

**WSSC FY 2019 Rate Structure
Technical Considerations
Addendum 9/13/17**

In preparation for the August 3, 2017, special Commission meeting to examine rate structure policy considerations, WSSC Staff submitted the attached memorandum that detailed legal and technical considerations. In this document, the Commission was advised that the Information Technology Department (IT) was working on reprogramming WSSC's current CSIS billing system to ensure that in the event the Commission adopted a tiered rate structure in which customers are billed incrementally through each tier, it could be implemented within the CSIS system effective July 1, 2018.

Since the time that the Technical and Legal Memorandum was submitted to the Commission in July, IT Staff has been working on creating the "rate patch" described in this memo in the CSIS system. During this process, IT personnel discovered that changing from billing customers at the highest consumption level to billing customers incrementally through each tier required a larger data field than is currently available in the CSIS system. Various methods to fix the data field problem, such as truncation of the consumption level within each tier or rounding of each consumption level, were thoroughly analyzed. However, these options resulted in either significant revenue losses or instances of customers being over or under billed. The bottom line is that incremental tiered billing is not technically feasible within the existing CSIS legacy billing system without significant negative consequences for WSSC and our customers. While it is possible to implement a uniform rate within CSIS, it is not possible to phase-in to a uniform rate, because phasing requires incremental tiers, with the same technical limitations of billing through the tiers described above.

Four of the five rate structure options that WSSC's consultants plan to present to the Commission involve incremental tiered billing. The CSIS data field constraint described above means that these tiered options cannot be implemented until July 1, 2019, when the Oracle C2M system is expected to be in place.

WSSC FY 2019 Rate Structure Technical and Legal Considerations

I. TECHNICAL CONSIDERATIONS

WSSC is currently in the process of upgrading its legacy billing system to the Oracle C2M system. The C2M billing system is widely utilized in the utility industry and can accommodate a variety of rate structure types. WSSC does not expect to transition to this system, however, until July 1, 2019.

The new rate structure effective July 1, 2018 must therefore be implemented within WSSC's current billing system. This system, known as the Customer Service Information System or "CSIS" was built in the late 1980's and runs on WSSC's IBM mainframe system. Put into production on May 29, 1990, CSIS was designed specifically for WSSC's tiered rate structure and is programmed largely in COBOL and ADSO. These programming languages are outdated, and it is therefore difficult to hire employees or contractors who possess the requisite knowledge and skillset to make necessary upgrades and changes. Due to these limitations, even minor changes to CSIS require a significant amount of time and effort to implement and test.

Notwithstanding these challenges, the WSSC Information Technology Department (IT) is currently working on upgrades to the CSIS system in advance of the new rate structure. Specifically, IT is working on reprogramming the tiered billing structure to ensure that in the event that WSSC adopts a tiered rate structure (either increasing or decreasing) that CSIS has the capability to bill customers incrementally through each tier. This is significant because with the current 16 tiered rate structure, WSSC bills customers for ALL usage at the rate that corresponds to the highest tier reached. This programming change to incremental tiered billing requires the development of complex logic, and months of testing is necessary to ensure that WSSC transmits accurate bills to its customers.

Due to the complexities inherent in making upgrades to CSIS, and the extensive testing that is required to ensure programming changes are accurate, there are limits to the types of rate structures that can be implemented within WSSC's CSIS system in a timely manner. For example, a rate structure that includes a seasonal component would be challenging to implement. At a minimum, a seasonal rate table would have to be added to CSIS to calculate special rates for summer versus winter months. This programming change would require scheduled system outages as well as additional developers to support coding and a lengthy testing period.

Once WSSC implements the Oracle C2M billing system, more complex options, such as seasonal rates, will be feasible.

II. LEGAL CONSIDERATIONS

As mandated by the statutory law that governs WSSC, the service rate set by WSSC must be “uniform” throughout the WSSC service area. *See* Maryland Annotated Code, Public Utilities Article (PUA), § 25-501(b). There are two limited exceptions to the uniformity requirement. One exception, as set forth in PUA §25-101(b), allows WSSC to set a different rate for all customers within a specific area or “subdistrict” if WSSC determines that the conditions for providing service to the “subdistrict” are “substantially different” from the conditions present generally throughout the WSSC service area. The second exception allows WSSC to set a higher rate for its industrial users if WSSC determines that conditions for service for industrial users are substantially different from the conditions for service generally within the WSSC service area. *See* PUA §25-101(c).

WSSC is restricted by the “uniformity” requirement from establishing a rate structure wherein different rates are charged to different classes of customers. Therefore, WSSC may not establish separate residential and commercial rates. In 2017, legislation was introduced in the Maryland General Assembly to modify the uniformity requirement to allow WSSC to establish classes of customers. While WSSC supported the legislation, it did not pass.

Even if the legislation in the 2018 session of the General Assembly is successful, the technical limitations of WSSC’s current CSIS billing system (as set forth in Section I above) would prohibit WSSC from moving forward on July 1, 2018 with a rate structure based on different classes of customers. The legislative timeline is such that WSSC would not know until April of 2018 whether the legislation passed, and the earliest effective date for the legislation would be June 1, 2018. This short window from passage of legislation to the adoption of a new rate structure is simply not enough time to implement and test the necessary programming changes. Moreover, the WSSC IT Department must focus on effectuating the programming changes for the rate structure that WSSC will recommend in December of 2017 based on the current uniformity requirement.

