



Point Roberts Water District No. 4

2010 Commercial Water Rate Review

Technical Memorandum – June 8, 2010

Introduction & Background

FCS Group conducted a study for the District in 2009 to update the District's water rates and general facilities charges (GFCs). **Exhibit 1** summarizes the recommended rate strategy derived from that effort:

Exhibit 1: 2009 Recommended Water Rate Strategy

Single-Family Residential & Multi-Family (2 - 4 Units)	Existing	Proposed	For Planning Purposes Only		
	Jan 2009 - Aug 2009	Sep 2009 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter:					
5/8" & 3/4"	\$ 53.01	\$ 59.90	\$ 63.65	\$ 68.74	\$ 74.24
1"	\$ 72.38	\$ 80.36	\$ 85.44	\$ 92.27	\$ 99.66
1-1/2"	\$ 91.74	\$ 100.82	\$ 107.23	\$ 115.81	\$ 125.08
2"	\$ 102.88	\$ 112.59	\$ 119.76	\$ 129.34	\$ 139.69
Volume Charge per ccf (By Bimonthly Volume Threshold):					
Block One (0 - 5 ccf) (Allowance Included In Fixed Charge)	\$ -	\$ -	\$ -	\$ -	\$ -
Block Two (6 - 14 ccf)	\$ 1.48	\$ 1.67	\$ 1.78	\$ 1.92	\$ 2.07
Block Three (15 - 40 ccf)	\$ 1.99	\$ 2.25	\$ 2.39	\$ 2.58	\$ 2.79
Block Four (> 40 ccf)	\$ 3.54	\$ 4.00	\$ 4.25	\$ 4.59	\$ 4.96

Commercial & Multi-Family (> 4 Units)	Existing	Proposed	For Planning Purposes Only		
	Jan 2009 - Aug 2009	Sep 2009 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter:					
5/8" & 3/4"	\$ 124.27	\$ 152.17	\$ 175.57	\$ 189.62	\$ 204.79
1"	\$ 172.13	\$ 209.79	\$ 242.13	\$ 261.50	\$ 282.42
1-1/2"	\$ 220.00	\$ 267.41	\$ 308.70	\$ 333.39	\$ 360.06
2"	\$ 247.52	\$ 300.54	\$ 346.97	\$ 374.73	\$ 404.71
3"	\$ 471.28	\$ 569.92	\$ 658.15	\$ 710.80	\$ 767.67
Volume Charge per ccf	\$ 2.95	\$ 3.61	\$ 4.17	\$ 4.50	\$ 4.86

Golf Course	Existing	Proposed	For Planning Purposes Only		
	Jan 2009 - Aug 2009	Sep 2009 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter (4" Meter)	\$ 513.54	\$ 683.63	\$ 808.34	\$ 873.01	\$ 942.85
Volume Charge per ccf	\$ 2.95	\$ 3.93	\$ 4.64	\$ 5.01	\$ 5.42

The 2009 study intended to develop water rates that would generate a sufficient amount of revenue to meet the District's financial needs (given the assumptions discussed in the 2009 Rate Study Report). Another key objective of the 2009 study was to verify that the District's water rates recovered costs equitably from the District's customers.

Exhibit 1 shows a fixed bimonthly charge structure that has significantly higher charges for commercial customers than residential customers. A key reason for this distinction is the difference in usage patterns summarized in **Exhibit 2**:

Exhibit 2: Single-Family Residential vs. Commercial Water Usage Patterns (Based on 2008 Data)

