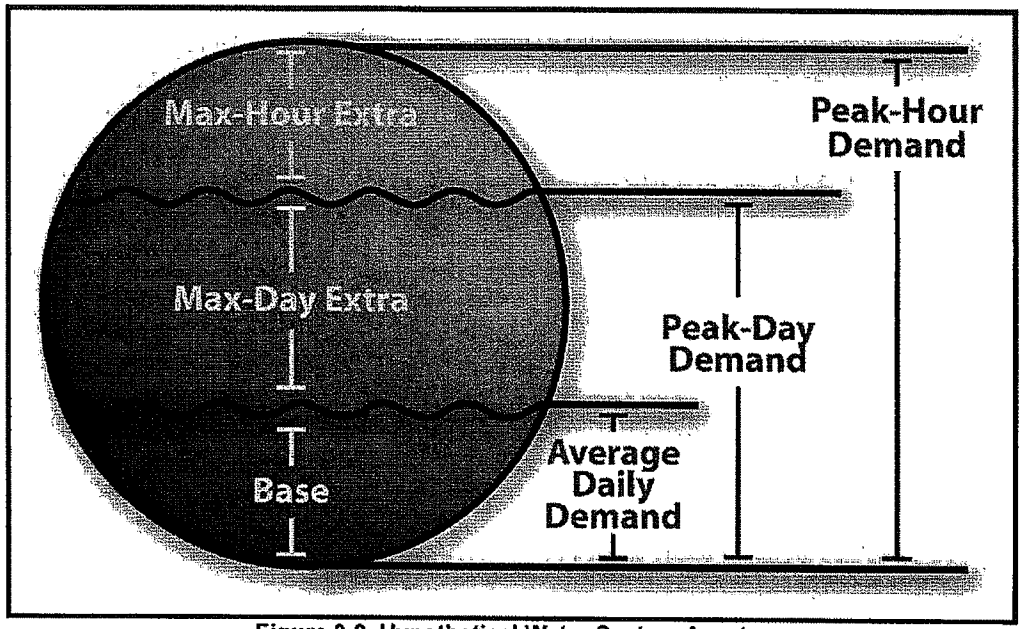

Figure 3-3 Hypothetical Water System Asset

The primary difference between the alternatives is the treatment of peak-related costs. The commodity/demand method more strictly follows the peak-load pricing model. The base/extra-capacity method is a deviation from the strict peak-load pricing model that accounts for the benefits that customers with lower peaking factors experience by the investment in capital-intensive facilities that lower the utility's overall costs for off-peak users.[6] Because the utility must select its production technologies from those that are effective and available but differ in their intensity of use of capital and O&M, the optimal technology may not be the technology chosen if it were merely used to meet peak-period demands. For instance, when planning future capacity with multiple technologies, a water utility will often select a technology based on its total costs (i.e., O&M and capital costs)[7] compared to the total costs of other technologies, given the utility's forecast of water demands.

For example, a water utility may have two options in meeting the demands of its customers. One option may be a conventional filtration facility using surface water with

[6] As the literature on peak-load pricing has matured, some authors suggest that, under certain conditions, non-peaking customers should pay a portion of the capacity-related costs of peak-related facilities. For example, if the production function for a utility allows for the substitution of O&M expenses for capital (i.e., a neoclassical production function), the peak-load pricing allocation approach may charge a portion of the capacity costs to non-peaking customers. See Elizabeth E. Bailey and Erick B. Lindenberg, "Peak Load Pricing Principles: Past and Present," in *New Dimensions in Public Utility Pricing*, ed. Harry M. Trebing (East Lansing, Michigan: Institute of Public Utilities, Graduate School of Business Administration, Michigan State University, 1976, 10. See also John C. Panzar, "A Neoclassical Approach to Peak Load Pricing", *The Bell Journal of Economics*, 7(2) (Autumn 1976): 521-30.

[7] These *total costs* are often called present worth estimates, which take into account the time-value of money.

a relatively low per unit variable cost but a relatively high fixed cost. The alternative option may be a smaller treatment facility augmented with supplies from a ground water system. In this case, assume the cost of pumping and the limitations on supplies makes the groundwater system have higher operating costs than the larger filtration facility option. It may be cheaper for those customers with higher peaks for the utility to use the ground water to meet their peak capacity so that the smaller filtration facility would be a non-peaking facility. This would reduce the cost attributed to the peak users under the strict peak-load pricing model. However, this outcome may be less efficient if the marginal cost of the larger filtration facility is lower than that of the groundwater system. In that instance, the alternative with the lowest overall costs may be the option with the larger filtration facility (which is sized larger to meet the peak-day demands.)

This finding is often the case for water utilities. As such, the larger filtration facility (which tends to be more capital intensive with lower marginal unit costs for operations) provides value to both those customers who peak on the facility and those that do not.[8] The base/extra-capacity method deviates from the strict peak-load pricing model to account for this possibility.