Summary of Customer Assistance Programs (CAP)

Utility	W, WW or Both	Population Served	Number of Participants*	CAP Type				
				Bill Discount	Flexible Terms	Lifeline Rate	Temporary Assistance	Water Efficiency
Charlotte Water, NC	Both	796,209	2,650		✓			
Richmond, VA	Both	197,000	N/A	✓				
Metro Water (Nashville, TN)	Both	599,595	N/A		✓			
St. Louis MSD, MO	WW	1,300,000	4,000	✓				
Cleveland Water, OH	W	1,262,955	N/A	✓				
NEORS (Cleveland, OH)	WW	993,251	17,000	✓			✓	
Dallas, TX	Both	1,253,000	N/A				✓	✓
BWSC, MA	Both	1,021,590	N/A	✓	✓			
Connecticut Regional Water	W	430,000	N/A				✓	

* - Information regarding the number of participants was not available for some utilities.

Charlotte Water

Website: <http://charlottenc.gov/water/pages/home.aspx>

Service Area: City of Charlotte and Mecklenburg County, NC

Any information on Customer Assistance online? (Y/N) N

Contact: 704-336-7600

Number Participating: 2,650

Population Served: 796,209

Program Name: Bill Forgiveness and Payment Plans

Households Targeted: Financial Hardship

Program Type: Flexible Terms

Program Description: Offers fee adjustments and payment plans when customers become delinquent

Eligibility: Must be a Charlotte resident with delinquent heating or water bills

Website: <http://www.richmondgov.com/publicutilities/EqualMonthlyPaymentPlan.aspx>

Service Area: City of Richmond, VA

Any information on Customer Assistance online? (Y/N) Y

Contact: Koscina Reynolds: 804-646-5610

Number Participating: water program is very new, so no data available

Population Served: 197,000

Program Name: MetroCare Water Assistance Program

Households Targeted: Low-Income

Program Type: Bill Discount

Program Description: Provides a discount on water and sewer fees and charges. Eligible customers receive credit for water and/or wastewater charges for the equivalent of up to 3 months of service.

Must occupy residence at the address provided on the utility bill.

Eligibility: Have not received assistance during the current program year (July – June).

Water utility balance has not been charged-off to collections.

Total gross household income is at or below 225% of the federal poverty level

More Information: http://www.richmondgov.com/PublicUtilities/documents/MetroCare_Water_Assistance_Program_Regulations.pdf
http://www.ci.richmond.va.us/PublicUtilities/documents/Metrocare_Water_Assistance_Program.pdf

Extra Information from Website

Program Name: Special Payment Agreement Plans

Households Targeted: No household type specified. This is the only description on the website: "If you're facing financial difficulty and need a special payment plan, call 804-646-5700."

Program Type: Flexible Terms

Program Description: N/A

Eligibility: Anyone can apply who is "facing a financial difficulty."

Program Name: Senior Care Program

Households Targeted: seniors (none specified on website)

Program Type: Flexible Terms

Program Description: includes energy bill waivers and no late fees for utility bills

Eligibility: seniors

Metro Water Services

Website: <http://www.nashville.gov/Water-Services/Customers/Assistance-and-Protection-Programs.aspx#flexiblepayment>

Service Area: City of Nashville, Davidson , Rutherford and Willianson Counties, TN

Any information on Customer Assistance online? (Y/N) Y

Contact: 615-862-4600

Number Participating: N/A

Population Served: 599,595

Program Name: Deferred Due Date Program

Program Type: Flexible Terms

Program Description: Permits qualified residential and not-for-profit commercial customers to extend their payment date, with payment due on the eighth day of the month following the billing date or 15 days from the bill date, whichever provides the most number of days to pay the bill. This allows qualified customers to delay payment until after they receive one of the benefits covered under this program.

Eligibility: Must be a residential customer. Must only request for primary residence. Have an account in good standing at time of the application. Not-for-profit commercial customers must provide proof of 501(C)(3) status and have an account in good standing at time of the application.

Metropolitan St. Louis Sewer District

Website: <http://www.stlmsd.com/customer-service/rate-information/customer-assistance-program>
<http://www.stlmsd.com/our-organization>

Service Area: "All of St. Louis City and 90% of St. Louis County, with Highway 109 as general western boundary and the three major rivers: Missouri, Mississippi, and Meramec as boundaries."

Any information on Customer Assistance online? (Y/N) Y

Contact: Theresa Bellville, Assistant Director of Finance, 314-768-6229

Number Participating: 4,000

Population Served: 1,300,000

Program Name: Customer Assistance Program

Households Targeted: Low-Income, Low-Income Seniors, Low-Income Disabled Persons

Program Type: Bill Discount

Program Description: Provides a 50% sewer rate reduction to qualified low-income, senior, and disabled customers

Eligibility: Must meet one of the following criteria: 1) Annual income for previous year must be less than 200% of the most recent U.S. Department of Health and Human Services (HHS) poverty guidelines starting at \$23,540 for 1 person per household to \$81,780 for 8 persons per household (\$8,320 for each additional person), or 2) Disabled citizens and seniors must earn less than 250% of the most recent HHS poverty guidelines starting at \$29,435 for 1 person per household to \$102,225 for 8 persons per household (\$10,400 for each additional person). A customer must also 1) Have liquid assets and real estate valued at less than \$10,000, excluding their residence and automobiles (with the exception of 62+ seniors and disabled individuals), 2) Own and/or reside as a tenant in the property that receives the rate reduction, and 3) Own or live in a single-family residence or multi-unit property up to six units.