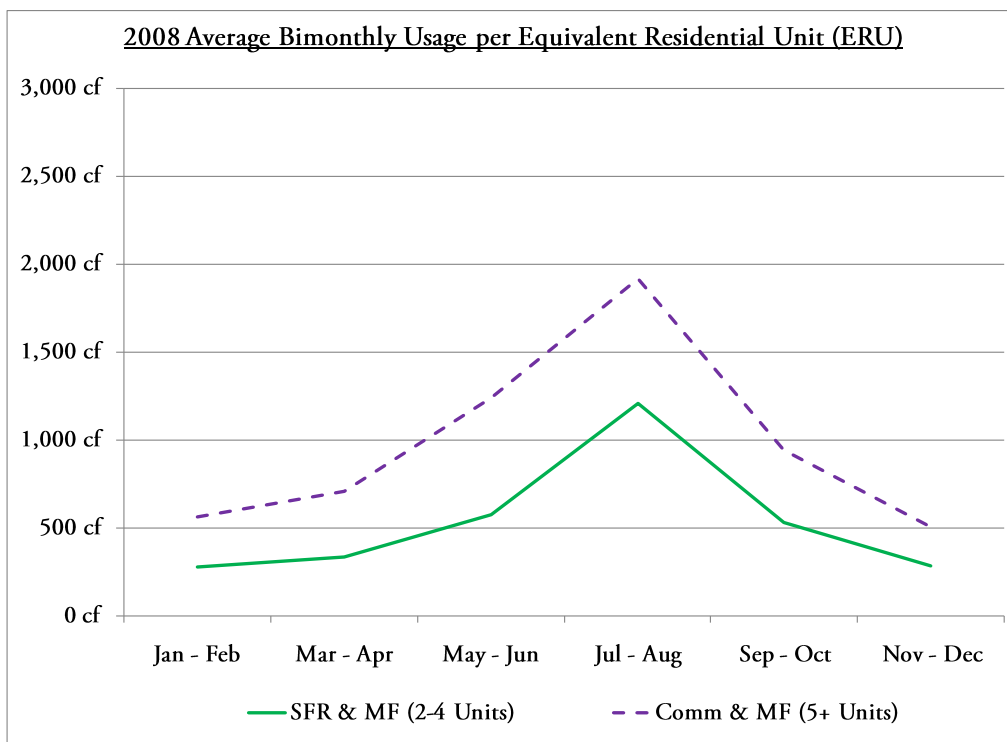


Exhibit 2 shows that on average, a commercial customer uses roughly twice the water that a residential customer with the same-sized water meter uses. Because a significant part of the District's customer base is seasonal, the District's water rate structure appropriately generates the majority of its revenue (about 80%) through fixed charges. Consequently, the discrepancy in usage shown in **Exhibit 2** is the primary factor leading to the observed gap between the current residential and commercial fixed charges.

The commercial class is much more heterogeneous than the residential class – while residences generally have similar water usage patterns, commercial water usage patterns can vary significantly depending on the type of business. While **Exhibit 2** shows that commercial water usage significantly exceeds residential water usage for any given water meter size in aggregate, there are likely businesses that use a similar (or even lower) amount of water than comparable residential customers. The District initiated this analysis in response to concerns that these “low-use” commercial customers are paying for a greater share of costs than they should, given the demands that they actually place upon the District's water system.

Adjustments to the 2009 Analysis

The District provided actual 2009 commercial water usage data for this further analysis. This data triggered the need for an update of the 2009 analysis for the following reasons:

- District staff found that roughly 20 commercial accounts had historically been included in the single-family residential class for billing purposes. These accounts (and their water usage) are moved from the single-family residential class to the commercial class for the purpose of allocating costs and designing rates.
- 2007 and 2008 demand records included several accounts in the commercial class using more than 1,000 ccf in a calendar year; the District found that much of this usage was actually water loss due to aged infrastructure. The infrastructure in question has since been replaced, reducing the usage of these accounts by about 99%. This change reduces the projected commercial water demand for the class by roughly 37% (and total demand by about 5%). It also changes the previously observed relationship between residential and commercial water demand – while the current rate structure is based on data suggesting that commercial customers use roughly twice the water that a residential customer with the same meter size does, the corrected data suggests that commercial customers only use about 30% more water than an average home.

With these changes, the share of costs that can be equitably allocated to the commercial class decreases. There is also an issue of revenue sufficiency, as the corrected commercial demand projections are expected to generate about \$19,000 less in 2010 than the original projections used to develop the current rates. For these reasons, we have updated the 2010 rate structure shown in **Exhibit 1**.