RECOMMENDATIONS

Red Oak recommends AWU use the base/extra-capacity method for allocating costs. This method is consistent with current practices and future uncertainties.

EXECUTIVE TEAM DECISION

The Executive Team decided to use the base/extra-capacity method for allocating water costs.

3.4.3.2. Issue 2: What Are the Appropriate Time Steps for the Cost Allocation Method?

DESCRIPTION

Regardless of cost allocation approach selected, the cost-of-service analyses will require the selection of time steps for the cost allocations. The time steps are used to determine which peak demands are included in the cost allocations.

Many alternative time steps exist in theory. But only two alternatives are relevant to AWU. These are:

1. Peak-day and peak-hour demands (current approach), and
2. Peak-season, peak-day, and peak-hour demands.

The selection of appropriate time steps for a cost-of-service analysis depends on the design and operation of the water system.

[8] Almost all customers have a peak demand that exceeds their average demand. However, the relative portions of the peak-related costs attributable to customer classes vary. For example, some large customers may have a peak-day demand that is 125 percent of their average-day demand, while other customers my have a peak-day demand that is more than 250 percent of their average-day demand.

RECOMMENDATIONS

Red Oak recommended that AWU use peak-day and peak-hour time steps for the cost-of-service analysis. These time-steps are consistent with AWU operations and facilities. Introducing an additional time step may diminish the accuracy of the cost allocations.

EXECUTIVE TEAM DECISION

The Executive Team decided to use peak-day and peak-hour time steps for the cost-of-service analysis.

3.4.3.3. Issue 3: Should AWU Charge Private Fire Connections for Both the Direct and Indirect Fire Costs?

DESCRIPTION

AWU incurs costs to provide fire protection to its customers. These costs are incurred both as direct and indirect fire costs. Water utilities throughout the industry have differing approaches to charging for private fire connections. Some utilities determine the charges for private fire connections to recover only the direct costs (e.g., billing, cross-connection controls, meter reading, billing, etc.) of the service. Other utilities include some of the indirect fire costs (e.g., the cost of over-sizing facilities, etc.) in the charge.

AWU does not charge separately for private fire connections. Two approaches to private fire lines are generally available in the industry. These are:

1. Charge private fire connections for the direct costs of providing the service (current approach); and

2. Charge private fire connections both the direct and indirect costs of providing the service.

The primary difference in the approaches is philosophical. Under the first alternative, private fire connections do not place an additional burden on the indirect fire costs of the system merely because they have a private fire connection. In fact, everything else being equal, private fire connections generally reduce the fire flow requirements of a facility and reduce the burden on the indirect fire costs of the utility.

Alternatively, private fire connections provide a service to private properties that benefit directly through lower insurance premiums and/or the ability to meet certain fire codes in a cost-effective manner. Additionally, many of those properties with private fire connections have those connections because of the disproportionate burden they place on the firefighting capabilities of the City. Including both the direct and indirect fire costs in the private fire connection charges for these customers may enhance the overall fairness of the charges.

RECOMMENDATIONS

Red Oak recommended AWU not charge private fire connections separately.

EXECUTIVE TEAM DECISION

The Executive Team decided to continue with the current methodology of not charging private fire connections separately.

3.4.3.4. Issue 4: How Should AWU Recover Its Public Fire Cost in Its Cost-of-Service Methodology?

DESCRIPTION

AWU has made significant investments in its infrastructure to provide fire protection services to its customers. These investments include over-sizing transmission and distribution mains, pumping facilities, and finished water reservoirs. A specific charge to customers for fire protection could more equitably recover these costs.

Additionally, as AWU pursues rate designs that provide greater water conservation, its revenue may become less stable. Designing a charge structure that provides more fixed revenue from fire protection charges may allow AWU to be more aggressive with its conservation efforts while maintaining the necessary financial health of the utility.

Red Oak identified four options that AWU can use to recover some or all of its fire-related costs. These options include:

1. Recover indirectly through the cost of water services (current approach);
2. Assess a fixed charge based on the value of the real property improvements;
3. Assess a fixed charge that varies by fire customer class; and
4. Assess a fixed charge based on the size of the water meter.

The first alternative is the most commonly used method of recovering fire charges. Under this alternative, fire-related costs are treated like overhead costs and embedded in the overall costs of water.

The second alternative establishes a charge based on the value of the real property improvements (excluding land.) The rationale for a charge based on real property improvements is that properties which are more valuable require greater fire protection. This alternative is very similar to an *ad valorem* property tax and may be considered a tax rather than a fee in some jurisdictions. Such a determination may affect the legality of the fee for AWU.

The third and fourth alternatives are designed to avoid the tax versus fee controversy. Under these alternatives, AWU's fire-related costs are recovered in a fixed monthly charge. Under alternative 3, the fixed monthly charge is based on a classification of each customer's fire flow requirements. The fourth alternative recovers the fire-related costs as a portion of AWU's fixed charge based on the size of the customer's water meter.