Notes from conversation with Theresa: The program serves both single-family customers and multi-family customers in dwellings of 6 units or less that are able to prove that they pay their own sewer bills (e.g. bills included in rent). Theresa emphasized that the policies for cutoffs are based on the Health & Human Services poverty levels--interesting to consider when comparing other programs. Another interesting feature of the program is the fact that there are no consequences for delinquency, because MSD cannot shut off sewer service (they failed to get the necessary cooperation from the Water department). This lack of consequences might explain why MSD has such a robust customer assistance program, as the program ends up bringing in more revenue by encouraging disadvantaged customers to pay some of their bill, rather than failing to pay multiple bills (and having no consequences). Theresa also mentioned several existing initiatives that make program implementation easier, as well as future plans for the program. If you sign up for assistance with delinquencies on your bill, they give you the benefit of the doubt that you had some difficulty, and give you the 50% discount, assuming you were eligible from the point of delinquency. If you have already signed up for the energy assistance program (called Low Income Home Energy Assistance Program, or LIHEAP), you get automatic acceptance into the MSD customer assistance program. If an elderly customer prepares taxes with the help of a certain municipal tax program, the tax people will know the customer's income and be able to help them enroll in the MSD assistance program. Finally, MSD is working on switching their sign-up frequency from every year to once every three years, because the sign-up process is difficult for some elderly and disabled people.

Cleveland Division of Water

Website: <http://www.clevelandwater.com/customer-service/water-rates/discount-programs>

Service Area: Four zones radiating out from the city along the shore of Lake Erie
Any information on Customer Assistance online? (Y/N)

Contact: 888-901-1222
<http://www.clevelandwater.com/customer-service/contact/ask-a-question>

Number Participating:

Population Served: 1,262,955

Program Name: The Homestead Discount Program
Households Targeted: Low-Income Seniors, Low-Income Disabled Persons
Program Type: Bill Discount
Program Description: Provides a lower fixed charge and consumption rate on water bill.

Eligibility: At least 65 years of age, or totally and permanently disabled; own and live at the property; income less than \$32,500.

More Information: <http://www.clevelandwater.com/customer-service/water-rates/discount-programs>

Program Name: The Affordability Program
Households Targeted: Low-Income
Program Type: Bill Discount
Program Description: Offers a 40% discount on all standard water charges. This includes both the quarterly fixed cost recovery charge and the consumption charge. Customers enrolled in this program are automatically enrolled in Northeast Ohio Regional Sewer District's affordability program (wastewater). Administered by the Cleveland Housing Network.

Eligibility: Must own and live at the service address; Household income must meet program guidelines starting at \$23,340/year for 1 person per household to \$55,820 for 5 persons per household (\$8,120 for each additional member); contact the Cleveland Housing Network for more information.

Website: <https://www.neorsd.org/customers-service-page/cost-saving-program-new/#HOMESTEAD>

Service Area: see Cleveland tab

Any information on Customer Assistance online? (Y/N) Y

Contact: 216-881-8247

Number Participating: 17,000 (2008 figure)

Population Served: 993,251

Program Name: Homestead Rate Program

Households Targeted: Low-Income Seniors, Low-Income Disabled Persons

Program Type: Bill Discount

Program Description: Offers a rate discount of 40% on wastewater charges to the elderly or disabled

Eligibility: At least 65 years of age; or anyone under 65 who is totally disabled; household income must not exceed \$32,000; customers must own the property in which they live; property must be within the Sewer District's service area.

More Information: <https://www.neorsd.org/save.php>

Program Name: Wastewater Affordability Program

Households Targeted: Low-Income

Program Type: Bill Discount

Program Description: Offers a rate reduction of 40% on sewer charges. Customers enrolled in this program are automatically enrolled in Cleveland Division of Water's affordability program (drinking water).

Eligibility: Household income at or below 200% of the federal poverty guidelines starting at \$23,540/ year for 1 person per household to \$56,820/ year for 5 persons per household (\$8,320 for each additional member).

More Information: <http://www.chnnet.com/media/documents/wap-application.pdf>

Program Name: Sewer Crisis Assistance Program

Households Targeted: Financial Hardship

Program Type: Temporary Assistance

Program Description: Offers credit of 50% of the outstanding sewer balance (up to \$300) to customers once in a 12-month period. Administered by the Cleveland Housing Network.

Eligibility: Must have experienced an emergency in the past 6 months such as major medical expenses not covered by any other source (e.g., jobless, separation/divorce, or death of a household member). Has not received assistance within the last 12 months. Contact the Cleveland Housing Network for more information.

More Information: <https://www.neorsd.org/save.php>

City of Dallas

Website: http://dallascityhall.com/departments/waterutilities/Pages/water_helping_others.aspx

Service Area: City of Dallas and 27 other communities

Any information on Customer Assistance online? (Y/N) Y

Contact: 214-670-3146

214-651-1441

Number Participating: N/A

Population Served:

1,253,000

Program Name: Operation WaterShare

Program Type: Temporary Assistance

Program Description: Provides temporary financial assistance for customers having difficulty paying their current water/sewer bill. Funded in part through customer donations.