Exhibit 3 shows the updated allocation of the 2010 revenue requirement, providing the original allocation derived during the 2009 study for comparative purposes:

Exhibit 3: 2009 Recommended Water Rate Strategy (Revised)

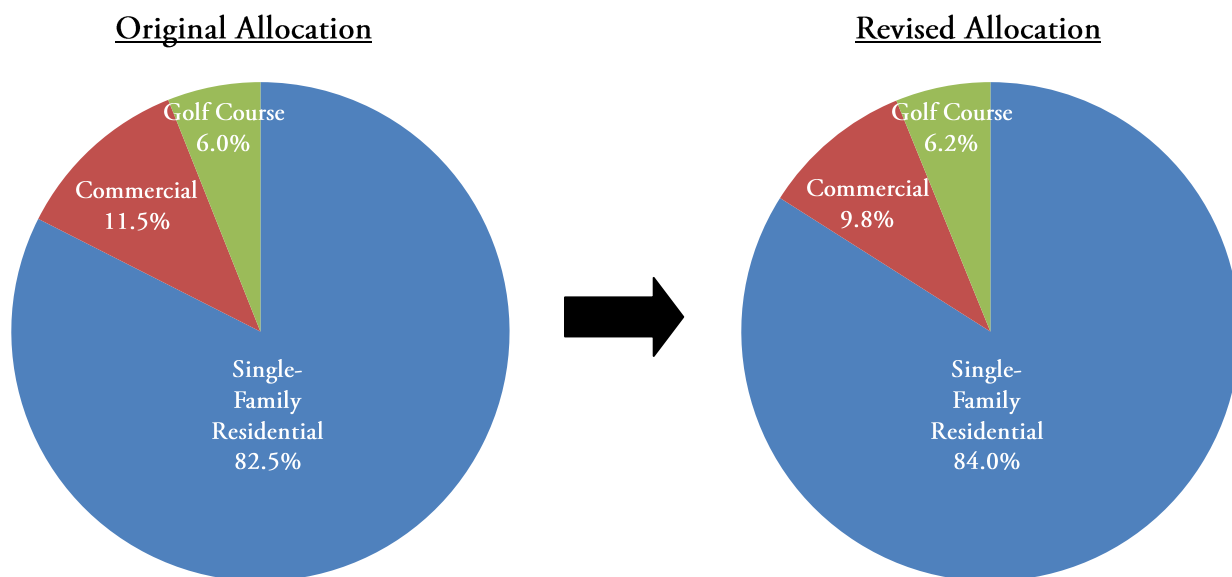


Exhibit 3 shows that the commercial class' share of the 2010 revenue requirement decreased from 11.5% to 9.8% based on the adjustments to the customer statistics discussed above. It is worth noting that both the original and revised allocations shown in **Exhibit 3** assume some phasing to reach full cost-based rates by 2011 – were the 2010 rates fully based on each class' cost of service, the impacts of these changes would be more significant.

Exhibit 4 provides an adjusted version of the rate strategy presented in **Exhibit 1** that reflects the updated cost allocations shown in **Exhibit 3**.

Exhibit 4: Revised Water Rate Strategy

Single-Family Residential & Multi-Family (2 - 4 Units)	Existing	Proposed	For Planning Purposes Only		
	Sep 2009 - Feb 2010	Mar 2010 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter:					
5/8" & 3/4"	\$ 59.90	\$ 61.26	\$ 65.90	\$ 71.17	\$ 76.86
1"	\$ 80.36	\$ 82.13	\$ 88.63	\$ 95.72	\$ 103.38
1-1/2"	\$ 100.82	\$ 103.01	\$ 111.36	\$ 120.27	\$ 129.89
2"	\$ 112.59	\$ 115.01	\$ 124.43	\$ 134.39	\$ 145.14
Volume Charge per ccf (By Bimonthly Volume Threshold):					
Block One (0 - 5 ccf) (Allowance Included In Fixed Charge)	\$ -	\$ -	\$ -	\$ -	\$ -
Block Two (6 - 14 ccf)	\$ 1.67	\$ 1.67	\$ 1.86	\$ 2.01	\$ 2.17
Block Three (15 - 40 ccf)	\$ 2.25	\$ 2.25	\$ 2.50	\$ 2.70	\$ 2.92
Block Four (> 40 ccf)	\$ 4.00	\$ 4.00	\$ 4.45	\$ 4.81	\$ 5.19