Eligibility: Must contact Dallas Water Utilities' Operation WaterShare to determine eligibility

Program Name: Minor Plumbing Repair Program

Program Type: Water Efficiency

Program Description: Provides free assistance with minor plumbing repairs and fixture replacement to reduce water waste and high water bills to low-income customers. Plumbing problems that qualify include leaking toilets, faucets, and showerheads; outdoor hose bib leaks; and easily accessible pipe joint leaks.

Eligibility: Customer of Dallas Water Utility. Must be homeowners and reside on their property. Household income must meet U.S. Department of Housing and Urban Development's low-income guidelines.

Boston Water and Sewer Commission

Website: <http://www.bwsc.org>

Service Area: City of Boston, MA

Any information on Customer Assistance online? (Y/N) Y

Contact:

Number Participating: N/A

Population Served: 1,021,590

Program Name: Discounts for Senior Citizens and Disabled Persons

Households Targeted: Senior Citizens and Disabled Persons

Program Type: Bill Discount

Program Description: Offers a bill discount of 30% on water charges to the elderly or disabled

Eligibility: At least 65 years of age; or who is fully disabled; customers must own the property in which they live; property must be one to four family home; applies only to water bill, not sewer

More Information: http://www.bwsc.org/SERVICES/billing_assistance/discounts.asp

Program Name: Payment Plans

Households Targeted: All Customers

Program Type: Payment Plans

Program Description: Allows customers to pay water and sewer bills over time

Eligibility: All customers are eligible

More Information: http://www.bwsc.org/SERVICES/billing_assistance/payment_plans.asp

South Central Connecticut Regional Water Authority (RWA)

Website: <http://www.bwsc.org>

Ansonia, Bethany, Branford, Cheshire,
Derby, East Haven, Hamden, Milford,
New Haven, North Branford, North
Haven, Orange, Seymour, West Haven

Service Area: and Woodbridge

Any information on Customer Assistance online? (Y/N) Y

Contact: Rochelle Kowalski, Vice President of Finance, 203-401-2527

Number Participating: N/A

Population Served: 430,000

Program Name: Residential Water Assistance Program

Households Targeted: Economically Disadvantaged

Program Type: Temporary Assistance

Program Description: Eligible customers receive a one-time
Residential Water Assistance grant of up
to \$80, applied directly to their water
bills.

Eligibility: Residential; Total gross household
income at or below 125% of the Federal
Poverty Income Guidelines.

More Information: <http://www.rwater.com/customer-care/residential-water-assistance-program>

Peer Utility Rate Structure Matrix

Utility	W, WW or Both	Number of Accounts	Water Volume Rate Structure	Wastewater Volume Rate Structure	Fixed Charges	Year Implemented	Comments
Charlotte Water	Both	W - 250,000 WW-240,000	Residential - 4 Tier Inclining Block Non-Residential – Uniform Irrigation - 2 tier Inclining Block	Uniform Volume Rate	Water Availability Fee by meter size Water Fixed Fee Sewer Availability Fee by meter size Sewer Fixed Fee	3 tier inclining block structure implemented in 1994. The tier cut-offs were modified in 2001. A fourth tier was added in 2008	The inclining block structure was implemented to promote conservation. The first and lowest tier (0–18 Ccf per month) covered essential water uses related to health and sanitation (e.g. consumption, bathing, washing clothes, cooking, etc.) The second tier (19–40 Ccf per month) was a higher rate and applied to higher water usage normally associated with substantial, outdoor water uses (e.g. irrigation). The third tier (greater than 40 per month) applied the highest rate to the highest levels of water use. The fourth tier was added in 2008 to strengthen the conservation message and enhance affordability of essential water. The first tier (lifeline) changed to 0–4 Ccf per month to provide low cost water for essential usage, the second tier changed to 5-8 Ccf per month, the third tier changed to 9-16 Ccf, and the fourth tier changed to greater than 16 Ccf per month.
Richmond, VA	Both	62,000 Retail plus wholesale	Uniform rate for all classes	Uniform Rate for all classes	Monthly Service Charge for Water by meter size Monthly Service Charge for Wastewater by meter size	2012	The City had a very complex rate structure with a large fixed charge and unique volumetric rates by customer class. Due to the amount of the fixed charge, the City was under significant pressure to reduce – challenges were coming from both an affordability and conservation standpoint. Both water and sewer fixed charges were reduced, and the City implemented uniform volumetric rates (water and sewer) to reduce complexity and improve customer understanding and acceptance.
Nashville, TN	Both	W -190,000 WW – 200,000	Uniform rate by class	Uniform rate by class	Minimum Charge by meter size with 200 ccf usage allowance	Over 15 years ago.	Information not available
St. Louis MSD, MO	WW	425,000	N/A	Uniform Volume Rate with High Strength Surcharge for Commercial/Industrial	Monthly Base Charge	Information not available	St. Louis MSD’s primary objective is cost based rates. The MSD Charter which was approved by the voters sets forth a number of factors that are required to be addressed in a rate change proposal. They have a governing process that includes a Rate Commission which conducts hearings on proposed rate changes. The Commission operates like a PSC and allows for intervenors. The Commission then presents their findings and recommendations to the Board of Trustees who make the final decision.
Cleveland, OH	W	1,400,000	Two tier inclining block by service area	N/A	Monthly fixed charge by meter size	Information not available	Information not available