Commercial & Multi-Family (> 4 Units)	Existing	Proposed	For Planning Purposes Only		
	Sep 2009 - Feb 2010	Mar 2010 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter:					
5/8" & 3/4"	\$ 152.17	\$ 120.34	\$ 120.34	\$ 129.97	\$ 140.36
1"	\$ 209.79	\$ 164.85	\$ 164.85	\$ 178.03	\$ 192.28
1-1/2"	\$ 267.41	\$ 209.36	\$ 209.36	\$ 226.10	\$ 244.19
2"	\$ 300.54	\$ 234.95	\$ 234.95	\$ 253.74	\$ 274.04
3"	\$ 569.92	\$ 443.02	\$ 443.02	\$ 478.47	\$ 516.74
Volume Charge per ccf	\$ 3.61	\$ 3.61	\$ 3.61	\$ 3.90	\$ 4.21

Golf Course	Existing	Proposed	For Planning Purposes Only		
	Sep 2009 - Feb 2010	Mar 2010 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter (4" Meter)	\$ 683.63	\$ 829.15	\$ 1,233.05	\$ 1,331.69	\$ 1,438.22
Volume Charge per ccf	\$ 3.93	\$ 3.93	\$ 4.64	\$ 5.01	\$ 5.41

Exhibit 4 retains the current volume charges for the remainder of 2010, adjusting the fixed charges to reflect the revised cost allocations. The rates above are consistent with the estimated revenue requirement for March – December 2010, which is based on the total 2010 revenue requirement net of estimated January – February billings. Consistent with the current rate structure shown in **Exhibit 1**, the 2010 rates shown reflect a partial shift to cost-of-

service rates; the rates shown for 2011 – 2013 are fully cost-based. We have proposed setting the commercial rates based on the “full” cost-of-service rate structure derived for 2011 – though this does slightly over-collect from commercial customers relative to their actual cost of service in 2010, it allows the District to phase in the increases to the golf course rates and stabilize the near-term commercial rate (otherwise, the District would lower the commercial rate for the rest of 2010 and then have to increase it in 2011).

With the rate structure shown in **Exhibit 4** as the revised “baseline,” the next step is to develop alternative rate structures for the commercial customers to recognize the differing demands that they place on the system.

Defining “Low” Commercial Users

Just what constitutes a “low-use” commercial customer? The first step in this review involves defining a “low-use” commercial customer, using standard residential usage patterns as a benchmark. The 2009 analysis estimated that an average residential customer (an “equivalent residential unit” or ERU) uses about 580 cubic feet (cf) per bimonthly billing period, or 3,480 cf during an entire year. Further analysis of District water consumption records revealed that over the past several years, the average bimonthly usage per residence has varied from 580 to 640 cubic feet. For simplicity, we recommend defining the standard bimonthly usage per ERU as 600 cubic feet (understanding that actual annual usage may vary from year-to-year). The District would not need to update this benchmark annually, but might want to review it periodically in case demand trends materially change over time.

For any specific customer, this threshold should scale up with the customer’s meter size to reflect the capacity that they purchased through their payment of the District’s general facilities charge (GFC). **Exhibit 5** shows the recommended “low-use” thresholds for commercial customers:

Exhibit 5: “Low-Use” Threshold by Water Meter Size

Water Meter Size	Number of ERUs	Bimonthly “Low-Use” Threshold
5/8” x 3/4”	1.00	600 cf
1”	2.50	1,500 cf
1-1/2”	5.00	3,000 cf
2”	8.00	4,800 cf
3”	16.00	9,600 cf
4”	25.00	15,000 cf

The scale of ERUs by meter size shown in **Exhibit 5** is based on meter flow equivalency factors published by the American Water Works Association (AWWA), and is the same scale used to calculate the District’s GFCs for meters larger than 5/8” x 3/4”.

We have developed two rate structure alternatives, each of which uses this structure of thresholds in a different way.