Peer Utility Rate Structure Matrix

Greater Cincinnati Water Works	W	255,000	<p>3 tier declining block for commercial customers; 7 tier inclining block rate for residential & commercial customers</p> <p>Outside city rates based on numerous contracts with Hamilton County and other surrounding communities. 0-60 Ccf per quarter; 61-1740 Ccf/quarter; over 1800 Ccf/quarter.</p>	2 tier declining block, same for both monthly and quarterly billing customers	Monthly/Quarterly Service Charge based on meter size.	Current rate structure implemented in 2014. Moving to monthly billing January 2018	<p>Service charge includes recovery of a portion of costs associated with the distribution system. Prior to the increased service charge, only meter and customer service related costs were included in the service charge. Volume charge structure has been in place for many years. GCWW has experienced declining consumption (volume/bill) for the past decade or more and very limited customer growth.</p>
Metropolitan Sewer District of Greater Cincinnati	WW	215,000	N/A	<p>2 tier volume charge. First tier recovers customer related I/I costs not recovered in the minimum charge in addition to uniform volume charge. Second tier = uniform volume charge only.</p>	Minimum charge based on meter size, includes minimum allowance of 9 Ccf (6.73 kgal) for quarterly customers and 5 Ccf (3.74 kgal) for monthly customers.	Basic rate structure in place for decades.	<p>Basic rate structure has been in place for decades. Billing services provided by GCWW for majority of service area. Moving to monthly billing early 2018. Hamilton County approves rates. Several rate resolutions approved by County Commissioners will result in changed rate structure in 2018, including:</p> <ul style="list-style-type: none">) Minimum allowance of 3 Ccf (2.244 kgal) for all customers (monthly). Continued discussion about phasing out minimum allowance in coming years.) Multifamily customers to be billed minimum charge based on meter size only (currently, multifamily customers are billed based on the greater of either meter size or number of units).) Additional rate structure changes are being evaluated for future years. <p>MSD has experienced declining consumption (volume/bill) for the past decade or more and very little customer growth.</p>
Northeast Ohio Regional Sewer District (Cleveland, OH)	WW	Serves approximately 1,000,000 people	N/A	Uniform rate by service area	Monthly fixed fee	Information not available	<p>NEORSRD had a minimum charge including 1 Mcf per quarter. A meaningful amount of customers were using significantly less than the minimum allowance, so they implemented a pure base charge (called a fixed cost recovery charge) that included customer service and related costs and a small portion of infiltration and inflow (wet weather costs were a huge factor for NEORSRD).</p>
Fairfax County Water Authority	W	Provides service to approximately 2 million people	Charge for Established Accounts - The charge per 1,000 gallons of water used in		Monthly/Quarterly Billing Service Charge - based on meter size. The charge for	Current rates Effective April 2017	Information not available

Peer Utility Rate Structure Matrix

			<p>the previous three months. Established accounts may be subject to a peak use charge.</p> <p>Charge for New Accounts - The charge per 1,000 gallons of water used in the previous three months. New customers pay a higher rate because they are not charged for their peak use until they establish their winter quarter consumption.</p> <p>Peak use charge - applied (during billing periods ending in June through November) to water consumption that is 1.3 times the Winter Quarter Consumption or 6,000 gallons above the Winter Quarter Consumption, whichever is greater.</p>		apartments, commercial, and municipal accounts also includes a fee to offset the cost of cross connection plumbing inspections.		
Fairfax County Wastewater	WW	367K accounts; Approx. 1M (population) on County Sewer System	N/A	Uniform volume charge for all volume above 5 Kgal.	Base charge including up to 5Kgal of volume. Different Residential base charge, Non-residential base charge, and Apartment base charge (charged by unit).	July 1, 2017	Residential billed quarterly, Multi-family and Non-residential billed monthly. Frontage charge also assessed.
Boston Water & Sewer Commission, MA	Both	90,000	Six tier inclining block for all classes	Six tier inclining block for all classes	None	BWSC had a declining block structure prior to 1977. From 1977 to 1985, BWSC had a uniform rate structure. In 1985, BWSC implemented an inclining block structure, for both water and sewer	Inclining block rate structure was implemented in 1986 in order to provide a conservation incentive. First 10 tiers, and now 6. Consumption has decreased since its implementation, but it is difficult to correlate this decrease solely, or even primarily, with the inclining block rate structure.
South Central Connecticut Regional Water Authority (RWA)	W	116,202	Uniform rates that differ with respect to meter size and schedule type (i.e. quarterly, monthly, or seasonal)	N/A	Quarterly or monthly fee by meter size		In 2013 they adopted rates by meter size class: small (5/8" and 3/4") @ 3.416/ccf, medium (1"-2") @ \$3.151/ccf, large (3"-6") @ 2.921/ccf, and very large (?6") @ 2.690/ccf. Rates since increased across the board. Goal was to reduce demands and better follow costs for each class as well as consolidating rates for two divisions.

Charlotte Water FY 2018 Rate Schedule

	Water	Sewer
Commercial Fixed Fee	\$3.57	\$3.57
Residential Fixed Fee	\$4.02	\$4.02

		\$/Month	
Availability Fee		Water	Sewer
	5/8" or 3/4" meter	\$3.17	\$7.50
	1" meter	\$7.92	\$18.76
	1.5" meter	\$15.84	\$37.52
	2" meter	\$25.34	\$60.03
	3" meter	\$55.43	\$131.31
	4" meter	\$95.03	\$225.10
	6" meter	\$166.30	\$393.92
	8" meter	\$285.09	\$675.29
	10" meter	\$498.91	\$1,182.00
	12" meter	\$538.51	\$1,276.00

VOLUME CHARGES

		Rate/ccf	
Residential		Water	Sewer
	Tier 1 - 0-4 ccf	\$1.58	\$4.51
	Tier 2 - 5-8 ccf	\$2.04	\$4.51
	Tier 3 - 9-16 ccf	\$4.71	\$4.51
	Tier 4 - >16 ccf	\$8.91	\$4.51

Commercial or Non-Residential Rates		Rate/ccf	
		Water	Sewer
		\$2.73	\$4.51

Irrigation		
	Tier 1 - 1-16 ccf	\$4.71
	Tier 2 - >16 ccf	\$8.91

Richmond, VA FY 2018 Rate Schedule

	\$/Month	
FIXED CHARGES	Water	Sewer
5/8" meter	\$14.56	\$17.51
3/4" meter	\$19.75	\$23.36
1" meter	\$30.13	\$35.07
1.5" meter	\$56.05	\$64.33
2" meter	\$87.17	\$99.42
3" meter	\$170.15	\$193.02
4" meter	\$263.49	\$298.34
6" meter	\$522.79	\$590.86
8" meter	\$833.94	\$941.87
10" meter	\$1,196.96	\$1,351.41
Unmetered	\$0.00	\$62.92
VOLUME CHARGES		
All usage	\$4.04	\$7.01

Metro Water (Nashville, TN) FY 2018 Rate Schedule

FIXED CHARGES

Residential

	\$/Month	
	Water	Sewer
5/8" meter	\$3.13	\$7.62
3/4" meter	\$10.62	\$21.63
1" meter	\$12.77	\$26.05
1.5" meter	\$18.77	\$38.29
2" meter	\$25.29	\$51.57
3" meter	\$33.38	\$68.04
4" meter	\$54.41	\$110.88
6" meter	\$85.42	\$174.12
8" meter	\$133.59	\$272.29
10" meter	\$133.59	\$272.29

Small Commercial

	\$/Month	
	Water	Sewer
5/8" meter	\$3.98	\$8.51
3/4" meter	\$11.32	\$24.22
1" meter	\$13.63	\$29.17
1.5" meter	\$20.03	\$42.89
2" meter	\$26.97	\$57.75
3" meter	\$35.61	\$76.21
4" meter	\$58.03	\$124.18
6" meter	\$91.12	\$195.01
8" meter	\$142.50	\$304.96
10" meter	\$142.50	\$304.96

Intermediate Commercial

	\$/Month	
	Water	Sewer
5/8" meter	\$13.85	\$27.89
3/4" meter	\$19.64	\$39.55
1" meter	\$21.51	\$43.33
1.5" meter	\$26.71	\$53.81
2" meter	\$32.63	\$65.73
3" meter	\$40.84	\$82.26
4" meter	\$64.65	\$130.22
6" meter	\$99.81	\$201.05
8" meter	\$155.38	\$312.96
10" meter	\$155.38	\$312.96

Large Commercial

	\$/Month	
	Water	Sewer
5/8" meter	\$597.23	\$1,076.37
3/4" meter	\$603.69	\$1,088.01
1" meter	\$605.80	\$1,091.79
1.5" meter	\$611.60	\$1,102.25
2" meter	\$618.22	\$1,114.18
3" meter	\$624.04	\$1,124.65
4" meter	\$650.65	\$1,172.65
6" meter	\$689.96	\$1,243.48
8" meter	\$755.41	\$1,361.43
10" meter	\$755.41	\$1,361.43

VOLUME CHARGES

	\$/ccf*	
	Water	Sewer
Residential	\$2.33	\$4.74
Small Commercial	\$2.48	\$5.30
Intermediate Commercial	\$2.14	\$4.32
Large Commercial	\$1.81	\$3.26

* - Volume charge applied to all consumption above 2 ccf

St. Louis MSD FY 2018 Rate Schedule

FIXED CHARGES

Base Charge		Sewer \$/Month
	Residential	\$19.46
	Commercial/Industrial	\$19.46

VOLUME CHARGES

Metered Volume		\$/ccf
	Residential	\$3.59
	Commercial/Industrial	\$3.59

High Strength Surcharge		\$/ton
	Suspended solids over 300 mg/liter	\$262.00
	Biodegradable oxygen demand over 300 mg/liter	\$654.00
	Chemical oxygen demand over 600 mg/liter	\$327.00

Cleveland FY 2018 Rate Schedule

FIXED CHARGES

	Water \$/Month
5/8" to 1" meter	\$9.00
1 1/2" to 2" meter	\$17.65
3" to 4" meter	\$60.00
6" meter	\$106.65
8" meter	\$160.00
10" meter	\$203.35
12" meter	\$243.35
Homestead	\$5.65