Commercial Rate Alternative #1: Two Commercial Classes

The District initially requested the development of an alternate commercial rate structure with two sub-classes: “low-use” commercial and “high-use” commercial. Each commercial customer is assigned to one of these two classes based on their annual water usage – a “low-use” commercial customer is defined as a customer using up to 3,600 cf of water per year per ERU (the residential average bimonthly usage of 600 cf per ERU, for each of the 6 bimonthly billing periods). **Exhibit 6** illustrates the water usage patterns of these two commercial customer groups, given this definition of “low-use” versus “high-use” commercial customers:

Exhibit 6: Single-Family Residential vs. Commercial Water Usage Patterns

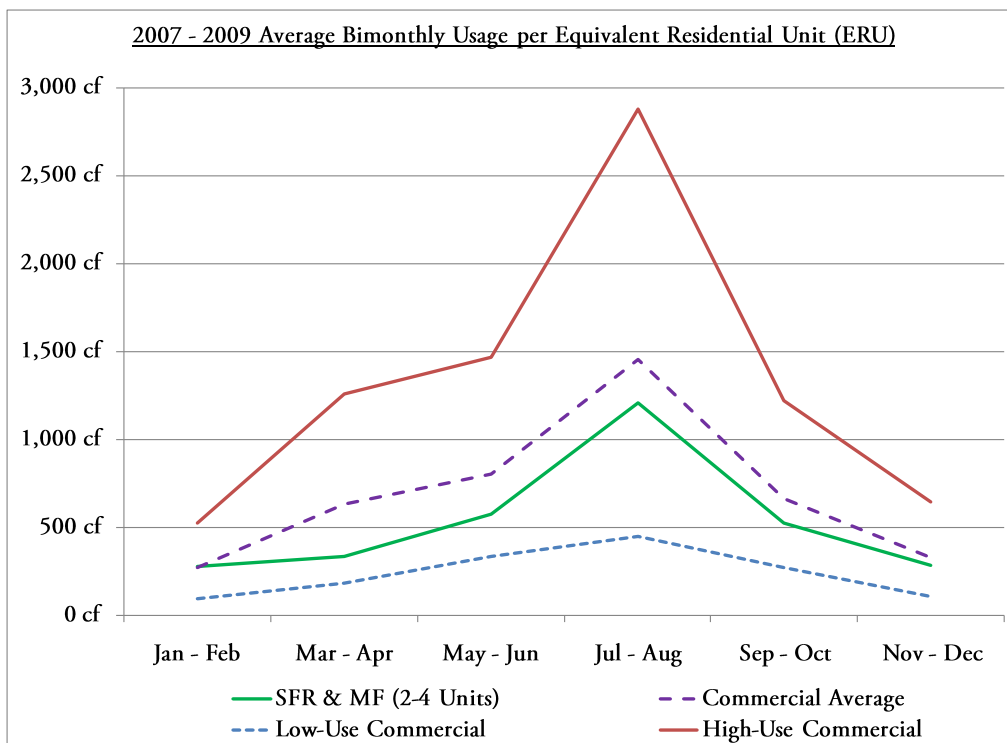


Exhibit 6, which is adjusted to exclude the high water loss from several commercial accounts during 2007 and 2008, shows a considerable divide between the average bimonthly usage of commercial customers in the “low-use” class and those in the “high-use” class. A review of the District’s 2007 – 2009 billing statistics suggests that 50 – 60% of the District’s commercial customers (roughly 35 accounts) would fall into the “low-use” category based on their annual usage.

Once the commercial class has been separated into these two sub-classes, the pool of costs allocated to the commercial class is split between them using the same metrics used in the initial cost allocation. A rate structure is then designed so that the two classes share the same volume charge and fixed charge per account, but have different fixed charges per meter equivalent based on their allocated share of costs. **Exhibit 7** shows the resulting commercial rate strategy:

Exhibit 7: Alternate Commercial Rate Strategy (Alternative #1: Two Commercial Classes)

Low-Use Commercial & Multi-Family (> 4 Units)	Existing	Proposed	For Planning Purposes Only		
	Sep 2009 - Feb 2010	Mar 2010 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter:					
5/8" & 3/4"	\$ 152.17	\$ 46.35	\$ 46.85	\$ 50.60	\$ 54.65
1"	\$ 209.79	\$ 61.09	\$ 62.05	\$ 67.02	\$ 72.38
1-1/2"	\$ 267.41	\$ 75.82	\$ 77.25	\$ 83.43	\$ 90.11
2"	\$ 300.54	\$ 84.30	\$ 85.99	\$ 92.87	\$ 100.30
3"	\$ 569.92	\$ 153.18	\$ 157.04	\$ 169.60	\$ 183.17
Volume Charge per ccf	\$ 3.61	\$ 3.61	\$ 3.61	\$ 3.90	\$ 4.21