VOLUME CHARGES

City of Cleveland

Tier 1 - 0 - 0.2 MCF*	\$19.26
Tier 2 - > 0.2 MCF	\$32.74
Homestead**	\$12.52

Low or 1st High Service Suburbs

Tier 1 - 0 - 0.2 MCF*	\$25.04
Tier 2 - > 0.2 MCF	\$42.56
Homestead**	\$16.27

2nd High Service Suburbs

Tier 1 - 0 - 0.2 MCF*	\$30.82
Tier 2 - > 0.2 MCF	\$52.39
Homestead**	\$20.03

3rd High Service Suburbs

Tier 1 - 0 - 0.2 MCF*	\$35.63
Tier 2 - > 0.2 MCF	\$60.57
Homestead**	\$23.16

* MCF = 1,000 cubic feet

** Homestead - Elderly assistance rate

Greater Cincinnati Water Works Rate Schedule FY 2018

WATER

Residential Service Charges Per Quarter

	Inside Cincinnati	Incorporated Hamilton & Clermont Counties	Unincorporated Hamilton County	Butler & Warren County
5/8" meter	\$18.88	\$21.17	\$22.52	\$24.34
3/4" meter	\$23.21	\$25.34	\$26.96	\$29.14
1" meter	\$29.25	\$31.19	\$33.19	\$35.87
1.5" meter	\$60.03	\$64.77	\$68.91	\$74.48
2" meter	\$84.92	\$90.99	\$96.81	\$104.64

Residential Water Volume Charges Per Quarter (\$/ccf)

	Inside Cincinnati	Incorporated Hamilton & Clermont Counties	Unincorporated Hamilton County	Butler & Warren County
0-60 ccf	\$2.58	\$3.23	\$3.44	\$3.71
61-1800 ccf	\$2.17	\$2.71	\$2.88	\$3.12
1800+ ccf	\$1.93	\$2.41	\$2.57	\$2.77

Commercial Service Charges Per Month

	Inside Cincinnati	Incorporated Hamilton & Clermont Counties	Unincorporated Hamilton County	Butler & Warren County
3" meters	\$70.71	\$76.15	\$81.03	\$87.58
4" meters	\$133.00	\$145.86	\$155.19	\$167.74
6" meters	\$266.56	\$292.41	\$311.12	\$336.27
10" meters	\$543.17	\$597.42	\$635.65	\$687.03
12" meters	\$646.52	\$714.36	\$760.08	\$821.51

Commercial Volume Charges Per Month (\$/ccf)

	Inside Cincinnati	Incorporated Hamilton & Clermont Counties	Unincorporated Hamilton County	Butler & Warren County
0-20 ccf	\$2.58	\$3.23	\$3.44	\$3.71
21-600 ccf	\$2.17	\$2.71	\$2.88	\$3.12
600+ ccf	\$1.93	\$2.41	\$2.57	\$2.77

SEWER

Base Charge

Meter Size (in.)	Number of Family Units	Monthly Bills	Quarterly Bills
5/8"	1	\$ 57.11	\$ 117.35
3/4"	2-3	\$ 68.49	\$ 151.32
1"	4-5	\$ 88.14	\$ 207.44
1.5"	6-12	\$ 135.90	\$ 352.51
2"	13-20	\$ 187.29	\$ 499.33
3"	21-50	\$ 459.03	\$ 1,281.49
4"	51-115	\$ 760.08	\$ 2,122.30
6"	116-250	\$ 1,487.10	\$ 4,193.17
8"	250+	\$ 2,210.47	\$ 6,256.78
10"	250+	\$ 2,970.50	\$ 8,360.75
12"	250+	\$ 3,458.83	\$ 9,653.24

Commodity/Volume Charge

Monthly Billing Customers

	\$/ccf
5-50 ccf	\$5.88
50+ ccf	\$4.70

Quarterly Billing Customers

	\$/ccf
9-150 ccf	\$5.88
150+ ccf	\$4.70

NEORSD FY 2018 Rate Schedule

FIXED CHARGES

	\$/Month
Cost Recovery Charge	\$4.95

VOLUME CHARGES

Location-based Volume Charges	\$/MCF
Cleveland Regular	\$88.40
Cleveland Affordability/Homestead**	\$53.05
Suburbs Regular	\$89.60
Suburbs Affordability/Homestead	\$53.85

* MCF = 1,000 cubic feet

** Homestead - Elderly assistance rate; Affordability refers to customer assistance program

Fairfax County, VA Rates for FY 2018

Water Base Charge

Quarterly Customers

Meter Size	Single Family/Townhouse	Multi-Family Residence, Commercial, Industrial or	
		Municipal	
5/8" meter	\$12.20		\$13.95
3/4" meter	\$13.00		\$16.50
1" meter	\$14.05		\$19.90
1.5" meter	\$18.30		\$30.00
2" meter	\$20.05		\$38.75
3" meter	\$0.00		\$87.85
4" meter	\$0.00		\$137.85
6" meter	\$0.00		\$244.50
8" meter	\$0.00		\$570.90
10" meter	\$0.00		\$658.15

Monthly Customers

Meter Size	Single Family/Townhouse	Multi-Family Residence, Commercial, Industrial or	
		Municipal	
5/8" meter	N/A		\$4.65
3/4" meter	N/A		\$5.50
1" meter	N/A		\$6.63
1.5" meter	N/A		\$10.00
2" meter	N/A		\$12.92
3" meter	N/A		\$29.28
4" meter	N/A		\$45.95
6" meter	N/A		\$81.50
8" meter	N/A		\$190.30
10" meter	N/A		\$219.38

Commodity Charge

\$/1000 gal.

A) Quarterly customers with accounts existing during the whole of the preceding winter quarter billing period (Feb.-Apr.)	\$2.81
B) Quarterly customers with accounts established during or after the preceding winter quarter billing period (Feb.-Apr.)	\$2.96
C) Monthly customers with accounts existing during the whole of the preceding winter quarter billing period (Feb.-Apr.)	\$2.81
D) Monthly customers with accounts established during or after the preceding winter quarter billing period (Feb.-Apr.)	\$2.96

Additional Peak Use Charge

\$/1000 gal.

A) For all consumption by customers identified in A above in the June through November billing periods exceeding the greater of (1) 1.3 times the preceding winter quarter consumption or (2) 6,000 gallons above the preceding winter quarter consumption	\$3.80
B) For all consumption by customers identified in C above in the June through November billing periods exceeding the greater of (1) 1.3 times the preceding winter quarter consumption or (2) 6,000 gallons above the preceding winter quarter consumption	\$3.80

Dallas Water Utilities 2017 Rate Schedule

CUSTOMER CHARGE	WATER	SEWER
5/8 Inch Meter	\$5.25	\$4.70
3/4 Inch Meter	\$7.26	\$6.44
1 Inch Meter	\$10.56	\$9.35
1 1/2 Inch Meter	\$19.66	\$17.99
2 Inch Meter	\$31.98	\$28.35
3 Inch Meter	\$74.90	\$68.52
4 Inch Meter	\$124.44	\$109.56
6 Inch Meter	\$247.11	\$215.64
8 Inch Meter	\$411.31	\$359.97
10 Inch Meter	\$631.58	\$565.59

USAGE CHARGE per 1,000 gallons* WATER SEWER

RESIDENTIAL

Up to 4,000 gallons	\$1.90	\$5.31
4,001 to 10,000 gallons	\$4.25	\$5.31
10,001 to 15,000 gallons	\$6.03	\$5.31
Above 15,000 gallons	\$8.55	\$5.31

GENERAL SERVICES

Up to 10,000 gallons	\$3.65	\$4.08
Above 10,000 gallons	\$3.91	\$4.08
Above 10,000 gallons & 1.4 times annual average monthly usage	\$5.94	\$4.08

OPTIONAL GENERAL SERVICES

1st million gallons or less (minimum)	\$2,192.92	\$3.65
Above 1 million gallons (per 1,000 gallons)	\$3.03	\$3.65
Sewer Metered Separately		\$3.73

** Sewer Charges for residential accounts are calculated on an average of the water billed in December, January, February and March (40,000 gallons maximum) or the actual month's water consumption, whichever is less. Sewer charges for general services and optional general services accounts are based on the month's water consumption unless sewer is metered separately. Industrial wastewater discharges containing concentrations of BOD and/or Suspended Solids greater than 250 milligrams per liter are assessed sewer surcharges. Certain commercial users such as restaurants, bars/lounges, small food processors*

Boston Water & Sewer Commission FY 2017 Rate Structure

Consumption (cubic ft/day)	Water		Sewer	
	per 1000 cubic ft.	per 1000 gal.	per 1000 cubic ft.	per 1000 gal.
0-19	\$ 49.36	\$ 6.599	\$ 69.43	\$ 9.282
20-39	\$ 51.67	\$ 6.980	\$ 71.57	\$ 9.568
40-89	\$ 53.81	\$ 7.193	\$ 73.02	\$ 9.762
90-349	\$ 57.21	\$ 7.648	\$ 77.03	\$ 10.298
350-1299	\$ 59.69	\$ 7.980	\$ 81.29	\$ 10.868
>1299	\$ 61.78	\$ 8.260	\$ 84.09	\$ 11.242

South Central Connecticut Regional Water Authority (RWA) 2017 Rate Schedule

Quarterly Rates

Meter Size	Service Charge	Per 100 ccf
5/8" meter	\$ 57.43	\$ 3.942
3/4" meter	\$ 67.01	\$ 3.942
1" meter	\$ 88.57	\$ 3.635
1.5" meter	\$ 134.06	\$ 3.635
2" meter	\$ 203.53	\$ 3.635
3" meter	\$ 595.24	\$ 3.370
4" meter	\$ 893.39	\$ 3.370
6" meter	\$ 1,671.71	\$ 3.370
8" meter	\$ 2,725.41	\$ 3.103
10" meter	\$ 3,874.93	\$ 3.103
12" meter	\$ 5,024.88	\$ 3.103
Privately Owned	\$ 19.10	

Monthly Rates

Meter Size	Service Charge	Per 100 ccf
5/8" meter	\$ 31.87	\$ 3.942
3/4" meter	\$ 35.07	\$ 3.942
1" meter	\$ 42.24	\$ 3.635
1.5" meter	\$ 57.41	\$ 3.635
2" meter	\$ 80.57	\$ 3.635
3" meter	\$ 211.13	\$ 3.370
4" meter	\$ 310.51	\$ 3.370
6" meter	\$ 569.96	\$ 3.370
8" meter	\$ 921.17	\$ 3.103
10" meter	\$ 1,304.20	\$ 3.103
12" meter	\$ 1,687.67	\$ 3.103
Privately Owned	\$ 19.10	

Seasonal Rates (Summer Season from April 1-November 1)

Meter Size	Service Charge	Per 100 ccf
5/8" meter	\$ 287.15	\$ 6.448
3/4" meter	\$ 335.07	\$ 6.448
1" meter	\$ 442.85	\$ 6.448
1.5" meter	\$ 670.35	\$ 6.448
2" meter	\$ 1,017.69	\$ 6.448
3" meter	\$ 2,976.55	\$ 6.448
4" meter	\$ 4,467.60	\$ 6.448