High-Use Commercial & Multi-Family (> 4 Units)	Existing	Proposed	For Planning Purposes Only		
	Sep 2009 - Feb 2010	Mar 2010 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter:					
5/8" & 3/4"	\$ 152.17	\$ 182.80	\$ 187.87	\$ 202.90	\$ 219.14
1"	\$ 209.79	\$ 252.12	\$ 259.48	\$ 280.24	\$ 302.66
1-1/2"	\$ 267.41	\$ 321.43	\$ 331.08	\$ 357.57	\$ 386.18
2"	\$ 300.54	\$ 361.29	\$ 372.26	\$ 402.04	\$ 434.20
3"	\$ 569.92	\$ 685.34	\$ 707.01	\$ 763.58	\$ 824.66
Volume Charge per ccf	\$ 3.61	\$ 3.61	\$ 3.61	\$ 3.90	\$ 4.21

The rate structure shown in Exhibit 7 contemplates that the new 2010 rate structure would be in effect beginning with the April 2010 billing cycle, which includes charges for water used during March and April. The 2010 revenue requirement is adjusted to account for estimated revenues from the January – February billing cycle. Under this rate alternative, “low-use” commercial customers would see a significant drop in their bill; “high-use” customers would see a significant increase in their bill.

Commercial Rate Alternative #2: Two-Block Commercial Class

The “Alternative #1” rate structure would achieve (or at least come closer to achieving) the District’s goal of recovering costs equitably from its customers. However, it has some setbacks:

- The District would have to annually reconcile each commercial customer’s usage in order to determine which class they belong to for billing purposes. There is the potential for a commercial customer to switch between classes from year to year, creating increased potential for billing errors.
- There is potentially an equity issue for commercial customers that use only a small amount of water in excess of the residential average benchmark discussed above. Considering the rate structure in Exhibit 7, a customer with a 5/8” x 3/4” meter using 3,600 cf of water in a year would pay a fixed charge of \$46.35 per bimonthly billing period. A customer with the same-sized meter using 3,700 cf of water per year would pay a fixed charge of \$182.80, despite the fact that they do not place much incremental demand on the system.

The District could address this issue by creating more usage sub-classes, but that would increase the complexity of the rate structure – this issue remains true regardless of where the threshold might be set.

- Assuming that each commercial customer is assigned to a usage sub-class annually, there is the potential for a significant lag between when a customer changes their behavior and when they see the financial benefits or consequences of their behavior. The District could address this issue by re-evaluating the usage sub-class for each customer more frequently, but that would increase administrative complexity.

For these reasons, we have developed another rate alternative that uses a block volume charge structure (similar to the structure already in place for residential customers, but simpler) to accomplish the District’s objective of shifting cost recovery to customers that place greater demands on the District’s water system. It includes the following elements:

- Under this structure, all commercial customers would be subject to the same structure of fixed charges based on water meter size. These charges would be materially lower than those currently in place.
- Volume charges would be imposed on all commercial customers in the same way. One volume rate would apply to all usage within the residential benchmark (600 cf per ERU); a significantly higher rate would apply to usage above the residential benchmark. Note that this structure would apply the thresholds shown in **Exhibit 5** to each bimonthly billing cycle, rather than on an annual basis as contemplated in the “Alternative #1” rate structure.

Exhibit 8 summarizes the rate strategy under this alternative rate structure:

Exhibit 8: Alternate Commercial Rate Strategy (Alternative #2: Two-Block Commercial Class)

Commercial & Multi-Family (> 4 Units)	Existing	Proposed	For Planning Purposes Only		
	Sep 2009 - Feb 2010	Mar 2010 - Dec 2010	2011	2012	2013
Fixed Bimonthly Charge per Meter:					
5/8" & 3/4"	\$ 152.17	\$ 71.27	\$ 75.89	\$ 81.96	\$ 88.51
1"	\$ 209.79	\$ 95.97	\$ 102.70	\$ 110.91	\$ 119.78
1-1/2"	\$ 267.41	\$ 120.67	\$ 129.51	\$ 139.87	\$ 151.06
2"	\$ 300.54	\$ 134.88	\$ 144.92	\$ 156.52	\$ 169.04
3"	\$ 569.92	\$ 250.35	\$ 270.26	\$ 291.88	\$ 315.23
Volume Charge per ccf (By Bimonthly Volume Threshold):					
Block One (0 - 600 cf per ERU)	\$ 3.61	\$ 3.61	\$ 3.61	\$ 3.90	\$ 4.21
Block Two (> 600 cf per ERU)	\$ 3.61	\$ 7.00	\$ 7.37	\$ 7.96	\$ 8.60

The rate structure shown above in **Exhibit 8** is beneficial in that it does not require the District to keep track of which class a particular commercial customer falls into. It also results in more gradual changes to a customer’s bill based on their usage, and sends price signals more efficiently (customers see changes to their bills within a two-month billing cycle).

The main setback of this structure is the greater degree of volatility in the District’s revenue stream that results from the increased utilization of volume charges for cost recovery. Based on the customer statistics used to derive the rates shown in **Exhibit 4**, the “baseline” rate structure recovers about 33% of costs assigned to the commercial class through volume charges; the structure shown in **Exhibit 8** recovers about 62% of costs assigned to the commercial class. However, it is worth noting that since the District derives roughly 10% of its total rate revenue from commercial customers, the impact to the District’s total rate revenue stream is proportionately smaller (in aggregate, the structure in **Exhibit 8** would recover 2% more of the revenue requirement through volume charges than the “baseline” structure in would recover). It is also worth noting that the “Alternative #2” rate structure is more susceptible to revenue risk associated with additional demand “corrections” resulting from repairs to faulty infrastructure or material changes in the usage patterns for individual customers.

Exhibit 9 provides a summary of bill impacts for three sample commercial customers under these various rate alternatives, based on actual data provided by the District for 2009.

Exhibit 9: Sample Bill Impacts Under Revised 2010 Commercial Rate Alternatives

Sample Commercial Bills (5/8" × 3/4" Meter) - 2010 Rates	Customer #1 "Low-Use"	Customer #2 "Average-Use"	Customer #3 "High-Use"
Average Bimonthly Usage	230 cf	750 cf	1,410 cf
Sample Bimonthly Bills:			
<i>Current Rates (per Exhibit 1)</i>	\$ 160.48	\$ 179.26	\$ 203.10
Revised "Baseline" 2010 Rates (per Exhibit 4)	\$ 128.65	\$ 147.44	\$ 171.29
Rate Alternative #1: Two-Class Structure (per Exhibit 7)	\$ 54.66	\$ 209.90	\$ 233.74
Rate Alternative #2: Two-Block Structure (per Exhibit 8)	\$ 79.58	\$ 103.44	\$ 149.64

Exhibit 9 shows considerable impacts depending on the rate alternative chosen. An average commercial customer with a 5/8” × 3/4” meter would pay roughly 2 times under the “Alternative #1” (two-class) rate structure what they would pay under the “Alternative #2” (two-block) rate structure.

Recommendation

We recommend that the District consider implementing the “Alternative #2” rate structure for the following reasons:

- It is simpler in that it would allow the District to retain a single commercial class and would apply uniformly to all customers with the same-sized meter (note that customers with larger meters should have a larger amount of usage included in their defined “residential benchmark” usage threshold, as shown in **Exhibit 5**).
- It provides a more gradual increase in a customer’s bill as their water usage increases than the “Alternative #1” structure, shifting the greatest degree of cost recovery to the users imposing the greatest demands on the system. To the extent that water loss is responsible for the highest apparent users (as was discovered during this study for several customers), this structure will provide additional incentive for those customers to do

what they can to address leaks on their local properties. Reducing system water loss might allow the District to defer supply investments and keep rates down for all customers.

- The fixed charges in the “Alternative 2” rate structure are more consistent with those imposed for the District’s residential customers, better reflecting the relative usage patterns between the two classes (**Exhibit 9** suggests that an average commercial customer uses roughly 25% more water than a residence with the same meter size).

As shown in **Exhibit 4**, **Exhibit 7**, and **Exhibit 8**, this analysis assumes that the updated 2010 water rates would go into effect with the April billing. The District could delay this implementation, or instead choose to wait until 2011 to adopt the 2011 rates shown above rather than implementing a mid-year change now. The 2011 rates were derived to fully reflect the cost of providing service to each customer class – however, it may also be worth re-evaluating the District’s revenue needs later this year as more information becomes available.